Effective business strategies for energy service companies in the East Asian business environment.

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EFFECTIVE BUSINESS STRATEGIES FOR ENERGY SERVICE COMPANIES IN THE EAST ASIAN BUSINESS ENVIRONMENT

(I)

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Military action is of vital importance to the state. It is a matter of life and death, a road either to safety or to ruin. Hence it is a subject of inquiry which can on no account be neglected.

In warfare, first lay plans which will ensure victory, and then lead your army to battle; if you will not begin with stratagem but rely on brute strength alone, victory will no longer be assured.

If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle.

- **By Sun Zi (around 476 BC), *The Art of War***

ABSTRACT

This study investigates effective business strategies for energy service companies in the East Asian business environment. The research purpose has three foci. First, it seeks to examine the dominant business environment conditions that impact upon the oil and gas service sector in China, and to a lesser extent, Singapore and Malaysia. Second, the study investigates business strategies adopted by oil and gas service companies in response to the business environment in which they operate. Third, the study seeks to evaluate the reliability of strategic theoretical frameworks based on Western business practice but applied in a non-Western business environment like East Asia.

Ten main propositions were formulated for empirical research. They are all related to the research objectives. Pilot fieldwork had been carried out between December 2000 and February 2001 in China. Data were collected through a questionnaire survey addressed to senior executives of oil and gas service organisations in the above three countries and 98 organisations participated in the survey. A number of statistical procedures like descriptive statistics, univariate statistics and bivariate analysis were applied. Various nonparametric techniques such as Spearman correlations, the chi-square test, the Kruskal-Wallis test and the Mann-Whitney test were utilised for data analysis. In addition, analysis of variance (ANOVA) was used to compare the differences or similarities in the three countries. In the light of empirical evidence, some propositions were shown to be well grounded whereas the others were not.

The business environment for the service sector in East Asia is found to be slightly uncertain, with the lowest level in China and the highest level in Singapore. Although the business environment is complex and dynamic in each country, the environmental conditions are predictable and attractive to oil and gas service companies. It is found that, in each of the selected countries, organisations can be classified into five strategic orientations, namely, Balancer, Analyser, Defender, Prospector and Reactor. In general, competitive strategies pursued by the service organisations comprise four categories, with Differentiation and Hybrid as the majority, Low-cost as the minority and with quite a few falling into a Non-purpose

group. Five strategically competitive positions can also be classified for the participating organisations. Notably, in each country, the majority of the participating organisations had improved their strategic performance over the five-year period examined.

Regardless of the types of strategies, a higher strategic performance is associated with a lower level of perceived environmental uncertainty. Different categories of strategic options do not show differences in the perceptions of perceived environmental uncertainty but do show differences in relation to strategic performance. Analysers or Balancers yield a better strategic performance than Reactors; Differentiation or Hybrid organisations outperform Low-cost organisations; and a strategic position of low customer added value with a high price level is doomed to have a poor strategic performance.

The significance of the research findings is important for senior executives in both Western and Eastern organisations who wish to enhance effectively the strategic competency of their businesses so that they may survive long-term in East Asia.

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Over two hundred senior executives of energy service organisations from Asia, Europe and America had taken part in the empirical research and 24 Chinese executives participated in the pilot fieldwork. At the early stage of this study, I received advice from a number of industrial experts. Without whose contributions, the achievements in this study could never have been made. Need for anonymity prevents me from listing them individually.

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CHAPTER 1
INTRODUCTION

1. 1 Research Rationale

The importance of understanding the business environment and adapting strategy to enable an organisation to achieve a high standard of performance is widely acknowledged in strategic management literature. Business strategy theory has largely been based on research into organisations that operate in a Western business environment. Consequently, it may have little practical application in East Asia, which is a major centre of oil and gas industry activity.

Strategic management theories and practices stress that understanding the business environment is essential in every organisation's life. Early in the 1950s, organisational theorists started to investigate organisation-environment interaction and they have found that the views of managers play a central role in learning about environment (Tung, 1979). Managers are encouraged to become more responsive to the dictates of the external environment and are required to scan and assess environment conditions when making strategic decisions. Environmental assessment implies identifying and evaluating how and why current and projected environment changes affect or will affect the strategic management of the organisation (Fahey and Narayanan, 1986). Assessment attempts to investigate what key issues are presented by the environment and what the implications of the issues are for the organisation. Accurate assessment of the environment by managers may help bring about more effective strategies and thereby higher performance for long-

term success (Downey and Slocum, 1975; Hambrick, 1982; Daft, et al., 1988; Hegarty and Tihanyi, 1999).

According to Johnson and Scholes (1999),

> Managers face difficulties in trying to understand the environment. "The environment" encapsulates many different influences; the difficulty is making sense of this diversity in a way which can contribute to strategic decision making. Identifying very many environmental influences may be possible, but it may not be much use because no overall picture embers of really important influences on the organisation.

Some of the macro-environmental influences are commonly seen as important to organisations. The examples of environmental influences may include government action and restructuring, economic conditions, social-cultural, technology, ecology, demographics, labour market, capital markets and suppliers. Strategies are affected by such influences (Johnson and Scholes, 1999). For instance, cultural factors may affect managerial style and the applications of strategy in an East Asian environment. Especially in China, social networks have strong impacts on manager's decisions and hence affect strategic effectiveness (Warner, 2000). "Guanxi" (personal relationship), for instance, has proved to be very important in securing a business success as "guanxi" can increase trust (Tan, 2001) in this country.

Rees and Porter (2001) suggest, "National culture can be shaped by many factors. These include history, religion, geography and climate. These in turn shape the behaviour of people, including the way they communicate with one another". Scholars such as Hofstede (1994) saw religious and philosophical values as helping explain economic success in many South East Asian countries. National culture can be identified as one of the factors that determines organisational structure and has an impact on managerial style (Rees and Porter, 2001). In his work, Hofstede (1994, 2001) identified initially four dimensions (i.e. power distance, uncertainty avoidance, individualism versus collectivism and masculinity versus femininity) for classifying

key national differences that affect work behaviour. He has also identified a fifth factor – Confucianism.

In his book, Paludan (1998) argues that Confucius (551-479 BC) gave China one of the most durable moral-political philosophies ever devised by man. His ideas became the cornerstone of the imperial system and still exert influence in Asia today. According to Paludan (1998), Confucius' emphasis on education provided the ruler with an official class with a common educational background stressing morality, moderation and respect of authority. Daoism was concerned with individual's relationship to nature and the other world. A main Daoist text is the Da De Jing (The Way and Power Classic) attributed to Lao Zi (believed to have lived in the 6th century BC). Daoist doctrines are diffuse, embodying local cults and animistic beliefs, and its fundamental tenet – the existence of a single cosmic force which animated all matter - led to an ideal which complemented but was almost diametrically opposed to Confucianism. "The Daoist ideal was to merge like a drop of water in the ocean, and where Confucians preached duty, Daoists urged no-action, harmony depending on acceptance of the Way. For most Chinese, the two philosophies were seen as complementary rather than opposites. A Confucian official could well be a Daoist in private or in retirement"(ibid.). This can also be applicable for businessperson in China.

Low (2000) asserts that, more than 2,000 years ago, Chinese people had already confronted and dealt with the same issues as encountered in business today. Nowadays, as China is the home nation of Sun Zi, the world's first acknowledged strategist, his book "The Art of War" is still the number one handbook for Chinese business people when they generate strategies or business tactics. The business strategies and management structures of the ethnic Chinese companies throughout East Asia were very much based upon traditional Chinese strategic philosophies and their strategic

practices were "imported" from China (Yeung, 1999). The family-based decision structures with extended business networks, conglomerate-style diversification, forward and backward vertical integration and acquisition emerge as predominant strategies of the ethnic Chinese firms. Managers may need to adapt to regional or local culture within their own or another country as well as to adapt to national culture. "When considering theories of motivation and seeking to improve employee motivation via reward structures or redesigned jobs, the potential impact of national culture needs to be taken into account" (Rees and Porter, 2001). This can also be true whilst making strategic decisions. In turn, a research orientation emerges as researchers can study which strategies are more likely to be chosen in different national cultures based on, for example, Hofstede's (1994, 2001) terminology.

Nonetheless, according to Johnson and Scholes (1999), environmental forces which are especially important for one organisation may not be the same for another; and, over time, their importance may change. A multinational corporation might be especially concerned with government relations and understanding the policies of local governments, since it may be operating plants or subsidiaries within many different countries with different political systems. A retailer, on the other hand, may be primarily concerned with cultural related issues such as local customer tastes and behaviour. An oil and gas related company is likely to be concerned with its technological environment which leads to product or service differentiations. In this sense, environmental analysis involves efforts to identify key issues.

The preliminary investigation (Appendix E2) helped this researcher to identify the economic, technological and political conditions as predominant influences because more than 90 per cent of 111 executives from oil and gas service firms perceived they were

important in a way affecting their businesses in East Asia. In this investigation, the result reveals that nearly half of these 111 executives (48 per cent) thought the socio-cultural conditions were not important influences affecting their East Asian businesses. It is for this reason the examination of socio-cultural factors was not highlighted in this study. Nevertheless, this researcher remained aware of the significance of these issues in the geographical area under review. It is deemed appropriate to make one extra point here. As Johnson and Scholes, (1999) have said that none of the environmental forces will remain constant and managers need to be aware of their changing impact, other macroenvironmental factors which have not been covered in this study can be investigated in future work.

With regard to strategy, its literature can be divided into two areas: one deals with the concepts of strategy in the East and the other focuses on strategy development in the West. Of these two areas, work conducted by Western strategists on strategy development is far more extensive. Much of this work is about the content of strategy, both in terms of conceptual frameworks and empirical evidence. The exact definitions of the strategy concept differ between Western and Eastern strategic theorists or strategists. However, what is never in question is the key attribute of strategy: the means of achieving a strategic goal. Basic doctrines about strategy – for instance, its importance to a firm's long-term success, the components of strategy and levels of strategy – receive almost universal acceptance (Hawkins, 1995). In a Western context, a large amount of work has been carried out in some key areas such as the strategy types an organisation can pursue and the organisational levels at which these strategies should be implemented.

Strategy is formulated not only by external environmental forces but also internal environmental factors. The distinctive strategic analysis

is in relation to an understanding which needs to be considered in terms of the resource base and competences of the organisation (Johnson and Scholes, 1999). This refers to the so-called internal environment analysis (McNamee, 1992). In analysing the internal environmental factors, a company can be evaluated by investigating issues pertaining to organisational behaviour, organisational structure and management effectiveness. The behavioural analysis encompasses an understanding of missions, goals or objectives, organisational culture, leadership and strategy. Organisational structure includes informal and formal arrangements. Organisations may be nominally independent but in practice not so. This can be because of factors such as the influence and deference to the state and political influences and expectations as well as the networks of contacts. The strategy may be appropriate but this may be of little use if the structure is wrong and/or the management is ineffective.

In China, after the completion of industrial re-construction, actual strengths - for example, management levels, safety consciousness and technology - will become more essential for service organisations. Not surprisingly, firms in China display distinctive business strategies that dazzle and bewilder the outside world (Peng, et al. 2000). For several decades, the Chinese economy has exhibited enviable growth. Since the growth of the economy boils ultimately down to the growth of the firm, some researchers like Peng, et al. (2000) believe that firms in this region must have employed strategies that have led to such performance. However, according to a Chinese industrial informant, despite real strengths, some state owned Chinese companies within the oil and gas industry may fail to perform well and their business development competences still need to be improved due to improper strategic settings within the organisations. In many indigenous Chinese companies, there are no systematic or articulated strategies and no formal strategic planning process. If these do exist, then it is only at the business or functional

levels (Tan, 13 August 2000). This existing industrial situation also stimulated the thought that it would be essential to conduct investigations into what business strategies are applied by the service firms in the region of East Asia. The investigations of business strategies formed the second research objective. Other important internal factors such as strategic implementation, strategic control, organisational structure and managerial effectiveness had to be left aside for future research. What is more, whereas joint ventures are concerned with corporate strategies, the objective of this study is to investigate strategies employed by oil and gas service companies at business level. Therefore, particular attention was not paid to joint ventures. Further research pertaining to this interest can also be conducted in the future.

To summarise, in this study, the researcher addresses some of the above concerns by examining the relative effects of the environment on the offshore oil and gas service sector in the selected East Asian countries. The empirical research seeks to study executives' perceptions of the environmental characteristics and their strategic orientations in order to develop, on an empirical basis, environmental and business strategy typologies grounded in organisational and strategic management theory.

1.2 Research Gap

For different industries in different countries, the nature of business environment can mean different things and the strategic directions pursued by firms can be different. How can the business environment be evaluated? What are the general trends of business strategies adopted by existing firms in East Asia? What is the alignment, if any between strategy and environment? These can be three typical issues for senior managers to take into account as they seek to apply better business practice in this region.

Despite most literature on organisational or strategic management theories introducing the concept of the environment, comprehensive analyses or empirical studies of environmental characteristics are limited. Tung (1979) argues that a major obstruction has been how best to describe and conceptualise organisational environments. Most commonly, general environmental uncertainty reflects the nature of the business environment. Integrating the perspectives on organisational uncertainties has been continuously developed.

Some strategy researchers emphasise uncertainties are related to market demand for products or services, product and process technologies, the availability of critical inputs, and strategic actions by competitors and potential entrants (Miller, 1992). Other previous research (Daft, et al., 1988; Tan and Lischert, 1994) uses the environmental dynamism, complexity and hostility to measure the environmental uncertainty. Mintzberg, Ahlstrand and Lampel (1998) suggest that the organisational environment could be static or dynamic, complex or simple, hostile or favourable. Thompson (1967) emphasises that the priority for an organisation is to deal with the uncertain eventualities of the environment, particularly those of the task environment (Dill, 1958). The reliability of an instrument for measuring manager perception on the business environment is still to be developed and tested. Research on managerial perception of the business environment remains an important theoretical and empirical task.

In most large organisations, their corporate strategies and business strategies are usually different; but in some organisations, especially small businesses, their corporate-level strategy and business-level strategy may be the same. In each incidence, it is important to be clear about the basis of strategic option at a business level (Johnson and Scholes, 1999). Miles and Snow's (1978) typology and Porter's

(1980) taxonomy are two of the most widely accepted conceptual frameworks on business strategy (Carter, et al., 1994; Slater and Olson, 2000).

Miles and Snow (1978) propose that organisations develop relatively enduring prototypes of strategic orientations in line with characteristics like the range of products and markets, technology solutions, desired growth pattern and attitude toward change. Researchers such as Hambrick (1982) criticise the Miles and Snow typology on the grounds that it is not the most elaborate framework that could be chosen. Researchers (e.g. Wright, et al., 1995; Croteau and Bergeron, 2001; Parnell, et al., 2000) have not only attempted to classify business strategies into typologies but also studied more effectively relations between strategy and other variables like performance. A common observation is that the more specific the type of business strategy adopted by an organisation, the better the organisational performance.

Porter (1980, 1985) emphasises that the basis of business generic strategy is how customer or client needs can be met best, usually through achieving a certain competitive advantage. A competitive position is the basis on which a business might achieve competitive advantages in its market (Johnson and Scholes, 1999). A number of empirical studies have been conducted to test the validity of Porter's (1980, 1985) generic strategies. Great attention has also been attracted to analysing generic strategies and competitive positions associated with the organisational performance (Yamin et al., 1999).

Although business strategy theory has largely been developed based on research into organisations that operate in a Western business environmental context, little or nothing is known about the strategic solutions needed for oil and gas service companies to survive and prosper long-term in the East Asian business environment.

Particularly, business strategies adopted by such companies operating in East Asia have not been written about in any great depth.

As a result, a clear research gap has been identified. Strategic management theories on the business environment and appropriate business strategies in the oil and gas service sector of East Asian economies like China, Singapore and Malaysia have been rarely written about and appear to be almost completely ignored. For companies seeking long-term success in an emerging market in East Asian countries like China, Singapore and Malaysia, conducting research into the business environment with regard to what effective business strategies they need is essential.

1.3 General Aim and Research Objectives

This research investigates the strategies chosen by the oil and gas service sector in China, Singapore and Malaysia, and the extent to which indigenous business practice can be aligned with that of Western industrialised nations. A general aim guiding this study is to examine the common trends concerning strategic orientations across the existing oil and gas service organisations in the East Asian business environment. In order to achieve the research aim, three main objectives are established in this study.

The first objective is to provide an understanding of the dominant business environmental factors which affect the oil and gas service industry in China and, to a lesser extent, in Singapore and Malaysia.

The second objective is to investigate strategies adopted by oil and gas service companies in response to the business environment(s) in which they operate.

The third objective evaluates, in the light of empirical evidence, the reliability of the assumptions drawn from the literature of strategic theoretical frameworks based upon Western business practice, and applied in a non-Western business environment like East Asia.

1.4 Research Problems and Positioning of Research

In the field of strategic management studies, a better understanding of the principles and significance of the business environment and the types of strategies arising from these principles is required. In line with the aim and objectives as stated above, this research is an empirically based study concerning itself more with the strategic formulation process arising from the narrower fields of strategic management, rather than with a theoretical study of strategic evaluation and implementation. How do managers perceive the business environment sectors and what exactly are the strategies selected by them within the oil and gas service sector in an East Asian context? To assess the feasibility of this study, it will be necessary primarily to ask six questions so that the positioning of this research can be clarified.

First, what elements should one be concerned with in terms of understanding an industry? The researcher believes that the business environmental influences, which are normally introduced in strategic management text books and research, describe a picture of an industry which needs to be understood. These influences include the remote environmental factors, which are normally addressed as political, economic, social and technological (PEST) influences; forces which drive the change in industry structure and competition (Porter, 1985); and the critical operating factors for which firms compete. Porter (1980) also develops a theoretical framework of using competitive strategy as a technique for analysing industries and competitors. Therefore, the investigation of strategies is also

considered as a particular approach of understanding an industry and its business environment. The concept of the business environment will be dealt with in Chapter 4.

Second, what are the differences in terms of strategy or the way of using strategy? Researchers describe different ways to distinguish the nature of strategy. Generally, strategies can be compared in formal and informal (Alexander, 1990), tangible and intangible (Mintzberg, Ahlstrand and Lampel, 1998), realised and intended (Johnson and Scholes, 1999), and implicit and explicit (Pearce and Robinson, 1997) ways. It was not until the late 1980s that Western modern strategic management and strategic theories were introduced into China at an academic level and were little applied in business practice. In fact, "The Art of War" by Sun Zi, an ancient Chinese military scientist, has been regarded as the most significant classical strategic thinking in East Asia (Chen, 1995). Therefore, within the context of this study, strategy is examined by taking both Western and Eastern strategic philosophies into account. More details of strategic concepts will be illustrated in Chapter 5.

Third, what are the common or individual characteristics that can be used to categorise a number of companies? To portray a general picture of the participating organisations, several criteria can be applied to categorise basically a number of companies, including utilising strategy, the industry segmentation in terms of oil and gas industrial end users, ownership structures which reveal the headquarters' national basis, the types of generic business strategies employed.

Fourth, why were mainly China, and to a lesser extent, Singapore and Malaysia selected while the other countries (regions) in East Asia were excluded? Ten different East Asian countries or regions were previously considered for inclusion in this research but only China,

Singapore and Malaysia were selected. The choice of these three countries is based upon the following reasons.

Firstly, in selecting China, Singapore and Malaysia over other East Asian economies, the diversity of survey sites was first reviewed. In the questionnaire-based survey carried out from September to November 1999 by the researcher, most participating Western oil and gas service firms had East Asia built into their future five-year business development plans, in particular, China, Singapore and Malaysia. Secondly, according to the oil and gas industry statistical report (The British Petroleum, 1998; BP Amoco, 2000), China and Malaysia are the most attractive emerging oil Exploration and Production (E&P) markets in East Asia. China alone is a massive marketplace for the energy service industry and the potential market opportunities there are becoming increasingly important to the oil and gas service sector. Most offshore exploration and production activity takes place in Malaysia (Mackay and Adam, 1998). Singapore has significant business environmental advantage in terms of its sound financial situation, economic stability and advanced information technology capability. In addition, thanks to a policy designed to encourage its development as an international oil and gas logistics centre, a large population of foreign service firms use Singapore as an operations hub. Thirdly, research evidence also indicates that these countries are fertile investigation areas in terms of the presence of domestic-based manufacturing plants and service organisations, professional high-tech service companies from North America and Europe, and other foreign companies operating in the selected areas within East Asia. Finally, China will potentially dwarf the US and the European Union to become the third global economy (Wolf, 2003). Undoubtedly, Chinese dominate businesses in East Asia. This researcher, as a Chinese national, enjoys advantages in carrying out and completing the proposed research. The combination of the above points rendered China, and to a lesser extent, Singapore

and Malaysia very suitable sites for empirical research concerning the business environment in the region.

After primary investigation, the other seven were excluded from the study. The reason for this was mainly because of the unstable economic and weak financial situation, in, for example, The Philippines, Thailand and Vietnam; and, in Japan, because of little oil exploration and operating activity as well as language barriers to accessing comparative data. More details are introduced in Chapter 3, which is concerned with the industrial background of this study.

The fifth question is why it has been decided to exclude certain firms (those with an operating age of no more than five years) from the part of analysis? Alexander (1990) says research indicated the best rationale is not to post questionnaires to firms that have been operating for less than seven years in a European context. A similar study (Wilson, 1984) indicates that eight years are an average for a new venture to reach break even with some ventures taking up to twelve years. In the context of the oil and gas service industry, such findings appear not to be valid. Secondary data show that some new firms may be set up as replacements for older ones. In this case, the replaced leaderships might continue business by combining their own strategic experience with strategies already in use. Even a five-year old, reborn and relabelled service firm could generate strategies successfully to enable the firm to outperform competitors. Furthermore, theoretically, a strategy should be made in a long-term sense, normally a minimum of five or ten years. In this study, a firm would be eligible for selection if it had been operating for a minimum of five years in the selected countries. As a result, firms operating for fewer than five years will be excluded from the result analysis on business strategies and the associated strategic performance.

Finally, why has the priority been placed on the upstream offshore oil and gas service sector for the studies? Much previous research has been done, but mainly from the perspective of oil and gas (E&P) firms, with little research conducted to examine the industry by using a strategic theoretical approach. Evidence from existing literature shows that the industry in China and other East Asian countries is at the stage in its introductory and growth cycle where there is ample space to conduct empirical studies. As energy makes a critical contribution to the GDP of the three selected countries, conducting research into oil and gas service activities is crucial. What is more, the upstream oil and gas service sector is considered as a priority in the research because of several particular characteristics. Within the supply chain of the oil and gas industry, the upstream is an essential part as it links directly to major oil clients (oil operators). Most firms are highly specialised and own unique technologies. Large firms and industry leaders are also found to be highly concentrated within this segment. Because of their size and influence over buyers, suppliers and competitors, any changes within this sector would influence the level of service activity in general and alter the industry structure, as well as indicate the status of the whole oil and gas service industry.

1.5 Scope of the Study

It is forecast that in another 25 years Asia will dominate more than half the world's economy and in 2000, some of the tigers in East Asia will again roar (Markillie, 1999). In the UK, due to the oil crisis of late 1997 through early 1999 and the consequent reduction of North Sea activity, many of the 5,000 oil and gas service companies are diverting their attention to business opportunities abroad, such as East Asia (United Kingdom Offshore Operators Association, 1998). According to authoritative sources, such as BP's Statistical Review of World Energy, China and Malaysia are the most attractive emerging oil E&P markets in East Asia. It is also well known that Singapore

offers environmental advantages to the oil and gas service industry in terms of good financial and economic stability as well as advanced information-technology.

In order to develop business in that region, a crucial challenge is to understand the business environment in which oil service firms have to operate and the manner in which Eastern people have generated businesses for themselves. Therefore, the following critical questions arise: What are the dominant business and economic characteristics of the oil and gas service industry? What is competition like in the industry? What are the driving forces in the industry? What is an oil service company's position in the industry? What are the business strategies of the oil and gas service companies?

Strategists need to acquire information about the business environment in order to make business strategic decisions. In this field of study, there is still a need to develop concepts and ideas in order that a framework linking strategy with its business environment can be used as a tool for analysis of an industry such as oil and gas. Many previous general studies have been conducted concerning world oil markets. However, most research has been approached from the operating companies' perspective while much less attention has been paid to the service and support sector. To resolve this, strategic management theoretical frameworks advanced by western strategic theorists is applied. Strategic researchers have conducted research with regard to assessing the business environment and business strategies, as well as evaluating the relationship between the two variables. This theoretical framework is employed as the bedrock of this study.

The business environment can be evaluated from three aspects: objective, perceived and enacted. In this study, the objective business environment (Dill, 1958) refers to the measurable reality such as oil-

related economic indicators and factors relevant to industrial technological aspects or government regulations. The perceived business environment (Mintzberg, et al., 1999) implies managerial perceptions on the nature of the business environment. The results developed at this stage can achieve the first objective of the study, which is to examine the dominant business environmental conditions that impact upon the oil and gas service sector in China and, to a lesser extent, in Singapore and Malaysia.

Business strategy options, in this research context, could be regarded as the enacted business environment (Weick, 1979). One of the research intentions is to categorise the companies in terms of five basic business strategic orientations, namely, Balancer, Analyser, Defender, Prospector and Reactor (Miles and Snow, 1978; Parnell, et al., 2000). Solution of this can achieve the second objective of this study, which is to investigate business strategies adopted by oil and gas service companies in response to the business environment(s) in which they operate.

Next, the relationship between the perceived business environment and strategies adopted are examined further. In the light of evidence gathered, the third research objective, which is to evaluate the reliability of the strategic theoretical frameworks based on Western business practice applied in a non-western business environment like East Asia, can be reached.

In short, the offshore service sector of the oil and gas industry is treated as the essential background for this research. These service companies are investigated with a geographical focus on the three East Asian countries: China, Singapore and Malaysia. The theoretical substratum of the study is to look at the oil and gas service sector in the region based upon strategic management frameworks.

1.6 Research Focus

The focus of this study is threefold: industrial, geographical and theoretical.

Firstly, the offshore service sector of the oil and gas industry is treated as the essential background for this research. The supply and service organisations from small size to large size, from indigenous to foreign owned and from upstream to downstream services are included. Such service organisations refer to entities engaged in the business of providing products or services to an oil and gas company, another oil service company, or to another energy industry (Simmons and Company International, 1999).

The second focus is concerned with the geographical context. As introduced in the above section, China is the regional leader in terms of oil and gas exploration and production (E&P) in East Asia. Malaysia ranks as an attractive emerging E&P market and a significant player in terms of offshore activity. Singapore offers considerable environmental advantages in terms of good financial and economic stability and advanced technology. All three countries are considered politically stable and in favour of profitable business opportunities. As a result, these three countries were selected for this study.

In China, although there are a few token non-communist parties, power rests with the 60 million strong Chinese Communist Party (CCP). China's politics affects its business environment as one would expect. Within the energy sector all industry regulation is government controlled (Scottish Enterprise, 2002). Chinese government, for instance, has implemented a more restrictive safety and environmental protection policy offshore. All Chinese offshore service support companies must obtain the national standard certificate for Offshore Operational Permission. The certificate is required to be

renewed annually. However, foreign companies did not need to go through this procedure as they would be examined on an individual project basis by operators and reports submitted to the relevant government department (Tan, 13 August 2000). Nonetheless, it will almost certainly be necessary to have contact with government bodies in the early stages of approaching the Chinese market in this sector. Details pertaining to the role of the CCP government are given in Chapter 3.

Thirdly, as an industry outsider, this researcher intends to look at the oil and gas industry from a different angle through strategic management perspectives. This leads to the next research focus, the theoretical substratum of the study. It is an axiom of strategic management theory that the strategic management process includes strategic analysis, strategic choice and, strategic implementation and control. Strategic analysis includes analysing the internal and external environment as well as expectations and purposes of an organisation; strategic choice refers to basis of strategic choice, strategic options and strategic evaluation and selection; strategic implementation covers organisational structure and design, resource allocation and control, and managing strategic change (Johnson and Scholes, 1999). In this study, the purpose is to evaluate the business environment and investigate business strategies adopted by indigenous and foreign service companies with businesses in the selected East Asian countries. In addition, the term "business environment" in the context of this study refers to the external environment. The theoretical focus of the study is therefore an examination of the external business environment and strategic options.

1.7 Research Propositions

After a review of the strategic management literature pertaining to the content of strategies, the variables of business environmental dimensions and business strategic characteristics as well as overall indicators of strategic performance are summarised. Some of the relationships among these variables are explored. Based on the classification of variables generated by this author and the conceptual developments and research findings to date, ten propositions pertaining to the perceived business environment, appropriate business strategies and the associated strategic performance are developed for the empirical study.

Proposition 1: The six environmental sectors – technology, regulation, economics, customers, suppliers and competitors – can be defined as the key task environmental sectors as they will be perceived by oil and gas service executives to be significant for the growth of their businesses in East Asia.

Proposition 2: For oil and gas service companies that operate in East Asian countries like China, Singapore and Malaysia, the nature of the business environment will be perceived to be uncertain.

Proposition 3: Oil and gas service companies' executives in East Asia perceive that the business environment in which they operate will be dynamic, complex and hostile.

Proposition 4: The perceived environmental uncertainty will be associated with the perceived environmental complexity, dynamism and hostility.

Proposition 5: The perceived environmental uncertainty will be associated with the influences of the task environmental factors.

Proposition 6: The level of perceived environmental complexity, dynamism and hostility will be associated with the influences of the task environmental factors for the oil and gas service sector in East Asia.

Proposition 7: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, the managerial perceptions of their business strategies will be different.

Proposition 8: For oil and gas service organisations operating in East Asia, the managerial perceptions of the business environmental uncertainty will vary in associating with the types of their strategic orientations.

Proposition 9: There will be relationships between the perceived business environment and strategic performance for oil and gas service organisations operating in East Asia.

Proposition 10: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, strategic performance will be associated with their business strategic orientations.

The investigation of propositions 1, 2, 3, 4, 5 and 6 is concerned with the first research objective. By evaluating Proposition 7, the second research objective can be reached. The research seeks to achieve the third research objective through the examination of propositions 8, 9 and 10. These ten propositions derived from the existing strategic management literature will be illustrated and discussed further in Chapter 6.

1.8 Research Methods

Because the nature of the study required exploration of business environment and strategy, considerable use was made of qualitative research methodology. The empirical research is progressed by employing a multi-method approach. It involves a formal questionnaire survey addressed to senior management. The data obtained represent the problems to be investigated and highlights the critical issues that form an important part of the thesis. The findings revealed by the survey are discussed in order to portray a comprehensive picture of the content of the questionnaire results. This is crucial to understanding the implications behind some of the data gathered in questionnaires. Joint methods of data collection, coding and analysis of data are the fundamental operations of this study. The researcher has blended and intertwined continually the three approaches from the beginning of the investigation to its end.

In order to collect primary data, a survey questionnaire approach was utilised. The collected data were based on a questionnaire survey sent to the senior managers of oil and gas service companies operating in China, Singapore and Malaysia. 500 questionnaires were distributed to the senior management respondents via post (mainly), email and fax between late 2001 and early 2002; then following-up phone calls and emails were made in an attempt to achieve the proposed response target. Each of the packets mailed contained a covering letter with the correspondent's photograph on it, the questionnaire and a self-addressed envelope for return. As a result, by August 2002, 108 completed questionnaires had been returned by managers involved in operating businesses in China, Singapore and Malaysia, with a response rate of 21.6 per cent. The response rates from China, Singapore and Malaysia are approximately 18 per cent, 23 per cent and 14 per cent respectively. Among those, 98 completed questionnaires are usable for the final primary data analysis. For the reasons of confidentiality, the names of respondents and companies

were classified in a code term. The associated details of these companies can therefore not be identified by anyone except this researcher.

As soon as the primary data had been collected, the process of analysis started from data summarising, rearranging and reduction. The focus of the analysis is to justify the relevance and validity of the data obtained and to discuss the extent to which the theories the researcher started with have been developed as a result of the research. Thereby, the significance of the research for oil service companies seeking long-term success by employing effective business strategies in the East Asian business environment would be addressed.

In this study, three interrelated procedures form the analysis stage. The first form of data analysis is descriptive analysis. The aim of using descriptive statistics is to provide the interpretation of raw data in a format that responses or observations can be described and understood easily. The second and third analytical procedures applied in this research were univariate statistics and birvariate analysis (Kerr, et al. 2002). Univariate analysis allows assessment of the statistical significance of various hypotheses about a single variable. Bivariate statistics refer to the tests of differences or measures of association between two variables at a time (Zikmund, 2000). These three types of data analysis will be tackled in Chapter 7, 8 and 9 that follow.

The type of scale on which the data is measured and whether the distribution is symmetrical or skewed, determine which measure of central tendency will provide a typical score (Kerr, et al., 2002). In this study, most data are measured at a nominal and ordinal level. Ordinal data give the first consideration of adopting the median as the measure of central tendency. The histogram graph is also drawn

up to examine the skewness. The general picture obtained is skewed and non-normal distributions. In order to cross check these observations regarding the distributions, the Kolgomorov-Smirnov goodness-of-fit test is performed on the data (to check for normality). The test confirmed that most of the variables are not normally distributed. Since the data are skewed, the mean would be distorted in the direction of the extreme scores, and therefore the median is considered mainly as the measure of central tendency. What is more, the above findings also had a major influence on the choice of non-parametric statistical techniques to be used for examining the proposed propositions, assumptions and hypotheses.

Different statistical techniques are used in this analysis and the selection of techniques is based on their relevance to the research objectives. First, the collected data are summarised using frequencies and histograms. In addition, various descriptive statistics are calculated including means, medians, standard deviations and coefficients of skewness. This is done for each of the variables. The explore and frequency statistics give a good picture of how the various variables were distributed. Second, further statistical analysis is carried out to evaluate the relationship of the perceived business environment, strategic orientations and strategic performance. Third, in order to distinguish the companies in China from the firms in Singapore and Malaysia, cross-tabulation statistics is utilised for comparative analysis.

To analyse the background information on company profiles, industry segment and business activities in East Asia, frequency distributions are used. In addition, the histogram graph is drawn up to examine the skewness of some variables. To evaluate the significance of each of the environmental sectors, the one-sample chi-square test is computed. To evaluate differences in medians among the managerial

perceptions of the importance or impact of six task environmental factors, Friedman's tests are conducted.

To test cognitive coherence between the perceived business environment uncertainty and the perceived dynamism, hostility and complexity, the Spearman correlation and chi-square tests are used. To evaluate the relationship between the two variables among the three dimensions of the perceived business environment, business strategic orientations and strategic performance, the Spearman correlation and Crosstabs with two-way contingency table analysis and chi-square tests are employed. To test the differences of the perceived environmental uncertainty and strategic performance by strategic groups, the Kruskal-Wallis tests are applied. A number of Boxplot graphs and Scatter diagrams are also applied to highlight the pattern of differences and correlations.

In order to explore the differences or similarities for variables in different countries, Mann-Whitney test of two medians, Kruskal-Wallis test of k medians, and chi-squared test of Cross-tabulation contingency table are performed to report the results of company profiles, the perceived business environment and business strategic orientations. In addition, analysis of variance (ANOVA) of k means and multiple comparison tests (Tukey) to identify significant differences are calculated for the results report of strategic performance. The statistical significance levels in relation to the questionnaire responses were also calculated in Chapter 7, 8 and 9. Results emerged show that some of the statistical findings were significant at the 0.01 or 0.05 levels or marginally significant at the 0.10 level whereas other findings were not statistically significant (see Table 8.5, for instance).

1.9 Significance of the Research

This research differs from previous contributions in four respects: these are theoretical and methodological contributions, industrial implications and the contribution to literature.

First, this research will cope with the existing literature on Western strategic models, frameworks and theories and will examine them in Eastern contexts. The expected outcome is that the work will lead to an understanding of whether the Western strategic theories can be adapted for successful application in East Asia. If there is a gap between the existing theories and Eastern practice, based upon the findings from the previous research, this should demonstrate how Western strategic management theories can be amended for application within East Asian industry.

Second, it has been argued that it is very challenging for any researchers, especially those who are familiar with Western theories and contexts, to conduct empirical work in East Asia. This study will develop a methodology (introduced in Chapter 2) for data collection and analyses in East Asian countries like China, and to a lesser extent, Singapore and Malaysia. This methodology could be considered for further research, such as in a similar industry or country context.

Third, as the oil and gas service firms under investigation are all companies operating in East Asia, the findings from this research will enrich our knowledge of both the petroleum and wider energy service industries in general and the service sector in particular. The research findings will make a useful contribution to corporate senior management in generating effective strategies to increase their capability of long-term survival in the East Asian market.

Fourth, this study will gather empirical evidence from the questionnaire survey of selected firms operating in East Asia. It is expected that the findings on the impact of the business environment and significance of adopted strategies in Eastern contexts will add empirical evidence to extend existing strategic management literature.

1.10 Organisation of the Thesis

The thesis is to be broken into four aspects: background context, focal theory, data theory, and contribution (Ogden, 1993) (Figure 1.1). First, the background context delivers a general picture on the oil and gas service sector in East Asia. This part of the thesis will include an "Introduction" chapter, which sets out the content and structure of the thesis and identifies principal objectives of the research; and a "Methodology" chapter that introduces the chosen methods for the study. A support chapter to the main theme on the characteristics of the service sector will be covered.

Second, the focal theory reviews relevant theoretical literature and discovers its link to the study. It studies schools of thoughts, similar research on the assumptions, hypotheses or propositions on the business environment and business strategy, and instruments used by previous researchers on how to measure the variables of the business environment and strategy. This constructs the basis of the theoretical framework of this study.

Third, data theory includes the analysis and presentation of the collected data. The author will accumulate sufficient evidence to allow a conclusion.

Fourth, the "Contribution" part will include conclusions drawn from the results of the data analysis and will illustrate how an original

contribution to knowledge has been made through completion of this research. The author will discuss the limitations of the study. Recommendations will be made for future research.

Apart from the current chapter, this thesis comprises nine further chapters and is presented in three main parts. The first part consists of Chapter 2 only and is concerned with research methodology design and procedures for the empirical studies. The second part contains four chapters: Chapter 3 through Chapter 6, which relate to the literature review of the industrial context, strategic management theories and similar research in the area. The third part covers the remaining chapters and deals with presenting research results and making up conclusions from the empirical evidence.

Chapter 1 defines the research aim, problems and positioning of the research, and briefly presents the expected outcomes of the research as well as the organisation of the study.

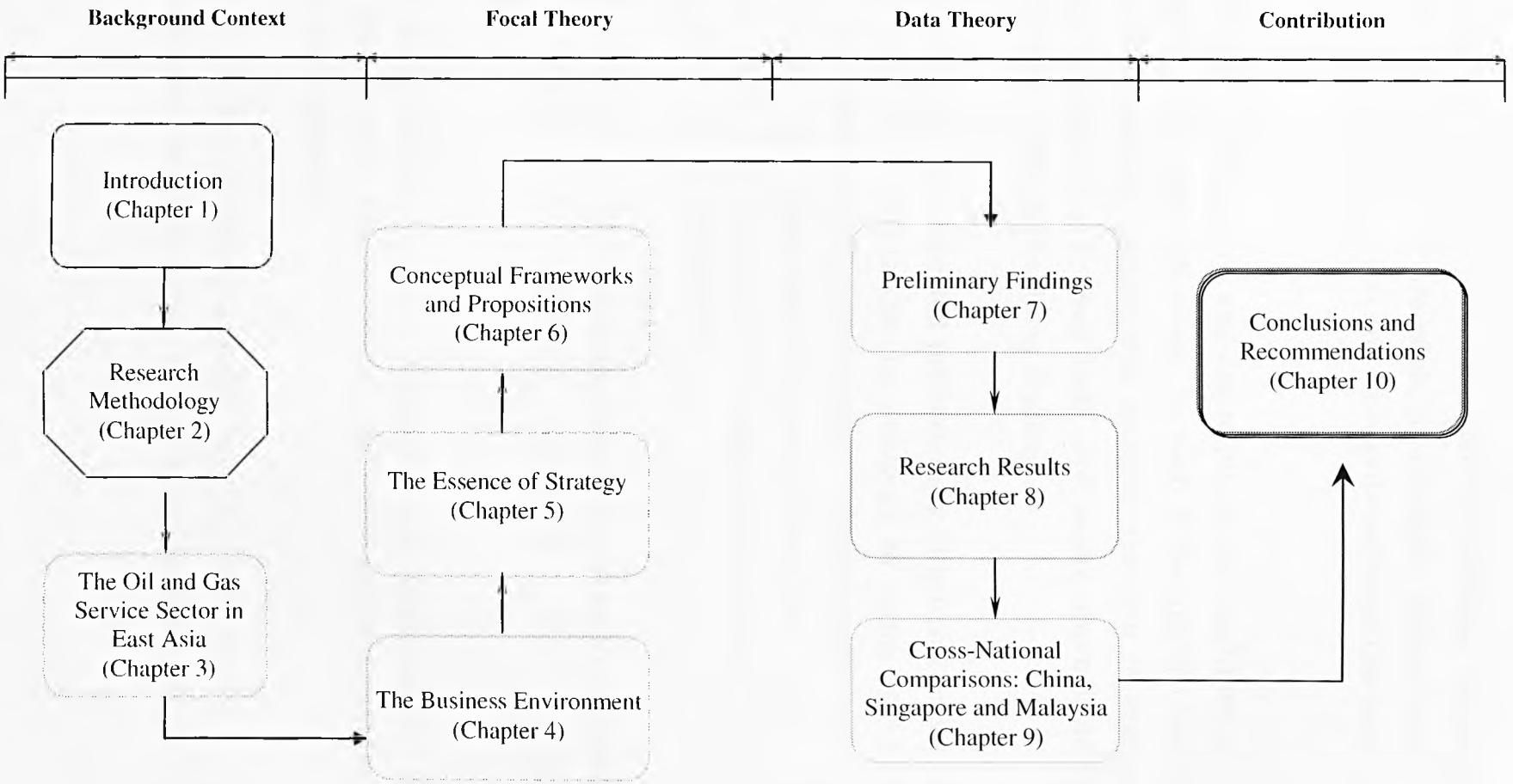
Chapter 2 sets forth how the methodology is used in the research design of the study.

Chapter 3 outlines the main features of the oil and service industries operating in the selected countries, which are treated as a basic contextual background.

Chapter 4 develops a selected review of the literature on frameworks of the business environment.

Chapter 5 deals with the major thinking and research on strategy. It is written comparatively and chronologically from a different Eastern and Western philosophical and historical perspective.

Figure 1.1 Thesis Outline



To conclude the second part, Chapter 6 develops theoretical frameworks and ten major research propositions drawn from the literature review in order to test the data gathered from the empirical investigation.

In the third part, propositions and assumptions are confirmed in the final analysis of the research result. In each of the result chapters, four major elements are taken into account: the aim of analysis, analytical tools applied, the result facts, and where appropriate, the comments of the research results or findings.

Chapter 7 describes the collected primary data in general terms and the comparison of variables can be analysed in terms of special groups by the selected criteria such as the industry segmentation or strategic styles. The preliminary findings cover four areas: the background context, the perceived business environment, business strategies and strategic performance.

Chapter 8 analyses the organisational coherence among the perceived business environment, business strategies and strategic performance.

Chapter 9 comparatively analyses similarities and differences for the collected data between China and the other two selected countries: Singapore and Malaysia.

Chapter 10 draws conclusions from the research findings and presents implications of the study as well as suggestions for further research.

CHAPTER 2

RESEARCH METHODOLOGY

In this study, methodology concerns basic philosophy and strategy to conduct a research design. This chapter starts by elaborating the methodological decisions of a philosophical orientation for the research followed by an introduction to the research strategy. The research design flows from the research strategy, including the methods of data collection and analysis.

2.1 Methodological Decisions

Researchers (Aosa, 1992) suggest that research design takes place at two levels: philosophical (methodological) and practical (method). In order to design a study, choices have to be made at both levels firstly to clarify epistemological issues and then to address the issues on selecting particular methods for the study. The philosophical nature of this study is discussed in the following three sub-sections.

2.1.1 Deductive v Inductive – A Philosophical Orientation

It is common for most investigators (e.g. Huang, 1993) to distinguish two orientations to scientific inquiries, one the humanistic-based qualitative (inductive) and the other is positivist-based quantitative (deductive). Ideographic methodologies (induction) emphasise the analysis of subjective accounts that one generates by "getting inside" situations and involving oneself in the everyday flow of life. Homothetic methodologies (deduction) have an emphasis on the importance of basing research on systematic protocols and techniques (Gill and Johnson, 1991).

For the current study, it was hard to clearly distinguish these methodological philosophies. To the oil and gas sector, one firm could be too special to represent the others, while the most common features within the industrial sector might not apply to one single case. However, as the nature of this study is to explore, from strategic management perspectives, the energy service sector in East Asia, considerable use was made of a qualitative research methodology. Bearing this in mind, the researcher identified the philosophical logical flow in this study as basically inductive. The research started from basic research questions. Next, the research problems were studied further from the selected cases. Then, theoretical frameworks were developed for investigation in a common sense approach to identify the particular and common phenomena.

2.1.2 Research Strategy: Qualitative v Quantitative

There is a lot of debate with regard to research strategies. Researchers (Burrell and Morgan 1979; Gill and Johnson, 1991) define and distinguish research strategies in terms of various logics. Most commonly, there are two general strategies for doing research, quantitative and qualitative. Yin (1994) discusses how one distinguishes "between quantitative research and qualitative research not on the basis of the type of evidence but on the basis of wholly different philosophical beliefs". Asoa (1992) argues that the term "qualitative research" means any type of research that produces findings not arrived at by statistical procedures or other means of quantification.

The Association of Qualitative Research Practitioners (1999) suggests that quantitative research refers to studies where the collection and analysis of data are in terms of numbers. It is based on the gathering of statistical data. They discuss how quantitative research aims to

produce reliable statistical evidence and works with large samples. The results of quantitative research are basically counted up and presented as numbers – such as percentages or other statistics. In order to do this, actual collection of the information has to be standardised, usually through a tightly structured questionnaire. Answers are normally pre-categorised, and based upon fixed-choice questions. It is suggested that this is the basic format of the familiar questionnaire survey.

AQRP (1999) describes qualitative research as informal and exploratory in nature. Researchers (Blaxter, et al., 1996) have pointed out that qualitative research is concerned with collecting and analysing information mainly without the use of numeral data. This is looking for insight and understanding, not statistics. It is more open and responsive to its subject, and focuses on findings as much possible "in depth" rather than "breadth". Saunders et al (1997) suggest that qualitative research is most appropriate where exploratory research is required to enable propositions to be approved. Stern (1980) discusses how qualitative methods can be used to explore substantive areas about which little is known to gain original insights. Strauss and Corbin (1990) suggest that qualitative methods can be used to obtain elaborate details about phenomena such as feelings, thought processes and emotions.

Other researchers (Patton, 1986; Goodyear, 1999; AQRP, 1999) explain that a qualitative approach seeks to capture the way people think, feel and behave, what their images, values and attitudes, experiences and interactions mean in their own terms. Because the nature of this study required exploration of aspects of business environment and strategy in East Asia, as mentioned above, considerable use was made of qualitative research methodology.

In this study, the earlier data were obtained from 111 respondents to a questionnaire survey in late 1999 (Appendix E). By doing a quantitative study at this point, the researcher could use that information to build further assumptions or hypotheses for investigation. These assumptions or hypotheses could be examined and refined through more pointed theoretical sampling using qualitative procedures (Strauss and Corbin, 1990).

In late 2000 and early 2001, the researcher conducted a pilot fieldwork through 5 informal interviews with 28 open-ended questions in the UK and 22 semi-structured face to face and telephone interviews in China. The formal questionnaire was constructed after collecting about six months field data and after carrying out preliminary analyses of these data. Hence, the qualitative aspects of the research directly influenced both the questionnaire construction and the later associated statistical analysis.

Consequently, the existent qualitative feature appeared in this study could be identified based on the following characteristics. First, the interview results during pilot fieldwork influenced questionnaire design and thereby established a qualitative basis for the collected data. Second, even though data was collected through a quantitative-technique-questionnaire survey and all answers were coded in term of numbers for data analysis, the essential nature of the collected data was qualitative rather than numerical as the answers mainly presented respondents' views, feelings and attitudes. Third, the essential nature of data analysis was built upon a qualitative approach - Grounded Theory (Glaser and Strauss, 1967). Though statistic techniques were used in data analysis, the results drawn upon quantitative analysis were used as the bedrock to complete the whole research analysis, for the purpose of generalisation and verifying or generating theory (Glaser and Strauss, 1967).

Asoa (1992) also stresses that, although most researchers tended to place emphasis on one form (qualitative or quantitative), both could still be used to reinforce each other. Thus in a qualitative study, one could use quantitative and qualitative data to illustrate and clarify findings obtained quantitatively. This point of view is therefore discussed further in the next section.

2.1.3 Development of Research Methodology – A Combining Approach

Denzin (1970) comments on the use of triangulation in conducting research. This calls for a combination of quantitative and qualitative methods of doing research. Kiggundu et al. (1983) even study the use of combined quantitative and qualitative research approaches in studying management in developing countries. Similarly, Aosa (1992) discusses the appropriateness of both quantitative and qualitative designs in social science research. All the arguments presented here suggest that the use of a combination of approaches is a plausible research strategy.

Strauss and Corbin (1990) criticise many quantitative researchers who dismiss qualitative studies completely as giving no valid findings. Meanwhile, they also allege that qualitative researchers ignore representative sampling, with their findings based only on a single case or a few cases. It takes a risk yielding shallow or completely misleading information when some qualitative researchers firmly reject statistical and other quantitative methods (Strauss and Corbin, 1990).

Since the 1980s and 1990s, there is a growing understanding of combining qualitative and quantitative approaches for intermediary solutions. Strauss and Corbin (1990) point out that combining methods may be done for the purposes of supplementing,

complementing, information and development. Morse (1991) observes that some researchers emphasise one mode with the others as supplementary; and other researchers view the research paradigms as complementary. As AQRP (1999) states, qualitative and quantitative evidence are complementary, and both are at their most valuable when used together - quantitative evidence supplies a framework and sense of scale, and qualitative work enhances understanding and depth.

Researchers can put procedures together for such a combination. Cresswell (1994) remarks that "there is no one standard set of methods equally useful for every research step, and it is not always useful to join the same specific techniques for all steps of all research project". So based on realistic phenomena, researchers are allowed to freely connect various available techniques to obtain desired results. However, Strauss and Corbin (1990) point out that these intermediate positions might yield "a misleading view of the realities of actually carrying out research" if qualitative and quantitative modes do not work with each other appropriately.

According to Strauss and Corbin (1990),

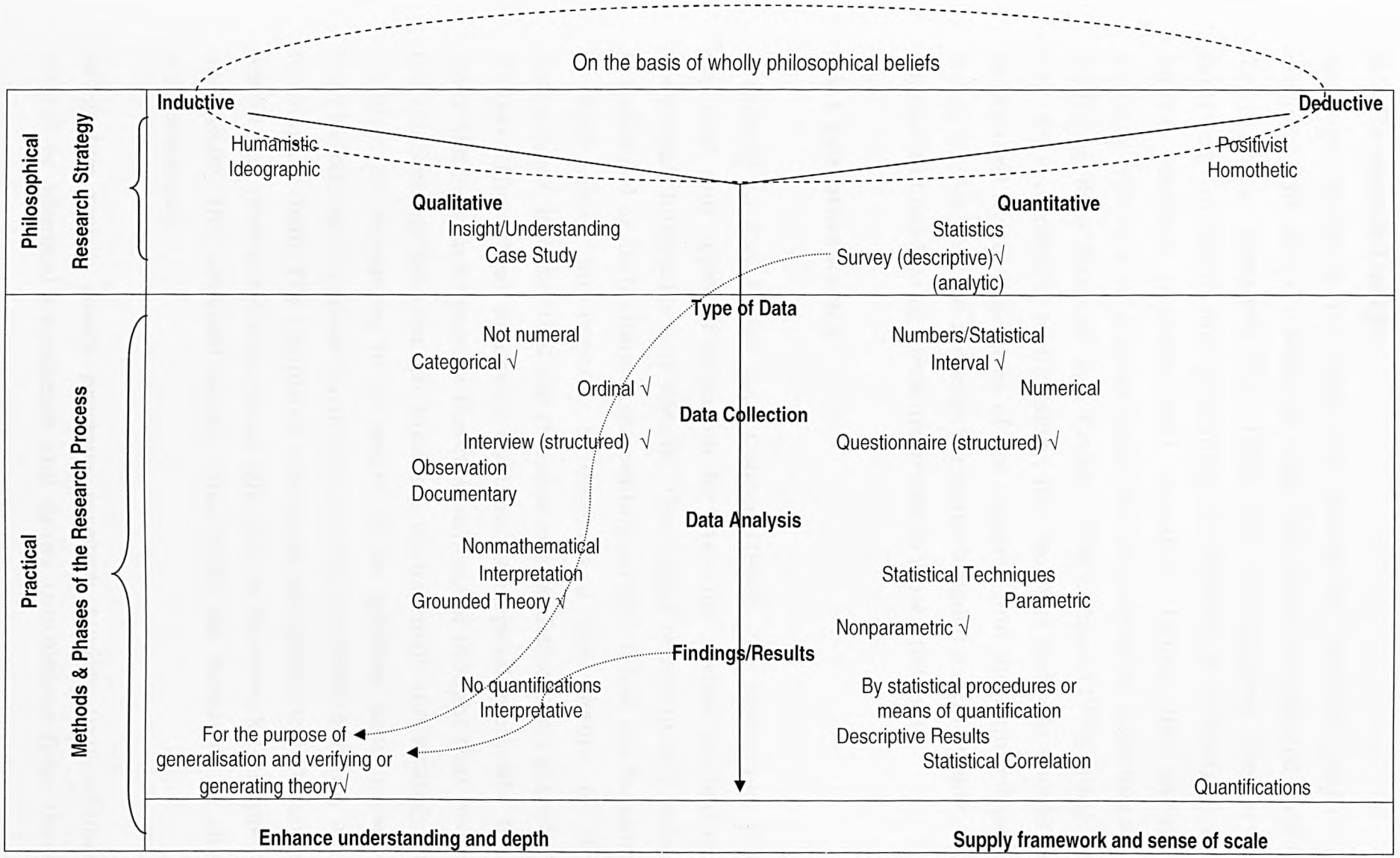
> There are several crossover disciplines in sociology where there is back – and – forth interplay between qualitative and quantitative methods. Useful research can be accomplished with various combinations of both qualitative and quantitative procedures. Thinking in terms of the interplay between qualitative and quantitative methods, they supplement each other and they complement each other. For example, statistical or quantitative data are likely to be analysed qualitatively in part, and conversely, the qualitative data are capable of being supplemented by statistical analysis. Data collection and analysis can be done in both modes, and in various combinations, during all phases of the research process.

In this study, both qualitative and quantitative forms have roles to play in analysis. The issue here is to provide a solution on how these might work together. As discussed above, qualitative and quantitative methods could be used in supplementary or complementary forms,

i.e. the qualitative should direct the quantitative and the quantitative feedback into the qualitative in a circular process (Strauss and Corbin, 1990). For the current study, concepts and assumptions have emerged from and been validated against data. In addition, qualitative primary data were produced through a quantitative approach, a questionnaire survey. The qualitative research has turned to quantitative measures and analysis as this enhanced the research process and methodological solutions (Figure 2.1).

The objective of this study required that, mainly, qualitative data had to be collected to facilitate propositions and hypothesis testing. The research findings are not subject to scientific quantification, as they mainly deal with managerial experiences, feelings and opinions on organisational environment and strategy. However, a quantitative aspect is not wholly absent for this research as some of the data, i.e. oil economic indicators, the age of an organisation or the number of employees are quantitative. When data were coded, they were quantified as well. Especially, statistical techniques are use as a major tool to analyse the collected data, but the bulk of the analysis is interpretative. Consequently, the current study is regarded as a mixture methodology of combining both qualitative and quantitative aspects. The combined nature of this study means several different things. First, the data was gathered by means of interviews, documentary and questionnaire survey, techniques normally associated with both qualitative and quantitative methods. Second, the data were coded in a manner that allows them to be statistically analysed. These are quantifying qualitative data. Third, in speaking about analysis, it refers to a nonmathematical process of interpretation rather than referring to the quantifying of qualitative data. The qualitative analysis should be carried out in order to discover concepts and relationships in raw data and then organise these into a theoretical explanatory scheme (Strauss and Corbin, 1990).

Figure 2.1 Research Design: A Combining Approach



"√" means the research methods or techniques involved in this study.

2.2 Research Design

Research design is the plan with which the research project is executed. The design reveals the logic that links the collected data to the research objectives (Yin, 1994) and the methods chosen for gathering, analysing and presenting information in relation to the defined research problems and objectives. Hence, the research methods refer to a set of procedures and techniques for collecting and analysing data (Strauss and Corbin, 1990). Asoa (1992) suggests that, for a combining methodology, the choice of methods should be determined by the objectives of the research and the required data. Before introducing the research methods designed for this study, the approach of conducting literature review is illustrated first.

2.2.1 Literature Review

According to Fox (1969) and Cooper (1989), the researcher has exploited four types of approach for literature review: contextual, theoretical, integrative and specific. Contextual review mainly refers to industrial or authoritative commentary on the oil and gas industry in East Asian sub-regions. It develops a big picture of the background, in order that the research can be defined and placed in context. Theoretical approach contains conceptual materials that cover strategic management theories, schools of thought that reveal the relationship between the business environment and strategy. It enables the researcher to be aware of the problem area, present theories offered to explain particular phenomena under scrutiny and to compare them. The completed contextual and theoretical literature review has provided a conceptual reference of framework to support and justify the proposed study. This forms the backbone of this research study.

Integrative review covers previous research studies that address related or identical hypotheses and draws conclusions from these

different studies. For example, the researcher discovered that an organisation could achieve a better performance if it properly perceives the business environment it faces and pursues appropriate strategic directions. Consequently, it is possible for the researcher to identify assumptions drawn from similar research in the area suitable for the study.

Specific studies concentrate on literature that is relevant in the research methods, variables, measurement and analytical techniques. Most recent developments and studies are included in order to ensure comprehensiveness of the research. As a result of this review, the researcher has been able to develop ideas for data-gathering approach(es), instruments and methods, as well as to assess the type and amount of development work needed to be undertaken for the next phase of studies.

The review on methodologies has also enabled the researcher to examine the current status of research in the area and to clarify the chosen method for the research. Strategic researchers have conducted research to measure environmental uncertainty, assess business strategies by examining organisations' strategic orientations and evaluate the relationship between the (perceived) business environment and pursued strategic directions. In this field of study, many researchers have used either primary or secondary data and a multi-method approach for collecting data. Furthermore, the review provides clues to analytical techniques that can be employed in this study.

2.2.2 A Multi-Method Approach

There is no harmony of opinion with regard to the selection of research methods. Blaxter, et al. (1996) categorise four techniques which are concerned with the use of data collection, namely

documents, interviews, observations and questionnaires, while Robson (1993) lists the three traditional research methods, namely, experiment, survey and case study. Yin (1994) also demonstrates that case study, experiments, survey, histories and the computer-based analysis of archival information or records are several approaches to social science research. Each approach is regarded as a research method and has its own way of collecting and analysing empirical evidence, following its own logic. Each method can be used for three research purposes - exploratory, descriptive or explanatory.

Asoa (1992) observes that some researchers are more oriented and temperamentally suited to attach certain research methods to specific designs. Others are not convinced of the plausibility of such connections. To the latter, once a particular research design has been selected, any methods can be used with both qualitative and quantitative research in collecting the required data. They tend to make the use of multiple methods to develop a flexible research strategy.

Currently, more research has combined different methods in order to smooth the progress of effective collection of required data. In their study, Strauss and Corbin (1990) and Yin (1994) emphasise this by suggesting that qualitative and quantitative methods may be combined in the same research project. For instance, a survey does not exclude a case study and a case study does not exclude a survey. This means the various research methods are not mutually exclusive. Some situations in which a specific method has distinct advantages can be identified and it is essential to use one type of method that is more advantageous than another (Yin, 1994).

Yin (1994) further explains three conditions in selecting a research method: firstly, the types of research question asked; secondly, the extent of control a researcher can handle over the actual

investigation; and thirdly, the level of focus on contemporary in preference to historical events. He points out that the first and most important condition that various research methods can be differentiated is to identify the types of research question being posed.

Generally, if "what" questions are being asked for an exploratory purpose, any of the research methods could be used; or if "what" questions are being asked about prevalence, the use of surveys or the analysis of archival records would be favoured. When "how" and "why" questions are being posed, case studies, experiments, or histories are likely to be preferred. When a "how" and "why" question is being asked about a contemporary set of events over which a researcher has little or no control, a case study approach would have more advantage (Yin, 1994).

When initiating this study, in order to understand "what" the dominant business environmental factors are for the oil and gas service sectors, a preliminary investigation through an initial survey on managers within the oil and gas industry would be favoured. For knowing "why" they are the dominant issues, the researcher has drawn upon a wider array of documentary information (some of which are demonstrated in Chapter 3), in addition to conducting interviews.

In selecting a method for collecting formal primary data, the researcher considered that surveys or case studies were superior compared to experimental methods, which would be more appropriate for natural scientific work. In order to reveal the prevalence of senior management views on what the dominant business environmental issues are, how the business environment might be and how they adopt business strategies, the data had to be collected from many respondents.

Hence, there was a need to retain capability of controlling the data collection process. In addition, the current study also required collection of qualitative data that would assist the researcher in testing propositions. All these requirements suggest that a survey was the most suitable and a major method for primary data collection. The survey can reveal the nature of the perceived business environment and examine strategy parterres, showing strategies adopted at a business level in each organisation. This could address the "how" questions.

In summary, this researcher urged the use of combination of research methods and generated a multi-method approach to conduct the empirical research. A mix of documentation, questionnaires, archives and interview techniques was adopted to collect relevant information and primary data. Particularly, the data obtained from the survey represent the problems to be investigated and highlight the critical issues that will form an important aspect of the thesis. In order to test the designed methods for this research, pilot fieldwork (which is introduced in the later section) was carried out in China.

2.2.3 Data Collection Techniques

In business and management research, the survey method is a popular and common strategy for data collection. A survey "is a research technique in which information is gathered from a sample of people by use of a questionnaire; a method of a data collection based on communication with a representative sample of individuals" (Zikmund, 2000). It allows the collection of a large amount of data from a sizeable population in a highly economical way. Based more often on a questionnaire, these data are standardised, allowing easy comparison.

Saunders, et al. (1997) comment, "the questionnaire is not the only data collection device which belongs to the survey category. Structured observation, of the type most frequently associated with organisation and methods research, and structured interviews, where standardised questions are put to all interviewees, also fall into this category." Zikmund (2000) suggests that a survey researcher may choose to contact respondents by telephone, by mail, or by person. Gill and Johnson (1991) discover that "the use of surveys to explore a substantive area, often using open-ended questions to collect data in an inductive form, merges the survey approach with styles of research which are more ethnographic in orientation." Saunders, et al. (1997) are also concerned that a survey approach could allow a researcher to have more control over the research process. The drawback of the survey is that much time is spent in designing and piloting the questionnaire.

Two kinds of survey research could be undertaken, either analytic or descriptive. Simons (1987) and Gill and Johnson (1991) explain that analytic or explanatory surveys attempt to test a theory by taking the logic of the experiment out of the laboratory and into the field. On the other hand, "a descriptive survey is concerned primarily with addressing the particular characteristics of a specific population of subjects, either at a fixed point in time or at varying times for comparative purposes" (Gill and Johnson, 1991). They also state that surveys are not only used for a descriptive purpose, but also for the development and testing of theory. Thus, by using a more structured questionnaire as part of the main study, theory is developed inductively.

In addition, interviews can be categorised based on the medium used to communicate with respondents, such as field visits or telephone interviews (Zikmund, 2000). There are three broad types of

interviews: structured, semi-structured and non-structured (i.e. in-depth, or non-standardised). Structure is important in achieving accuracy and comparison. Asoa (1992) observes that most interviews lie in a semi-structured continuum and this intends to ensure both comparability and flexibility. Structured or standardised interviews can be used in survey research to gather data which will then be the subject of quantitative analysis. Zikmund (2000) comments that semi-structured and non-structured interviews are used in qualitative research in order to conduct exploratory discussions to reveal and understand not only the 'what' and the 'how', but also to place more emphasis on exploring 'why'.

A couple of approaches can be used to collect data for a survey: personal interview, telephone interview and postal (including email). Each method has its advantages and disadvantages. When conducting pilot fieldwork, the researcher found that, compared to other ways, a face-to-face interview was very helpful in yielding the highest quantity and best quality of data. It was then decided to interview each individual separately with open-ended questions so that the key issues prepared for the pilot test could be tackled.

Before conducting a formal survey, the interview was appropriate because it also helped identify and investigate variables. Through this approach, it was possible to gather some supplementary information for many of the issues raised (yet it is an expensive way of doing a large-scale research). Hence, during the pilot study, semi-structured face to face and telephone interviews were used.

When carrying out the formal survey, the researcher decided to use more than one approach to collect primary data in order to achieve a better response rate. Telephone structured-interviews were made by using the survey questionnaire but on the whole a mailing (including postal and email) method was essential.

2.2.4 Data Analysis Methods

In this study, a "grounded theory" framework has emerged during the research progress. Predominately, statistical procedures were adopted for data analysis. The results derived from statistical analysis were the fundamental contributions to this combinatorial qualitative-quantitative research.

2.2.4.1 Three Qualitative Analysis Strategies

Dey (1993) observes that, traditionally, the "emphasis in qualitative research has been on generating theories rather than testing them". Today, more and more qualitative analyses not just only develop conceptualisations but also examine their adequacy in the light of the data. He states:

> The first step in qualitative analysis is to develop thorough and comprehensive descriptions of the phenomenon under study. Description includes information about the context of an act, the intentions and meanings that organise action, and its subsequent evolution. Thus, description encompasses the context of action, the intentions of the actor, and the process in which action is embedded. Description lays the basis for analysis, but analysis also lays the basis for further description...In qualitative analysis there is a strong emphasis on describing the world as it is perceived by different observers.
>
> (Dey, 1993)

Three basic streams of qualitative analytical strategies can be distinguished based upon the type of approaches employed: using a theoretical or descriptive framework (to analyse data) or not using a pre-determined theoretical or descriptive framework (to explore data).

First, where a researcher has made use of existing theory to formulate research question(s) and objectives, the theoretical propositions are used as a means to devise a framework to organise

and direct data analysis (Yin, 1994). Second, a researcher can start an investigation with a series of preconceived concepts, a guiding theoretical framework, or a well thought out design. Researchers are free to revise the pre-determined theories, propositions and even pre-designed research methods (Strauss and Corbin, 1990). However, Bryman (1988) argues against this point:

> The prior specification of a theory tends to be disfavoured because of the possibility of introducing a premature closure on the issues to be investigated, as well as the possibility of the theoretical constructs departing excessively from the views of participants in a social setting.

This has led us to the third stream of analytical strategy. Strauss and Corbin (1990) summarise the following aspects of this approach: it is inductive; such a study is conducted with questions rather than a defined theoretical framework; theory is built from the process of data collection and analysis; the relationships between collected data are not identified, and questions and hypotheses are developed to test these (Saunders, et al., 2000).

Glaser and Strauss (1967) regard the second and third streams of the above three analytical strategies as the grounded theory. In the current study, the analytical feature is categorised into the second strategy. Thereby, a grounded theory approach has emerged and is discussed further as below.

2.2.4.2 Grounded Theory

To date, the dominant school on qualitative analysis philosophy has been based on grounded theory (Glaser and Strauss, 1967). Grounded theory is the discovery of theory from data so that a researcher can show such a theory fits empirical situations and is understandable to theorists. The essential is to provide "relevant predictions, explanations, interpretations and applications" (Glaser

and Strauss, 1967). They point out that, whether or not there is a previous speculative theory, discovery gives a theory that "fits or works" in a substantive or formal area since the theory has been derived from data, not deduced from logical assumptions. However, it is still necessary to conduct a further testing, clarification, or reformulation. Grounded theory can be presented either as "propositions" or "a running theoretical discussion" (Glaser and Strauss, 1967). The elements of grounded theory include theoretical frameworks and relevant concepts, and hypotheses or generalized relations among the theoretical frameworks and concepts.

This researcher set up two purposes of using a grounded theory approach. The first is to establish the generality of a fact. In other words, by comparing where the facts are similar or different, theoretical frameworks can be generated to increase the generality and explanatory power of the chosen theories. This is associated with the first and second research objectives. The second purpose of the data analysis is, if appropriate, to verify and generate existing theories. Here, the concern is focused on theory. The collected new evidence could be used for verifying a part of the chosen theory. By constantly checking out the pre-developed relevant theoretical frameworks and pre-convinced propositions and assumptions as the data pour in, the existing theories can be revised. Verifying and generating theory carries not only the same benefit as testing theory, but also further benefits. Verifying a deductive theory gives at least a theory that does not appear to fit or work and at most a reformulated proposition(s) or hypothesis(ses) and an unconfirmed set of assumptions (ibid.). This is associated with the third research objective.

Some analysts focus on creating (generating) new theories that emerge in their data. However, this is not the key concern of this study. This researcher considered that it might be better to generate

new theories in a relatively well-regulated business environment. It would not be appropriate if new theories were developed in an emerging marketplace like East Asia.

2.2.4.3 Statistical Procedures

The core of qualitative analysis exists in three related processes of describing phenomena, classifying them and seeing how concepts interconnect (Dey, 1985). In this study, statistic techniques like descriptive, correlation and analysis of variances can help these processes. For example, by examining the association between different variables, connections between them can be identified. By using frequency and cross-tabulation with which different characteristics occur, the identification can be further judged. These statistical techniques are quantitative and are chosen for analysing data collected from the survey. The results of which are embedded in the qualitative process. They supplement or provide information to the results of this research which contains a qualitative nature.

In this study, three interrelated procedures form the analysis stage. Typically, the first form of data analysis is descriptive analysis. Descriptive analysis refers to the interpretation of the raw data in a format that responses or observations can be described and understood easily. The aim of using descriptive statistics is to provide a shorthand description of large amounts of data by making summary statements about the sample as a whole, rather than making allusion to each participant's responses (Kerr, et al., 2002). The calculation of averages, frequency distributions, and percentage distributions is used to summarise data. The characteristics examined include measures of central tendency and variability (i.e. the mean, standard deviation and range) and frequency counts of how often a value occurs in the particular data set (Klecka, et al., 1975).

The second and third analytical procedures applied in this research are univariate statistics and birvariate analysis (Kerr, et al. 2002). Univariate analysis was carried out to assess the statistical significance of various assumptions or hypotheses about a single variable pertaining to the business environment and business strategy. Bivariate analysis was applied to examine associations between two variables or conduct significance tests for the comparison of similarities or differences among various categories.

2.2.4.4 Parametric or Nonparametric Tests?

In this study, some of the survey data were categorical and most were ordinal as they were measured by using a 5-point or a 7-point scale (see Section 2.3.2). Zikmund (2000) suggests that a single scale item on a summated rating scale like this design is regarded as an ordinal scale. Thus, the relative descriptive analysis for the measure of central tendency could be the median.

In his book, Zikmund (2000) comments that many researchers assume that the semantic differential scale provides interval data, whereas some others critically argue that this kind of data have only ordinal properties because the weights are arbitrary. He suggests that the data can be assumed either interval or ordinal. As a result, the arithmetic mean or the median can be utilised to plot the profile.

Field (2000) argues that the mean is a hypothetical value that can be calculated for any data set. As such, the mean can be a model used to summarise the collected data in the following analysis. He further explains the perceptions on the interval data that the distance between points of the scale should be equal at all parts along the scale. For example, if using a 7-point scale, the difference in each

item measured by a change in score from 2 to 3 should be the same as that measured by a change in score from 4 to 5.

In this study, the researcher accepted the concept that a semantic differential scale produces interval data and embraced the arithmetic means as the measure of central tendency for descriptive statistics. Hence, although the data were measured by using an ordinal scale, and from the Boxplot statistics, some categories have a non-nominal skew distribution, the assessment of the significance of business environmental factors are presented mainly by mean figures as in this case, the hypothetical mean values are more discriminating for the comparison of items.

The type of scale on which the data is measured and whether the distribution is symmetrical or skewed, determine which measure of central tendency will provide a typical score (Kerr, et al., 2002). Ordinal data gives the first consideration of adopting the median as the measure of central tendency. The histogram graph is also drawn up to examine the skewness. The general picture obtained is skewed and non-normal distributions.

In order to cross check these observations regarding the distributions, where appropriate, the Kolgomorov-Smirnov goodness-of-fit test was performed on the data (to check the normality). The test confirmed that most of the variables are not normally distributed. For those skewed data, the mean would be distorted in the direction of the extreme scores. In which case, the median is considered mainly as the measure of central tendency for this study.

Having taken all the above issues into account, a conservative position was considered and nonparametric tests were therefore utilised mainly for data analysis (Figure 2. 2a and b). The details of the employed statistical techniques are illustrated in Section 2.7.4.

Figure 2.2a Analytical Techniques (To Test Relationships)

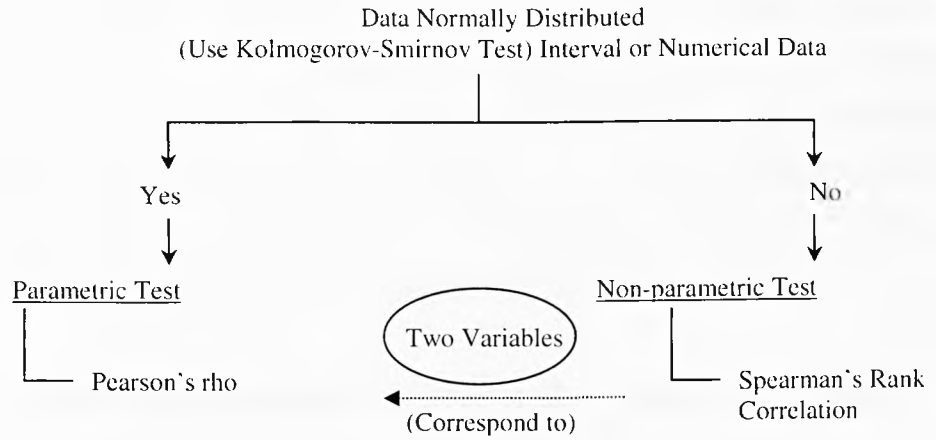
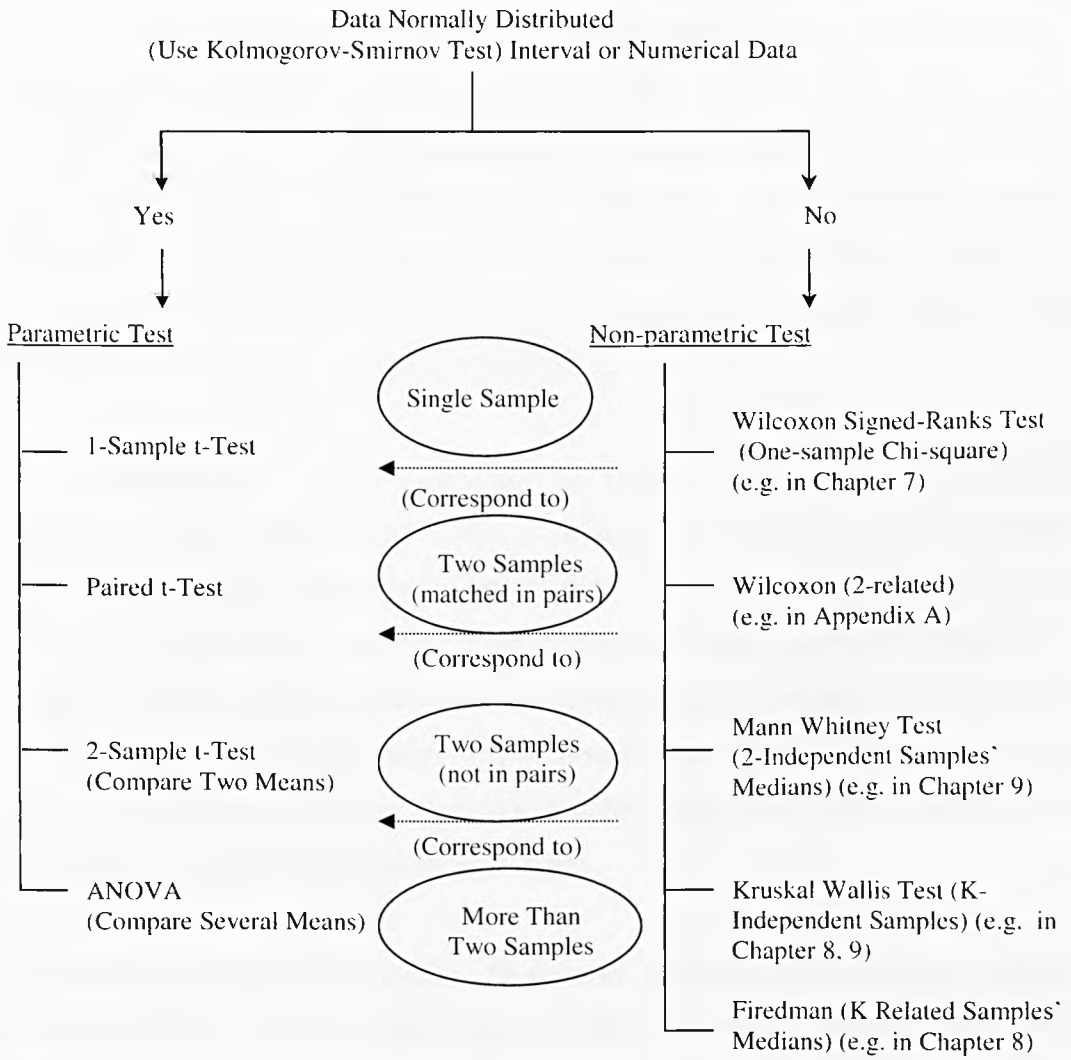


Figure 2.2b Analytical Techniques (To Test Differences)



2.3 Research Instrument

Zikmund (2000) remarks that an essential aspect of developing a survey design is concerned with compiling a questionnaire and determining the list of questions and the format. This researcher generated questions based mainly upon contemporary writings and similar or previous research theory on the business environment and strategy. The similar studies and theories from which questions were developed are discussed in chapters 4, 5 and 6.

2.3.1 Questionnaire Construction and Research Variables

The Survey Questionnaire (Appendix B1) is divided into three distinct sections, each dealing with one of the following issues: Section One, Background, together with Section Three, which comprises the Strategic Orientation and Strategic Performance parts, are used to survey the facts of organisations. Section Two, The Business Environment, which consists of the Environmental Sectors part and the Nature of the Business Environment part, is used to assess the attitude of managers or senior executives.

The questionnaire was arranged to begin with easy or general questions before moving into more difficult or sensitive and specific areas. Participants were told there was no such thing as right or wrong, nor were there good or bad answers, what mattered was their thoughts. The subjects were therefore encouraged simply to respond by justifying from their own experience, how they felt about each topic. A Chinese version questionnaire (Appendix B2) was also prepared for collecting data from China.

A variable generally is anything that may assume different numerical or categorical values (Zikmund, 2000). Totally, there are 141 variables (Appendix C) developed for this study, which cover four major areas: firm background, managerial attitude on the external

business environment, managerial opinions on organisational strategic direction and managerial perceptions of organisational performance. Among those, variables like the organisational legal status is a categorical variable because it has a limited number of distinct values, while the organisational age is a continuous variable as it may have an infinite number of values.

Dependent variables and independent variables are also encountered in this study. Managerial attitudes, opinions and perceptions were defined as the dependent variables because they are the criteria that had been to be predicted or explained. The independent variables encompass organisational information such as company size, year and ownership types because these are the expected factors that influence the dependent variables. The categorisation into dependent and independent variables can been seen in the survey questionnaire.

2.3.2 Measurement and Scales

Based on the early stage exploratory research, the primary research developed the key concepts (dependent variables) to be investigated: the perceived business environment, business strategy and strategic performance. These three concepts were assessed on 111-categories scale. Their mode of measurement is presented in the survey questionnaire.

2.3.2.1 The Business Environment Assessment

Questions pertaining to the environmental sectors were based on a five-point Likert scale (which was advanced by Likert in 1932). For the assessment of the importance and impact of the environmental factor variables, respondents were required to indicate the extent to which six task environmental sectors, namely, economic, regulatory,

technological, customers, suppliers and competitors, had affected their business over a defined period of the last five years. To indicate how important these sectors were for the growth of their business, individuals chose from five alternatives: not important, slightly important, important, very important and the most important. To indicate how the impact of these sectors affects the growth of their business, the five options were: non-existent or very weak, weak, moderate, strong and very strong. From very positive to very negative, the researcher also assigned scores of 5, 4, 3, 2 and 1 to the alternative answers relating to one attitudinal object. The weight of 5 was assigned to the response which was strong agreement indicating the most favourable attitudes on the statement.

Another multidimensional construct (Elenkov, 1997, Luo and Park, 2001) is used to conceptualise environment. Three environmental dimensions, viz. complexity, dynamism and hostility were defined as the measurement for assessing the environmental sectors at a task environment level. The senior executives' views of and attitudes toward the environmental factors were measured by using a 45-items scale developed by the researcher. The questions were arranged as multi-item scales corresponding to the six environmental sectors. Each of the environmental items indicates the degree of environmental complexity, hostility and dynamism, and in turn, the level of the environmental uncertainty. The respondents were asked to rate the degree to which they agreed on various characteristics of the environmental sectors.

The answers on the perceived complexity and hostility were measured by a series of 7-point bipolar (the "bipolar" concept was advanced by Osgood in 1957) rating scales (Zikmund, 2000). Bipolar adjectives anchor the right and left of the scale, with 1 indicating that the respondent most strongly agrees with the left assessment; 7 indicating that the respondent most strongly agrees with the right

assessment; and 4 showing that the respondent felt that, for his organisation, the situation was midway between both. Similarly, the environmental dynamism was examined by perceived predictability of those six environmental sectors. The answers were measured by using a 7-point numerical scale, with 1 indicating very predictable, 7 indicating very unpredictable and 4 indicating a neutral situation.

For instance, to measure the attitude towards perceived dynamism, from left to right, the scale intervals were interpreted as very static, static, tend to be static, neutral, tend to be dynamic, dynamic and very dynamic. If the question asks:

The business environment in which you operate is

very static 1 2 3 4 5 6 7 *very dynamic*

Weights of 7, 6, 5, 4, 3, 2 and 1 were assigned to the answers and a score was assigned to each position on the rating scale. Strong agreement indicates the most favourable attitudes on the statement, and the weight of 1 was assigned to the most positive response while 7 was assigned to the most negative response. Hence, in each measuring situation, a score has been assigned for the perceived business environmental dynamism. Should "5" be selected by a respondent, it indicates that the respondent "agrees with the assessment as stated on the right".

2.3.2.2 Strategic Assignment

Questions of the Strategic Orientation section comprised multi-item scales including Miles and Snow's typology, Porter's taxonomy and Bowman's Strategy Clock. Hence, the data could be transformed in a category form showing various strategic classifications.

A 7-point Likert scale was utilised to assign strategic orientations and competitive strategies, with 1 indicating strong agreement; 7 indicating strong disagreement. Questions were randomly arranged to eliminate question-ordering bias. In total, 28 questions pertaining to business strategies were developed. Each of the items was designed for assigning different types of business and competitive strategies.

Firstly, the construct of Miles and Snow's business strategy was measured by examining five types of strategic orientations, namely, Defender, Prospector, Analyser, Balancer and Reactor. The appropriate measures were constructed to assess the range of product or service domains, product-market strategies, the attitude toward change and the approach to managing change. The methods advanced by previous strategic researchers (Parnall, et al., 2000) was employed to classify business strategies. 20 questions were designed to deal with the variations of managerial perceptions in business strategies. Among these, one question was related to whether they had clearly articulated business strategies in supporting the assignment of strategic categories.

Secondly, eight questions were used to assess competitive strategies and two of these questions pertained to whether organisations were aware of competitive strategies in supporting the associated assignment. Based on Porter (1980, 1985), four generic strategies, namely, Low-cost, Differentiation, Hybrid and No-purpose, have been selected and examined in this study.

Furthermore, competitive advantage is the underlying concept of generic strategies and all organisations are in a competitive position in relation to each other as they compete either for customers or for resources (Porter 1985; Johnson and Scholes, 1999). Because of the characteristics of the service sector within the oil and gas industry, firms compete mainly for customers (i.e. operators). In order to

understand an organisation's strategic position within which it attains competitive advantage, Bowman's strategy clock (Johnson and Scholes, 1999), which is advanced by Faulkner and Bowman (1995) as Customer Matrix, has been developed further in this study. Two dimensions of the strategy clock were defined as firstly, the perceived customer added value (PCAV, which is also conceptualised by Faulkner and Bowman as Perceived Use Value) and secondly, the offering price. The first dimension, PCAV, refers to the senior managerial perceptions on the degree of the value that their businesses create to satisfy customers' needs.

In particular, for oil and gas service organisations in East Asia, it was assessed by managerial perceptions on five variables: quality valued by customers, technological reliability, safety performance, speed of response to customers and price that customers are willing to pay. These five variables were generated based on previous fieldwork and pilot studies at the early stage of the research. The second dimension refers to the level of price offered by service firms for their products or services. It was measured by managerial perceptions on the level of price charged.

A 6-item scale (i.e. six questions included) was used in an attempt to construct a map of strategic competitive positions for the participating organisations. For the first five items, a 5-point semantic differential scale was used with 1 indicating very low, 3 indicating a moderate and 5 indicating very high position. For the price that customers are willing to pay, 1 indicates much lower than that a service provider charges, 3 indicates the same as the service provider offers and 5 indicates much higher than the service provider offers. The weights of 1, 2, 3, 4 and 5 shown in parentheses were not printed on the questionnaire.

For the same reason as explained in Section 2.2.4.4, this 5-point scale was assumed as interval, the mean of managerial perceptions on the five variables for PCAV was performed as the measure of central tendency.

2.3.2.3 Strategic Performance Assessment

To evaluate strategic performance, 20 questions were developed covering overall organisational activity areas such as finance, operations, marketing, human resource management and other strategic aspects. This study employs a subjective measurement (Dess and Robinson, 1984) that calls upon the managerial perceptions. The reliability of this self-reporting approach has been proved by various studies (Tan and Litschert, 1994; Luo and Tan, 1998; Luo and Park, 2001). A 7-point interval scale was drawn from Ramanujam and Venkatraman's (1987) work, with 1 indicating much less or worse and 7 indicating much more or better. It was also assumed that data were interval, thus the mean value (average score) was adopted as the indicator of strategic performance for each participating organisation.

2.4 Sampling

2.4.1 Sample-Selection Criteria and Sampling Techniques

In order to provide a comprehensive picture of the industry, companies selected for the empirical studies should be informative and representative. The sample-selection criteria are, firstly, either foreign or domestic oil and gas service companies generating their business mainly in the domestic market; and secondly, independent entities, which had their own strategic units, decision-making and control centres, particularly foreign companies operating

internationally. Large companies, which mainly served the upstream sector offshore, would be accorded priority, and companies in China would be essential, while companies selected from Singapore and Malaysia would be regarded as comparative. The reason of selecting the upstream offshore service companies is because the key industrial leaders, whose business activities are considered to be representative, operate mainly within this sector.

A non-probability sampling strategy and purposive sampling technique (Saunders, et al., 1997) were utilised in this study. Combining snowball and convenience sampling (ibid.), a multi-stage sampling technique was employed for the formal survey. That involves selecting the most accessible potential respondents, including those that participated in the earlier surveys and interviews; making initial contact with these respondents; ask them to identify further contacts; asking the new contacts to identify further new contacts (and so on); and continuing the sampling process until the required sample size has been reached.

2.4.2 Sample Population and Frame

As it was impossible to find a comprehensive list of oil and gas service companies in the selected East Asian countries, notably China, the total population was difficult to identify. The researcher used three oil and gas registers to discover relevant organisations situated in China, Singapore and Malaysia. The following directories were used: Oil and Gas Directory 2000 Petromin Hydrocarbon Asia; Shanghai Exhibition 2001; and Bejing Oil Exhibition 2000. In addition, the researcher generated a separate list by using personal industrial contacts. The intention was to use all of the available information to construct a sampling frame that was as complete as possible.

Apart from organisations within the oil and gas service sector, all oil production companies and other industry participants eliminated. Some 500 organisations remained and they were the companies that constituted the sampling frame. The researcher contacted all the companies that constituted this sampling frame by post (mainly, email and telephones. By the end of March 2002, 108 companies had participated in the research. This became the achieved sample, with the response rate of approximately 22 per cent. The sample frame was made up of foreign, indigenous and joint venture companies, providing services mainly to the upstream offshore oil and gas industry as well as to midstream, downstream and other service companies.

It appears that the characteristics of companies in the population were reflected in the sample. The research results would thereby be validated based on the sample (Nunnally, 1970; Parasuraman, 1986). The response rate achieved in the survey does not appear to have negatively affected the validity of the sample.

2.5 Pre-Period of Data Collection

In late 1999, in an attempt to gather relevant industrial information or contacts, the researcher embarked on informal conversations with managers in the offshore industry of South China. Meanwhile, in order to identify the dominant business environmental conditions for the supply and service sector within the oil and gas industry, the researcher initiated a survey which sought to investigate common interests of relevance to the research among senior management.

2.5.1 Preliminary Investigation

A questionnaire (Appendix E1) was prepared in order to obtain a basic picture of mainly Western oil and gas service organisations'

businesses in East Asia. 200 copies of questionnaire were distributed to potential respondents. By the end of 1999, the researcher had received 111 completed questionnaires for initial investigation analysis. The key findings reveal that, in terms of their business activities, Singapore, Malaysia, Indonesia, China and Japan were the top five countries for the sample companies. Most managers regard operating, competitive, technological and economic environmental influences the most important issues to be taken into account for their organisations (Appendix E2).

Between July and August 2000, an interview guide (Appendix D1) had been generated for discussion-based interviews or self-administered questionnaires. Three service industry observers and three senior mangers from the service companies participated in answering the questions in preparation for the pilot questionnaire design and empirical fieldwork. A Pilot Questionnaire (Appendix D2) was developed before the researcher went to China in November 2000 for conducting the pilot fieldwork.

2.5.2 Pilot Study and Pre-Test

In order to pilot the proposed research methods (mainly primary data collection techniques), further refine the questionnaire and test the administrative procedures that would be used in the main study, pilot fieldwork took place between December 2000 and February 2001 in Shenzhen, a city regarded as the offshore service hub of the South China Sea. The intention of this pilot fieldwork was also to amass relevant primary data at an early stage so that the researcher could test statistical tools in advance, which, in turn, would help clarify the analytical techniques used for formal data analysis. In addition, the researcher could gauge the validity and sensitivity of questions, as well as the reliability of the data collected.

The pilot research started out with an informal and exploratory character, by using face to face interviews. The pilot questionnaire was revised after each round of discussions with academic supervisors and advisors. It was also revised following pre-testing with respondents during the pilot study. After the pilot study, a standard structured questionnaire for the formal survey emerged.

Having completed the pilot fieldwork and combined the experiences from previously empirical studies, the researcher felt that is was more appropriate to use mainly closed questions for collecting standard data. For the supplementary data required, a few open-ended questions were included in the questionnaire. In order to finally ensure the reliability, validity and sensitivity of the questionnaire and improve its effectiveness, it was discussed in depth with academics and other parties, and also tested between June and July 2001 by potential respondent organisations that operate in China, Singapore and Malaysia. By taking the comments from academic and industry experts and potential respondents, a balanced view on the questions asked has been generated. A final version of the survey questionnaire for collecting data from mainly China, Singapore and Malaysia was produced in September 2001.

2.6 Questionnaire Survey Process

After completing the design of the study, the survey took place to collect the required data. Telephone interviews and self-administered questionnaires were used for this survey. The designed questionnaire differs according to how it is administered. Self-administered questionnaires are usually completed by the respondents with postal or mail questionnaires as well as delivery and collection questionnaires.

2.6.1 Distributing Questionnaires and Following Up

In this study, the self-administered questionnaire had most frequently been delivered by mail or e-mail. Responses to interviewer-administered questionnaires were recorded by the researcher on the basis of each respondent's answers. 500 questionnaires were distributed to the senior management respondents between late 2001 and early 2002. Each of the packets mailed contained a covering letter with the correspondent's photograph on it, the questionnaire and a self-addressed envelope for return.

Two month later, following-up (Appendix B3) mails, phone calls and emails were made in an attempt to achieve the proposed response target (of 20 per cent). As a result, by August 2002, 108 completed questionnaires had been returned by managers involved in operating businesses in China, Singapore and Malaysia. Among those, 98 completed questionnaires are usable for the final primary data analysis.

When making phone calls to Singapore or Malaysia located companies, it was usually not easy to get a hold of CEOs directly. Rather, their secretaries or personal assistants answered the phones. Normally, the following questions were raised before some real helps appeared: "Who is on the line?" "Which organisation?" and "What is it regarding?" In such a situation, the researcher had to make an effort in order to get their assistance first. What was done is to explain clearly that the purpose of the phone call is for a survey and emphasise that it just takes no more than 30 minutes to answer all questions as they might give an excuse that they were tight of time.

It was observed that, when distributing questionnaires in each of the three selected countries, some extra techniques can be adopted in order to increase the response rate. In China, postal and calls should

be made first and in Singapore, postal or emails are suitable survey approaches. However, in Malaysia, more efforts should be made. It is better to make a phone call first. The next task is to overcome the obstacle set by a secretary or assistant by gaining her or his support (through the phone) and then to confirm a reception of a response from them.

2.6.2 Reasons for No Response

There are a number of reasons for no responses. Most frequently, potential respondents claimed they were too busy to answer any questions. Some managers may have no patience for completing a 30-minute questionnaire at all. Occasionally, senior executives were travelling or aware of confidentiality or for small organisations, managers were not concerned with the issues regarding strategic management. Unexpected occasions occurred as well. For instance, previous managers left, companies or offices had been closed down or moved to other places, and mails or emails disappeared or lost. A difficult scenario is the "secretary obstacle": some senior managers' secretaries or assistants might throw the mail into a rubbish bin as it was not a business order. Alternatively, they decided for their bosses that the bosses would not have a time for replying to questions which are not relevant to their businesses and then they were not willing to do a favour!

2.7 Data Analysis

In this study, the perceived business environment is analysed on a person-by-person basis while business strategy and strategic performance are analysed on an organisation-by-organisation basis. Statistical techniques were used to analyse data; the final results are subject to descriptive explanations rather than scientific quantifications.

2.7.1 Types of Data

The data required comprises primary data and secondary data. The primary data refer to that collected through the questionnaire-based surveys and (telephone) interviews within the sample groups and other relevant parties. They form the result of the researcher's individual discoveries through access to information supplied by respondents. The completed questionnaire produced the primary data for analysis. The secondary data refer to that collected from sources such as books, archives, newspapers, organisations' reports, conference proceedings, periodicals and authoritative publications. Background information on the economic, political and technological factors of the business environment to an oil service firm in China, and to a lesser extent, Singapore and Malaysia was the main secondary data. This provides a basic context to the empirical research and is supplementary to primary data. It helps to identify the important issues necessary to generating the content of the questionnaires.

The collected primary and secondary data can also be categorised into qualitative and quantitative data. The first deals with meanings (Dey, 1993). It includes the qualitative assessment of the managerial views, feelings, opinion (primary data) and the statement generated from relevant text (secondary data). The last deals with numbers. It consists of the quantitative figures such as employee numbers or organisational age in terms of years (primary data) and oil economic indicators like exploration and production levels, well counts, rigs counts or rigs rate etc (secondary data). The quantitative data describes what the results were in value terms, while the qualitative data explain how the sound results were achieved. Hence, the qualitative meanings and quantitative numbers complement each other.

2.7.2 Data Editing and Coding Sheet

In order classify data for interpretation and explanation, a conceptual framework was developed for conducting the investigation at the early stage of study. In line with the questionnaire construction, the data was edited in four major dimensions: firms' background information, managerial perceived business environment, business strategic orientations and strategic performance. Each of the responses was coded to facilitate computer data input. A coding sheet (Appendix C), which contained variables and their definitions, was developed for coding the data. The SPSS statistical package, Minitab and Excel were used for the data input. For each of the 98 usable cases, 141 variables were ready to create a data matrix that could be handled by SPSS Version 11.5.

2.7.3 Company Classifications

The research design required analysis of the whole sample, and then comparison made between groups of companies on various variables. As a result, the classification is a conceptual process and provides information about what falls within categories, the boundaries between them, and how the categories are ordered in relation to each other. When classified, the data are broken up into bits, and then these bits are assigned to categories or classes that bring them together again.

First, the whole sample was split into sub-samples and comparisons were made between these. The sub-samples were based on the location where organisations were. On this basis, the sample was split into four sub-samples: China (30), Singapore (34), Malaysia (29) and other countries (7). In the last case, these were the companies that operated business in the above three countries, but their

business strategic decisions were made elsewhere like in Thailand and the UK by their headquarters.

Second, for the reasons of confidentiality, the names of respondents and companies were classified in a code term. The associated details of these companies can therefore not be identified by anyone except this researcher. In order to identify companies, they were coded as follows:

i. China-based organisations (CN001-CN030)
ii. Singapore-based organisations (SG001-SN034)
iii. Malaysia-based organisations (ML001-ML029)
iv. Organisations based in the other countries (OT001-OT007)

This coding system was used to maintain confidentiality and made it convenient for a comparative analysis between China-based organisations and non-China-based organisations.

2.7.4 Statistical Analysis

Before conducting advanced statistical analysis, a preliminary analysis was carried out. There were two purposes of the preliminary analysis. First, it served as a quality check on the data. Second, the descriptive statistics and frequency distributions presented a clear picture of how the various variables were distributed. The general picture obtained was that of skewed, non-normal distributions. The data were summarised using frequency, explore (Box plot) and cross-tabulation descriptive statistics. Various descriptive statistics were calculated including means, medians, modes, standard deviations, coefficients of skewness and Kurtosis (explore). This was done for the dependent variables on the perceived business environment and strategic performance (average score). These observations formed a basis for further decisions on what other statistical techniques would be selected at the next stage of data analysis.

As said in Section 2.2.4.3, primary data were analysed by statistical procedures of descriptive statistics, univariate statistics and bivariate analysis. Descriptive statistics provided the assessment of a single variable and correlations examined the relationship between two measurements. In order to distinguish the companies in China from the firms in Singapore and Malaysia, use of a comparative analysis method was included.

Different statistical techniques were used in this analysis and the selection of techniques was based on their relevance to the research objectives. First, the collected data were summarised using frequencies and histograms. In addition, various descriptive statistics were calculated including means, medians, standard deviations and coefficients of skewness. This was done for each of the variables. The explore and frequency statistics gave a good picture of how the various variables were distributed.

Second, further statistical analysis was carried out to evaluate the relationships of the perceived business environment, strategic orientations and strategic performance. To do this, the Spearman correlation and Crosstabs with two-way contingency table analysis and chi-square tests were employed. Moreover, to evaluate differences in medians among the managerial perceptions of the importance or impact of six task environmental factors, Friedman's tests were conducted. To test the differences of the perceived environmental uncertainty and strategic performance by strategic groups, Kruskal-Wallis tests were applied. A number of Boxplot graphs and Scatter diagrams were also applied to highlight the pattern of differences and correlations.

Third, for the purpose of the exploration of the differences or similarities for variables in China, Singapore and Malaysia, Kruskal-

Wallis test of k medians, Mann-Whitney test of two medians and chi-squared test of Cross-tabulation contingency table were performed to report the results of company profiles, the perceived business environment and business strategic orientations. In addition, analysis of variance (ANOVA) of k means and multiple comparison tests (Tukey) to identify significant differences were calculated for the results report of strategic performance.

During the data analysis procedure, in order to classify firms based on their business strategies and managerial perceptions of the business environment and then on their strategic performance, factor analysis and clustering analysis were performed. To check the consistency across responses reliability, Cronbach's alpha was calculated. In order to check whether managers within the same organisation or the same respondent responding at different times have different views on their organisations, Wilcoxon tests were conducted by comparing the research results of the control groups (Appendix A). Moreover, to check the normality, the Kolgomorov-Smirnov goodness-of-fit test on the data was performed. The finding of the above tests had a big influence on the choice of statistical techniques employed in this study. The details of these statistical procedures and analytical results are presented in Chapter 7, 8 and 9.

2.8 Limitations of Methodology

As survey was used as a major method to collect primary data, it has the built-in limitations of the method. The survey sought to deal with phenomenon and context, its ability to investigate the context was deemed limited. This is because there were limits to the number of variables to be analysed, the number of questions that could be asked, and the number of respondents that could be surveyed.

There is a risk that the questionnaire method was done badly. Several major errors common to survey research might occur, such as random sampling error, non-response, response bias, etc (Zikmund, 2000). Particularly, the data bias issue should be stressed. Managers, especially Chinese, appeared to be biased towards saying good rather than bad regarding their answers. Senior management would be able to scan and assess the environment for signals which can be fed into business strategic decisions yet middle or functional-level management might have a very parochial outlook on these relevant issues. However, having completed pilot fieldwork, relevant approaches were designed and employed to reduce each error.

2.9 Summary

This chapter discusses the philosophical nature and research strategy of the study; then introduces the research design, which includes the methods selected for data collection and analysis; following that, focus moves on to the research process and techniques in collecting and analysing data; and finally, this chapter indicates the limitations of the selected methodology.

CHAPTER 3

THE OIL AND GAS SERVICE SECTOR IN EAST ASIA

East Asia [1] is now the second most important oil and gas consumption region after North America. Among the East Asian countries, China is the regional leader in terms of oil and gas exploration and production (E&P) and has become the regional economic driving engine in the past decade (British Petroleum, 2002). Malaysia ranks as an attractive emerging E&P market and a significant regional player in terms of offshore activity (BP, 1998; Mackay and Adam, 1998). It is also well known that Singapore offers environmental advantages to the oil and gas service industry in terms of good financial and economic stability as well as advanced information-technology (Mackay and Adam, 1998; BBC, 1994). These three countries were selected for the empirical work of this study.

In order to examine the impact of the dominant environmental factors, this chapter seeks to construct a comprehensive picture of the service sector within the oil and gas industry in East Asia, with a focus on China, and to a lesser extent, Singapore and Malaysia. In this study, the dominant business environmental factors refer to (oil and gas focused) economics, technology, politics, competition, suppliers and oil operators (customers) as well as industrial organisations. Each environmental factor is dealt with in two

[1] The East Asia includes China, Hongkong, Taiwan, Vietnam, Indonesia, Malaysia, Thailand, the Philippines, Singapore, South Korea and Japan.

dimensions: identifying and presenting the key issues of that factor; and comments on the impacts of these environmental factors.

3.1 The Oil and Gas Industry

3.1.1 Definition

The Oxford English dictionary says that industry is "a particular form or branch of productive labour; a trade or manufacture". The Hutchinson Encyclopaedic Dictionary says it is "the extraction and conversion of raw materials, the manufacture of goods and the provision of services". A Concise Dictionary of business says it is either an organised activity in which capital and labour are utilised to produce goods or the sector of an economy that is concerned with manufacture. Pearce and Robinson (1997) further define an industry as a collection of firms that offer similar products or services. "Similar products or services" mean that customers perceive them to be substitutes for one another.

With respect to the concept of the oil and gas service industry, it refers to a group of professional companies which often engage in highly specialised supply and service work in the petroleum industry. Integrated contractors offer a portfolio of interlined services and products, all geared towards client oil companies or other oil and gas service companies (Phillips, 1998). Many service organisations such as Halliburton, a technologically focused oilfield service company, cover the complete value chain from exploration, via field development to production.

Service companies serve the needs of the wider oil and gas industry and other sectors of economically important energy industry, such as nuclear energy, coal, power generation and petrochemicals. Many of them are also involved in business outside the energy industry. FMC Technologies Inc., for example, along its product lines, is divided into three Business Units serving different industrial sectors: FMC Energy Systems, FMC FoodTech and FMC Airport Systems.

The service industry is therefore defined as entities engaged in the business of providing products or services to an oil and gas company, another oil service company, or to another energy industry (Simmons and Company International, 1999). The industry consists of many sub-industrial sectors. Within each of the sub-sectors, firms usually have their own specialised (focused) area and they rarely become involved with other activities apart from their advanced ones. They provide related and highly specialised services (e.g. cementing, casing into a well, pumping acid into a well or drilling a well). Frequently, they design, manufacture and own specialist equipment to enable them to perform their specialist service. They generally have highly trained and experienced personnel to carry out the work. A service company in one sub-sector might have no knowledge or interest in any other service activities (Phillips, 1998).

Some industry experts (Phillips, 1998) suggest that the service industries mainly comprise contracting and construction companies, service companies and vendors. They may include drilling contractors, well equipment specialists, component supply, fabrication and engineering and subsea contractors. Contracting and construction companies carry out the design, fabrication and construction of infrastructure such as platforms (e.g. Halliburton - Kellogg Brown & Root, Sembawang), pipelines (e.g. Grant Prideco),

process equipment (e.g. Baker Hughes EIMCO Process Equipment Company) and associated electrical and mechanical services (e.g., Natco Group) used in the oil and gas industry.

Service companies carry out a wide range of specialist services. In this study, the service businesses include: drilling of wells by drilling contractors; services associated with drilling and evaluating wells, including casing, cementing, logging, testing, etc; specialist technical services in support of the platform operations, including instrumentation, helicopter and ship operations as well as completion, fishing and workover solutions. General services such as catering and cleaning, deck labour and crews are also included. Vendors only produce equipment. Some of the equipment may be used in other industries like diving facilities, electronics, and cabling and communications.

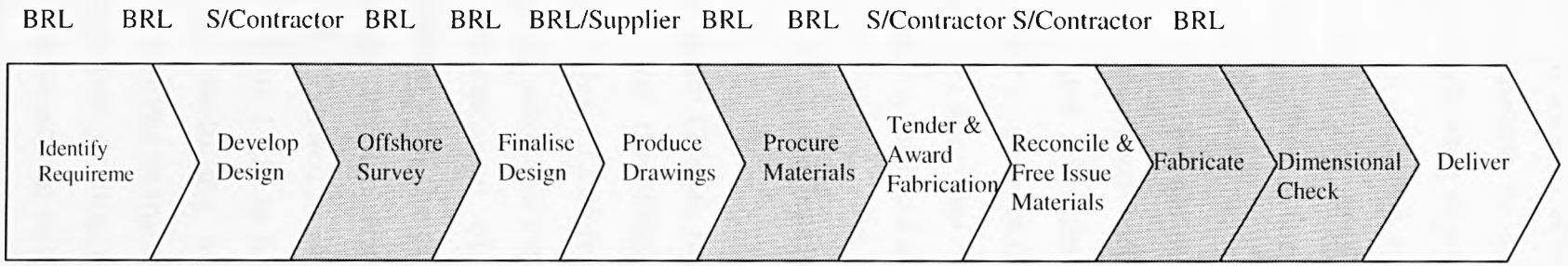
3.1.2 The Supply Chain Concept and Industry Selection

> The supply chain is the network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer. Each of these organisations in the chain are dependent upon each other by definition and yet paradoxically by tradition do not closely co-operate with each other.
>
> (Christopher, 1998)

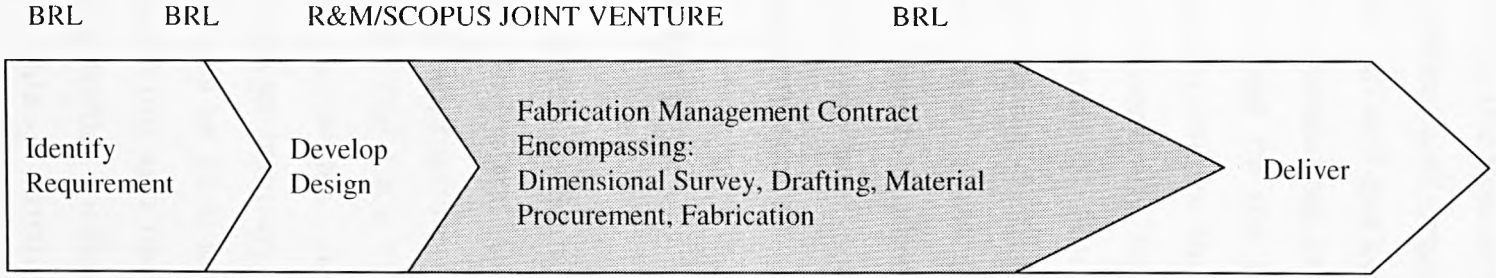
For the oil and gas industry, the concept of the supply chain is essential. Service organisations form a clear embodiment of the supply chain within the oil and gas industry, which comprises upstream covering exploration and production; midstream covering oil and gas transportation pipelines and tankers; and downstream covering refining marketing and sales. The supply chain extends upstream through the suppliers and manufacturers, and downstream

Figure 3.1 Traditional Fabrication Supply Chain

i) Brown & Root previous approach



ii) Current approach



Source: LOGIC Conference 1999, Aberdeen.

through distributors and other suppliers to the final consumer. It is a complex and dynamic network of facilities and organisations with different and conflicting objectives. Each oil and gas service company like ASCO plc - a logistics specialised organisation, can be a part of the supply chain. The approach developed by the Brown & Root company (1999) offers a further understanding of the supply chain (Figure 3.1). In its previous approach, the company, its suppliers and other sub-contractors constructed a traditional fabrication supply chain; in its new approach, the current supply chain is organised by the company and another company, the "R&M/SCOPUS" joint venture. In order to concentrate on the subjects studied in this study, the offshore oil and gas service industry was selected for the empirical research, with a focus on upstream sectors.

3.1.3 Industrial Classification – Industry Code

According to Anne (2000), neither the American Standard Industrial Classification nor the 1992 Standard Industrial Classification of economic activities (UK version) has an appropriate heading for oil and gas supply and service companies. The UK's "1992 Standard Industrial Classification of Economic Activities" describes some definitions related with the oil and gas service industry. The 1992 SIC code 1110 (page 38, also written sometimes as 11.1) is for companies involved in "the extraction of crude petroleum and natural gas". The SIC code 1120 (or 11.2) is for "service activities incidental to oil and gas extraction including surveying". This is further defined as including "oil and gas extraction service activities provided on a fee or contract basis; test drilling and test-hole boring; directional drilling and re-drilling; spurring in; derrick erection in situ, repairing and dismantling; cementing oil and gas well casings; pumping of wells; plugging and abandoning wells etc".

It has been very difficult to find any classification code that covers all oil service companies, because they provide such a wide range of services that individually they are usually classified under other headings. For example, there are a lot of companies who provide things like food or cleaning services to oil rigs which do not fall within this definition. They will either be classified under "cleaning services" or a general heading such as "business services not elsewhere classified" (ibid.). By consulting the FAME CD ROM which gives company accounts, and which can be searched by SIC codes, and then looking up a company such as Bedford Marine who provide contract services to the oil industry, they are classified at SIC code 7484 – other business services not elsewhere classified. To a narrower extent, Petromin (2000) has developed a coding system to classify the oil and gas industry including its service sectors. "When we started the directory years ago, we needed a basis on which to categorise our inputs. Since we had created a subscription form, which required detailed information for audit purposes, and which had to have sufficient variability to allow for additions, it was designated as 1000, 2000, 3000, etc. These groups stuck, and when it came to creating the directory structure, we used the same numbers" (Croy, 2001). In general, the number of potential dimensions for classifying companies within the service industry has become very broad - oil and gas services versus the other energy services, onshore versus offshore, domestic versus foreign, giant oil corporations versus stripper (small oil companies) players, upstream versus downstream, and oil versus gas, among others. There are two approaches for industrial classification. The first one is that the service industry can be divided into a number of groups in terms of the product or service lines. In the Gulf Coast Oil Directory, for instance, the oil and gas industry is, with the majority of the service sector, categorised into the following sub-segments:

Associations & Government Agencies
Bits & Tools
Blowout & Firefighting Specialists
Caterers Food & Services
Computer Services - Oil & Gas
Corrosion Control & Cathodic Protection Services
Directional Drilling, Well Surveying & MWD Services
Diving & ROV Contractors
Drilling Contractors
Drilling Mud & Mud Loggers
Engineering & Construction
Environmental Services
Fabricators - Machine Shops - Welders
Geologists
Geophysical & Seismographic Services
Information Services - Reports, Maps, Log Libraries
Insurance Services, Claims Adjusters
Laboratories - Core Analysis, Measuring Services
Lease, Royalty & Property Brokers, incl. Landmen
Lease Services, Location & Roadwork
Marine Contractors
Marine Supply Bases, Expediters & Chandlers
Marine Surveying & Positioning
Oilfield Chemicals Personnel Services
Petroleum & Consulting Engineers
Pipe Services
Pipeline Contractors
Pipeline Operators
Producers & Operators (Oil Companies)
Rental, Tools & Equipment
Ship, Boat & Offshore Rig Builders
Stimulation & Cementing Services
Suppliers & Manufacturers
Surveyors, Lease & Pipeline
Transportation Contractors - Land, Air, Marine
Valve & Instrument Reconditioning
Well Testing, Completion & Wireline Services
Workover & Well Services

Source: Gulf Coast Directory, 2002.

The second representative approach developed by Simmons and Company International (1999) is that oil and gas services are split in four: upstream, midstream, downstream and service companies. For simplification, the second approach was adopted in this study as a framework for empirical research.

3.2 The Service Sector in East Asia

3.2.1 Petroleum Industry: East Asia Overview

This section briefly examines East Asian countries, including those excluded from the context of this research and explains why they are excluded.

3.2.1.1 Three Selected Countries

China is the world's most populous country, the world's largest potential market for energy and, after the USA, the second largest consumer of energy. It is the world's third largest producer of energy, the largest producer of coal and the sixth largest producer of crude oil (IEA, 2000). Although coal remains China's dominant fuel, Beijing recognises that this is a major polluter and is therefore taking steps to deal with the problem by seeking to increase significantly the production and use of oil and gas, mostly as feedstock to raise electricity capacity.

The substantial Chinese exploration and production industry has been generated by the Ministries and state owned enterprises (SOEs). This makes the Chinese oil and gas industry different to the Western model. The most striking difference is that Chinese oil companies have almost everything integrated into them whereas western companies operate very differently. For example, Chinese companies have their own research institutions, universities and service companies and these service companies are not gathered into a particular group to form an industry sector, as they are in the west.

The island state Singapore has no oil and gas reserves nor has there been any offshore activity. Like Japan, this country is a substantial importer of oil and Gas (Department of Trade International-DTI, 1996). Nevertheless, it is unquestionably Asia's leading petroleum industry centre: "It is the world's largest single bunkering port, the third largest refining centre after Houston and Rotterdam...and the major oil and futures trading market for Asia. Refining, bunkering, petrochemical production, oil trading, and oil rig manufacturing are all important components of the industry, but refining and petrochemical production are the backbone" (The USA Singapore Embassy, 1997). Singapore is also regarded as an important logistics support basis from which international service firms deliver their services to the region, mainly South East Asian E&P countries (Mackay and Adam, 1998; DTI, 1996; and Abraham, 1999). What is more, the country has become one of the three major global refining centres: US Gulf Coast (USGC), North West Europe (NEW) (Rotterdam) and Singapore (BP, 2002). Although it is encountering increasing competition from others in the region in refining and petrochemical production, Singapore remains the preferred regional hub for numerous international service and supply companies. The advantages of Singapore as a petroleum industry centre are "strong government support; ideal geographic location to serve Asia; sound infrastructure, including highly efficient port services; and political stability" (Lucas, 2000).

Malaysia is the most significant East Asian country in terms of offshore oil and gas activity and is an essential producer in the region (Mackay and Adam, 1998). Domestic oil production is offshore and primarily near Peninsular Malaysia. Activity in the States of Sarawak and Sabah off Kalimantan Island and in the Joint Development area between Malaysia's Jerneh and Lawit fields and Thailand's Bongkot

field is also substantial (DTI, 1996; EIA, 2001). One of the most active areas in Malaysia for gas exploration and development is the Malaysia-Thailand Joint Development Area (JDA), located in the lower part of the Gulf of Thailand and governed by the Malaysia-Thailand Joint Authority (MTJA) (EIA, 2001; BP, 2001). Whilst Malaysia is developing its own oil and gas expertise, by developing partnerships with foreign companies, it is also now looking to play a bigger part regionally. Many Malaysian companies are now developing their domestic base and seeking to become involved in playing an important role in the region of South East Asia and beyond.

3.2.1.2 Excluded East Asian Countries

Like Malaysia, Indonesia has since the 1960s developed its own infrastructure and adopted policies supporting the development of domestic established companies. In spite of the fact that the country is very active in well drilling and a large regional oil and gas producer, Indonesia is a politically and economically unstable country and has financial problems. The legal protection for enterprises is weak and the business environment is becoming more hostile for foreign investors (Zaobao, 2002). It was considered that Indonesia would be a less appropriate selection than Malaysia and it was thereby excluded from this study. Japan is one of the leading industrial countries in the world but its domestic energy sector is quite small compared with other East Asian countries. Although it has considerable manufacturing, engineering, software and wider technological capabilities to support the development of the oil and gas service business world-wide, like Singapore, Japan depends heavily on imported oil and gas. Because the majority of previous research has only examined its role as an importer and also since there is a language barrier with respect to communications, access to

information and data collection, Japan was excluded from the context of this research.

The Philippines is among the smaller oil and gas producers of East Asia. Between 1996 and 2000, its offshore exploration activity only had around six or four wells. It has also financial problems. For these reasons, the country was excluded from this study. South Korea is one of the most prosperous and fastest growing countries in the Asia-Pacific region but has no indigenous oil or gas production. The Korea Petroleum Development Corporation (Pedco) has drilled a few offshore wells with no real success. The expected activity levels will not increase over the next few years. Taiwan has a very small offshore oil and gas industry and little offshore activity is expected. Thus, neither of these two countries was considered. Thailand is primarily a gas producing country with a small level of oil production. Despite the E&P industry in this gas-prone country outperforming the overall economy in 1998 (Abraham, 1999), it was also not considered due to its financial problems and a low level of offshore exploration activity (with a peak of 43 wells in 1996 and a fall to 30 in 2000). Vietnam is a significant country in the region in terms of offshore oil production and there is growing evidence of significant offshore gas reserves. There is currently no offshore gas production and there is one small onshore gas field. For the same reasons which apply elsewhere, Vietnam was not an appropriate country to be selected for the study.

In conclusion, the critical reasons for excluding the above countries from further empirical research are twofold. Firstly, the excluded countries were neither the significant oil and gas players in the region nor were they financially and politically stable. Secondly, it was also because of the downturn in economic activity in these countries which reduced the demand for petroleum production services.

3.2.2 A Historical Review of the Selected Countries

3.2.2.1 China's Industrial Development

Before 1939, over the period that Japan invaded China, very few oil exploration operations could be carried out. The oilfields in the northern part of Shanxi province were targeted but with little result. In 1939, Yumen oil field was discovered. Between 1939 and 1949, Yumen produced 524,000 tons of oil in total. In 1949, when the People's Republic of China was established, Mobil became the first foreign company to conduct oil reserves surveys and explorations in China (Scottish Enterprise, 2002). The details of major post-1949 oil discoveries in China are shown in Table 3.1.

Table 3.1 Post-1949 major activities of the petroleum industry in China

Date	Oilfield discoveries and operations
October 29, 1955	Karamay Oilfield with Exploration - 1 well striking commercial oil in the Junggar basin of Xinjiang.
September 13, 1958	Qinghai's Lenghu 5 Oilfield with Dizhong - 4 well striking commercial oil.
September 26, 1959	Daqing Oilfield, a world-class giant oilfield with Songji - 3 well striking commercial oil at Songliao basin in Heilongjiang.
September 23, 1962	Shengli oilfield with Ying - 2 well producing high-yield oil flow in Dongying, Shandong Province.
December 21, 1964	Dagang Oilfield with Gang - 5 well producing significant oil flows.
August, 1969	Construction of Jianghan oilfield began
September 6, 1969	Xinglongtai oilfield with Xing - 1 well in the Liaohe basin
June 27, 1971	Changqing Oilfield with Ling - 9 well striking commercial oil flow in Maling, Gansu Province
August 8, 1971	Henan Oilfield
July 3, 1975	Zhongyuan oilfield with Pushen - 1 well at Dongpu, Henan Province.
May, 1977	Kekeya oilfield in the Tarim Basin of the southern Xinjiang area.
March 2, 1989	Turpan-Hami oilfield with Taican - 1 well striking commercial oil flow in the Turpan-Hami area in Xinjiang.

Source: Adapted from Scottish Enterprise, 2002.

The significant restructuring development of the Chinese Petroleum Industry commenced in the 1980s. Production in China's major onshore oil fields began to decline over that period. Consequently, the Chinese government amplified its efforts in explorations in both western onshore regions (Tarim, Juggar and Qaidam basins) and offshore oilfields. For instance, by 1997, the share in China's total output by western onshore regions had doubled to reach 15 per cent. Jumping from 0.0845 million tons in 1985 to 15 million tons in 1999, now China's offshore oil production is nearly ten per cent of the China's total output.

In the early 1980s, the offshore division of China National Offshore Oil Corporation (CNOOC) had been formed to facilitate the development of offshore exploration in conjunction with foreign oil companies. Offshore exploration started following the formation of CNOOC and the opening of offshore exploration to foreign oil companies. Many companies, including BP, Shell, Esso and others, offered considerable work programmes in return for the right to conduct seismic and exploration drilling activities under new production sharing contracts. Initial activities were concentrated on the areas of Pearl River Mouth Basin, the East China Sea and the Yellow Sea. Despite considerable efforts, the results of these activities were generally disappointing. Some small oilfields were discovered and developed in the Pearl River Mouth basin and the Beibu Gulf (north of Hainan Island) but the major discovery was Arco's Yacheng 13 gas discovery off the southern coast of Hainan. In the mid 1980s, the former Ministry of Petroleum was further generated into a commercialised orientation (Scottish Enterprise, 2002). By the late 1980s, most of China's sedimentary basins had been put through geological and geophysical surveys and many exploration wells had

been drilled in the more prospective areas. China began to open onshore areas to foreign companies for exploration.

In the early 1990s, the blocks released in the Tarim Basin had little attraction for foreign interest. In the late 1990s, some apparently more attractive acreage had been offered for foreign participation for development and enhanced oil recovery projects. As a result Kerr-McGee and Phillips made significant oil discoveries in Bohai Bay and this stimulated some interest in exploration from foreign companies (Scottish Enterprise, 2002). Since the 1990s, the industry was also restructured fundamentally, with the establishment of two integrated major oil companies (PetroChina and Sinopec) from the assets of the former upstream company (China National Petroleum Corporation - CNPC) and the downstream company (Sinopec). Offshore activities continued to be dominated by CNOOC.

In a major restructuring of the industry in 2000, the downstream assets of Sinopec and the upstream assets of CNPC were combined and re-distributed with upstream and downstream assets in the north and west of the country owned by CNPC and those in the south by Sinopec. CNPC then created a new company, PetroChina, to hold all of its operating assets, with CNPC acting as a holding company for minority interests and controlling the State's interest in PetroChina. In 2000, PetroChina Ltd, Sinopec Ltd, and CNOOC Ltd. were listed on the New York, London and Hong Kong stock exchanges.

3.2.2.2 Industrial Development in Singapore and Malaysia

In the 1960s, Singapore strategically established itself as the region's leading oil refining and petrochemicals centre, as well as the logistics support basis for the Southeast Asia's oil and gas industry. Its

essential economic contribution has gradually reduced whilst other Asian markets have developed from the 1980s. For instance, the capacity to produce petrochemicals in Thailand and Indonesia has passed or will soon pass Singapore. However, Singapore remains a centre of major business activities in East Asia, including acting as a regional service and supply hub for numerous service and supply companies, which manage their operations stretching from the north west shelf of Australia to the Middle East, and north to China and beyond. As Singapore seeks a future increasingly marked by globalisation, the country is positioning itself as the financial and high-tech hub in East Asia (McNulty, 2001; CIA, 2001). Currently, for the East Asian region, high-tech services are especially concentrated mainly in Singapore (DTI, 1996). There has been substantial oil and gas activity in Malaysia (population 19 million) for over 100 years (e.g. Shell in Sarawak) and the market for equipment and services can be considered mature. Malaysia has since the 1960s developed her own infrastructure and adopted policies supporting the development of domestic established companies. With relatively healthy oil prices and the increasing demand (both domestically and internationally) for gas, activities in the upstream segment of the Malaysian oil and gas market were on the rise by 2001 (Britain Organisation, 2001).

3.3 Economic Environment Factors

3.3.1 Macro-Economic Context

East Asia's economic problems of 1997 are widely known. Although the situation had become brighter by 2000, it is still hard to determine whether Indonesia, the Philippines, Thailand, Japan, South Korea etc., have really recovered from the 'economic crisis

sequel'. Malaysia was fastest in terms of its economic recovery, while China and Singapore, as two powerful economies, continued to grow.

In spite of the Asian financial crisis in the late 1990s, China has been able to sustain a sound economic performance featuring rapid growth, low inflation (about 1 per cent in 2001) and high profits. It remains the engine of growth for South East Asia and its stable market climate is attractive to foreign investors, even given the current global economic slowdown. Its GDP (gross domestic product) grew by 8.2 per cent in 2000, grew by 7.4 per cent in 2001, was expected to be around 7 per cent in 2002 and grew 9.9 per cent in 2003 (The Economist, 2002) despite the creeping worldwide recession. The Chinese economic growth is forecast to continue strong.

Singapore is blessed with a highly developed and successful free-market economy, a remarkably open business environment, and the fifth highest per capita GDP in the world. Exports, particularly in electronics and chemicals, and services are the main economic drivers. GDP grew 10.1 per cent in 2000, but this fell to an estimated 4.5 per cent growth in 2001 largely because of weaker global demand and was forecast to recover to 5.5 per cent in 2002 but the real growth in 2003 was 3.7 per cent (ibid.). Malaysia has achieved economic growth following the deep recession caused by the Asian financial crisis of 1997 and 1998. Following a 7.5 per cent decline in GDP in 1998, Malaysia experienced GDP growth of 5.6 per cent in 1999 and 7.5 per cent in 2000. It is estimated the country's real GDP growth fell by 5.6 per cent in 2001 because of softening demand for Malaysian exports associated with the economic slowdown in the United States (EIA, 2001). In 2003, its GDP grew 3.5 per cent yet the

Malay's industrial production grew by 13.3 per cent in the year 2003 (The Economist, 2002).

3.3.2 Oil and Gas Economics

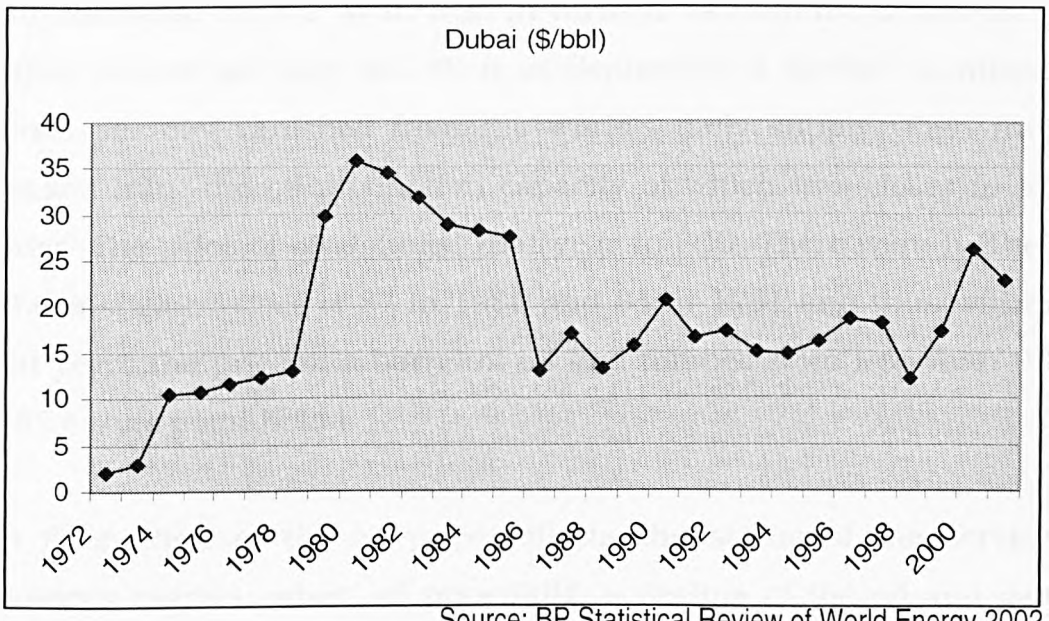
The essential variables indicating the economic trends for the oil and gas service companies as a whole, or parts, include oil prices, exploration and production (E&P) levels, reserves, expenditure of the industry, well counts, and rig counts (showing drilling activities). All of these point to business opportunities for energy service companies.

3.3.2.1 Oil Price and Its Impact on the Service Market

Crude oil is priced internationally. Whatever the currency cost of extracting crude oil - and it is obviously much less expensive to extract from a desert in Arabia than from the depths of the North Sea – its revenue value to the operator is always expressed in terms of US dollars per barrel. The $ price level and the $ exchange rate against national currencies both fluctuate and this volatility exerts a considerable measure of influence not only on the forward planning, which all oil operators carry out, but also on any current exploration and production. For many decades these fluctuations were so small that they could be virtually ignored but by the early 1970s there was soon to be dramatic change in this comfortable economic climate. Two unrelated but contemporary events, the collapse of the international currency system and political upheaval in the Middle East, brought about this change (Gourlay, 1996).

The world oil price has been dynamic since the 1970s (Figure 3.2) as a result of being driven by a number of sophisticated influences.

Figure 3.2 The Oil Price since 1972



Source: BP Statistical Review of World Energy 2002.

In 1969, Quadaffi demanded an immediate increase in the posted price of Zelten (i.e. Libyan) oil, which was valued highly on account of its low sulphur content and he successfully encouraged the other OPEC[2] countries to demand similar increases. By September 1973, the price paid to the oil companies had risen to $2.90 per barrel in comparison with the previous figure of $2.26. Then in October 1973 another Arab-Israeli war erupted. The Arab nations cut oil supplies by 25 per cent and this pushed up the price which by January 1974 had risen to $11.65 per barrel and then to over $22 on the wholesale market in Rotterdam. The price eventually stabilised at around $13 but this was a figure more than five times greater than the level a few months previously (ibid).

The price of oil seemed to be on a permanent upward spiral which rose even more steeply in 1979 when the events of 1973 were repeated. OPEC raised the price of its oil by 5 per cent just before a

[2] The Organisation of Petroleum Exporting Countries had been founded in 1960, largely at the instigation of Venezuela, which subsequently played so small a role in its decisions that OPEC appeared to the general public to be a Middle Eastern cartel.

revolution in Iran replaced the rule of the Shah with a religious fundamentalist regime. With Iran in turmoil its output fell first by 6 million barrels per day and then in September a further 4 million barrels per day vanished from the world's daily supply when Iraq attacked Iran, the oil production capacity of which was closer to its border. The price of oil doubled that year to $26. There were further OPEC instigated rises of $7 in 1980 and $4 in 1981 and thus within eight years the price of a barrel of oil had jumped from less than $3 to$37 at one point (ibid.).

The fluctuation of the oil price reflects the status of the service industry's market: when oil price falls, a decline of the oil and gas activity occurs and in turn, it influences service businesses. For example, many of the rigs in Europe and America had been "cold stacking" during the late 1997 and early 1999 oil price downturn. In Indonesia, for another example, due to the low level of oil prices, spending on projects fell 9.2 per cent to $5.56 billion in 1999 from $6.12 billion in 1998. After drilling 991 wells in 1997 and 1,015 in 1998, about 970 wells in 1999 were drilled by Pertamina, a state-owned company, and the foreign oil companies drilled, the lowest total since 1996 (Abraham, 1999). The same situation also applied to China and Malaysia because of the falling oil prices over the period.

Obviously, the economic business environment is quite frequently uncertain due to unpleasant low prices' conditions. How do service companies cope with such an environmental dynamism with regard to pursing an appropriate business strategy? This is the issue which should be examined in this study.

3.3.2.2 Oil and Gas Reserves

Petroleum product demand and consumption throughout Southeast Asia has increased dramatically with rapid economic growth. The region has considerable proved oil and gas reserves (Table 3.2), which has stimulated an increase in exploration drilling over the period 1997 to 2000.

Table 3.2 (i) Oil - Proved Reserves (Thousand million barrel)

	at end 1980	at end 1981	at end 1990	at end 1991	at end 1999	at end 2000	at end 2001
China	20.5	19.9	24	24	24	24	24
Singapore		-	-	-	-	-	-
Malaysia	3	2.8	2.9	3.9	3.9	3.9	3
Philippines	-	-	-	-	-	-	-
Indonesia	9.5	9.8	11	6.6	5	5	5
Vietnam			0.5	0.5	0.6	0.6	0.6
Thailand			0.2	0.3	0.3	0.4	0.5
Japan	-	-	-	-	-	-	-
South Korea		-	-	-	-	-	-
Total Asia Pacific	40	39	50.3	44.1	44	44	43.8

(ii) Natural Gas - Proved Reserves (Trillion cubic metres)

	at end 1980	at end 1981	at end 1990	at end 1991	at end 1999	at end 2000	at end 2001
China	0.69	0.69	1	1	1.37	1.37	1.37
Singapore	-	-	-	-	-	-	-
Malaysia	0.42	0.54	1.61	1.67	2.31	2.31	2.12
Philippines	-	-	-	-	-	-	-
Indonesia	0.67	0.78	2.59	1.84	2.05	2.05	2.62
Vietnam	-	-	-	-	0.19	0.19	0.19
Thailand	0.23	0.34	0.17	0.39	0.35	0.33	0.36
Japan	-	-	-	-	-	-	-
South Korea	-	-	-	-	-	-	-
Brunei	0.21	0.2	0.32	0.32	0.39	0.39	0.39
Total Asia Pacific	4.28	4.3	8.46	8.47	10.28	10.34	12.27

Source: BP Statistical Review of World Energy 2000, 2002.

China is moderately endowed with oil and gas reserves. By the end of 2001, oil reserves were 20.3 billion tonnes while gas reserves were 2.2 trillion cubic metres (cu.m). The largest reserves of natural gas

are located in Western China. Malaysia is important in energy terms because it has the 27th largest oil reserves and the 12th largest gas reserves in the world (Britain Organisation, 2001). Malaysia had proven oil reserves of 3.9 billion barrels at the end of 2000, down from 4.3 billion barrels in 1996. Proven gas reserves stood at 2.31 trillion cu.m (81.7 trillion cubic feet-Tcf) at the end of 2000.

3.3.2.3 Oil and Gas Production

Production of oil in the Asia-Pacific region has increased steadily since 1993 (Table 3.3). China is the East Asia's largest oil player and produced more than 160 million tonnes of crude in 1999, making the country the world's fifth largest oil producer for 13 consecutive years. Oil output increased to 162.3 million tonnes in 2000. During the period between 1990 and 1999, China's oil production grew at a compound annual rate of 1.7 per cent while its petroleum consumption increased at a compound annual rate of 6.3 per cent.

Table 3.3 Oil Production (thousand barrels daily)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
China	2828	2841	2888	2930	2989	3170	3211	3212	3213	3252	3308
Singapore	-	-	-	-	-	-	-	-	-	-	-
Malaysia	660	670	662	674	724	736	764	815	791	791	788
Philippines	-	-	-	-	-	-	-	-	-	-	-
Indonesia	1669	1579	1588	1589	1578	1580	1557	1520	1408	1456	1410
Vietnam	80	111	128	144	155	179	205	245	296	328	350
Thailand	75	83	87	87	87	97	116	121	132	164	178
Japan	-	-	-	-	-	-	-	-	-	-	-
South Korea	-	-	-	-	-	-	-	-	-	-	-
Total Asia Pacific	6933	6918	6996	7185	7320	7570	7718	7739	7612	7980	7943
USA	9076	8868	8583	8389	8322	8295	8269	8011	7731	7733	7717
United Kingdom	1919	1981	2119	2675	2749	2735	2713	2805	2903	2667	2503

Source: BP Statistical Review of World Energy 2002.

Since 1993, China has been a net importer of oil. The country's economy is forecast to keep growing at an annual rate of 7 per cent over the next 15 years and oil consumption is expected to expand by 4 per cent every year. Oil production, however, will only grow by 2 per cent, which indicates that China will become more and more dependent on oil imports (Scottish Enterprise, 2000). Despite the trend toward declining oil reserves (due to a lack of major new discoveries in recent years), Malaysia's crude production has been stable of date, with monthly production fluctuating between 660,000 barrels per day (bbl/d) and 780,000 bbl/d between 1991 and early 2001. In 2000, crude production averaged 690,000 bbl/d and annual oil output was 36.2 million tonnes.

Table 3.4 Gas Production (billion cubic metres)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
China	14.9	15.1	16.2	16.6	17.6	19.9	22.2	22.3	24.3	27.2	30.3
Singapore	-	-	-	-	-	-	-	-	-	-	-
Malaysia	20.4	22.8	24.9	26.1	28.9	33.6	38.6	38.5	40.8	45.3	47.4
Philippines	-	-	-	-	-	-	-	-	-	-	-
Indonesia	51.5	54.3	56.2	62.9	63.8	67.1	67.6	64.7	71.4	67.3	62.9
Vietnam	-	-	-	-	-	-	-	-	-	-	-
Thailand	7	7.5	8.4	9.5	10.1	11.8	14.1	15.5	16.9	17.9	18.1
Japan	-	-	-	-	-	-	-	-	-	-	-
South Korea	-	-	-	-	-	-	-	-	-	-	-
Brunei	9.1	9.8	10.3	10.4	11.8	11.7	11.7	10.8	11.2	11.3	11.4
Total Asia Pacific	163.9	175.2	184.4	200.3	212	228.3	238.9	241.2	267.3	273.7	280

Source: BP Statistical Review of World Energy 2002.

Historically, natural gas has not been a major fuel but, given China's significant domestic reserves and the environmental benefits of using this energy source, a major expansion of gas infrastructure is taking place. Production (Table 3.4) has been rising steadily in the last decade, reaching 30.3 billion cu.m in 2001, up from 22.3 billion cu.m in 1998 (EIA, 2001; BP, 2001). Gas production in Malaysia has been

rising steadily in recent years, reaching 47.4 billion cu.m in 2001, up from 38.5 billion cu.m in 1998.

3.3.3 Major Offshore Oil and Gas Indicators

3.3.3.1 Offshore Oil and Gas Production

The Asia Pacific offshore oil production was estimated to have totalled 124.5 million tonnes in 1996, which was 12.9 per cent of the world offshore total. Offshore total gas production was 91.2 billion cubic metres, which was 17.6 per cent of the world offshore total. The offshore sector contributed 37 per cent of total Asia-Pacific oil production in 1996 (363.0 million tonnes) and the equivalent figure for gas was 39.5 per cent (Mackay and Adam, 1998; BP, 1998). Offshore production has increased around 30 per cent since 1996 in East Asia, which is ahead of the worldwide average (Table 3.5). These percentages illustrate the importance of the offshore oil and gas industry in the region.

Table 3.5: Offshore Oil Production East Asia (million tonnes)

	Actual 1996	Estimate 1997	Forecast 1998	Forecast 1999	Forecast 2000
China	14.6	17.7	18.8	20	20.5
Indonesia	30	29.5	29	29.6	31.3
Japan	0.4	0.4	0.3	0.3	0.3
Malaysia	31.4	32.7	33.9	34.9	35.7
Philippines	0.7	0.7	0.7	0.8	1
Singapore	-	-	-	-	-
South Korea	-	-	-	-	-
Taiwan	0.1	0.1	0.1	0.1	0.1
Thailand	1.4	1.5	1.7	1.8	2
Vietnam	8.5	9.3	10.4	12	14.4
Total	88.3	91.9	94.9	99.5	105.3

Source: adapted from Mackay and Adam, 1998.

The offshore oil output was spread very widely throughout the region, with the largest producers being Malaysia and Indonesia. China and

Vietnam have the highest growth rates. Most Chinese oil production capacity, approximately 90 per cent, is located onshore. However, China expects to see an annual average increase of 20 per cent in offshore oil and gas production from 2001 to 2005, as it launches a massive development drive to produce oil and gas equivalent to 40 million tonnes of oil by the year 2005. China produced 158.5 million tonnes of oil in 1996. Of this, offshore oil production was estimated a total 14.6 million tonnes in 1996, some 9.2 per cent of total Chinese oil production (People Daily, 2000; BP, 1998, 2001). The two consistently largest offshore gas producers were Malaysia and Thailand in 1996 (Table 3.6). Malaysia is the most significant country in the region in terms of offshore oil and gas activity. It is currently the largest offshore producer of both oil and gas in East Asia. Offshore gas production in China was 1.3 billion cubic metres in 1996, which was 5.9 per cent of total Chinese gas production (Mackay and Adam, 1998).

Table 3.6: Offshore Gas Production (bcm) East Asia

	Actual 1996	Estimate 1997	Forecast 1998	Forecast 1999	Forecast 2000
China	1.3	1.7	2.1	2.5	3
Indonesia	8.5	8.8	9.6	10.4	11
Japan	0.5	0.5	0.5	0.6	0.6
Malaysia	24	26.3	28.5	31.5	33
Philippines	0	0	0	1.3	1.5
Singapore	0	0	0	0	0
South Korea	0	0	0	0	0
Taiwan	0.2	0.3	0.3	0.4	0.4
Thailand	10.9	12.6	14.1	15.7	16.7
Vietnam	0.2	0.2	0.5	1	1.6
Total	45.6	50.4	55.6	63.4	67.8

Source: adapted from Mackay and Adam, 1998.

3.3.3.2 Offshore Expenditure

Offshore expenditure in Malaysia accounted for the largest share (33.8 per cent) of the total East Asia in 1996, followed by Indonesia,

and China (Table 3.7). In China and Malaysia, expenditure is set to increase. An expected change, however, was that there would be a decline over the period between 1997 and 2000 in Indonesia due to financial uncertainties.

Table 3.7: Offshore Expenditure East Asia (US$ million, constant 1997 values)

	Actual 1996	Estimate 1997	Forecast 1998	Forecast 1999	Forecast 2000
China	1466	1577	1612	1625	1538
Indonesia	2533	2538	2524	2405	2376
Japan	45	45	47	46	62
Malaysia	2963	3307	3482	3736	3993
Philippines	72	75	70	319	410
Singapore*	-	-	-	-	-
South Korea	1	0	1	8	8
Taiwan	29	30	27	29	29
Thailand	955	1047	1081	1135	1165
Vietnam	703	695	665	708	840
Total	8767	9314	9509	10011	10421

* The total investment made by around 55 companies has risen to more than US$21 billion in Jurong Island, Singapore.

Source: Mackay and Adam, 1998.

3.3.3.3 Well Counts

It was believed that activity had peaked in Asia-Pacific in 1997 at 274 offshore exploration and appraisal wells drilled and that this would decline over the next three years (Table 3.8). It indicates the constraint on service demand in the East Asia area because of a decline in well construction activities. This has forced service firms to adjust their strategies and search for opportunities elsewhere including, for example, picking up work in other energy sectors, such as coal, nuclear power, electric power, etc. In China, 48 offshore exploration wells were drilled offshore in 1996, of which 24 were wildcats (exploration wells in an unproved area) and 24 were appraisal wells. It was expected that a small fall in exploration activity from a peak of 51 wells in 1997 to 44 in 2000 would occur. In Malaysia, due to low oil prices, a small fall in offshore exploration

activity from a peak of 26 wells in 1997 to 20 in 2000 was expected. On average, six rigs drill 60 to 70 wells annually in Malaysia (Abraham, 1999).

Table 3.8: Trends Offshore exploration and appraisal wells

	Actual 1996	Estimate 1997	Forecast 1998	Forecast 1999	Forecast 2000
China	48	51	50	46	44
Malaysia	24	26	24	22	20
Singapore	-	-	-	-	-
Asia-Pacific total	262	274	241	227	216

Source: Adapted from Mackay and Adam, 1998.

Overall, well activity in Malaysia and China was forecast to decline less than in the rest of the Asia-Pacific region between 1997 and 2000, which again indicates these two countries will offer a real emerging market for the oil service sector over that period. There has been no offshore activity or wells drilled in Singapore. As stated already, this country is an important logistics support base from which international service firms deliver their services to the region, mainly South East Asian E&P countries.

3.3.4 Drilling Activity Levels

3.3.4.1 Definition of Rig Counts

The rig[3] counts (Bank of Scotland, 1996) are an important business barometer representing the activity level of the drilling industry, and this has an economic impact on most parts of the service sector. When drilling or workover rigs are active, they consume products and services provided by the oil service industry. The active rig count acts

[3] Rig is a collective term to describe the permanent equipment needed for drilling a well. It has come to include the onshore and offshore vehicles, mobile platforms, or vessels on which the equipment is installed (Jack-up, Semi-submersible, Drill Ship).

as a leading indicator of demand for products used in drilling, completing, producing and processing hydrocarbons (Baker Hughes, 2002).

For example, the Baker Hughes International Rotary Rig Count[4] is a monthly census of active drilling rigs exploring for or developing oil or natural gas outside North America (U.S. and Canada). The drilling industry and many suppliers follow the Baker Hughes International Rotary Rig Count as closely as the Dow Jones stock average. A rotary rig rotates the drill pipe from surface to drill a new well (or sidetrack an existing one) to explore for developing and producing oil or natural gas. To be counted as active, an international rig must be drilling at least 15 days during the month. A rig is considered drilling if it is turning to the right (i.e. the well is underway but has not reached the target depth or T.D.). Rigs that are in transit from one location to another, rigging up, drilling less than 15 days or are being used in non-drilling activities including production testing, completion and workovers are not included in the active rig count.

Other companies approach for rig counts is different from that of Baker Hughes. For example, Schlumberger's counts (2002) may include rigs that are available or contracted but not actively drilling. These counts provide a census of rigs available for work rather than rigs that are actually working. Rigs included in the M-I Rig Count are engaged in drilling and related operations, which include drilling, logging, cementing, coring, well testing, fishing, waiting on weather, running casing and blowout[5] eventer (BOP) testing.

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[4] The Baker Hughes Rotary Rig count includes only those rigs that are significant consumers of oilfield services and supplies and does not include cable tool rigs, very small truck mounted rigs or rigs that can operate without a permit. Non-rotary rigs may be included in the count based on how they are employed. For example, coiled tubing and workover rigs employed in drilling new wells are included in the count.

[5] Uncontrolled or uncontrollable release of downhole pressure upward through the well-bore or casing. Although the main danger is fire, the gases are also toxic, and in floating operations a gas blowout may include a threat to the stability of the rig itself.

The M-I Worldwide Rig Count is the sum of the Worldwide Rig Count and the average of the weekly US & Canada rig counts for the calendar month. It is tabulated monthly on a per country basis. A rig is included in the count if it is engaged in drilling and related operations on the day of the count; or it is in transit to a location where it will commence drilling and related operations immediately upon arrival; or it has performed drilling and related operations for more than 15 days of the previous month. Unlike the US & Canada Rig Count, the Worldwide Rig Count may include completion activities if the rig continues directly from drilling and related operations to completion operations after reaching total depth (TD). Workover activities are explicitly excluded from the Worldwide Rig Count.

3.3.4.2 Factors Influencing Rig Counts

Economic, political and technological factors can have an impact on individual countries' drilling rig activity levels. Rig count trends are governed by oil company exploration and development spending, which in turn is effected by the current and expected price of oil and natural gas. Rig counts therefore reflect the strength and stability of energy prices. The rig counts also change due to local taxation policies, government sanctions, political unrest, development of new infrastructure (such as roads and pipelines) and availability of capital investment. If these regulatory environmental conditions are constrained or unfavourable, the rig count drops.

The development of technologies like minimising the number of wells required to develop a reservoir; maximising production from new and existing fields; increasing the operational efficiency of the active

drilling fleet; opening new frontiers for exploration (such as deepwater areas) can also influence drilling activity and rig count. There are many other influences such as weather and seasonal spending patterns. Hurricanes can impact the rig count by forcing the evacuation of personnel from offshore platforms and delaying rig moves to new locations. Rig counts rise and fall with company budgeting and spending cycles.

3.4.4.3 Rig Counts - Worldwide and East Asian Countries

In this chapter, the Baker Hughes Rig Counts statistics are used as one of the oil economic indicators.

Table 3.9 Asia Pacific Rig Counts, Land & Offshore, 2001

	Land	Offshore	Total
Australia	6	4	10
Brunei	1	2	3
China Offshore	N/A	10	10
India	38	11	49
Indonesia	34	7	41
Japan	6	0	6
Malaysia	0	11	11
Myanmar	6	0	6
New Zealand	1	0	1
Papuan Guinea	2	0	2
Philippines	0	0	0
Taiwan	0	0	0
Thailand	1	5	6
Vietnam	0	7	7
Other	0	0	0
	-----	-----	-----
Total	95	57	152

Source: Baker Hughes's International Rotary Rig Count, 2002.

Due to the difficulty of data collection, rigs drilling in onshore China are not included in their report. Since 1975, the highest international rig count was 1,509, recorded in November 1982. The lowest international rig count of 556 was recorded in August 1999 (Baker

Hughes, 2002). There was a slow turnaround trend for marine rigs worldwide and the total number of rigs in the world in 1999 was 613, comprising 362 jackups, 165 semi-submersibles, 77 drillships and barges, and 9 submersibles (Snyder,1999). China and Singapore own most of the mobile rigs and support vessels in the East Asia area. The most active rig drilling East Asian countries in 2001 are Indonesia, China, and Malaysia (Table 3.9).

3.4 Political Environment Factors

This section examines government policies, regulations and legislation and protectionism related to the oil and gas industry in the selected countries.

3.4.1 The Impact of China's Policies and Legislation

In China, within the energy sector, all industry regulation is government controlled. The Chinese government's current priorities are maintaining production in the eastern regions (including at the Daqing field) and accelerating the pace of oil exploration in western and offshore regions. Additionally, in order to meet the increased demand for energy in coastal China, it has encouraged foreign investment in the development of infrastructure to transport oil from the west to consumers in the east.

For the above purposes, China has outlined the following goals for 2000-2005 oil exploration and production: Firstly, it will enhance the exploration and development in the western region, specifically the Tarim basin, Junggar basin, Tuha basin, Qaidam basin, Ordos basin, and Sichuan. Annual crude oil output should increase by five million tons by 2005. Secondly, offshore oil exploration will be intensified. A cluster of discoveries in recent years has highlighted the potential of

Bohai Bay. In 2000, CNOOC discovered four oilfields in Bohai Bay: Penglai 19-3, Caofeidian 11-1, Bozhong 29-4 and Bozhong 25-1. Thirdly, exploration activities in the mature East China region will also be increased (this are now accounts for 80 per cent of China total output annually). Finally, in recent years, Chinese oil firms have acquired interests in the Central Asian region, the Middle East, North Africa and South America. The focus now is to expand these interests to Russia, Kazakstan, Turkmenistan, Iran, Iraq, Sudan, Venezuela and Indonesia. The aim is that the overseas production will contribute 15-20 million tons to China's domestic supply by 2005.

China's oil and petroleum industry plays a pivotal role in its economy and receives considerable official support as Chinese leaders have quickly grasped the essentials of energy-security issues in an import-dependent environment. Its oil and petrochemical industry will continue to enjoy its status as the key focus of official support. Playing a pivotal role in the country's economy, the industry is expected to take in over ten billion dollars of investment (China-Britain Business Council Scotland, 2000).

The government has made four basic strategies for its oil and gas industry: maximum development of domestic resources, creation of strategic reserves, seeking foreign technology and investment, and making strategic investments in upstream production facilities abroad (IEA, 2000, Chen, 2000). In order to achieve these strategic objectives, the Chinese government has conducted restructuring of the industry since 1998. The three largest national oil companies, CNPC, China Petrochemical Corporation (Sinopec) and China National Offshore Oil Corporation (CNOOC) have partially reorganised and the process is ongoing. Reform of the Chinese petroleum industry has created more room for service sector development by allowing

indigenous firms to have greater control of resources and more freedom to manage their own affairs (Chen, 2000; WBG, 2001). This also represents a considerable opportunity for foreign service companies to compete in the marketplace.

In November 2001, China joined the World Trade Organisation (WTO) and consequently conditions are expected to become increasingly conducive to business development. Under the terms of the WTO agreement, the Chinese government will no longer be allowed to provide soft loans to help domestic firms to modernise. Multinationals can no longer be banned from the most money-spinning markets and the areas in which the competitive advantage and the weakness of the Chinese companies are most marked. Joint ventures will no longer be a condition for multinationals' entry into China. After China's entry into the WTO is fully implemented, a Zero Import Tariff for crude oil and gas will be introduced, the various tariffs on fuel oils will be reduced by around 6 per cent within one or two years, and non-tariff regulations covering imported crude or refined oil will be revoked. The multinationals will be able to import freely oil, gas, oil products and petrochemicals from wherever they wish (Chen, 2000; Scottish Enterprise, 2002).

These changes will inevitably affect the Chinese oil and petroleum industry, though the impact upstream (oil and gas production) will be less than downstream – refining and sales (Chen, 2000). However, competition between the two giants, Sinopec and PetroChina, for control of the Chinese filling stations is clear evidence that the domestic petroleum industry is seeking to corner as much of the market as possible before foreign competitors use China's membership of the WTO as a doorway of opportunity (Jin, 2001). As Beijing still maintains some policies designed to protect its petroleum

industry, WTO membership is unlikely to have a significant impact on the oil service sector in the next few years. What is more, Chinese officials pointed out that being part of this trading bloc would benefit Chinese economic development and deliver more opportunities to its petroleum industry (Yang and Lu, 2000).

3.4.2 The Impact of Singapore's and Malaysia's Policies and Legislation

The Singaporean government has set up very supportive policies towards the oil and petroleum industry. Appreciating its strategic location and attractiveness to foreign investors, Singapore established itself as the region's leading oil refining and petrochemicals centre, as well as the number one logistics support basis for upstream activities when it began its industrialisation programme in the 1960s (DTI, 1996). Because of the high value-added nature of the petroleum industry, Singapore targeted this sector to complement its port facilities. Over the years, the government worked closely with the industry to make sure that its strategic planning development kept pace with integrating processes (The USA Embassy Singapore, 1997).

The Malaysian government polices allow indigenous firms to enjoy more benefits than other inward investing companies. The Malaysia government conducts a protectionist policy by means of strict investment regulatory requirements. Like China, there are initiatives that promote indigenous suppliers. All companies supporting the upstream sector must be licensed by Petronas, the state oil and gas company, which was established in 1974, and those supplying the downstream sector must be registered. Companies wishing to supply equipment, services or materials to the upstream sector must partner a local firm run by Bumiputras (Bumiputra means "Son of the Soil" and refers to the indigenous Malays). The Bumiputra policy is

designed to encourage participation of indigenous Malays in the Malaysian economy which, at the time, was dominated by Malaysian Chinese, and foreign business people (DTI, 1996). The Vendor Development Programme is a particular initiative that ensures locally manufactured goods are used in preference to international goods; only high-tech equipment not available locally is exempt from this programme (Britain Organisation, 2001).

3.5 Technological Environment Factors

Overall, more technology is needed to fill the production "gap": squeezing the last drop from older fields; managing old platforms and pipelines; unlocking small fields; challenges of heavy oil and HPHT (high-pressure, high-temperature) fields; more accurate and successful exploration; and maintaining safety and environment (Ellix, 2002). Furthermore, companies exploring in East Asia will find technology crucial, as many unexplored areas may be in harsh (Taifeng- hurricane) or sensitive (rain forest) environments, where the current known techniques cannot provide sufficient solutions.

3.5.1 Key Technological Gaps

Currently, service companies must focus on the key technology gaps existing in developed oil and gas fields such as the North Sea. These gaps come under the following seven major headings (Ellix, 2002). The first heading is Subsea Development, including flow assurance including improved insulation systems, alternatives to chemical treatment and wider application of low dosage hydrate inhibitors; more effective chemical deployment systems; pipeline inspection; increased subsea system reliability; and field trailing of slug mitigation techniques.

The second heading is Emissions Control such as better understanding of the environmental impacts of emissions to water and atmosphere; new technologies to achieve lower emissions. The third heading is High Resolution Imaging by targeting innovative non-traditional approaches and transferring them from other industries, focusing on seismic acquisition method, noise reduction and pre-stack and data imaging. The fourth heading is Brownfield Recovery with respect to low permeability reservoirs or zones of low permeability, flow dynamics and removal of the effects of gas condensate banking. The fifth heading is Improved Reservoir Simulation covering improving simulation technologies, potential for streamline simulation and other 'non-traditional' methods. The sixth heading is Infill Drilling including application of complex multilaterals, through tubing drilling systems, reducing non-productive time; improved targeting or steering and expendables and through tubing sand control. The seventh heading is Brownfield Production Management involving downhole monitoring and control, enhancing and sustaining production, well intervention cost and reliability, isolation technology and remedial completions (ibid).

3.5.2 Significance of Advanced Technologies

Conventional oil recovery technologies allowed producers to recover only about one-third of the oil in a reservoir. The remaining two-thirds represented a substantial target for advanced recovery technologies. Development and application of technology has made substantial contributions to the enlargement of the Exploration and Production (E&P) industry. Technological advances could help to lessen finding costs by reducing drilling and production costs and therefore increase profit margins. They could also generate new

environmental protection techniques in an attempt to reduce potential risks or increase the level of protection. What is more, advanced technologies would be increasingly important to achieving and maintaining a competitive advantage (Pearce and Robinson, 1997).

During the past 20 years, the petroleum technology has become of more importance as offshore exploration increasingly focused on deeper water, arctic and other frontier areas. Without previous development of advanced technology, production in these areas would not be possible. The industry's future success is seen to be keyed to technology (Pearce and Robinson, 1997). 24 thousand million barrels of oil remain in known reservoirs in China, and 3 thousand million barrels in Malaysia, which could potentially be recovered via advanced technology.

3.5.3 Impact of Technological Factors

3.5.3.1 Impact of Advanced Technology on the Upstream Oil Industry

In general, only the largest companies in the industry possess the technological sophistication and financial resources to apply advanced technologies successfully (Pearce and Robinson, 1997). Application of advanced technology by upstream oil and gas companies has yielded them enhanced operations activities. They can better define their drilling prospects, thereby lower the risk of a dry hole (e.g. 3-D seismic technology). They can drill a well faster or less expensively (e. g. improved drilling mud, measurement-while-drilling technology). It is also possible for them to increase the volume of oil produced from a reservoir through, for example, fracturing technologies, horizontal drilling and enhanced oil recovery

techniques. Exploiting oil and gas deposits in difficult environments (e.g. subsea completions for deep water, ice islands for Arctic sea, directional drilling under wetlands) is possible and environmental compliance costs can be reduced (e.g. closed drilling systems to recycle and reduce the waste column).

Producers who develop and employ advanced recovery techniques can obtain properties that others are willing to abandon because production has reached its economic limit. Since technology in a mature industry has the potential to rejuvenate the industry, advanced recovery technologies can rejuvenate an old field, and producers with appropriate expertise can benefit. Nevertheless, as technological advances create competitive advantages, they are not well diffused throughout the industry or across international regions. Only the largest oil companies within the industry engage in E&P - related R&D. Even though old technologies have stepped into their mature stage and the major companies no longer hold them as proprietary, technology transfer to the smaller companies has been poor (Pearce and Robinson, 1997).

3.5.3.2 Impact on the Service Sector

Service companies which master the application of the above types of advanced technologies can be more successful than their competitors which lack similar capabilities. Particularly, expertise in the geology, drilling processes, or recovery technologies required in a particular area has high added value since it can help oil clients to exploit opportunities more successfully than other companies. The value can be added also because the expertise can help their clients to achieve lower operations' costs than another producer less familiar with that area. It is in the unconventional, higher-cost, and frontier areas such

as offshore throughout the world that the benefits of these expertise are manifest (ibid.). In Malaysia, for example, those contractors and drillers located with 3D seismic and drilling equipment, have technological advantages for obtaining considerable business opportunities.

3.5.3.3 Current Technological Status in the Selected Countries

The Chinese industry has been, to a great extent, self-sufficient, with its own geological, geophysical, drilling and production facilities, although specialist technologies were imported from the west from the early 1980s (Scottish Enterprise, 2002). Although China produces equipment for onshore exploitation, it is estimated that about 80 per cent of the equipment needed for offshore activity is imported (CTI, 1995). Other Chinese enterprises, such as Chiwan Sembawang Engineering Co. Ltd-CSE, belong to the labour intensive manufacturing industry. Other Chinese companies such as CITIC Offshore Helicopter Co., Ltd cooperate with international corporations so that the Chinese companies can use advanced foreign experience for reference.

In Singapore, there are domestic human resources shortages and numerous foreign specialised dealers service the larger companies, providing opportunities for small or medium overseas firms to supply equipment or components (DTI, 1996). Malaysia has also to import advanced technologies from abroad. In this sense, foreign owned service companies are more competitive than indigenous companies which don't have the same advanced technologies. Quite often, indigenous companies' access to new or advanced technologies has not been easy not only because of competitive issues but also on account of the policies of foreign companies' governments that have

prevented the exports of certain high technologies to the countries where they operate.

3.6 Competitive Environment

3.6.1 Industry Concentration[6] Ratios

Within the oil and service sector, a small proportion of service firms may share a majority of the total industry revenues. In the North Sea, for example, of over 1300 suppliers of goods and services, more than 80 per cent of the total spend was with fewer than 140 suppliers in 1998 (Lee, 2000). However, some niche service industries could be highly concentrated. For instance, in offshore drilling, firms like CNSPC, CONDC (China Offshore Oil Northern Drilling Company) and COSDC (China Offshore Oil Southern Drilling Company) are the owners of rigs which operate in the China Sea, the South China Sea and North China Sea (World Oil, 1999). Chinese local policy encourages Chinese oil companies to use drilling rigs owned by the Chinese at a lower rig day rate than the international standard. Most of the E&P companies are either totally or partially owned by the Chinese. By applying the location and policy advantages, these Chinese players are able to keep a hold on most domestic drilling spending leaving little for industry followers or outsiders. Since the market is controlled by a few key players, it could be one of the reasons why there has been relatively little discounting within this industry sector.

[6] Concentration refers to "the extent to which industry sales are dominated by only a few firms. In a highly concentrated industry the intensity of competition declines over time. High concentration serves as a barrier to entry into an industry because it enables the firms that hole large market shares to achieve significant economies of scale and to lower their prices to stymie attempts of new firms to enter the market" (Pearce and Robinson, 1997).

A similar scenario can be seen in an offshore logistics industry. For example, in the UK North Sea, the concentration ratio of the industry is high because over 50 per cent market share was held by the top two main competitors - ASCo Group Limited and Seaforth Maritime in 2000. In the South China Sea, however, there is nothing like a logistics service industry. Also, due to customs problems, and always-changing Chinese import policy, oil companies have to keep enormous inventories - similar to North Sea or Gulf based oil companies in the 1980s. Chinese management realises the issues and has started to search for a way of reducing their high inventory cost. This situation shows a potential market demand and indicates business opportunities. Thus, there is a gap in terms of the current situation between the mature industry in the west and the still developing industry in East Asian countries when comparing concentration ratios. It is assumed that the ratio could increase dramatically if several players were able to develop the logistics market. First in would have a chance to dominate that market if they apply suitable strategies.

3.6.2 Industry Structure

There are four major features of the industry structure (Porter, 1985) for service companies. Firstly, service firms create high value for their buyers and have historically captured a good proportion of the value. For example, many products can significantly reduce the cost of drilling and as a result, many firms have been able to retain a share of these savings in the form of high returns. The industry structure has made favourable opportunities for oil service firms. Secondly, the structural attractiveness of many niche specialists in the oil and gas service sector has been eroded as a result of falling demand, new entrants, eroding product differentiation and greater buyer price

sensitivity. Consequently, despite the fact that products offered still create enormous value for buyer, the profits of many firms and therefore the industry as a whole may have fallen significantly (Porter, 1985). Thirdly, exit barriers keep firms from leaving an industry when there is too much capacity, and prolonged periods of excess capacity. In oil tanker shipping, for example, the exit barriers are very high because of the specialisation of assets. In price terms, this has translated into short peaks and long troughs. Thus the industry structure shapes the supply and demand balance and the duration of imbalances.

Finally, the consequence for industry profitability of an imbalance between supply and demand also differs widely depending on industry structure. Some industries will trigger price wars and low profitability even if there is little change in the amount of excess capacity. In oil tools and many other oilfield equipment products, for example, there was intense price-cutting during the recent sharp downturn in East Asia. There are sectors where there are structural pressures that create intense rivalry, or powerful buyers, like CNOOC and Petronas. In other sectors, periods of excess capacity have had relatively little impact on profitability because of favourable structure. In drill bits, for instance, there has been relatively little discounting. China National Star Petroleum Corp. (CNSPC), China Offshore Oil Northern Drilling Co. (CONDC) and China Offshore Oil Southern Drilling Co. (COSDC) are examples of competitors operating in a favourable industry structure in their domestic markets.

3.6.3 Rivalry within the Service Sector

The East Asian market is very competitive (DTI, 1996). Pricing and after sales services are the crucial issues when competing in this

sector of the market. Competition comes from USA, Japan, Korea, Italy, Germany and France. American Petroleum Institute (API) equipment standards are commonly used in the procurement process. Competition for the provision of offshore oil and gas equipment comes from several main sources. For instance, mobile rigs (jack-up or semi-submersible) are provided by nine main suppliers from Japan, Singapore, Norway, Sweden and China respectively, while support vessels are mostly supplied by Japan, Norway, Malta, Singapore, Denmark and China (Scottish Trade International, 1995). For contractors and consultants, competition comes mainly from USA, Japan and Korea who have a strong foothold in the region (DTI, 1996). Foreign companies may need to bring in their own technicians from elsewhere. There are manpower shortages in Singapore. Attracting technical talents may also be a competition issue within the industry particularly in Singapore.

3.7 Key Industry Participants

The oil and gas industry comprises different participants including operators, contractors, investors, government administrators, service and supply firms and pressure groups (Phillips, 1998). Currently, there are over 2,000 large, medium and small indigenous and international oil and gas firms in Asia (Petromin, 2000). Of those, service and support entities are the majority within the industry. This sector is characterised by a large number of companies, which are widely diverse in terms of size, product or service provided and niche activities. It has developed very quickly to become one of the most important developed energy service industries. The following tables identify mainly government administrators, oil operators and some leading services companies in each of the selected countries.

3.7.1 Government Administrators

The oil industry was controlled and developed by a variety of ministries in China (Table 3.10). China's oil and gas industry is monopolised by the three key companies owned by the state. The key players, China Petrochemical Corp (Sinopec), China National Petroleum Corp. (CNPC) and China National Offshore Oil and Gas Corp. (CNOOC), are controlled by China's State Council. The State Economic Trade Council (SETC) co-ordinates the majority of economic activities within the oil and gas sector and supervises the operations of all subsidiary organisations, which refer to CNPC, Sinopec and CNOOC.

Table 3.10 Chinese Petroleum Ministries

Year	Ministries
1929-1955	Ministry of Fuel Industry
1955-1970	Ministry of Petroleum Industry
1970-1978	Ministry of Fuel and Chemistry Industry, which controlled petroleum, coal and chemical sectors
1978-1988	Ministry of Petroleum and, to a limited extent, the Ministry of Geology Bureau of Mineral resources
1982	China National Offshore Oil Corporation (CNOOC), which was formed to be responsible for offshore exploration in association with foreign companies
1983	China National Petrochemical Corporation (Sinopec), which was formed to be responsible for downstream activities
1988	China National Petroleum Corporation (CNPC), which was formed to be responsible for onshore exploration and production

Source: Adapted from Scottish Enterprise, 2002.

Before 1998, CNPC, Sinopec and CNOOC had administered the Chinese petroleum industry on behalf of the government. They had been awarded considerable co-ordinating and supervisory powers by the State Council. Nonetheless, as a result of the government's continuing marketing economic drive in 1998, the companies handed over all of their previous regulatory authorities to the State Economic

and Trade Commission (SETC), enabling the central government to assume full regulatory control of the sectors. The companies continued to restructure themselves further towards market orientation and their attentions focused mainly on commercial activities (Scottish Enterprise, 2002).

Sinopec, CNPC and CNOOC have their own numerous subsidiaries or institutions to support and service every activity from exploration to production and refining. For instance, the China Offshore Oil Development and Engineering Corporation (COODEC) is the only design institute for China's large offshore projects. CNOOC self-financed projects are designed by this organisation. If any service companies want to sell their equipment to projects, it is essential that they should contact COODEC and more importantly, to a greater extent, its procurement department and the end-user of the one the four CNOOC's regional corporations (CTI, 1995). However, when a foreign company seeks to do business in the Chinese service sector, it needs only to deal with various local oil and gas field bureaux and administrations (end users) as well as the design institutes, rather than go to the headquarters of the key organisations.

In Malaysia, the National Oil Company of Malaysia, Petronas (Petroleum National Berhad) was established in 1974. It controls petroleum activity and participates in all production sharing contracts (PSCs). In Singapore, National Oil Co Pte Ltd is the major indigenous organisation (Petromin, 2000).

3.7.2 Major Operators[7]

3.7.2.1 Indigenous Companies

CNPC produces crude oil onshore for its domestic refineries as well as supplying Sinopec's. Sinopec produces crude oil onshore and offshore but only has one oil field at Pinghu (a joint venture with CNOOC). CNPC owns six major oilfields: Shengli, Zhongyuan, Henan, Jianghan, Jiangsu, and Dianqianqui. Over the past 40 years, CNPC has grown into a multi-disciplinary vertically integrated organisation, engaged not only in petroleum exploitation and processing, but also in the manufacture of relevant equipment as well as in other diversified businesses. CNPC's own factories produce 60 per cent of the equipment which it uses in exploration and production (CTI, 1995). By the late 1980s', the company was divided into more than 20 divisions, each responsible for a specific geographical area (Scottish Enterprise, 2002). CNOOC focuses on the E&P offshore petroleum and natural gas resources in China, frequently in co-operation with foreign oil companies. It also owns the China Offshore Oil Research Centre, one chemicals company, eight specialist service companies and five logistics companies (ibid.). CNOOC claims to own 4,000 offshore rigs, engineering vessels and other special equipment, most of it conforming to world standards. CNOOC's equipment is not only used by itself, but also rented by foreign companies (CTI, 1995). PetroChina owns 13 large oilfields: Daqing, Jilin, Liaohe, Huabei, Dagang, Jidong, Changqing, Sichuan, Xinjiang (Karamay), Tarim, Tuha, Yumen and Qinghai. In 2000, it produced around 66 per cent of China's total production of oil and gas.

[7] The company or other organisation responsible for conducting operations on a concession, on behalf of itself and any other concession-holders (non operators). The operator usually has the largest share of equity participation.

PetroChina, Sinopec and CNOOC have good experience in developing partnerships with foreign companies, both in terms of joint ventures in exploration, development, petrochemicals and downstream activities, and being significant purchasers of foreign plant, equipment, technology and services. These three companies continue to have the State as their major shareholder and are regulated by the State Economic and Trade Commission after they were listed in New York, London and Hong Kong in 2000. The three oil firms started venturing overseas for exploration and production, mainly to North Africa, South America and former Soviet countries as the growth in domestic crude oil output has declined significantly in recent years (Scottish Enterprise, 2002).

Compared with China, the component of national oil companies in Malaysia and Singapore is less sophisticated. Petronas is an active driller and operator, being engaged in almost every sphere of activity in the Malaysian petroleum industry, including the oil and gas service sector. Its corporate structure comprises a number of wholly-owned subsidiaries and other partially-owned or associated firms. Anticipated investment estimated in the mid to late 1990s was RM 4-5 billion per annum (DTI, 1996).

3.7.2.2 Multinationals and Joint Development Projects

In China, major international oil firms[8] with production interests in China include those companies from North America, Europe, South East Asia and Middle East. The international operators were still increasing in 2000. For Malaysia, the only international operators offshore in Malaysia were Esso and Shell by 1996 and by 2000,

[8] Shell and BP Amoco respectively had a capital commitment in excess of $7 billion involving in the Nanhai and Jinshan petrochemical projects in 2000 (CBBCI Scotland, 2000). Chevron Texaco planed to invest $45 million in offshore exploration and development in 2002. For Kerr-McGee China Petroleum Ltd, its first oil from the South China Sea was produced in 1996, followed by first production from a field onshore Indonesia in 1997.

international producers increased dramatically (DTI, 1996). In Singapore, there are many major international oil and gas operators (Petromin, 2000).

Offshore oil and gas projects could be divided into two categories in China: joint exploitation between CNOOC and foreign companies, and CNOOC self-financed exploitation. It is essential to identify the designers and owners of the projects concerned when seeking to supply equipment. Joint exploration projects (Production Sharing Agreements - PSAs) are always conducted by a foreign company which begins exploration at its own risk, having successfully bid for the contract. In this scenario, the suppliers would be expected it to approach the foreign company (e.g. Shell and Arco) rather than the Chinese side. Onshore, in the Tarim Basin, PetroChina is conducting exploration with Exxon, Agip and JNOC. Agip signed an agreement with PetroChina in mid 2000 to explore for oil and gas in the Cai Da Mu Basin in the west of the country. Offshore, CNOOC announced that in 2000, new contracts and agreements were signed with BP, Shell, Kerr-McGee and Santa Fe (Scottish Enterprise, 2002).

3.7.3 The Supply and Service Companies

Small companies are not well known and are difficult to identify because they go in and out of business, alter their corporate identities and change addresses frequently (Pearce and Smith, 1997). This is one reason why it is difficult to determine accurately the number of companies in the oil and gas service industry in the East Asian region. Some world leading giants, such as Schlumberger, Bechtel, Halliburton and Baker Hughes have operated widely in East Asia, but they comprised only a small portion of all service companies.

In Malaysia, the supply to platforms operated by EPMI and Carigali offshore Terengganu is generally from the Kemaman Supply Base (KSB) near Kertech. KSB has an expansion programme. The supply to platforms operated by Shell and Carigali offshore Sarawak and Sabah is from the Asian Supply Base on Labuan and some equipment is also supplied from the supply base in the Singapore where there are two offshore supply bases. The Loyang base, operated by Singapore Offshore Petroleum Services (SOPS), part of the Sembawang group provides office, warehousing, and workshop facilities. Jurong Marine Base acts mainly as a storage, consolidation and rear-supply base, and can offer temporary office facilities for visiting teams of engineers (DTI, 1996).

In China, U.S. based oil-engineering firms such as Halliburton, Baker Hughes and Schulumberger are very active in collaboration with CNPC's Changqing oilfield company and enjoy strong traction in the local market for their advanced technologies, oil instruments, tools and equipment (Scottish Enterprise, 2002). In Singapore, numerous specialised international dealers service the larger companies, providing opportunities for small or medium overseas firms to supply equipment or components. Schlumberger, Unocal, Hunting, Expro Group, Weatherford and Halliburton, as well as many small operators are among the 150 companies using the Loyang base.

3. 8 Discussions of the Service Industrial Sector

A number of features set oil and gas service companies apart from other industries. First, the service industry as a whole has a low level of concentration because provision of services is very widely spread. Second, the service industry is diversified and characterised both by few players with large market shares and many players with fragmented market shares engaged in a wide range of different

activities. The service companies range from small to very large indigenous and international firms, including technology intensive and labour intensive enterprises. Some firms only focus on certain areas while some others have vertically integrated businesses. Third, the service business activities rely largely on the oil and gas clients for their survival. Between this buyer-seller relationship, oil companies usually have a dominant power. Fourth, many service companies (although highly specialised) provide services not only to the oil and gas industry, but also to other energy industries like electricity and nuclear; or even provide services outside the energy industry. Fifth, the maturity of the domestic resource base in East Asia made overseas investment attractive. Although the oil service firms heavily depend on oil companies, they do not necessarily appear to be in the same place as where their clients stay. The trend of such a development is to provide services globally. E-commerce and e-business create necessary conditions for this. Many multinational firms like Halliburton, Schlumberger or Baker Hughes have set up their subsidiaries or joint ventures or offices in the domestic East Asian markets like China, Singapore and Malaysia.

Sixth, the industry is regarded as dynamic. Bankruptcies, mergers, and acquisitions, organisational restructuring, and changed ownership structures have substantially reduced the number of companies of all sizes and types active in the industry. Looking at the Petromin Directory 2000, it indicates that many companies had left the service industry sectors in their East Asian marketplaces and many senior managers have moved to their headquarters or left or resigned there jobs by 2002. Some of these companies went out of business or were sold, and many others sold their producing properties and undeveloped acreage or changed their business domains. For example, Sembawang's business in China has been

different from five years ago. In 2002, Petromin had to convert its annual compilation to the directory, since industry consolidation had changed the number of services firms in the region of East Asia. The service firms in China used to be owned by the state companies. Now the ownership structure is changing through joint ventures (JVs), joint development, wholly foreign-owned and domestic ownership shifts. The service industry's market is also changing. The oil and gas service market is quite different from oil and gas markets and is be restructured consistently. Oil and gas companies are focused on production and integrate into mid-stream and downstream activities. While service companies produce products or technologies, or relevant support. Some have also diversified into other energy sectors, with clear implications for the service sector. Historically, state owned companies in China (e.g. Chinese CNPC, CNOOC and CNSOC) and Malaysia (e.g. Petronas Carigali) have been the key buyers from the service industry there. In recent years, with more and more international oil firms stepping into E&P activities in the East Asia domestic markets, the buyer structure has been widened. Buyers from the wider energy or marine industries are becoming one of the market segments on the service companies' customer profiles.

Finally, forces acting and having a significant impact on the service sector in East Asia include: continuing dynamic economic conditions; restructuring of industry markets; changing of ownership structures; growing importance of technology; and competitions within the industry. Companies in the oil and gas service industry create and maintain competitive advantages in four primary ways: attaining a competitive price; and establishing high added value for clients by developing expertise in a particular area; applying advanced technologies and developing new technologies through research and development (R&D). For firms operating in China, the competitive

advantages may refer to the advantaged geographical conditions, powerful shareholders background and first class processing equipment and technical talents.

3.9 Summary

This chapter has several objectives. Firstly, it introduces the oil and gas service industry. Secondly, it reviews the service sector in East Asia and gives the reason why three countries as stated above have been selected while the others are excluded for the empirical research. Thirdly, it examines the oil and gas economics in East Asia, including a macro-economic context. Fourthly, it illustrates political issues related to the industrial sector and fifthly, it demonstrates the technological factors in the region. Sixthly, it discusses the competition and seventhly, key industrial participants. Finally, it draws conclusions regarding the service sector.

Overall, the chapter examines the oil and gas service industry in East Asia as a basis upon which a strategic theoretical framework can be constructed, focusing on dominant industrial environmental factors. It tries to explain how these environmental factors could form opportunities or challenges to service firms. The chapter indicates why China, Singapore and Malaysia have been selected for the empirical research, while other East Asian countries were excluded. The economic trend shows the market is not mature and the selected countries are in better economic and financial shape than others in the East Asian region. It also reveals the lack of reliable records regarding relevant industry statistics in East Asia, which indicates gaps left by previous industry researchers. A series of assumptions stressed for later propositions development of further empirical investigations.

CHAPTER 4

THE BUSINESS ENVIRONMENT

When talking about the word "environment", people normally might think about the natural or ecological environment. However, in business, and specifically under the context of this research project, the term of environment does not only refer to this, although that may be an important matter for many organisations. This chapter sets out a methodology for understanding the total environment in which a company operates and then identifying and analysing those significant elements or sectors.

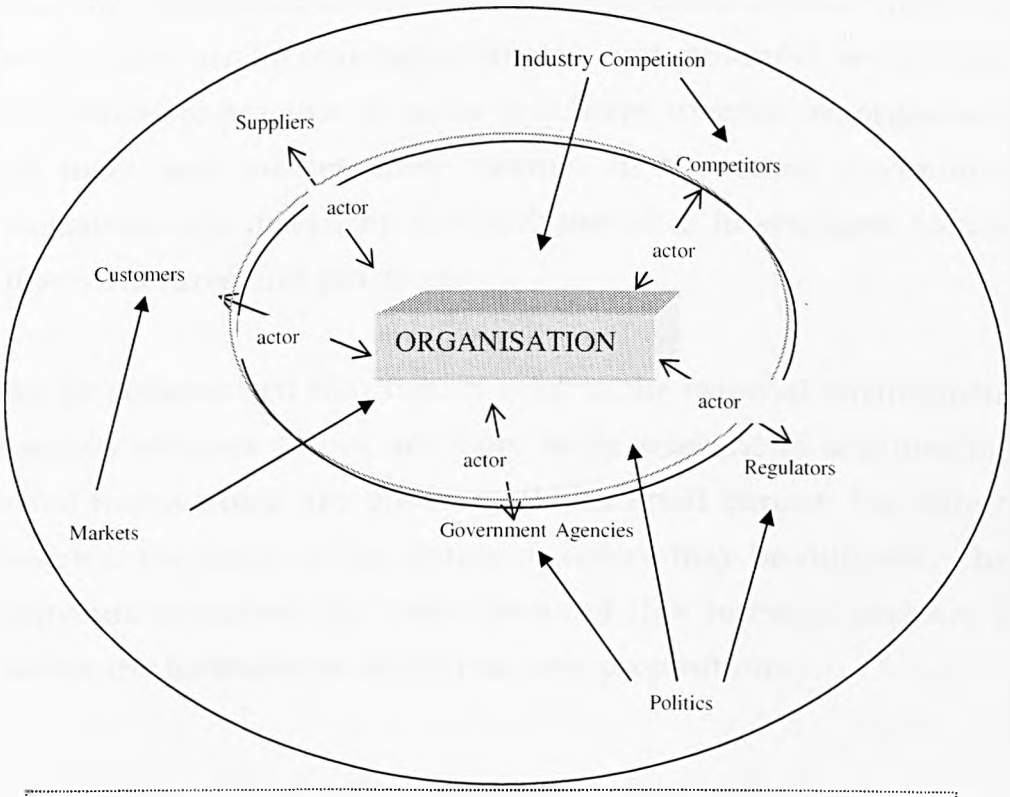
4.1 Definitions of Environment

According to Brooks and Weatherston (1997), the business environment "is a generic concept which embraces the totality of external environmental forces which may influence any aspect of organisational activity". Similarly, the word "business" is used to imply any type of organisation, whether it is a financial or market driven enterprise, a government agency or a non-profit charitable trust. Thus, the term of the "business environment" can be considered as a term of the "organisation environment". It is suggested that the business environment can be segmented into the broad forces set out below, which have been found frequently by strategists to be the most crucial.

Environmental conceptions vary according to the theoretical level of analysis selected. Scott (1985) identifies three levels of analysis: ecological community, population of organisations and organisation-

set. The first level of the ecological community is mainly to do with the pattern or network of relationships connecting individual organisational units and other social entities in a delineated geographical area. The second level of the population of organisations refers to aggregates of organisations that are alike in some respect and it focuses on what firms do in the industry. The third level of the organisation-set refers to a variety of relations between an organisation and its specific partners, such as suppliers, customers and regulating bodies and so on.

Figure 4.1 Environment Viewed as Factors or Actors



External factors such as politics, industry competition, markets, customers and suppliers.

"The business environment" includes a broad and comprehensive content which cover any sort of external influences which affect organisations. It is the "set of forces outside the organisation" (Mintzberg, et, al., 1998). Mintzberg, et al. (1998) comment that some

schools of thoughts see this as a factor; while the environmental school sees it as an actor (Figure 4.1).

Some leading theorists proposed that the relationship between an organisation and its key suppliers, customers, regulators and other government agencies and competitors. Organisational daily operations interact with these external environmental factors. Such daily operations related factors have been named as the "task environment". This concept was raised by Dill (1958) and is concerned with the day-to-day activity of an organisation.

Hence, the environment consists of these interactions, which over time produce an increasingly complex and powerful set of norms which dominate practice. In order to achieve success, an organisation must meet and master these norms. In the same environment, organisations are driven by the environmental interactions to adopt similar structures and practices.

It can be summarised that factors refer to the external environmental influences whereas actors are more likely relevant to organisational internal forces which are driven by the external impact. For different industries, the focus of the factors or actors may be different. These standpoints construct the basic frame of this research and are the bases for the formulation of the research propositions.

4.2 Environment Categories

Many well-known researchers (Brooks and Weatherston, 1997; Mintzberg, et al,; 1998; Weick, 1979) have categorised the different approaches to define the environment. Strategic, organisational and international business scholars and researchers develop the conceptions of the business environment from three different

perspectives, and suggest that the business environment may be viewed as the objective, perceived and enacted environment.

The objective environment is a clear, measurable and definable reality. It emphasises the external existing facts which affect an organisation. Nearly all strategic management literature includes this assumption that there are factors that all organisations face and deal with. The business environment can be apprehended only if it is described and measured.

The perceived environment "remains real, material and external", but involves strategists' "incomplete and imperfect perceptions of the 'environment', and focuses on minimizing the gap between their flawed perceptions and reality of their environment" when they set up missions, goals and objectives (Mintzberg, et al., 1999). This is a subjective fact. The particular characteristics of the environment rely on each individual's interpretation and perceptions. Brooks and Weatherston (1997) point out that that "different organisation in the same industry often 'view' environmental forces quite differently from one another, even though those forces may in fact be very similar".

The enacted environment refers to companies' strategists link the business environment to their behaviours by using strategies and developing strategic models or using exist models to test them (when they adapt approaches to achieve their goals) (ibid.). Weick et al. (1979) propose the concept of enacted environment as a replace with the external environment since "the human actor does not react to an environment, he enacts it". In which case, the category between organisation and environment is not clear and the environment is created and defined by individuals (Brooks and Weatherston, 1997). Thus, objective measures of the environment become irrelevant (Corrieria, 1994). In Porter's (1980) and Ohmae's (1982) books, they use examples that some companies raise a price to damage the

profitability of the other companies within the industry and then upset the whole industry. On the other hand, Weick's (1979) concept of enacted environment can be view as a development of the perceived environment since its attention is to understand the subjective approach to organisations' interactions with environment.

Part of the contradiction present in empirical results is caused by an unresolved issue in the environmental literature, for instance, objective versus perceived environment (Bourgeois, 1980). Bourgeois (1980) thus distinguishes three categories of definitions currently used for describing the environment: objects, attributes and perceptions. The first category refers to entities or objects external to the organisations. The most influential contribution for this category was that of Dill (1958) who distinguished between general and task environments, the latter including customers, suppliers, competitors and regulatory groups. The category of attributes focuses on the complexity and turbulence of the task environment. The category of perceptions refers to managers' perceptions of environmental uncertainty. Sutcliffe (1991) found that a number of mismatches can occur between managerial perceptions of environmental attributes and actual environmental attributes.

There are also limitations of the understanding on the business environment by organisations and individuals. Corrieria (1994) argues,

> ...different organisations and different individuals will react differently to the same context. Because individuals are submitted to innumerable constraints, their perceptions and understanding of reality are necessarily limited, and their representation of the world is shaped by their own experience... Not only is it limited... it is also a representation of the past, because nothing that has not occurred is available for processing. Because all decisions and plans for future action are based on prior experience, this is, on an enacted environment of the past, any failure that might occur as a result of a given decision or plan means that the theory of the past that was built upon description of past events was wrong.
>
> (Corrieria, 1994)

Due to the drawbacks of individual differences as the only determinants in the perceived and enactment process, it is necessary to adopt an approach of using systematic records of the reports, statistics, facts or information that are regularly collected when the business environment is investigated. In other words, a comprehensive understanding of the business environment covers the objective facts and subjective views as well as enacted interpretations.

4.3 Dimensions of Environment

Two approaches are widely employed. The first one is to conceive environment as a source of information and the second is to view the environment as a stock of resources (Aldrich and Mindlin, 1978). Information-based theories focus attention on the degree of uncertainty confronting organisations, whereas resource-based theories focus on the degree to which the organisation is dependent on others for vital resources (Fahay and Nayaranan, 1985). Mintzberg, et al., (1998) suggest that environment is usually delineated as a set of abstract dimensions. The following proposes several dimensions as affecting uncertainty or dependence.

4.3.1 Information Uncertainty Perspectives

One of the important concepts used in the description of organisational environments is that of uncertainty, which can be defined as the degree of difficulty in anticipating or predicting future developments in the organisational environment (Huber and Daft, 1987). Uncertainty refers to the unpredictability of environmental or organisational variables that have impact on corporate performance or the degree to which future states of the environment cannot be

accurately predicted (Pfetter & Salancik, 1978). It is determined by the capability of the organisation to forecast the coming events.

The conceptual confusion involving the use of the construct of environmental uncertainty aroused some problems. Starbuck noted:

> The usefulness of subjective perceptions, including environmental uncertainty, is not in question. What is in question is whether data about perceived environments should be treated as if they were data about real environments and whether uncertainty should ever be considered an environmental characteristic.
>
> (Starbuck, 1976)

Bourgeois (1980) adds that perceived environmental uncertainty is more relevant to the study of strategy making than to the study of an organisation's external environment. Dill (1962) argues the uncertainty of the environment when its properties are intent to be analysed:

> The complexity of what we find and the grossness of most of the data that we collect are not consistent with the standards of precision and parsimony that social scientists have become to respect. Good bases for general propositions about environmental influences of or for systematic classifications and comparisons of different environments are hard to find.
>
> (Dill, 1962)

The environmental school (Mintzberg, et al., 1998) has its roots in contingency theory, which grew up to oppose the confident assertions of classical management that there is one best way to run an organisation. To contingency theorists, "it all depends": on the size of the organisation, its technology, and the stability of its context, external hostility, and so on. This has satisfied the common sense realisation that different situations give rise to different behaviours. Nevertheless, it also made necessary more systematic descriptions of the environment.

Therefore, work began to identify the dimensions of the environment responsible for the differences we observe in organisations. Mintzberg et al,. (1998) summarised this in four main groups: complexity, dynamism, diversity and hostility.

First, stability refers to a variety of factors can make an environment dynamic. It includes unstable governments; unexpected changes in customer demand or competitor supply; client demands of creativity or frequent novelty, as in an advertising agency; a rapidly changing technology, or knowledge base, as in the case of electronics manufacturer; even whether that cannot be forecasted. Second, complexity indicates that an environment is complex to the extent that it requires the organisation to have a great deal of sophisticated knowledge about products, customers, or whatever. It becomes simple, however, when that knowledge can be rationalised, that is broken down into easily comprehended components. Third, market diversity refers to that the market of an organisation can range from integrated to diversified, from that of a firm sells its single product or service to a single industry in one geographical marketplace, to those of a company that seeks to promote all of a nation's industrial products or services all over the world. In the context of this study, market diversity is regarded as an evidence of environmental complexity. Fourth, hostility is influenced by competition, by the organisation's relationships with government, and other outside groups, as well as by the availability of resources to it.

4.3.2 Resource Dependence Perspectives

Emery and Trist (1965) identify four types "causal texture" or environment which can be thought of as existing in the real world of most organisations. Tung (1979) argues that these could be turbulent or stable, complex or noncomplex, routine or non-routine. Corrieria (1996) gives a summary from four different aspects. First, placid-

randomised environment is where resources needed by the organisation are randomly distributed. Second, placid-clustered environment is where the pattern of resources is predictable. Third, disturbed-reactive environment is where the distribution and probabilities of resources are created by the organisation themselves. Third, turbulent environment is where the environment itself is interconnected with other sets of interdependent actors causing greater uncertainty to affect organisations (Figure 4.2).

Figure 4.2: Four Types of "Causal Texture" or Environment

Types	Resources	Nature	Key Objectives
Placid- randomized environment	are randomly distributed	stable and unchanging	do one's best strategy
Placid- clustered environment	are concentrated, some positions in the environment are richer than others	stable	seek an optimal location
Disturbed-reactive environment	are concentrated	(resources are) unstable because there is more than one kind of organisation	meet competitive challenges
Turbulent environment	are changing	dynamic	efficient environmental scanning and monitoring

Source: Adapted from Emery and Trist, 1965.

Some other researchers extended their propositions, arguing that the four types of environments were in fact stages in an evolutionary process, since environments were becoming increasingly turbulent. More explanations are given by Mintzberg, who suggests that the environment is seen "as a repository of two types of resources: economic and symbolic" (1998). Mintzberg et al. (1998) say:

> Economic resources are the familiar, tangible money, land, and machinery. Symbolic resources include such things as reputation for efficiency, leaders celebrated for pass achievements, and the prestige that derives from close connection with powerful and well-known firms. Strategy becomes finding ways of acquiring economic resources and converting them into symbolic ones and vice versa, in order to protect the organisation from uncertainty in its environment. Hence, the process moves into the realm of "impression management".
>
> (Mintzberg et al., 1998)

Preffer and Salancik's (1978) resource dependency theory emphasises that organisations structure their external relationships in response to the uncertainty resulting from dependence on elements of the environment.

4.3.3 Concept of Perceived Environmental Uncertainty

Some have used the concept of uncertainty as if it were a characteristic of the environment itself (Lawrence and Lorsch, 1967), other have used it of the perceptions that individual members of organisations have about the environment under which circumstances it is called perceived environmental uncertainty. A conceptual shortcoming in much of the existing literature on uncertainty is the tendency to isolate particular managerial uncertainties to the exclusion of others. Little research integrates the perspectives on organisational uncertainties.

Managers operating in the international business context confront a variety of uncertain environmental factors. In the past, international management researchers have focused primarily on the assessment of political government policy and macroeconomic uncertainties and appropriate organisational responses. In the strategy field, researchers view industry dynamics as giving rise to managerial uncertainties. As such, the strategy field emphasises uncertainties regarding product and process technologies, the availability of critical input supply, product market demand, and strategic moves by competitors and potential entrants. The reliability of an instrument for measuring managers' uncertainty perception is developed and tested (Miller, 1993).

Miller (1993) proposes a threefold uncertainties: general environment, industry and firm-specific variables. Most commonly, general environmental uncertainties include the PEST uncertainty. Industry

uncertainties encompass suppliers, buyers, entrants, substitute products or services, rivals among competitors and partners. The third category, firm-specific uncertainties includes uncertainties regarding operations, research and development. The concept of uncertainty has long been a central component of a number of theorise of organisation and strategy. Thompson (1967) suggests that an organisation's primary task is coping with the uncertain contingencies of the environment, particularly those of the task environment.

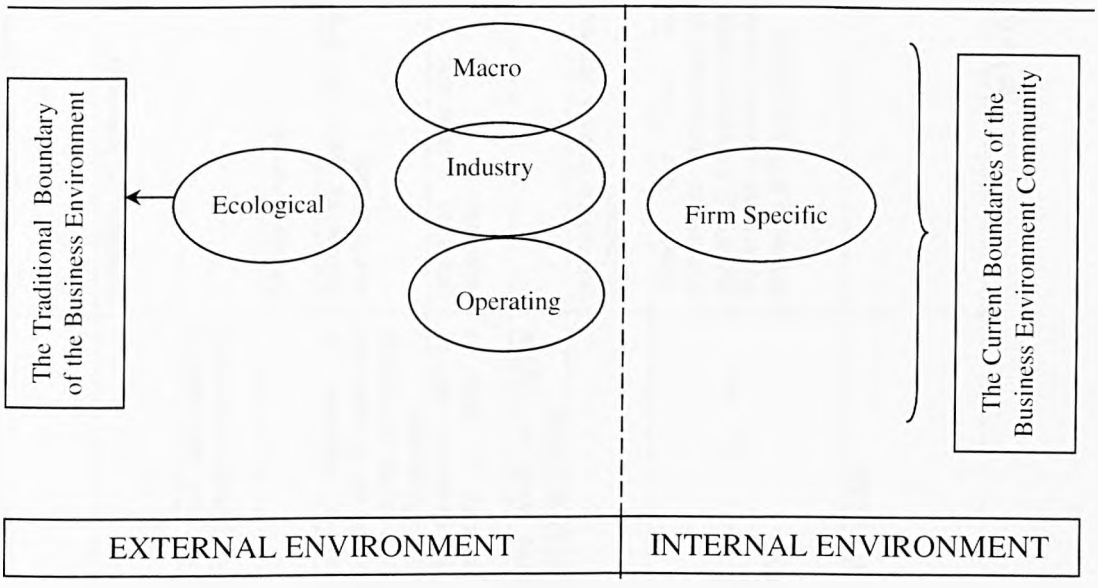
4. 4 Major Theoretical Developments

4.4.1 Theories on Environment and Their Evolution

A first stream of theorists has focused on numerous presentations of the business environment (Daft, 1992). Theorists have attempted to provide typologies of environments and to formulate some general theories of their evolution. The representative work includes: strategic and organisational scholars and contemporary business researchers. The following presents the developments and differences (Figure 4.3).

For analytical purposes, Pearce and Robinson (1997) separate a firm's external environment into three categories. They refer to firstly the "remote environment", including global and domestic political, social and technological concerns; secondly the "industry environment" (the use of Porter's (1980) five competitive forces); and thirdly the "operating environment", which comprises a rather mixed group of actors including suppliers and customers and is similar to Dill's (1958) task environment.

Figure 4.3 The Evolution of the Business Environment as a Field of Study



Fahey and Narayanan (1985) summarise four types of models: natural selection models, resource dependence models, industrial organisation models and re-adaptation models. They also defined three levels of environment with similar contexts. At the general level, it includes factors (PEST) which influence all the industries. At the competitive or industrial environmental level, it refers to factors, which affect all competitors and comprises, a firm or a business unit and its competitors functioning in the same industry. At the task environmental level (Dill, 1958), it focuses on day-to-day operations and includes customers, suppliers, competitors and other environmental agencies directly related to the firm.

McNamee (1992) separates environment into different segments, but points out that, in practice, the separated environments are overlapping, and the distinction between each of them will not always be clear. He suggests that the segment "other" has been included as a catch-all or new category for environmental influences not captured by the other segments named in the list.

Table 4.1 Some Major Contributors to the Redefinition of the Field: Models of the Business Environment

Author	Types of Model	Model	Typology	Contents	Dimension Perspectives
Dill (1958)		Task	Customers, suppliers, competitors, regulatory groups, trade unions and shareholders		
Emery and Trist (1965)			Placid-randomised, placid-clustered, disturbed-reactive and turbulent environment.		Uncertainty and dependence
Weick (1979)		Enacted environment		Replace external environment, understand the subjective approach to organisations interactions with environment.	
Ansoff, et al. (1974, 1979)					Primarily uncertainty
Pfeffer and Salancik (1978)	Resource dependence		Typically, suppliers, customers, competitors, and regulators are treated as vital input and output resources of the organisation.	View organisations as dependent on environment for resources and an organisation has continued ability to acquire and maintain resources is the key to its effectiveness.	(address the dependence dimensions of the environment)
Aldrich and Mindlin, (1978)			Information source and resources stock	Degree of uncertainty; or degree to which the organisation is dependent on others for resources.	Information uncertainty; resources dependence
Schendel and Hofer (1979)				Five forces variables which act together determine the profitability of an industry.	
Porter (1980)	Industrial Organisational				(address the resource dimensions of the environment)
Bourgeois (1980)			Object, perceptions and attributes environment		General and task environment/ environmental uncertainty/complexity and turbulence of the task environment.
Lawrence and Dyer (1983)	Re-adaptation models			Resource scarcity Information complexity:	(address both uncertainty and dependence dimensions of the environment)
Daft (1992)		"Dartboard"	Government, Economy, Socio-cultural, International, Technology, Industry raw material market, Human Resource, Finance.	Similar to the LE PEST C model.	

(to be continued)

(Table 4.1 continued)

Author	Types of Model	Model	Typology	Contents	Dimension Perspectives
McNamee (1992)		Environmental segments	Market forces, Competitive forces (Porter), PEST, Geographical location. Other forces.	The environment can be segmented into the broad forces.	
Brooks and Weatherston (1997)		LE PEST C	Legal, Ecological, Political, Economic, Social, Technological, Competitive.	Perceive environment refers to different organisations' views and enacted environment is created and defined by individuals.	
Pearce and Robinson (1997)		Remote Industry Operating	PEST, Porter's five forces, Customer compositions, suppliers, creditors, labour markets and competitors.		
Mintzberg, et al., (1998)		Environmental school	Objective, perceived and enacted.		
Johnson and Scholes (2000)			Government action and restructuring, demographics, social-cultural, capital market, technology, labour market, ecology, competition, economic conditions, suppliers.	(Environmental influences can affect organisational strategy).	
Lynch (2000)		Eight stages	SCSD, PEST and scenarios, Industry life cycle, KSFs, five forces, four links, competitor analysis and product portfolio, market and segmentation.	Nature of environment, factors affecting normally, growth, factors deliver industry's success, factors specific to the industry competition, factors to co-operation in the industry, factors to immediate competitors, customer analysis.	

Pfetter and Salancik (1978) adopt the description by levels with a different formulation. They distinguish between a first level corresponding to the entire system of individuals and organisations related to one another and to a focal organisation, a second level corresponding to a sub-set of individuals and organisations keeping direct interactions with the focal organisation and a third level corresponding to the enacted environment (the organisation's perceptions and representation of the environment). Given the basis at these three levels, the developments by different researchers and scholars are presented in the above summarised table (Table 4.1).

4.4.2 Theories on Organisation-Environment Relations

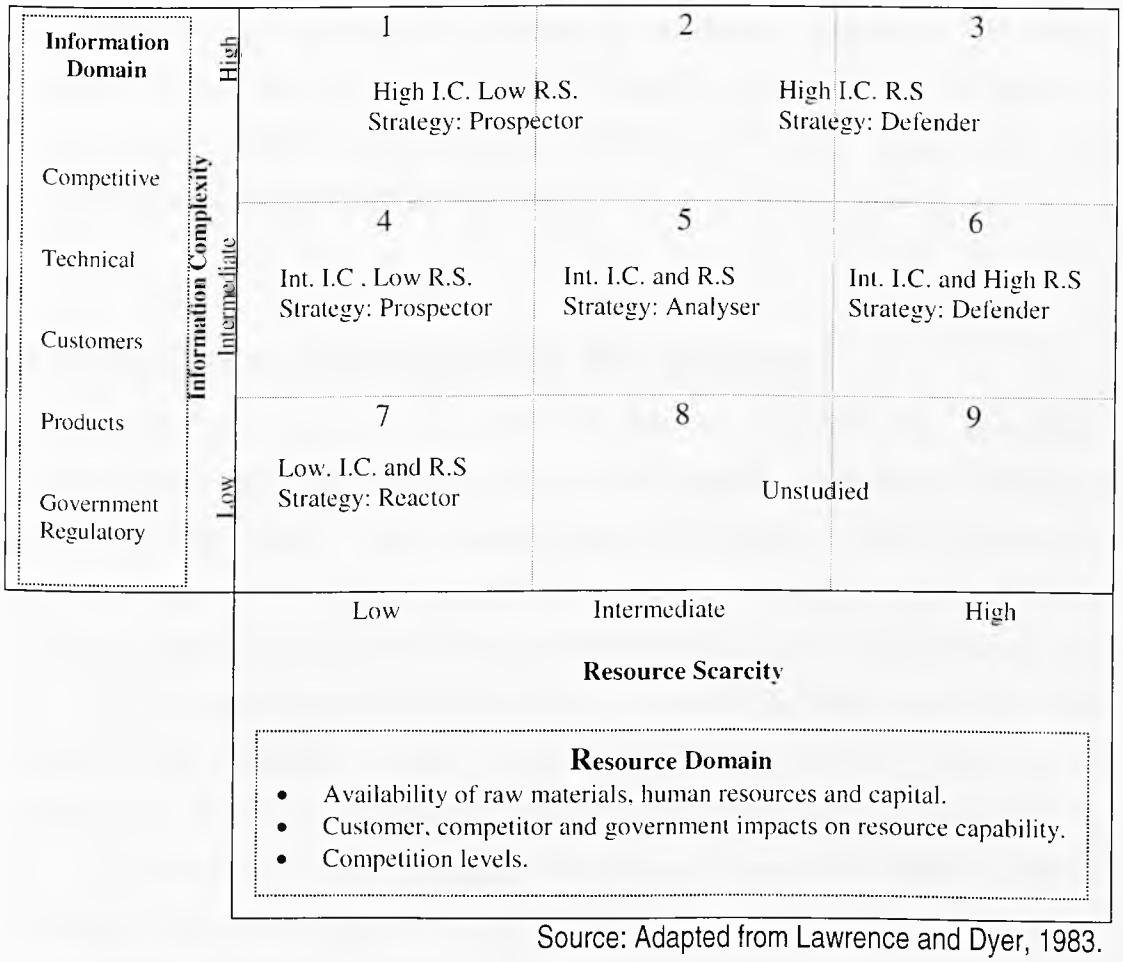
A second stream of theorists has focused on relationships between organisations and environments. Over the last three decades, a wide range of theorists and researchers has been concerned with the organisation-environment interface (Fahey and Narayanan, 1985). Differences exist in level of analysis, dimensions of environment attended to (Scott 1981) and various theories' primary focus.

According to Emery and Trist (1965), a comprehensive understanding of organisational behaviour requires some knowledge of each member of three major sets. The first set refers to some potentially lawful connection; the second set is the organisation; and the third is the environment. They further propose three processes: processes within the organisation – the area of internal interdependencies; exchanges between the organisation and its environment – the area of transactional interdependencies, from either direction; and processes through which parts of the environment become related to each other – i.e. its causal texture - the area of interdependencies that belong within the environment itself (Emery and Trist, 1965). Based on the above propositions given by Emery and Trist (1965), this research is

focused primarily on the second and third processes which are relevant to the "area of transaction interdependencies".

Fahay and Nayaranan (1985) suggest that the linkages of environment to a firm present themselves as threats and opportunities to firms. Business strategy could indicate the linkage between organisation and environment. Lawrence and Dyer (1983) develop a model of environmental relationships. Hence, two dimensions have been generated: information domains and resource domains (Figure 4.4).

Figure 4.4 Model of Environmental Relationships



Source: Adapted from Lawrence and Dyer, 1983.

Information domains include competitions or competitors, Technology, customers, products and government regulatory. Resource domains refer to the availability of raw materials, human resources or capitals; customers, competitors, government impact on resource capability; and the competition level. The correlations between these two dimensions may form various strategies. For instance, when information complexity is low and the resource scarcity is also low, a reactive strategy is preferred; when information complexity is high whereas the resource scarcity intermediate or low, a prospective strategy is preferred.

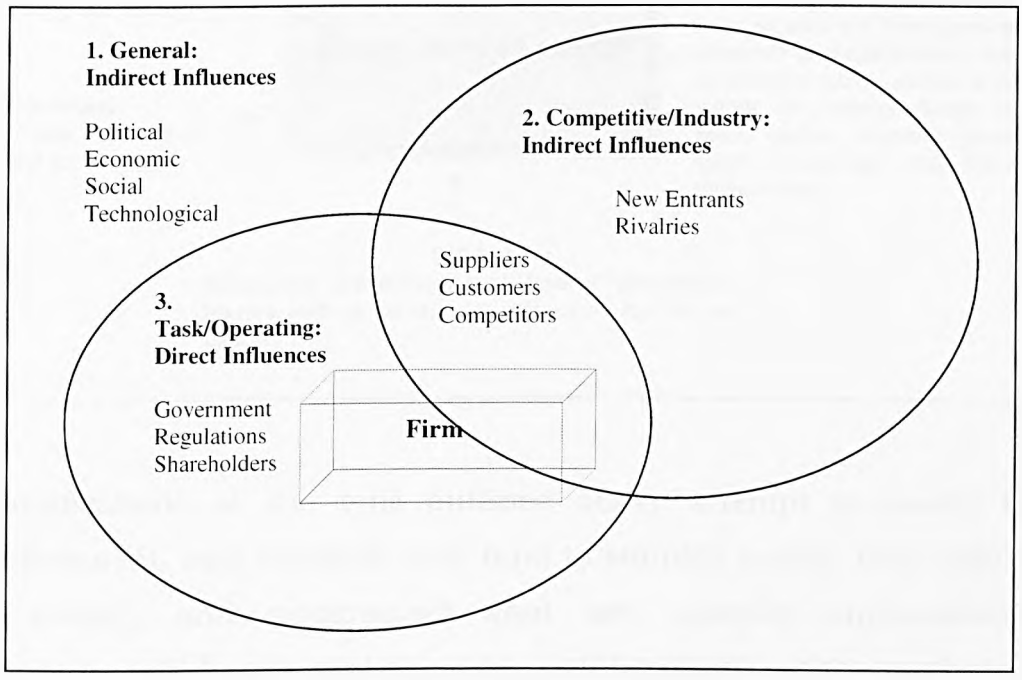
The significance of these models is that they provide a map of the kinds of linkage between environment and organisations that need to be stressed. Environment is linked to business strategies (product-market directions). More details on similar research are discussed and a new model is developed in Chapter 6 that deals with the proposition development of this study.

4.5 Conceptual Frameworks for Analysis

Numerous attempts have been made to model the business environment either in "its totality or in its specific elements" (Johnson and Scholes, 1999). The normal understanding is that of external environment. The most popular accepted demonstration of the external environment refers to general, industry and task. Based on the above theoretical developments, a model which describes the three environmental levels is developed (Figure 4.5). General or remote or macro-environment refers to the broadest which impacts on all industries, even though in different ways (Corrieria, 1994). Perhaps the most popular and classical category of the general or macro-environment refers to political, economic, social and technological (PEST) when considering the array of environmental influences on the business activity. In addition, the elements of

cultural, legal and ecological categories are encompassed in most areas of concern regarding the general external environment. PEST enables us to assemble a logical and comprehensive picture of the business environment; "it is the interrelationship between the apparently different factors which adds not only complexity and uncertainty to the analysis but also richness and greater accuracy" (Corrieria, 1994).

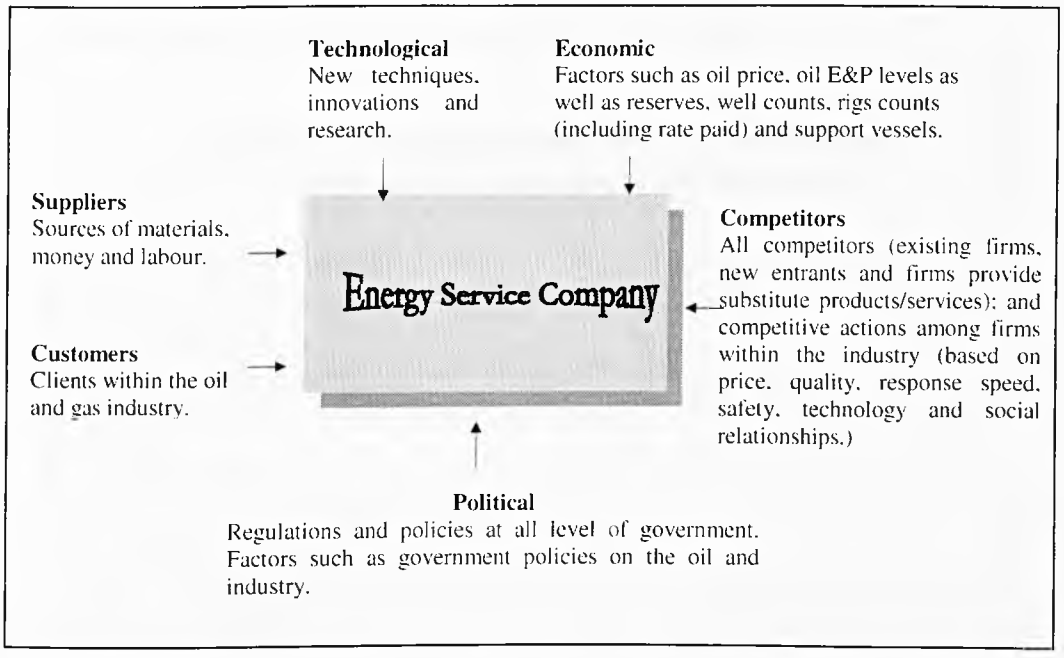
Figure 4.5 Levels of the Business Environment



Industry or competitive environment represents specific characteristics of a certain industry and refers to the forces which drive the competition of an industry. The most known competitive forces are the power of buyers and suppliers, the threats of substitute, entry barriers and the rival within an industry. The concept of industry environment is in a certain way an overlap of the concept of task environment as they have similar environmental categories. As said earlier, the elements of operating or task environment include the sub-set of customers, suppliers, competitors

and other agencies (Corrieria, 1994) directly influence the "daily-based" company's business (Figure 4.6).

Figure 4.6 The Business Environment Model

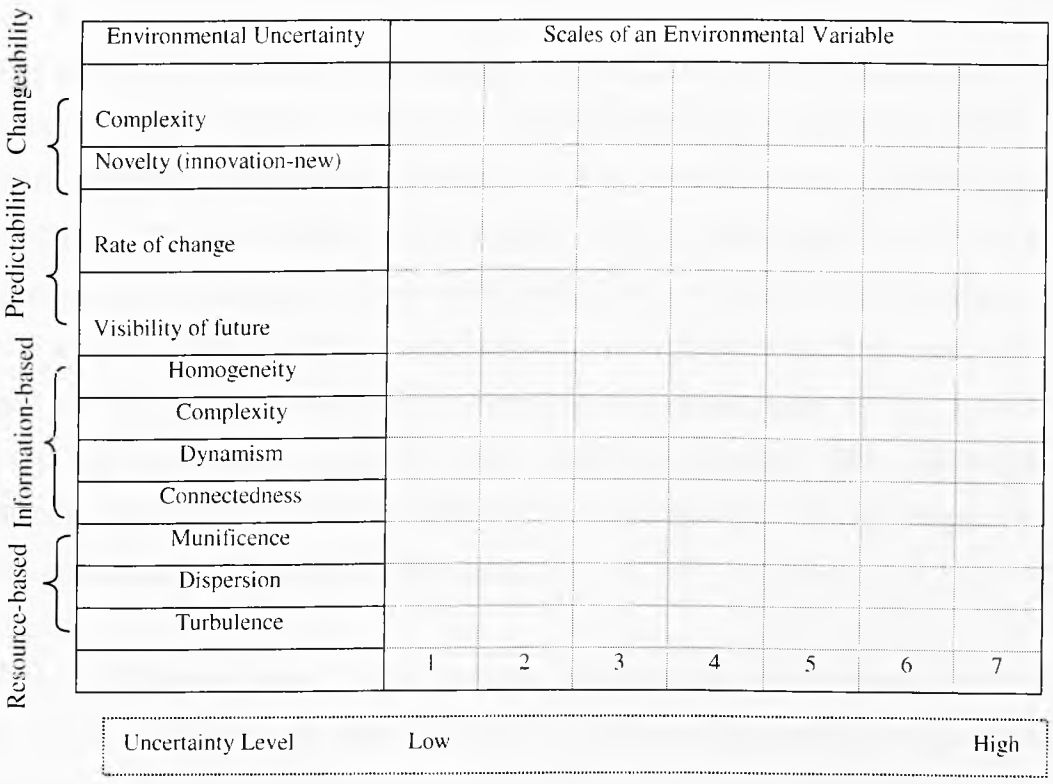


Classifications of the type outlined above attempt to model the environment, and although they tend to simplify reality, they help us to identify and understand what are complex environmental processes and forces, and serve as useful tools to aid the analysis of the environment. The "real" environment is a complex array of interrelated forces. In reality, a number of forces within the environment combine to influence an organisation (Corrieria, 1994). This research concentrates a number of important aspects of environment which influence the oil and gas service company's activity and its business and strategic decision making in an East Asian like China, Singapore and Malaysia.

4.6 Methods of Environment Analysis

Lynch (2000) suggests that the environmental forces surrounding the organisation can be assessed according to two main measures: "Changeability" - the degree to which the environment is likely to change (low or high of the market) and "Predictability" - the degree with which such changes can be predicted (Figure 4.7).

Figure 4.7 Assessing the Nature of the Environment – A Typology of Organisational Environments



These measures can each be subdivided further. Changeability comprises: complexity - the degree which the organisation's environment is affected by factors such as internationalisation and technological, social and political complications; novelty- the degree to which the environment presents the organisation with new situations. Predictability can be further subdivided into: rate of change of the environment (from slow to fast); visibility of the future in terms of the availability and usefulness of the information used to

predict the future. Using these factors as a basis, it is then possible to build a spectrum that categorises the environment and provides a rating for its degree of turbulence.

Following numerous studies in organisational and strategic management theory, this researcher summarises six dimensions of environment that capture uncertainty: dynamism, complexity, hostility, competition, technology and market or industry concentration.

Environmental dynamism is defined as the rate and the instability of environmental change (Child, 1972; Dess and Beard, 1984). Environmental dynamism is the product of several forces operating at one time. These include an increase in the size and number of organisations within an industry, and an increase in the rate of technological change and its diffusion throughout that industry. An effect of increasing levels of environmental dynamism is to reduce access to knowledge needed to make critical decisions. This, in turn, reduces the stability and predictability of relations among firms and their constituents within an industry.

Fahey and Narayanan (1986) define complexity as referring to the degree of similarity or differentiation between elements or entities within and across environmental factors or components. It pertains to the number and heterogeneity or diversity of factors and components in the external environment. Hostility describes the capacity of the environment to support organisations in the marketplace. Competition highlights the interrelations between the focal organisation and its environment. An ecological conception of this construct indicates that competitive interdependence among firms in an industry will increase environmental uncertainty (Barnett and Carroll, 1987).

Technological change induces firms to divert substantial resources to adaptation. Technological shift results in greater product sophistication and dynamism. Technological shifts in the environment generate uncertainty because they increase firm-level competition as technologically superior firms attempt to displace firms with outmoded technologies.

The construct of the environmental uncertainty is not complete without including an industry structure variable. An important variable that measures industry structure is market concentration (Porter, 1980). Market or industry concentration describes the number and the size distribution of firms competing against each other in an industry. The degree of environmental uncertainty is affected by the extent of realised or potential collusion that results from the number and size distribution of firms in the industry (Scherer, 1980).

In this study, the researcher concentrates on three environmental measures, namely, complexity, dynamism and hostility. Relevant concepts and similar research in the area will be introduced further in Chapter 6.

4.7 Purpose and Limitations of Environmental Analysis

The purpose of environmental analysis is concerned with predicating environment based upon the assumption that the forces in the environment affect industries and destinies of the firms within them. In this study, the researcher conceives the environment as sectors. Macro environmental sector consists of four segments or sets of forces (social, economic, technological and political). Industry or task environment refers to stakeholders (new entrants, buyers, suppliers, competitors and partners). Environmental analysis is thus the analysis of current and potential change in these segments or

stakeholders and the assessment of their implications for strategic management.

Nevertheless, Fahay and Narayana (1985) have pointed out that there are some limitations of environmental analysis. For instance, environmental analysis does not foretell the future, nor does it eliminate uncertainty for any organisation. Environmental analysis in and of itself is not a sufficient guarantor of organisational effectiveness. It forms only one input for strategy development and testing. Environmental analysis should be used in conjunction with other forms of analysis such as competitor and organisational analysis. Sometimes, certain information derived form environmental analysis may become irrelevant due to the fast changing business environment.

4.8 Summary

This chapter outlines some theoretical notions and a framework for thinking about the environment. A conception of environment built around three levels is presented and various linkages to strategy formulation are pointed out. An analytical framework for engaging in environmental analysis is developed. The critical activities in environmental analysis - scanning and assessment - are described in detail. The analytical process involved in doing environmental analysis is also detailed.

CHAPTER 5

THE ESSENCE OF STRATEGY

The literature on strategy can be divided into two areas: one deals with the concepts of strategy in the East and the other focuses on strategy development in the West. Of these two areas, work conducted by Western strategists on strategy development is far more extensive. Much of this work is about the content of strategy, both in terms of conceptual frameworks and empirical evidence. The exact definitions of the strategy concept differ between Western and Eastern strategic theorists or strategists. However, what is never in question is the key attribute of strategy: the means of achieving a strategic goal. In this regard, there is clear unanimity. Basic doctrines about strategy – for instance, its importance to a firm's long-term success, the components of strategy, and levels of strategy – receive almost universal acceptance (Hawkins, 1995). Particularly, in a Western context, a large amount of work has been carried out in some key areas such as the strategy types an organisation can pursue and the organisational levels at which these strategies should be implemented.

The objective of this chapter is to review strategic theories so that a framework for the investigation of business strategies can be developed. It contains five main aspects of strategy. Firstly, it offers a historical perspective on how strategy definitions evolved from military use into a discipline within the field of strategic management. Secondly, it explores chronologically the various schools of business strategists and the major thrust in each of their arguments. An overview of major work that has been carried out in the area of strategy development in the past and an outline of how it will develop

in the future are presented. This discusses the evolution of different conceptual frameworks over time, together with their impact on today's business practice. Thirdly, it looks at the nature of strategy, including strategic sense, its functions, components, power and limitations. Fourthly, strategy in relation to the strategic management process is discussed and finally, the applications of strategies in both Western and Eastern contexts as well as in the oil and gas industry are presented.

5.1 Concept of Strategy

A most serious semantic problem in strategic management literature is the lack of consistency in the use of fundamental concepts like strategy and business strategy. In some instances, strategy is defined as the means to achieve a goal; in others, the definition is expanded to include both the goal and the means to achieve this goal. In spite of the surrounding polemics, it can be seen that any differences in definitions lie mainly in their scope: some authors bring goals into the definition; others do not. This section reviews the overall traditional concepts of strategy and outlines the difficulties in reducing strategy concepts to one single definition.

5.1.1 A Brief Review of Definitions

Different definitions of strategy have been addressed world wide, from the East to the West, and from ancient times to the modern epoch. Although strategy definitions vary, the major content of strategy concepts can be generalised. A generic definition provided in the Concise Oxford Dictionary of Current English (1995) says:

> Strategy is the art of war; is the management of army in a campaign, or the art of moving troops, ships, aircrafts, etc. into favourable positions, or an instance of this or a plan formed according to it; is a plan of action or policy in business or politics etc.

The word "Strategy" in Middle English came from French strategème and Latin strategema from Greek stratēgēma via stratēgeō to stratēgo. "Stratagem is a cunning plan or scheme especially for deceiving an enemy or trickery" (Oxford Dictionary, 1995). From Greek literature, the term "Strategy" is a derivative of the word "stratēgo", which means the psychological capability and skills that generals should have when they lead an army.

As a word, "Strategy" can be derived from two main sources: military and commercial terms. In military terms, the Oxford English Dictionary (1933) defines strategy as:

> the art of a commander-in-chief; the art of projecting and directing the larger military movements and operations of a campaign; usually distinguished from tactics, which is the art of handling forces in battle or in the immediate presence of the enemy.

The importance of strategy as a topic of study may be traced back to 1513 when Nicolo Machiavelli, the first great political philosopher of the Renaissance, studied how a government can stay in power. Later, Carl von Clausewitz (1780-1831), a famous Prussian military thinker and strategic theorist, provides a detailed concept of strategy. In his definition, he emphases not only the content of strategy but also the process involved in strategy. He argues that

> strategy is the employment of the battle to gain the end of the war; it must therefore give an aim to the whole military action, which must be in accordance with the object of the war; in other words, strategy forms the plan of the war; and to this end it links together the series of acts which are to lead to the final decision... it makes the plans for the separate campaigns and regulates the combats to be fought in each... strategy must go with the army to the field in order to arrange particulars on the spot, and to make the modifications in the general plan which incessantly become necessary in war.
>
> (Vom Kriege, translated by Gatzke 1942).

In commercial terms, Johnson and Scholes (2000) say that

> Strategy is the direction and scope of an organisation over the long term. It ideally matches its resources to its changing environment and in particular its markets, customers or clients so as to meet stakeholder expectations.
>
> Strategy is about an organisation's ability to utilise its strengths and weaknesses to take advantage of the opportunities and overcome the threats facing the business. Strategy is about balancing the internal factors with the external drivers of the business.

Similarly, Kay (1999) suggests that "business strategy is concerned with the match between a company's internal capabilities and its external environment" and says that strategy "is a set of analytic techniques for understanding and influencing a company's position in the market place". In his holistic review of definitions, Chandler (1962) describes strategy as the determination of the basic goals and objectives of an enterprise; and the adoption of courses of action and the allocation of resources necessary for carrying out these goals. In short, strategy is the art of management in establishing goals, making decisions and preparing action plans with available capabilities and resources to gain the final victory in battles, and particularly, long-term success for a commercial purpose.

5.1.2 Major Streams of the Strategy Concept

5.1.2.1 Military and Political Rules of Strategy

Militarily, the first documented concept of strategy goes back to the world's first acknowledged strategist Sun Zi[1], whose "The Art of War" was written in the later years of Spring and Autumn Period (approximately from 770 BC to 476 BC) in China and at almost the same period as the ancient Greek strategists. The Art of War comprises thirteen chapters. From chapter one to chapter six, it is concerned with strategy. The first chapter, Laying the Plan, is the key to The Art of War. It begins, "military action is of vital importance to

[1] Named as Sun Tzu by Westerns.

the state. It is a matter of life and death, a road either to safety or to ruin." Then Sun Zi points out that a victory depends not only on martial power but also other issues such as politics, economics, time, location, people and discipline. He emphasises that "these elements should be familiar to every general; he who knows them will be victorious; he who does not know them will fail." Both ancient Chinese and Greek strategists emphasise attributes of the guile and cunning required to develop a wining strategy.

5.1.2.2 Entry of Strategy Concepts into Commerce

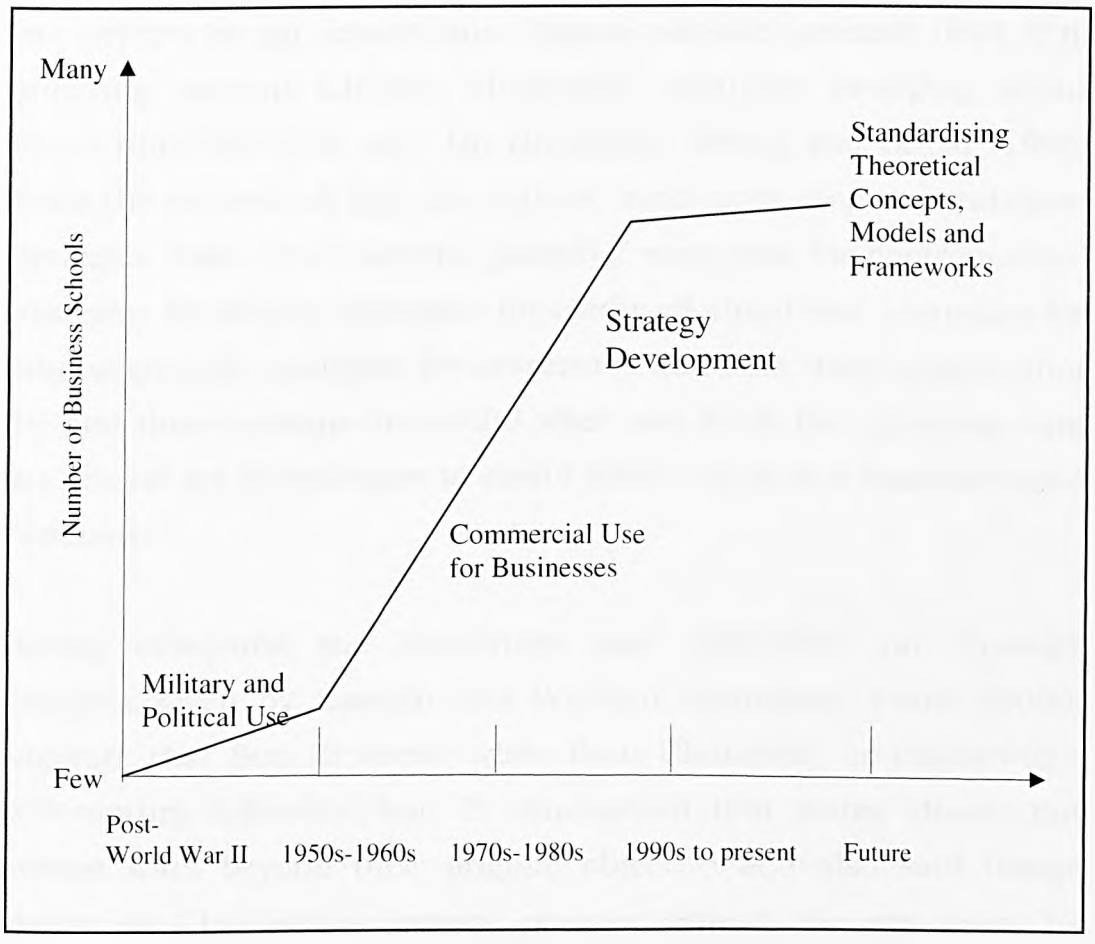
Through the medieval period into the present day revolutions in agriculture and industry have made an increasing need to adopt strategy from a military use for commercial purposes (Alexander, 1990). Strategic warfare has been applied over many centuries to help kings win wars over their enemies. Pheng and Sirpal (1995) comment that the business world is like war. Military manoeuvres can similarly and equally be applied strategically to help businesses win the "business war" (Low, 1995; Low and Sirpal, 1995; Low and Yeo, 1993).

Many business leaders and researchers have begun to bring the lessons of the battlefield to the marketplace. Frank (2002) comments that there is a widespread American belief that books about the arts of war can teach us about the art of business. The relationship of military strategy and business elements is a major flow found in many strategy studies. Whenever possible, a preamble on the parallels between the military and business is always included in the study of corporate strategy (Alexander, 1990). For example, attempts have been made by Pheng and Sirpal (1995) to extend the thirty-six Chinese classical strategies of war into the realms of Western generic business (Porter, 1980, 1985; Hofer and Shendel, 1978) and corporate strategies (Drucker, 1974) for use in the business world.

5.2 Evolution of Strategy: A Chronological Review

This section provides a compendium chart depicting the evolution of strategy. It moves chronologically to provide a snapshot view of the major influences on the concept of strategy. In order to do so, the period of strategy evolution is divided into four major parts (Figure 5.1).

Figure 5.1 Evolution of Strategy



5.2.1 Period I: Initial Appearance of Strategy (Post-World War II Era)

The first period refers to the years preceding World War II when strategy was used mostly as the military parlance for warfare and political control. As stated above on page seven, the recorded history of strategy reaches back to 476 BC when the Chinese military

strategist Sun Zi wrote "The Art of War", which has been regarded as the most influential classical strategic thinking in East Asia (Chen, 1995). Zhuge Liang (around 229 AD) is another most famous Chinese military strategist but the gist recommended by some researchers is that his book is in favour of generals displaying leadership, character, responsibility and knowledge. Therefore, Zhuge Liang's strategic thoughts are more suitable for managers who wish to have competent management skills. The third highly influential ancient Chinese military strategy is "Thirty-six Chinese Classical Strategies of War". It was written by an anonymous Chinese scholar (around 1644 AD), gathering ancient Chinese strategists' thoughts emerging about fifteen hundred years ago. On the whole, Pheng and Sirpal (1995) divide the entire book into six sections, each containing six strategies: strategies when in a superior position; strategies for confrontation; strategies for attack; strategies for confused situations; strategies for gaining ground; strategies for desperate situations. They suggest that the first three sections are useful when one holds the advantage and the second set of strategies is useful when one is in a disadvantaged situation.

Having compared the similarities and differences on strategic thoughts given by Eastern and Western strategists, Frank (2000) suggests that Sun Zi seems wiser than Clausewitz or Clausewitz's 20th-century followers: Sun Zi emphasised that states should not pursue wars beyond their original objective and also said things similar to Clausewitz's famous pronouncement: the war must be supported by politicians and people back home. No matter what is stressed, the aim of strategy at this period was to assist army commanders to win battles of the war and gain access to the extended agricultural resources such as land for political rulers.

In the era of economic development between the First and Second World War, there was an overlapping period when military strategies

were transformed or applied for the use of business purposes. Over the period, for instance, Japanese systematically studied and applied Sun Zi's strategic thinking to their management and business strategy-making. Pheng (1998) states that nowadays the ancient Chinese strategies of war are commonly applied to business practice by Asian managers. Though the first acknowledged strategy book appeared in China, strategy development has been generated mainly in the West.

5.2.2 Period II: Theory Building (1950s-1960s)

The second peak period of strategy development is during the 1960s. Many of the concepts that form the basis of today's understanding of strategy development were developed during the first half of the twentieth century. Since the concept of strategy was not developed extensively in the business literature until the late 1950s, almost no empirical research related to it was done until the early 1960s. Since the late 1960s, a number of studies have emphasised the generic content of the organisation's strategy.

At the early stage of the theory development, scholars like Ansoff (1965) laid the foundations for strategic planning by demonstrating the need to match business opportunities with organisational resources and illustrating the usefulness of strategic plans. Later, Hofer (1975) discovered that the concept of organisational strategy during this period had emerged as one of the cornerstones of both management theory and practice. Formal theory in the 1960s focused on tools and techniques to help managers with decisions about business direction (Whittington, 1990). The critical works include the portfolio matrices produced by consultants like the Boston Consulting Group. By then industrial economics was dominated by the structure-conduct-performance paradigm. This emphasised how market structure was the principal influence on a company's

behaviour (Kay, 1999). Rainer and Chaharbaghi (1995) summarise that this early phase was followed by a stage of generalisation in which researchers attempted to identify common patterns of success.

5.2.3 Period III: Theory Debate and Development (1970s-1980s)

In the 1970s, both theory and research on the content of business and corporate strategy developed in a piecemeal fashion. However, the most influential criticism given by Hofer (1975) is that much of this work has failed to differentiate between business and corporate strategies. Shortly after that, Miles and Snow (1978) developed a typology for assigning different business strategic orientations.

In the 1980s, the focus shifted from strategic planning towards strategic management. In 1980, Michael Porter's "Competitive Strategy: Techniques for Analysing Industries and Competitors" was published. Led by Porter (1980, 1985), a broad range of concepts and techniques evolved which were aimed at building and sustaining competitive advantage by anticipating and exploiting business opportunities. This was popular during the 1980s and remains deeply entrenched in strategy thinking today. It translates the structure-conduct-performance paradigm into an industry structure model, which can be used by business, although some people, such as Lynch (2000), have pointed out the serious limitations of this model. For example, the model does not allow for the phenomenon of co-operation within an industry.

As Rainer and Chaharbaghi (1995) summarised, during the 1970s and 1980s, researchers increasingly recognised that strategy development cannot be regarded as a simple design mechanism but that different strategy processes may exist in different organisations. The idea that there may be a gap between the intended and achieved strategy had also been raised. Numerous studies culminated in a

large number of strategy tools and frameworks that are still used for analysis purposes today.

5.2.4 Period IV: Theory Test, Modification and Standardisation (1990s to the present and future)

The fourth period is from the 1990s to the present and future. In the 1990s, the concept of strategy was still developing and literature was growing rapidly in every direction, such as strategic groups, value chains and key success factors and other ideas. The represented work was conducted by Minsberg et al. (1998, 1999) by studying various types of strategies. Intended strategy and realised strategy means that organisations develop plans for their future, in part by evolving patterns out of their past. Deliberate strategy and unrealised strategy refer to the intentions that are fully realised or not realised. Emergent strategies, where actions are taken one by one and some sort of consistency or pattern emerged over time are not expressly intended.

Today, strategists become aware of the increased speed of change and the level of uncertainty in the business environments. In fast-changing circumstances, some (Rainer and Chaharbaghi, 1995) argue that it is not possible to determine a strategic direction for an organisation on a systematic basis. Hence, organisations must constantly adapt to such circumstances and move towards dynamic strategy development. As Alexander (1990) has pointed out, the future strategy development will become more fragmented, more flexible, and enable local divisions to react decisively to the newest or strongest threat arising from the environment. However, there is a need to set up standards for universal application of numerous theoretical models, frameworks and theories.

5.3 Main Aspects of Strategy

5.3.1 Strategy in the Broad and Narrow Sense

Hawkins (1995) observes that the literature on strategy can usually be organised into two areas, one focusing on the content of strategy and other focusing on the process. Of these two areas, work on content is far more extensive. The two areas can refer to strategy in the broad and narrow sense. In the broad sense, strategy contains goals, intention or aims and the main policies made for achieving these goals and strategy is a pattern of plans. The strategic pattern defines the business activities a firm undertakes and defines the industry in which the firm should be. Hence, the strategy to be selected should be determined by the environment prospects, the nature of the competition and the company's resources, goals and culture. For example, Sondhi (1999) suggests that strategy is a broad and general plan developed to reach long-term objectives, focusing on actions for each of the functional areas and strategy can be expressed in terms of the visions, missions, objectives and tactics.

Defining strategy in the narrow sense, the period of goal setting is linked with the strategic formulation and implementation process. Ansoff (1979) is among those who held this idea of strategy in a narrow sense. He suggests that strategy is a "main line of operation" throughout a firm's operation, products and markets. It decides the current businesses a firm undertakes, or the plans the firm will be engaged in. This main line consists of four main elements: the range of products and markets, which means products produced and markets they compete in; the growth direction, which means a firm's plan of the changing direction for its products and market segments; the competitive advantages, which mean the characteristics that enable a firm to be in a strong competitive position with regard to its

products competing in the marketplace; and the co-operation within the firm.

Hofer and Schendel (1978) suggest that when a firm makes its strategy, it should consider the interrelationship between the resources and the external environment. On a more management specific view, Hofer and Schendel (1978) define strategy as: "fundamental pattern of present and planned resource deployments and environmental interactions that indicates how the organisation will achieve its objectives". This definition is preferable to Ansoff's (1979), as it takes the external environmental factors into account, and so is much closer to the modern thinking on strategic management.

In summary, the main thoughts of scholars in terms of strategy in the broad sense is that strategies should include the objectives pursued and the way to achieve them. On the other hand, the process of making up objectives is one part of strategic decision making and the concept of strategy in the narrow sense only emphasises the approaches a firm uses to pursue the planned objectives.

5.3.2 Elements of Strategy

Sun Zi defines strategy in terms of five key elements. These are: Tao – the Moral law, means doctrine of the organisation. It essentially means the culture or values and beliefs of an organisation. Tian – Heaven or Nature, refers to the environment of the organisation. The environment of nature represents the boundaries of the organisation, including its competitors. Di – Earth, means the situation, that is the current position of the organisation or its current strengths and weaknesses, particularly in relation to the environment. Jiang – The Commander or Leadership, means that the role of leadership is vital

in ensuring progress against objectives is met, through the motivation of individuals and communication within the team. Fa – Methods and Discipline, mean that the goals or outcomes of a strategy should be made without emotional attachment. The strategy needs to be based on complete control of the strategic planning process.

Clausewitz in "Vom Kriege" suggests that the elements of strategy may include the moral, physical, mathematical, geographical and statistical ones. In their review of strategy research, Hofer and Schendel (1978) identified four key elements of an effective strategy: scope, resource deployments, competitive advantage and synergy. The four components are widely regarded as equal contributors to a firm's overall success, although in some cases, one component may assume a greater role than another. Taken together, an organisation's four strategic elements determine its effectiveness (Hawkins, 1995). Similarly, Alexander (1995) suggests nine strategic elements: external assessment, best choice, multi-tiered goals or plans, resource allocation, forecasted assumptions, internal assessment, contingent plans, monitoring and scanning. Robert (1999) also has ten components as an entity's strategic engine. Namely, strategy can be driven by product, user or customer class, market type or category, technology, production capability or capacity, sales or marketing method, distribution method, natural resources, size or growth, and by return or profit.

When a company has formulated its strategy, normally, it needs to illustrate its mission and define the goals and objectives. Mission statements go back to the late 1960s. Levitt (1969) emphasises that companies should focus the mission on customer needs, or benefits sought, rather than production or technology processes. Drucker (1970) also states that a firm needs a clear definition of what business each is in, backed up with specific objectives and strategies.

Mission therefore means that management defines the directions, aims, characteristics and guiding ideology which a firm should follow (Xu, 1997). It reflects the value set by management and the image that a firm tries to build up, and reveals the differences in objectives between the firm and the other companies in the same industry. It also includes the range of its main products and services and how the firm tries to satisfy customers' needs and requirements. In a simple structured firm, a corporate owner who is also a manager takes all the responsibilities, and his beliefs, desires, and aspirations decide the mission of the firm. Thus, the corporate mission basically includes: products and services which a firm's production and technology can provide; benefits received from products or services provided; satisfaction provided to customers in market segments served by the firm's products or services; management self-consciousness; and corporate public image.

When firms develop and grow, or are forced to change their products, markets and technologies due to competitive stresses, they must re-define their missions. In this situation, although a firm's mission is basically the same as that of a simple structured firm, its contents should reflect the new ideas. First, it includes goals, especially the economic goals. Survival, growth and profit are the three economic objectives which decide the strategic direction of a firm. Second, it includes competitive positions. A firm needs to define its competitive position based on the technology owned, products produced and markets served, by assessing its strengths and weaknesses. Therefore, the standards for its competition can be made. Third, it refers to corporate beliefs and fourth public image. Finally, benefits to stakeholders should be mentioned.

In management literature, goal and objective are sometimes two different concepts while sometimes they mean almost the same thing. From the strategic management perspective, some scholars (Xu,

1997) suggest that goal is the intention behind management's decisions or actions and goals will frequently never be achieved and may be incapable of being measured. McNamee (1992) defines that objective is the detailed programme set up for the firm and its employees to achieve those goals and objectives are goals expressed in a form in which they can be measured. The shorter the time limit available for the firm, the greater must be the details of the objective.

Particularly, with regard to long-term goals, Xu (1997) indicates that, normally, the period for long-term goal planning in China is five years. Strategic decision-makers set up long-term goals by taking the following factors into account: capability of making profit, production capability, competitive position, advanced technology and employee development.

In conclusion, the normal elements of a strategy are summarised as: mission, goals and objectives; business range (including products, technology and customers), resources held and competitive advantages pursued. These elements will be examined further in the next chapter when formulating a comprehensive typology of business strategies. The typology will then be used as part of the conceptual framework in this study.

5.3.3 Functions, Power and Limitations of Strategy

In the modern business world, strategy is further developed. Strategy is considered by Mintzberg, Ahlstrand and Lampel (1998) to have four functions: strategy sets direction, focuses effort, defines the organisation and provides consistency. Prahalad (2000) asserts that strategy is "not an extrapolation of the current situation but an exercise in 'imagining and then folding the future in'. This process needs a different starting point. This is about providing a strategic direction – a point of view and identifying, at best, the major

milestones on the way." Therefore, the art of strategy is concerned with managing conflicts within an organisation, within the external business environment, with competitions and among leaders.

With regard to the power of strategy, Sondhi (2000) suggests that "a broad and general plan is the translation of the strategy into meaningful terms for the benefit of employees, customers and all other stakeholders". Hawkins (1995) finds that strategy can give a firm and its top management a distinct advantage in providing a long-term direction, adapting to an increasing rate of change, gaining a competitive advantage in high-risk environment, and achieving a more effective organisation.

Researchers' synthesis of the relevant research over the last few decades clearly shows a strong link between strategy and performance: those who use strategic management concepts are more likely to conduct systematic planning, and better at understanding their environment and anticipating future changes, take a more long-term perspective, and better empower both managers and employees by involving them in the strategic decision-making process and thus are more profitable and successful (Hawkins, 1995). Nonetheless, Alexander (1990) points out that "a strategy, at its best can provide a degree of certainty that one is acting 'proactively' in an uncertain environment, but it is not a guarantee of success." Ohmae (1982), the former Director of Mckinsey and Company Inc., also comments: "In the real world of business, 'perfect' strategies are not called for. A good business strategy is one by which a company can gain significant ground on its competitors at an acceptable cost to itself".

5.4 Types of Strategy

From strategic management literature, there are numerous ways of categorising the types of strategies. Mintzberg, Ahlstrand and Lampel (1997) are the most influential in the field and have developed various frameworks for assigning types of strategy. An initial framework developed is five P's for strategy. The five Ps refer to plan, pattern, position, perspective and ploy. When strategy is considered as a plan, or something equivalent, it is a direction, a guide or course of action into the future, a path to get from here to there. When strategy is considered as a pattern, it shows the consistency of an organisation's behaviour over time. Strategies may arise out of the experiences from the past. When you look "down", strategy can also be a position, which means the location of particular products in marketplace. Strategy is a perspective, which defines the fundamental way of doing things for an organisation as in this situation, strategy looks in - inside the organisation but it also looks up - to the grand vision of the enterprise. Finally, strategy is described as a ploy, and the nature of this kind of strategy is to create threats to outwit an opponent or competitor (Mintzberg, Ahlstrand and Lampel, 1997). Shortly after that, a model of ten schools was generated (Mintzberg et al. 1999). These ten schools include: design, planning, positioning, entrepreneurial, cognitive, learning, power, cultural, environmental and configuration. The ten schools provide a comprehensive typology for assigning strategy into different type.

Prahalad (1999) argues that the traditional view sees strategy as fitting with available resources; or as positioning in existing industry space; or as top management activity; or as an analytical exercise; or as extrapolating the past. However, the emerging view of strategy contrasts dramatically with the traditional view. The new emerging view perceives strategy as stretch and leverage; or as creating new industry space; or total organisational process; or as an analytical and organisational exercise; or as creating the future. Based upon the

various theories reviewed, a summary of strategy concepts and strategy development is given in Table 5.1.

In the similar field of work, Quintella (1993) develops types of strategies in the sense of being related to the strategic results. She suggests eight different types of strategies. Planned strategies must be deliberate and initiate "through formal plans, where exact intentions exist and are formulated and implemented by central leadership, using formal controls to avoid any possible surprise". Entrepreneurial strategies come from a central vision of a single leader, but intentions exist as personal views and these strategies are extremely adaptable to new opportunities and threats. These strategies usually situated in a "niche environment" and are relatively deliberate but can also emerge. Ideological strategies are originated from shared beliefs and are mainly deliberate. Umbrella strategies are generated from constraints and they are partly deliberate, partly emergent and partly deliberately emergent. Process strategies originate in process and they are partly deliberate, partly emergent and partly deliberately emergent. Unconnected strategies are "generated in enclaves where some of the actors produce their own patterns of actions consciously contradictory to central or common intentions, or in the absence of the strategies emerge, whether or not deliberate." Consensus strategies are emergent and, through a natural learning from each actor to the other, and from the response from the environment, they originate through mutual adjustment. Imposed strategies are mostly emergent and they dictate "patterns of actions either through direct imposition or 'implicitly pre-emptying' organisation choice" (Quintella, 1993).

Table 5.1 Review of Strategy

	Main Thrust of Strategy Concepts		Corresponding to Current Thinking on Strategy
Rules of Strategy	**Major Influences in the East**	**Major Influences in the West**	
In Military	Sun Zi's (circa BC 476) "The Art of War"		Competitive strategies, also concerning planning and positioning (Lee, et al., 1998).
	Secret Art of War: Thirty-six Strategies (by an anonymous scholar but its first appearance was about 1500 years ago).		Business and corporate strategies (Low and Sirpal, 1995).
	Zhuge Liang's "Long Zhong Dui" (circa AD 220-280), translated meaning is the "Art of Management".		Leadership development (Low and Lee, 1997).
		Clausewitz's (1812) Vom Kriege	Planning
Representative work			
Entry Into Commerce		Sondhi (1999), MaNamee (1992).	Design
		Ansoff (1979) .	Planning
	Ohmea (1982)	Porter (1980, 1985), Bowman (1995).	Positioning
		Weick (1979), Prahalad (1999).	Learning
		Pfeffer and Salanncik (1978).	Power
		Chandler (1993), Mintzberg et al. (1999), Miles and Snow (1978).	Configuration

5.5 Strategy at Corporate and Business Levels

Ansoff (1965) defines corporate strategy as a grand or mixed strategy and comments that it also plays a decisive role in the choice of particular strategies that the firm should consider in a particular situation. Kay (1999) suggests that "business strategy is concerned with the match between a company's internal capabilities and its external environment" and says that strategy "is a set of analytic techniques for understanding and influencing a company's position in the market place".

Drucker (1980) also discusses the issue of size constraints and his research indicates that firms with fewer than fifty employees generally do not engage in strategic planning. When firms in this bracket engaged in such activities and were successful in a European context, they either did not remain small for long or were acquired. He also points out that it was only when the firm started to increase to over fifty employees, or the firm had been in business over fourteen years that strategic activities were pursued (Alexander, 1990).

5.5.1 An Outlook of Levels of Strategy

In most large organisations, there are a number of separate Strategic Business Units – SBUs (Hall, 1978) and their corporate strategies and business strategies are usually different; but in some organisations, especially small businesses, their corporate-level strategy and business-level strategy may be the same. In each incidence, it is important to be clear about the basis of strategic option at a business level (Johnson and Scholes, 1999). From the strategic implementation point of view, it is popularly and widely accepted by strategists (McNamee, 1992; Johnson and Schole, 2000; Pearce and Robinson, 1997; Mintzberg, Ahlstrand and Lampel, 1997) that strategy can be identified at three different levels: corporate, business and functional.

At the early stage of strategy development, Hofer (1975) distinguishes the level of strategy:

> The term business level refers to that level in an organisation at which responsibility for the formulation of a multifunctional strategy for a single industry or product-market arena is determined; the term corporate level refers to the top level of the organisation regardless of the number of industries in which it competes. Thus, for a multi-industry company, the business level normally would correspond to the divisional level. In single product line company, however, the business and corporate levels would be the same.

Ohmae (1982) also gives definitions of business and corporate strategy:

> What business strategy is all about - what distinguishes it from all the kinds of business planning - is, in a word, competitive advantage. Without competitors there would be no need for strategy, for the sole purpose of strategic planning is to enable the company to gain, as efficiently as possible, a sustainable edge over its competitors. Corporate strategy thus implies an attempt to alter a company's strength relative to that of its competitors in the most efficient way.

In the narrow sense, functional strategies normally refer to those conducted in the departments within an organisation.

Traditionally, the key departments within an organisation should include marketing, finance, production and personnel. Hence there are four basic functional strategies: The marketing function has the goal of ensuring that the company's products or services meet the needs and wants of customers in a manner that enables the company to realise its goals. The primary goal of the finance function is to maximise shareholders' wealth. The finance function pursues this goal through three main and interrelated sets of strategies: the investment strategies, the financing strategies and the dividend strategies. The production function attempts to satisfy company goals through producing the highest quality goods at the lowest possible costs through cost reduction, quality maximization and capacity flexibility strategies. Personnel function should provide appropriate

people needed through strategies in the fields of recruitment, training and development, appraisal compensation and reward system (McNamee, 1992).

Because of the purpose of this study, which is to investigate business strategies employed by oil and gas service organisations in East Asia, the following will focus on discussions of strategies at the corporate and business levels.

5.5.2 Major Influences in Corporate Strategies:

5.5.2.1 Some Generic Typologies of Corporate Strategies

Ohmae (1982) suggests that there are three kinds of corporation: single-product, conglomerate and diversified. The strategy of a single-product company that is not planning to diversify is identical with business unit strategy. Conglomerates try to maximize the wealth of the stockholder by financial measures such as resource allocation, especially allocation of funds. The diversified company goes a step further. "It tries to maximize the wealth of the corporation by exploiting synergies (cross-fertilization of strengths) between its various businesses" (Ohmae, 1982). Based on this, Ohmae (1982) develops nine specimen standardised corporate strategies: serious entry into the market; limited expansion or withdrawal; loss-minimizing; selective growth; selective expansion; overall harvesting; all-out struggle; maintenance of superiority; and limited harvesting.

By comparison, McNamee (1992) develops five fundamental strategies which are carried out at a corporate level: conservative growth, high growth, neutral, recovery and reduction. A conservative growth strategy could have various sub-strategies: greater internal efficiency, deeper penetration of existing markets with existing products, existing products in new markets, new related products in existing

markets, and new related products in new markets. When a company is adding to its portfolio of products and (or) markets and (or) businesses, a high-growth strategy occurs and it can be achieved by internal and external means. The sub-strategies to achieve high growth are: increasing sales of existing or related products; and increasing sales of unrelated products.

A neutral strategy is defined as one where there is no significant deviation from the past strategy, i.e. the goals achieved, the company's activities and its current competitive position have been historically satisfactory and similar achievements in the future would also be considered satisfactory. In this type of strategy no change is proposed.

The aim of any recovery strategy is at the least to minimize the losses that are occurring and, if possible, to change a declining company into one achieving satisfactory returns and developing a long-term sustainable competitive position. The essential elements of recovery strategy are, identifying causes of failure, how to recover, and then implementing that recovery. It there is a decline in demand due to economic recession, then the appropriate reduction strategy in the scale of operations of the company, including range of activities, products, markets, and assets and personnel, should be adopted to match the reduced economic circumstances. Overall, the above five fundamental decisions will be determined by the company's goals, its current strategic position and its competitive prospects.

5.5.2.2 Grand Strategies

Pearce and Robinson (1997) argue that the need for firms to develop generic strategies remains an unresolved debate. They summarised 14 grand strategies, which are also called master or business strategies and commonly used by firms in the USA. These grand

strategies provide basic direction for strategic actions. Any one of these strategies could serve as the basis for achieving the major long-term objectives of a single firm. A firm involved with multiple industries, businesses, product lines, or customer groups usually makes a mix of several grand strategies. These grand strategies are illustrated briefly as follows.

Corporate integration refers to a firm obtaining external business resources, and seeking external development. There are five types. Horizontal integration means that two firms operating in the same markets at the same region and being engaged in the same products merge. Vertical integration means that two firms located close together in the supply chain merge. Expanding product categories integration refers to the merger of two firms that have a relationship in production or sales, but the products sold are not in direct competition. Where there is a merger of two firms that produce similar products that are sold in different markets, this is know as expanding markets integration. Multi-integration when firms that have no relationship in terms of products and markets merge.

Concentrated growth is the strategy of the firm that directs its resources to the profitable growth of a single product, in a single market, with a single dominant technology. The main rationale for this approach, sometimes called a market penetration or concentration strategy, is that the firm thoroughly develops and exploits its expertise in a delimited competitive arena. The strategies lead to enhanced performance. The ability to assess market needs, knowledge of buyer behaviour, customer price sensitivity, and effectiveness of promotion are characteristics of a concentrated growth strategy.

Market development, selling present products in new markets, includes opening additional geographic markets such as regional

expansion, national expansion and international expansion; attracting other market segments, which refers to developing product versions to appeal to other segments, entering other channels of distribution and advertising in other media. Product development is to develop new products for present markets. This kind of strategy develops new product features by adapting (to other ideas, developments), modifying (change colour, motion, sound, form, shape), magnifying (stronger, longer, thicker, extra value), minifying (smaller, shorter, lighter) and substituting (other ingredients, process, power). It can also develop quality variations and additional models or sizes. Innovation might involve the purchase or acquisition of one firm by another. The underlying rationale of the grand strategy is to create a new product life cycle and thereby make similar existing products obsolete. Thus, this strategy differs from the product development strategy of extending an existing product's life cycle.

Concentric diversification is a grand strategy typically involving the acquisition of businesses which are related to the acquiring firms in terms of technology, markets or products; or internal generation of a separate business to balance the strengths and weaknesses of the two businesses. Conglomerate diversification is based principally on profit considerations. The principal concern of the acquiring firm is the profit pattern of the venture.

Joint Ventures are third commercial companies (children) created and operated for the benefit of the co-owners. Strategic Alliances are distinguished from joint ventures because the companies involved do not take an equity position in one another. Strategic alliances are in many instances identical with licensing agreements. Outsourcing is another approach to strategic alliances that enables firms to gain a competitive advantage. Consortia are defined as large interlocking relationships between businesses of an industry. It is designed to use industry coordination to minimize risks of competition, in part

through cost sharing and increased economies of scale (Pearce and Robinson, 1997).

The above grand strategies were utilised when developing a typology of business strategies in this study. The recovery and reduction related grand strategies including turnaround, divestiture, and liquidation are irrelevant to the objective of this study and thus are not dealt with here.

5.5.3 Business Strategies

5.5.3.1 Major Schools of Eastern Approaches to Business Strategies

Sun Zi, Zhuge Liang, the Chinese Thirty Six strategies and Ohmae can be regarded as the major influences of strategy in the East. Particularly, there are a number of papers and books published on Sun Zi's The Art of War applying the war strategies in business and management environments (Lee et al 1998). Low's (2001) views of Sun Zi's The Art of War could be made to converge with the Western marketing concepts and could be adapted for its relevance or application in business management. The first 13 chapters of the book were researched by Lee et al (1998) with the equivalent competitive business strategies.

From the point of view that "operational" improvements can be regarded as a part of business strategy, Ohmae (1982) develops four basic business strategies based upon the practice from successful Japanese industries. He suggests that business strategy is based on key success factors (KSFs) and the identification of its differences from competitors. Ohmae's (1982) philosophy is that in any of his four strategic methods, the principal concern is to "avoid doing the same thing, on the same battleground, as the competition". The aim is to attain a competitive situation in which a company can gain a

relative advantage through making its competitors feel difficult to follow, and further enhance that advantage. The remarkable competitive performance of Japanese industry largely relies on these approaches. In his thoughts, these strategies can be constructed based on three Cs: the customers, the corporate and the competitors. A firm that uses the customer-based strategies is in fact driven by the marketing factors. The corporate strategies are defined as a functional basis. In the competitor-based strategies, business strategy can be constructed by looking at possible sources of differentiation in functions ranging from purchasing, design and engineering to sales and services.

5.5.3.2 Main Thrust of Western Theories on Business Strategy

Miles and Snow's (1978) typology and Porter's (1980) taxonomy are two of the most widely accepted conceptual frameworks on business strategy (Carter, et al 1994; Slater and Olson, 2000). As a result, in this study, the focus is on the generic strategies advanced by Miles and Snow (1978) and Porter (1980, 1985) as well as competitive positions based upon Bowman's strategy clock model (Johnson and Scholes, 1999). The details of these major theoretical models and their associated debates will be discussed with more details in Chapter 6.

5.6 Applications of Strategy in an East Asian Context

The applications of strategy in an East Asian context are examined from four clusters of organisations: ethnic Chinese companies; indigenous companies in China, Singapore and Malaysia; non-indigenous international companies in East Asia; and particularly, the service sector within the oil and gas industry. For the latter type, it comprises two sub-groups: indigenous service organisations and non-indigenous international service companies.

5.6.1 Strategies of Ethnic Chinese Companies throughout East Asia

The ethnic Chinese business firms are major players in the regional economy throughout Southeast Asia. In Malaysia, Thailand, Singapore, Indonesia and, to a lesser extent, the Philippines, Chinese business firms are family-based businesses, most of which are run by heads of the family, who make key decisions, change directions, and exhibit aggressive entrepreneurship (Peng et al., 2001). Originally, these Chinese business groups were immigrants from China a few decades ago. During their early existence in the twentieth century, Chinese business firms focused predominantly on domestic operations. Their business strategies and management structures were very much based upon traditional Chinese strategic philosophies and their strategic practices were "imported" from China (Yeung, 1999).

A number of researchers (Yeung 1999; Peng et al. 2001) have discovered some unique features of their strategies. These common strategic characteristics can be highlighted into four categories. The first hallmark of these firms' strategies is family ownership and management to exercise strict control and intra-group coordination among foreign affiliates. These firms rely on loose and entrepreneurial networks linking different business groups. A second strategy is the sector specialisation through forward and backward vertical integration. It is commonly adopted by Chinese conglomerates from Southeast Asia in their internationalisation process and is applicable to both manufacturing and non-manufacturing Chinese firms when specialisation takes place in different segments of production chains.

A third key strategy pursued by family-based Chinese business firms from East Asia is diversification into unrelated businesses. In order to minimise their risks, large Chinese family firms in East Asia tend to

have highly diversified holdings pursuing economies of scale. Peng et al. (2001) argue that there is very little rigorous research examining the relationship between diversification strategies and performance. As there are some similarities between diversification corporate strategy and analyser or balancer business strategy, this argument provides a fundamental reason for developing relevant frameworks and propositions (see Chapter 1 and 6) which are concerned with the association between business strategies and strategic performance.

As a form of direct investment, a fourth strategy is acquisition so that economies of scale can be gained quickly. Once critical mass is achieved in a particular host country, such firms can exploit their business networks and other cooperative strategies to further their business growth (Yeung, 1999; Peng et al., 2001).

In summary, family-based decision structures with extended business networks, conglomerate-style diversification, forward and backward vertical integration and acquisition emerge as predominant strategies of the ethnic Chinese firms operating in an East Asia business environment.

5.6.2 Strategies of Indigenous Organisations in Selected Countries

5.6.2.1 Chinese Indigenous Companies

Low (2001) points out that ancient Chinese treatises in the areas of philosophy, administration, management and strategy can continue to provide much wisdom for modern business application. It is just unfortunate that all of these archaic treatises were originally written in the Chinese language which does not appeal to a majority of the English-speaking business world today. In his work, a comparison was made between modern Western business and corporate strategies and ancient Chinese classical strategies of war. It is found

that there is considerable overlap in concepts between the two. This indicates that, more than 2, 000 years ago, Chinese people have already confronted and dealt with the same business issues of modern time (Low, 2001).

Chinese State Owned Enterprises (SOEs) have dominated the mainland Chinese economy for the past half century. As a result, the mainstreams in Western literature regard SOEs widely as stylised firms to which a lot of research attention has been paid. Research by Peng et al. (2001) shows that mainland Chinese SOEs exhibit a number of strategic behaviours such as expensive bargaining between their managers and the government and the lack of concern for efficiency due to the soft budget constraints.

More recently, scholars have increasingly paid attention to the strategies applied by other types of firms, such as private firms, collective firms, and township and village enterprises (Clarke and Du, 1998). Strategies adopted by these firms are found to be similar to those of SOEs and to some extent, similar to the above mentioned ethnic Chinese: the extensive use of networks involving managers and government officials - a "collective hybrid" strategy named by Nee (1992). He suggested that for newly founded firms, the network with local officials in China may form an effective strategy to lead to better institutional protection, and hence, to better performance.

It was not until the late 1980s, that Western modern strategic management and strategic theories were introduced into China at the academic level and little applied in business practice. Nowadays, as China is the home nation of Sun Zi, his book The Art of War is still the number one handbook for Chinese business people when they generate strategies or business tactics. Not surprisingly, firms in China have exhibited distinctive business strategies that dazzle and bewilder the outside world (Peng et al. 2001). Today, many Chinese

scholars continuously develop the concept of strategy by combining Western theory and Chinese practice.

More findings have been gained with regard to strategic applications in China. Based on the value chain concept and in line with the Chinese business practice, Xu (1997) discovered that Chinese firms have employed three types of strategies: corporate integration, internal rebuilding and co-operation. As the sub-fundamental strategies, these are quite similar to the grand corporate strategies (which were described earlier) developed by Pearce and Robinson (1997).

5.6.2.2 Singaporean and Malaysian Indigenous Companies

Compared with China, international scholars pay much less attention to strategies applied in Singapore and Malaysia. In this field of study, little work has been carried out in these two countries. From the limited number of work, a snapshot of strategies employed by Singaporean and Malaysian indigenous companies can be provided.

Wong and Kwan (2001) found that, for hotels and travel agents, "cost competitiveness, mobilising people and partners, and building a robust service delivery system are the top three competitive strategies" in Singapore. Igel and Islam (2001) studied Malaysian entrepreneurial software firms to develop a strategic management framework for service and market development by identifying their dominant business strategies. The theoretical framework in their study was based on Porter's competitive strategies. It was found that the Malaysian entrepreneurial software firms lacked a clear strategic focus on developing technological superiority and assessing multiple sources of technology to achieve competitive advantages. The research also found that more organisations had adopted differentiation as a competitive strategy, followed by focus and cost

leadership strategies. In short, research that has been conducted for the investigation of strategies in Singapore and Malaysia concentrates on strategies employed at a business level. For a technological based industry, differentiation is a dominant competitive strategy.

5.6.3 Non-indigenous International Companies in East Asia

Lasserre (1995) attempted to propose a framework for organising the architecture of an Asian strategy and discuss the various strategic issues to be addressed at each stage of the formulation process for Western companies. He suggests that it is important to consider a firm's Asian strategy as an independent part of its overall world-wide strategic effort. The finding is that there are two types of strategic opportunities in the region: resources-based versus market-based strategies. He suggests that for a strategic orientation based on access to resources, the firm should concentrate its activities in the countries which have the cheapest and or best sources of supply. In the case of a market-based strategy, the choice can be made for local marketing and sometimes manufacturing activities, either wholly-owned or with local partners. Hence, market development or joint venture strategies may get involved.

Many researchers pay extra attention to international firms in China. By examining foreign-invested electronics firms in China, Li et al. (2000) observe that three strategic choices confronting those multinational corporations (MNCs) in the country: labour-intensive versus capital-and technological–intensive; coastal versus inland location; and joint venture versus wholly-owned investment. They argue that, to compete successfully in China today, firms cannot just focus on cheap labour and the production of low-value-added goods; a capital and technology-intensive strategy is more rewarding.

Elsewhere such as in Japan, the research conducted by Gemba and Kodama (2001) shows that, for large Japanese international firms such as Hitachi, Toshiba and Sony, related or unrelated diversification strategies into downstream activities would contribute to increased profitability. In conclusion, strategies applied commonly by non-indigenous international companies in East Asia are diversification, joint venture or market development. Seeking to achieve cost advantages is perceived as a feasible option by these international firms for a competitive strategy in the region.

5.6.4 Strategies Applied in the Oil and Gas Service Sector

Since existing study of strategy within the oil and gas service sector is limited, from service firms' corporate websites or where available, organisational brochures, this researcher has searched intensively in order to gain a basic understanding on what common strategies are employed within this industrial sector. The major trends of strategies are outlined as below:

5.6.4.1 Strategies of International Service Companies

When looking to strategies pursued at a corporate level, international oil service organisations grow through both internal and external development. For internal development, many service companies grow via market and product development. These companies may also emphasise product development and technological innovation to pursue leadership within the industry world wide. For example, the Cooper Cameron Corporation's strategy is to expand aggressively and profitably and defend its position as an established market leader in its served markets through product leadership, focused attention, aggressive marketing, responsive service and teamwork.

For external development, corporate integration and diversification as well as co-operation are commonly employed by these international companies. First, these service companies seek to achieve business growth through diversification by mergers and acquisitions. For examples, Baker Atlas has grown as a global company through a progressive series of mergers, acquisitions and expansions; Baker International and Hughes Tool Company merged in 1987 to form Baker Hughes Incorporated, which is the combination of many innovative companies that have developed and introduced technology to serve the petroleum service industry. During its history, it has also acquired and assimilated numerous oilfield pioneers. Second, the service companies also pursue growth through integrating. Hunting, for example, is a vertically integrated provider with sales, service and manufacturing facilities located throughout the major petroleum centres of the world. Third, co-operation strategies have become a noticeable feature throughout the oil and gas industry. For instance, Halliburton, the energy service group has developed and maintained strategic supplier relationships that bring long-term value to its customers.

Besides, international service organisations appear to pursue comprehensive business strategies and compete through focusing on differentiation. Weatherford, for example, is one of the leading oilfield products and services companies in the world, offering customers innovative mechanical technologies and responsive, specialised services focusing on the drilling, completion and production sectors of the oil and gas industry. Cooper Cameron Corporation is focused entirely on the oil and gas and power equipment industries and is committed to allocate resources, make investments and direct its efforts toward meeting the specialized needs of its customers.

Furthermore, energy service organisations also devote their attention to low cost strategy. Halliburton, for example, set up its mission to ensure the delivery of the lowest total cost of acquisition of materials, equipment and service across the company.

5.6.4.2 Strategies of Indigenous Service Organisations in the Selected Countries

The oil service companies located in China and Malaysia pursue a growth mainly through internal development such as market penetration, market development and product development. Usually, Chinese companies have a wide and complete range of niche industrial products and services. For example, Chinese Offshore Helicopter Company (COHC) regarded marine petroleum helicopter services as its main business. Realising the value of diversification, the company opened up general aviation businesses. This has allowed the company to become the leading enterprise in the general aviation industry in China.

From the perspective of the range of markets, some of the indigenous service companies focus on their core businesses (i.e. a defensive strategy). In this case, Shenzhen Chiwan Sembawang Engineering Company Limited, for instance, has set up its goal to become a first class international offshore engineering contractor based upon domestic Chinese market and covering Southeast Asia. Nonetheless, some of them are also engaged in a number of non-oil industry related businesses such as real estate or even entertainment industries.

Indigenous Malaysian service organisations also have a wide range of products and services for petroleum and other related industrial markets. However, there is a lack of formal evidence to indicate what types of strategies these Malaysian companies pursue. Companies situated in Singapore are most likely to pursue a growth strategy

through product development and innovation. Organisations like Pan Abrasives attempt to enhance its market share with a continued program of organic growth, strategic alliances and acquisitions. Integrated Production Services, a Singaporean organisation offers a unique combination of essential services, advanced technologies and production engineering and it is committed to integrity and technical depth. South Seas International, another Singapore registered company has focused on the oil and gas industry providing a full range of services to its clients in the region.

5.6.4.3 A Comparison of Strategies in the Selected Countries

Service companies are aware of the importance of innovation and the development of high technology products or services in East Asia. In order to maintain a broad range of products and services, leading oil and gas service companies always seek to innovate and initiate change in the industry. To achieve a competitive advantage within the petroleum industry, they realise that advanced technologies are essential.

In connection with a relevant technological level, international firms are outstanding in specialised fields in terms of the technologies and skills of their products or services. They create and lead industrial standards, while indigenous Chinese, Malaysian and Singaporean organisations make efforts to trace and reach the international standards (e.g. ISO 9001) or standards developed by the others. They can only achieve a technologically leading position in their domestic markets.

Compared with Singapore based or international oil and gas service companies, Chinese and Malaysian firms pay less attention to pursuing a competitive strategy such as cost leadership or differentiation. Most Singapore or international companies conduct a

differentiation strategy in an attempt to create a unique feature that is perceived industry wide. Hence, the competition of Singapore based organisations is based on high technology while indigenous Chinese and Malaysian companies can achieve a relatively lower cost due to the cheaper labour expenses. The major types of strategies employed by service organisations are summarised in Table 5.2.

Overall, from the existing organisational related data resources (e.g. companies' brochures and websites), it appears that many indigenous service organisations do not have clarified corporate strategies. In most cases, business strategies throughout the oil and gas service sector in East Asia are almost non-existent. This situation stimulates further the researcher's enthusiasm and provides inspiration to further investigation into the oil and gas service industry.

Table 5.2 Characteristics of Strategies for Oil and Gas Service Organisations

		Corporate Growth Strategy	Business Strategy (Competitiveness)
Indigenous Companies	**China**	Mainly through internal development	Lack of a competitive strategy; might achieve a low cost.
	Singapore	Both internal and external development	Compete through providing high technologies
	Malaysia	Mainly through internal development	Lack of a competitive strategy; might achieve a low cost.
International Companies		Both internal and external development	Compete through creating high technologies

5.7 Identify Theoretical Areas for Further Research

On the whole, contemporary research into the subjects pertaining to East Asia is increasing. However, little has been done for strategies, and particularly business strategies, relevant strategic models or frameworks, or theory applications in this area of the world. Much

less work regarding strategic management has been conducted for Singapore and Malaysia. In addition, hardly any proper research into the energy service sector has been found. Particularly, for several decades, the Chinese economy exhibited enviable growth. Since the growth of the economy boils ultimately down to the growth of the firm, some researchers like Peng, et al. (2001) argue that firms in this region must have employed strategies that have led to such performance. Consequently, the common trends of business strategies employed by the energy service organisations in East Asian countries like China, Singapore and Malaysia present new research opportunities.

Mintzberg (1985) was one of the first to point out that the realised strategy of an organisation can strongly differ from the intended strategy and that the extent to which an intended strategy can be realised is closely related to the strategic processes that exist within the organisation. In this regard, strategies described in organisational documents, brochures or archives would be perceived as intended strategies. It is considered worthwhile to conduct empirical research into realised strategies. Two areas that have not received much research attention are worth investigating to: the orientations of business strategies and competitive strategies (including strategic competitive positions).

5.8 Summary

This chapter examines the essence of strategy, and by way of conclusion, identifies the current research gap in the strategic field of studies. Five main aspects of strategy were determined. Various definitions of strategy were given firstly. Next, it moved chronologically towards the development of different concepts of strategy. Third, it looked at strategy sense and the functions, elements, power and limitations of strategy. Fourth, strategy in

relation to strategic management process was discussed and fifth, the applications of strategies in both Western and Eastern contexts were illustrated presented. The research gap in strategy field of work was identified and will then be used as the theoretical backbone for this study.

CHAPTER 6

CONCEPTUAL FRAMEWORKS AND PROPOSITIONS

For different industries in different countries, the strategic directions pursued by firms can be different. What are the general trends of business strategies adopted by existing firms in East Asia? This is an essential question for senior managers to take into account as they seek to apply better business practice in this region. Yet little or nothing is known about the solutions needed for the oil and gas service companies to survive and prosper long-term. Particularly, business strategies adopted by such companies operating in East Asia have not been researched to any great depth. In order to fill this gap, conducting research into what effective business strategies they need is essential. A general objective guiding this study was to examine the common trends concerning strategic orientations across the existing oil and gas service organisations in the East Asian business environment.

This chapter discusses the conceptual framework underpinning the study. The conceptual framework brings together the business environment concepts model introduced in Chapter 4, the strategy concepts and industrial and regional strategic applications introduced in Chapter 5, and the typology of business strategies developed and the strategic performance assessment approach generated in this chapter. In order to gain a view of a proper context for the study, an overview of the strategic management process is presented firstly.

6.1 The Conceptual Context

6.1.1 A Generic Model for Strategic Management Processes

A formal strategic management process can be progressed in five major phases when an organisation has operated businesses for a number of years (Figure 6.1). Phase one involves an evaluation of current strategies. In this stage, corporate, business and functional strategies should be clearly identified or clarified. Particularly, business strategies are distinguished from business tactics (e.g. niche focus competitive strategies versus marketing segmentation strategies).

Phase two is concerned with information gathering, strategic scenario analysis and new strategic options. The environmental (internal and external) scanning and assessing progress is conducted at this stage.

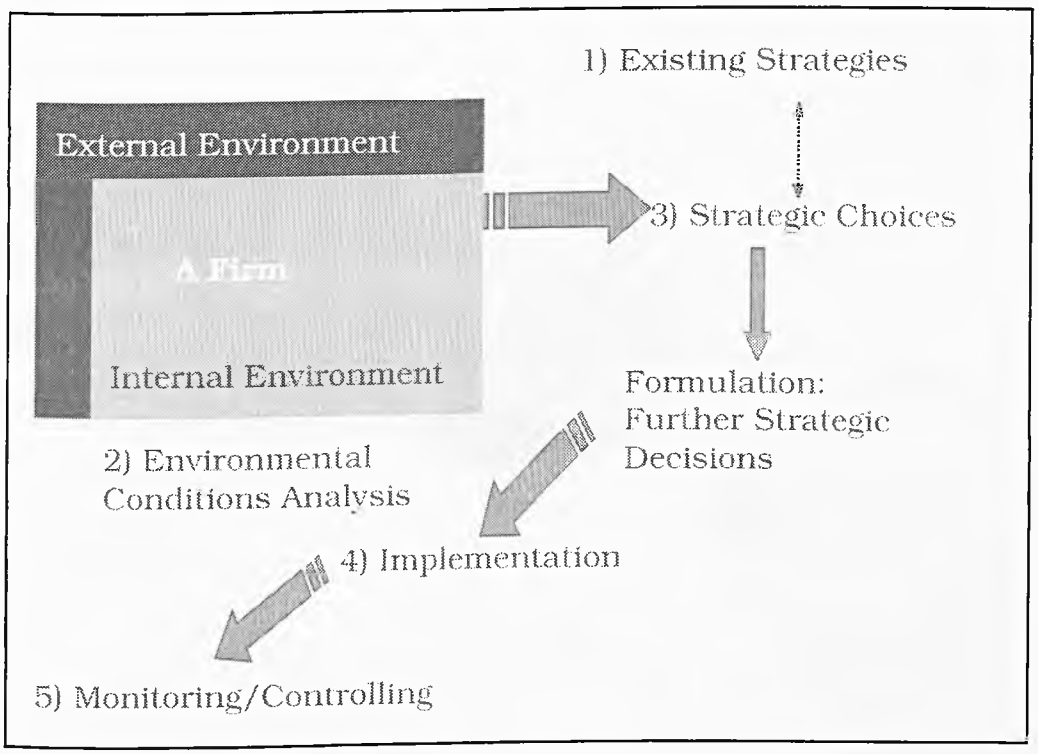
Phase three pertains to developing models and frameworks for existing strategic business units. Based on current strategies, it is also a so-called business process modelling and strategy developing progress. The above three phases form the process of strategic formulation.

Phase four is a strategic implementation process. The defined strategies and the strategic process should be promoted to the organisational management team and if necessary, appropriate training can be arranged.

In phase five, the on-going process of the strategic management assessment is carried out to monitor the expected outcomes of the adopted strategic solutions. This may include the development of a strategic performance assessment system. This process can also be called strategic monitoring and controlling.

Within this conceptual context, the scope of the present research is limited to three focused aspects: the business environment assessment, the identification of existing strategies and evaluation of strategic performance. More details relating to these three aspects will be discussed in the following sections.

Figure 6.1 A Generic Model of Strategic Management Processes

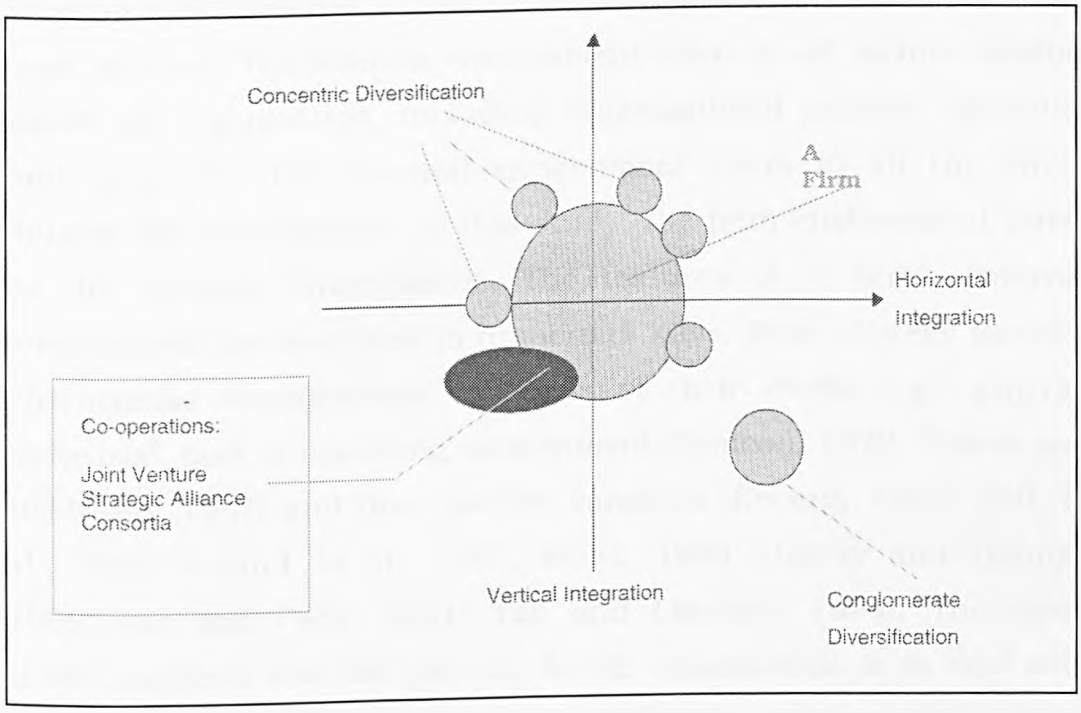


6.1.2 Business Growth-Related Grand Strategies

An oil and gas service organisation can conduct its operations at both a corporate level to achieve growth and a business level to compete in the marketplace. Its core businesses grow up through both internal and external development. For internal development, there are five strategic approaches. Concentrated growth is to increase the use of current services provided by existing business units in the existing markets. Market development is concerned with finding new markets for the current services, i.e. seeking opportunities in the international

markets or other upstream sectors. Service development involves finding new solutions to provide services or finding new oilfield technologies which can be applied by the company and its end users for the present markets or clients (e.g. the asset transition business unit). Business "fission" means that when a business unit becomes big, it can be split up into small parts for purpose of effective management.

Figure 6.2 The Corporate Growth Strategy through External Development



For external development, integration and diversification as well as co-operation strategies such as joint venture, strategic alliance and consortia are essential strategic options (Figure 6.2). Integration includes horizontal integration and vertical integration. Horizontal integration seeks to pursue growth through the acquisition of one or more similar firms operating the same stage of the production-market chain. Vertical integration acquires firms that supply the company with inputs (raw materials) or are customers for its output (warehouses for finished products). Diversification includes

concentric and conglomerate types. Concentric diversification refers to acquisition of businesses that are related to the firm in terms of technology, markets, or products. Conglomerate diversification refers to acquisition of a business representing the most promising investment opportunity and it is based on profit considerations (Pearce and Robinson, 1997).

6.1.3 Theoretical Focus: A Model of Environmental School Analysis

Duncan (1972) defines a concept to distinguish external environment from internal. The internal environment refers to all factors existing inside an organisation, including organisational culture, structure and functions. The external environment refers to all the forces outside the organisation. In this study, the term environment refers to the external environment. The features of a firm's external environment are described in numerous ways. Most strategy theories characterise environments in terms of their levels, e.g., general, industrial, task or operating environment (Duncan, 1972; Pearce and Robinson, 1997) and firm specific variables (Koberg, 1987; Daft, et al., 1988; Ireland, et al., 1987; Miller, 1993; Hegary and Tiahnyi, 1999; Luo and Park, 2001; Tan and Lischert, 1994). Thompson (1967) suggests that the priority for an organisation is to deal with the uncertain eventualities of the environment, particularly those of the task environment (Dill, 1958).

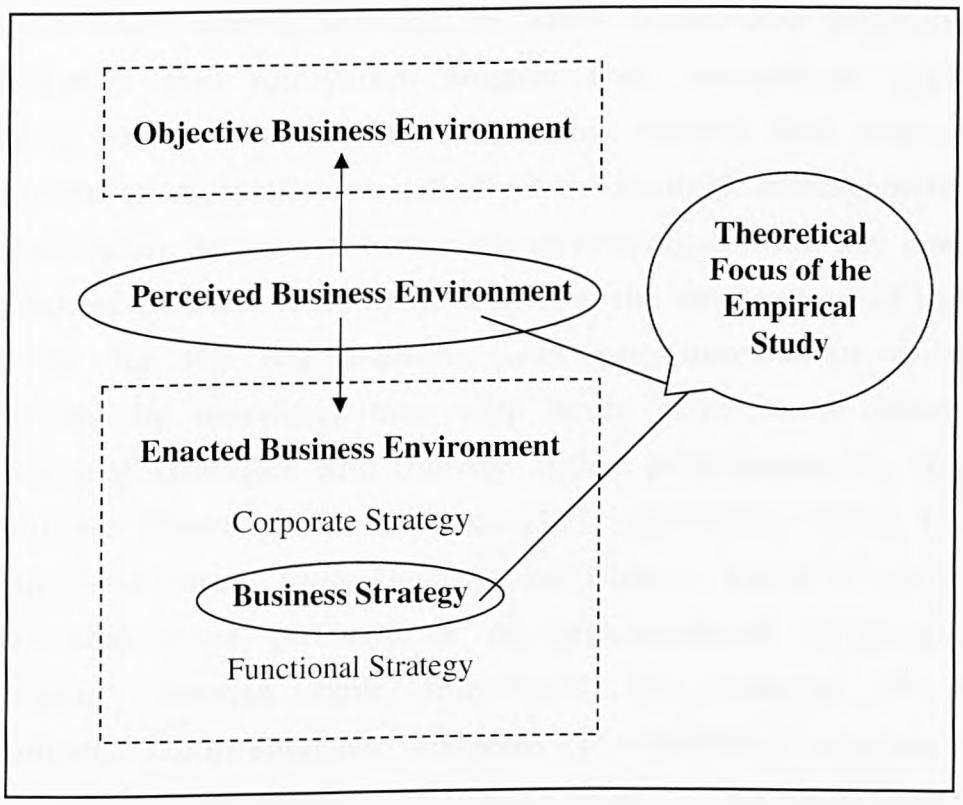
In the past, researchers have made a distinction between the composition of organisational environments and environmental characteristics or dimensions (Tung, 1979). The composition of environments refers to the factors or sectors encompassing the crucial environment, e.g., economics, government regulations and policies, technology, society, customers, competitors and suppliers (Miles and Snow, 1978; Miller, 1993). For environmental characteristics or dimensions, it refers to the aspects of the

environment confronting the organisation, e.g., complexity, dynamism, hostility (Tung, 1979; Miles and Snow, 1978; Miller, 1993). The organisational environment could be static or dynamic, complex or simple, hostile or favourable (Mintzberg, Ahlstrand and Lampel, 1998).

Having reviewed the industrial context in Chapter 3, the principal focus of the empirical study will be on the perceived business environment and the development of a theory of business strategy (See Figure 6.3). The decision to concentrate on the perceived and enacted business environment rests on two assumptions. First, the research into the objective business environment for the oil and gas service organisations has received a huge amount of attention from industrial analysts or expertises. Second, and equally importantly, few examples of work concerning the perceived and enacted business environment for the oil and gas service sector in East Asia have been found.

Furthermore, with regard to the enacted business environment, the focus lies on the study of business strategies employed by oil service organisations that operate in East Asia. There are three reasons for this and two are based upon Hofer's assumptions (1975). First, the study of the business strategy requires a smaller, less complex set of variables than the study of the corporate strategy. Second, a firm cannot achieve long-term success at a corporate level until it knows how to achieve success at a business level (Hofer, 1975). Third, it was discovered that international oil and gas service organisations had a vital role within the industrial sector in East Asia due to their advanced technological competencies, yet many of them had only business or operating units in the region. Hence, the study of strategy at a business level would be more appropriate and applicable.

Figure 6.3 A Model of the Environmental School and Theoretical Focus



The following will review broader literature of previous studies in the field of the perceived business environment and business strategies and then explain the reasons for conducting relevant research.

6.2 Perceived Business Environment

6.2.1 Essence of Analysing Perceived Business Environment

Early in the 1950s, organisational theorists started to investigate organisation-environment interaction (Tung, 1979) and they have found that the views of managers play a central role in learning about the environment (Hegarty and Tihanyi, 1999). Strategic management theories and practices stress that understanding the business environment is crucial in every organisation's life. Managers are

encouraged to become more responsive to the dictates of the external environment and are required to scan and assess environment conditions when making strategic decisions (Fahey and Narayanan, 1986). Fahey and Narayanan suggest that assessment implies identifying and evaluating how and why current and projected environment changes affect or will affect the strategic management of the organisation. Assessment attempts to investigate what key issues are presented by the environment and what the implications of these issues are for the organisation. Accurate assessment of the environment by managers may help bring about more effective organisational strategies and thereby higher performance for long-term success (Downey and Slocum, 1975; Hambrick, 1982; Daft, Sormunen and Parks, 1988; Hegarty and Tihanyi, 1999). In spite of the fact that most publications on organisational or strategic management theories have introduced the concept of the environment, comprehensive analyses or empirical studies of environmental characteristics are limited. Tung (1979) argues that a major obstruction has been how best to describe and conceptualise organisational environments. The reliability of an instrument for measuring the business environment is still to be developed and tested. Especially, research on managerial perception of the business environment remains an important theoretical and empirical task.

6.2.2 A Typology of Environmental Dimensions

This study uses a multidimensional construct (Elenkov, 1997, Luo and Park, 2001) to conceptualise environmental uncertainty. Three dimensions of the environment, viz. complexity, dynamism and hostility were assessed for the environmental sectors at three levels: remote, industry and operating environment (Pearce and Robinson, 1997).

6.2.2.1 Perceived Uncertainty

The concept of uncertainty has long been a central component of a number of theories of organisation and strategy. In recent years, researchers have devoted their attention to managerial perception under uncertain environmental conditions. The concept of the uncertainty of the perceived environment advanced by many researchers (Tung, 1979; Hrebiniak and Snow, 1980; Koberg, 1987, Daft, Sormunen and Parks, 1988) has been a key aspect of a number of strategy theories (Miles and Snow, 1978; Lawrance and Lorsch, 1967; Mintzberg, Ahlstrand and Lampel, 1998; Miller, 1993).

Managers operating in the external environment context confront a variety of uncertain factors. International business management researchers have focused primarily on the assessment of political government policy and macroeconomic uncertainties and appropriate organisational responses. Some researchers in the strategy field emphasise that uncertainties are related to market demand for products or services, product and process technologies, the availability of critical inputs, and strategic actions by competitors and potential entrants (Miller, 1993). Most commonly, general environmental uncertainty includes the uncertainty of politics, economics, social or cultural factors and technology (PEST). Industrial or task or operating environmental uncertainty encompasses suppliers, buyers, potential entrants, substitute products or services and rivalry among competitors. Some analysts (Sutcliffe and Huber, 1997) have identified industry environment characteristics in terms of industry concentration, entry barriers and changes in demand or changes in product characteristics. The category of firm-specific uncertainties pertains to the uncertainties of operations, management, research and development as well as employee actions (Miller, 1993).

Research (Ireland, Hitt, Bettis and Porras, 1987; Kotha and Nair, 1995; Sutcliffe and Huber, 1998; Sutcliffe and Zaheer, 1998; Elenkov, 1997; Simerly and Li, 2000) integrating the perspectives on organisational uncertainties has been developed. As Miller (1993) find out, "a major obstacle to empirical research on perceived environmental uncertainties is the lack of well-established measurement instruments. Existing measures from organisation theory suffer from conceptual problems and inadequate reliability and validity". That difficulty still exists.

In this study, the researcher addresses some of these concerns by examining the relative effects of the environment on the offshore oil and gas service sector in East Asia. It studied executives' perceptions of the environmental characteristics in order to modify, on an empirical basis, an environmental typology grounded in organisational and strategic management theory.

6.2.2.2 Perceived Complexity

Fahey and Narayanan (1986) define complexity as referring to the degree of similarity or differentiation between elements or entities within and across environmental factors or components. It pertains to the number and heterogeneity or diversity of factors and components in the external environment. Tung (1979) explains that the heterogeneity or diversity includes two arrays of variables: the number of factors and components in external environments and the relative differentiation or variety of these factors and components. Early work (Lawrence and Lorsch, 1967; Duncan, 1972; Tung, 1979; Downey and Slocum, 1975; Dess and Beard, 1984; Luo and Park, 2001) find that if the number and diversity of environmental factors or components increase, the executives' cognitive abilities to figure out the significances are increasingly limited. As a result, the level of perceived environmental uncertainty increases.

6.2.2.3 Perceived Dynamism

Previous research has directed attention to managerial perceptione under changing environmental conditions and suggested that dynamism is an important dimension (Lawrence and Lorsch, 1967; Duncan, 1972; Tung, 1979; Dess and Beard, 1984). Industry dynamics have been viewed as giving rise to managerial uncertainties. They suggest that environmental dynamism is the product of several forces operating at one time, including the growth of the size and number of organizations within an industry, and the growth of the rate of technological change and its dispersion throughout the industry. Dess and Beard (1984) define environmental dynamism as the rate and the degree of instability of environmental change. Change rate refers to the frequency and enormity of turbulence of environmental factors and components. Instability may increase the complexity of environmental factors and require prompt organisational actions (Hegarty and Tihanyi, 1999). Miles and Snow (1978) emphasise that uncertainty refers to the unpredictability of environmental or organisational variables that have an impact on corporate performance. An effect of increasing levels of environmental dynamism is to reduce access to knowledge needed to make strategic decisions. This, in turn, reduces the stability and predictability perceived by executives regarding environmental factors or components (Tung, 1979).

Tung (1979) defines that the concept of dynamism pertains to change rate, which includes frequency and magnitude of change; and the stability of change or predictability of the change pattern. If the change is more or less random rather than following a trend, the change may be too sudden and completely unpredictable for organisations to possess the capabilities to deal with the change. It was hypothesized that this sort of change would greatly increase the

degree of environment uncertainty perceived by executives (Tung, 1979). When it is difficult or impossible for an organisation to predict the latest changes and grasp their implications of operations and activities, the dynamism dimension thus has an impact on the degree of uncertainty perceived by executives (Thompson, 1967; Duncan, 1972; Downey and Slocum, 1975, Tung 1979; Simerly and Li, 2000). Simerly and Li (2000) propose that greater environmental uncertainty is associated with greater environmental dynamism.

6.2.2.4 Perceived Hostility

Research has shown that there are two aspects to hostility (Luo and Park 2001). Firstly, it points out how critical are the resources controlled by each environmental sector and secondly, it refers to the deterrence factor, in other words, the extent to which each environmental sector becomes a threat to the growth of an organisation. In the first case, hostility shows the extent to which resources required by the organisation are available in its environment and describes the capacity of the environment to support organisations in the marketplace (Fahey and Narayanan, 1986). In the second case, Pfeffer's and Salancik's (1978) resource dependency theory proposes that organisations arrange their external relationships in response to the uncertainty rising from dependence on components of the environment. Using Tan's and Litschert's (1994) approach and suggesting from the resource dependence perspective, hostility focuses on the degree of the organisation's dependence on others for resources. The degree of dependency on the factors and components affect or restrict the executives' management capabilities for carrying out business activities. What is more, the level of perceived environmental hostility depends not only on resource availability, but also on relationships with direct environmental agencies and competition within the same industry (Mintzberg, Ahlstrand and Lampel, 1998). As the environment

becomes less favourable or more hostile, firms are subjected to greater uncertainty (Tan and Litschert, 1994; Luo and Park, 2001; Kotha and Nair, 1995).

6.3 Major Streams of Business Strategy

Over the years, researchers identified more and more types of business strategy through both empirical and theoretical research, culminating in a wide range of business strategy models and typologies. Most of these business strategy models and typologies stand by two major schools of business strategies: Miles and Snow's taxonomy (1978) and Porter's theory (1980, 1985).

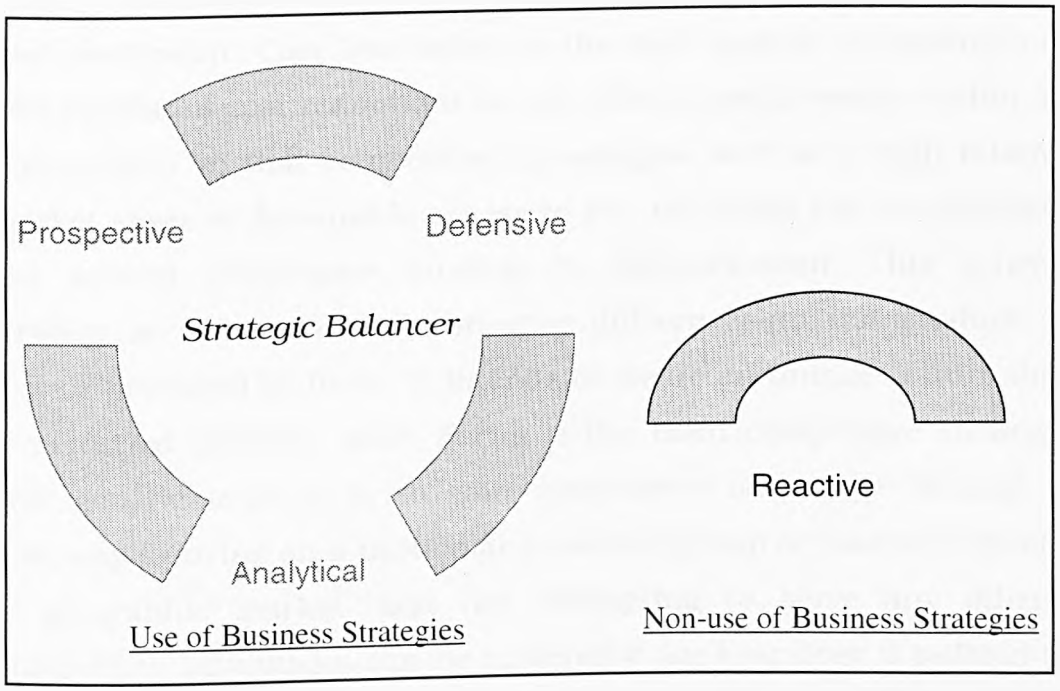
6.3.1 Miles and Snow's Typology of Business Strategic Directions

Miles and Snow (1978) propose that organisations develop relatively enduring prototypes of strategic orientations in line with characteristics like the range of products and markets, technology solutions, desired growth pattern, and attitude toward change. In this study, a conceptual framework of five types of business strategies, namely, Defender, Prospector, Analyser, Balancer and Reactor, was developed (Figure 6.4).

Defenders seek stability and control in their operations to maximise efficiency. They provide a narrow range of products or services to serve well-defined niche markets. Normally, they focus on a single core technology and typically grow by market penetration. In contrast, Prospectors provide a broad range of products or services and create changes in the industry. They pursue growth through product and market development. Analysers emphasise both stability and flexibility, and follow keenly the most promising changes developed by Prospectors and Defenders. Reactors are naturally unstable in terms of their adjustment and lack consistency in

strategic options. As a result, the Reactors' performance is relatively poor.

Figure 6.4 A Model of Strategic Orientations: Generic Business Strategies



Researchers such as Hambrick (1982) criticise the Miles and Snow typology on the grounds that it is not the most elaborate framework that could be chosen. A later study by Wright et al. (1990) suggests a good-performing amalgamation strategy: the Balancer. They assume that the Balancer combines the features of Defender, Prospector and Analyser. Parnell, et al. (2000) summarise the Balancer as having three separate product-market spheres. The feature in the first sphere is very similar to that of Defenders whose managers stress the domain of existing products or services and customers. The second sphere resembles the Analyser type. Conducting technological changes is encouraged in order to imitate the best of products and markets developed by Prospectors. In the third sphere, managers attempt to initiate changes within the industry. The strategically operational style tends to bear a resemblance to the characteristic of Prospector organisations.

6.3.2 Porter's Taxonomy of Generic Competitive Strategies

Porter (1980) proposed four types of generic business strategies under a competitive situation. The first competitive strategy is overall cost leadership. Cost leadership is the total control of expenditure and pursuit of cost reductions for an efficient performance within an organisation so that competitive advantages such as a high relative market share or favourable access to raw materials can be achieved. The second competitive strategy is Differentiation. This generic strategy is concerned with bringing differences to the product or service produced by firms. It intends to create an unique feature that is perceived industry wide. Focus is the third competitive strategy. This generic strategy is to gain competitive advantage through a company focusing on a particular customer group or market segment or geographic market; and not attempting to serve any others. Competitive advantages can be achieved if one's strategy is tailored to the needs of a relatively small niche market. A firm can achieve either differentiation or low cost or both. The fourth competitive situation is "stuck in the middle". "Stuck in the middle" is where a firm fails to develop its strategy in at least one of the three strategic directions stated above. The firm is regarded as one of low profitability. It is assumed that, in some industries, when some firms became stuck in the middle, it may mean that "the smaller (focused or differentiated) firms and the largest (cost leadership) firms are the most profitable, and the medium-sized firms are the least profitable" (Porter, 1980).

Porter (1980, 1985) emphasises that the basis of business generic strategy is how customer or client needs can best be met, usually through achieving a certain competitive advantage. A competitive position is the basis on which a business might achieve competitive advantage in its market (Johnson and Scholes, 1999). Great attention has been attracted in analysing generic strategies and competitive

positions associated with the organisational performance (Yamin et al., 1999). However, the majority of research on business generic strategy has been conducted in relation to Western businesses. A limited number of studies have been conducted in East Asia. Little or nothing is known about the solutions needed for service companies within the oil and gas industry in China, Singapore and Malaysia. Empirical academic studies examining the competitive position for these service companies are also rare.

6.4 Conceptual Development of Strategic Performance

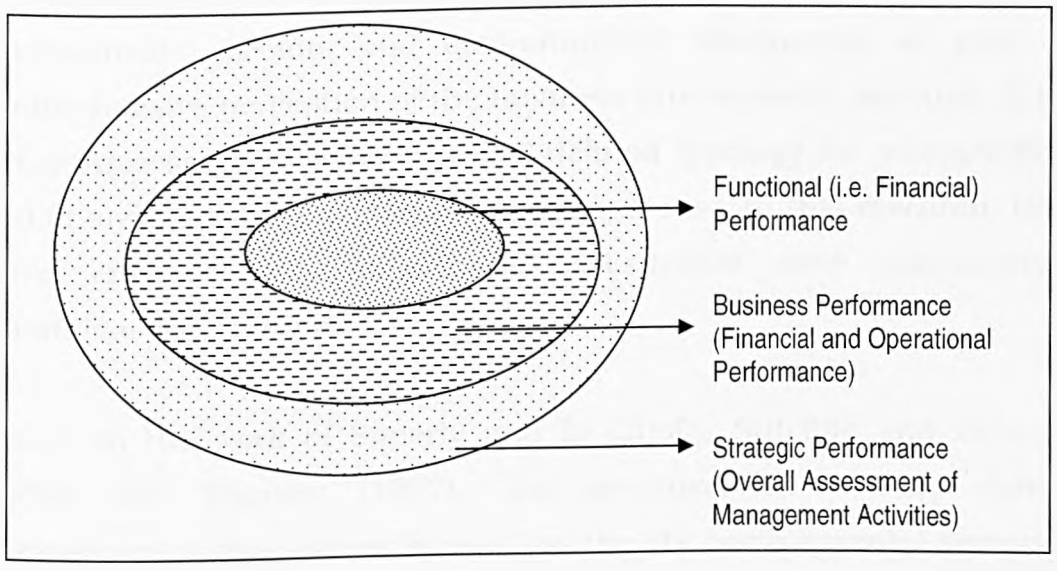
Performance has been of interest to both academic researchers and practising managers. There is literature widely available for the assessment of organisational or business performance and there are numerous ways to measure the performance (Nash, 1983). Slater and Olson (2000) suggest that performance is a complex multidimensional construct that is influenced by both the level of analysis (i.e. individual, business unit, or organisation as a whole) and strategy type. However, Croteau and Bergeron (2001) argue that measuring organisational performance can be a problem because no universally recognised measure of this concept is available. Today, academic debates about issues of terminology, level of analysis, and conceptual bases for assessing performance are still on going.

The most dominant model in empirical research on business or organisational performance is based on the simple outcome of financial indicators and is referred to as the financial performance (Yamin et al., 1999). Typical financial indicators usually include sales or production turnover, profitability and total asset growth. Some strategy studies have employed market or value-based measurements in conjunction with financial based measures because of their relevance regardless of types of strategy (Parnell et al., 2000). In addition to indicators of financial performance, another broader

conceptualisation of business performance (Venkatraman and Ramanujam, 1986) would include non-financial emphasis indicators such as operational performance (Helm et al., 1997). The available measures can be product or service quality, effectiveness, efficiency, added value and technological reliability.

In order to measure the fulfilment of the overall goals of business, using only the single functional performance approach is not an appropriate solution applied in this study. The concept has therefore been expanded to a wider range including the indicators which are assumed to reflect the general achievement of an organisational business. This concept is referred to as strategic performance that covers the organisational activities such as marketing, operations, finance, human resource management and organisational image (Figure 6.5).

Figure 6.5 Measurement of Strategic Performance



6.5 Developing Theoretical Frameworks

6.5.1 The Assessment of Environmental Sectors

Previous research (Tan and Litschert, 1994; Miles and Snow, 1978; Hrebiniak, and Snow, 1980) has developed a number of sectors or categories to measure the three dimensions of environmental uncertainty in general and task environment. However, the limitation of the validity of their environmental components is that the scope of the concept on each of the environmental factors is still too broad for Chinese managers to understand perfectly the meaning. For instance, when assessing regulatory environmental sector (Tan and Litschert, 1994), Chinese managers might wonder which levels of governmental regulations they should consider. Is it the international level, national level, or local level? Very recently, several studies (Hegary and Tihanyi, 1999; Luo and Park, 2001) were conducted to model the perceived business environment through quantitative analysis, but few consider how to combine the degree and scope of determinant environmental sectors and environmental dimensions to gain a comprehensive perception of the business environment. As such, it is indeed necessary to develop a well-defined typology for interpreting and analysing three environmental dimensions. In this research, the three environmental dimensions investigated were complexity, dynamism and hostility.

Based on the work of Simerly and Li (2000), Sutcliffe and Zaheer (1998) and Elenkov (1997), the measurement of the three environmental dimensions focused on the six environmental sectors, namely, economics, regulatory, technology, customers, suppliers and competitors. Using the above environmental components as a basis, it is possible to build a scale that categorises the environment and provides a rating for its degree of environmental uncertainty. The

three dimensions were developed as the following typology presented in Figure 6.6.

Figure 6.6 Environmental Typology: Three Dimensions Versus Defined Environmental Variables

Dimensions	Variables	7-point Bipolar Scale*						
	Factors of Task Environmental Sectors							
(I)		Homogeneity						Heterogeneity
Complexity	Economics	1	2	3	4	5	6	7
	Technology	1	2	3	4	5	6	7
	Regulatory	1	2	3	4	5	6	7
	Customers	1	2	3	4	5	6	7
	Competitions	1	2	3	4	5	6	7
	Suppliers	1	2	3	4	5	6	7
(II)		Predictability						Unpredictability
Dynamism	Economics	1	2	3	4	5	6	7
	Technology	1	2	3	4	5	6	7
	Regulatory	1	2	3	4	5	6	7
	Customers	1	2	3	4	5	6	7
	Competitions	1	2	3	4	5	6	7
	Suppliers	1	2	3	4	5	6	7
(III)		Friendliness						Hostility
Hostility		1	2	3	4	5	6	7
	Economics	1	2	3	4	5	6	7
	Technology	1	2	3	4	5	6	7
	Regulatory	1	2	3	4	5	6	7
	Customers	1	2	3	4	5	6	7
	Competitions	1	2	3	4	5	6	7
	Suppliers	1	2	3	4	5	6	7
	The Uncertainty Level:	*Very Low*						*Very High*

*The 7-point bipolar scale is introduced in Chapter 2.

(Adapted from Tan, et al., 2000)

Hence, four basic assumptions emerged as follows. First, the greater the numbers or heterogeneity (diversity) of an environmental sector, the higher the degree of the perceived complexity of this environmental sector. Second, the higher the unpredictability of an environmental sector, the higher the degree of the perceived dynamism. Third, the higher the degree of the difficulties of resource availability and resource deterrence, the higher the degree of the perceived hostility. Fourth, when the degree of the perceived

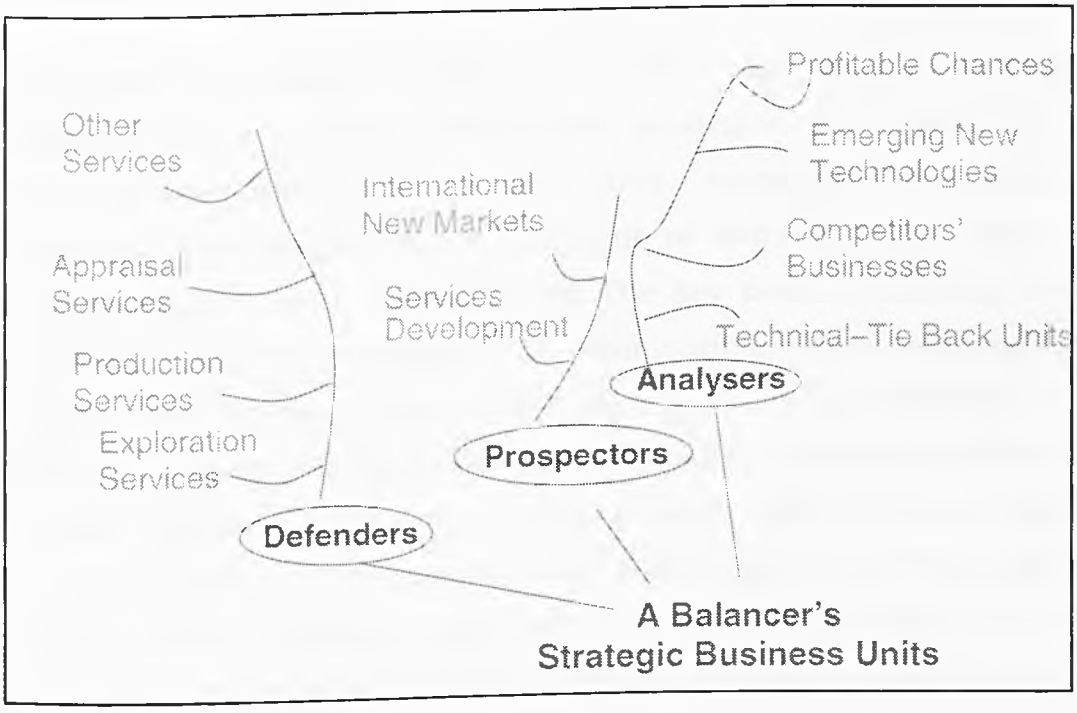
complexity, dynamism and hostility is high, the perceived environmental uncertainty also tends to be high.

Although some other researchers have proposed different environmental dimensions which may also produce a resulting degree of perceived uncertainty (Thompson, 1967; Lawrence and Lorsch, 1967), such as dimensions of the routines of organisational environment (Tung, 1979) and visibility of future (Luo and Park, 2001), they are not within the scope of this study.

6.5.2 Typology of Generic Business Strategy

Figure 6.7 illustrates a Balancer framework for an oil and gas service organisations. As a Defender, its strategies may be concentrated growth across other upstream industrial sectors (e.g. from serving exploration to appraisal to development to decommissioning) or across different countries throughout the world. Prospectors may pursue firstly, market development to find new markets for current services internationally; and secondly, service development based upon creating differentiations so that new services can be available for existing clients. An Analyser may have concentric or conglomerate business units. It has an existing range of products and services such as technical Tie-backs units. In the mean time, it also benchmarks the changes of identified competitors' businesses and seeks to obtain potential profitable or new technologies from oil companies, technological institutions or government parties. A Balancer is a combination of these three strategic types.

Figure 6.7 Business Modeling:
A Balancer Framework for an Oil and Gas Service Organisation



6.5.3 Taxonomy of Competitive strategies

According to Porter (1980), businesses can attain significant and enduring competitive advantage over their rivals by adroitly pursuing generic strategies (i.e. cost leadership, differentiation, low cost focus or differentiation focus and multiple strategies). A firm failing to adopt its strategy in any one of the generic directions or engaging in each generic strategy without achieving any of them will stay in the position of being "stuck in the middle" (Porter, 1980, 1985).

The "focus" generic strategy is that a firm is concentrating on a number of particular market segments such as buyer group, division of the product line, or geographic market (Porter, 1985). Because the nature of this study accentuates business rather than marketing attributes, and in so far as no existing standards have been found to define the "focus" level for firms within the oil and gas service sector,

the focus strategy is not included in this study. Consequently, attention has been devoted on the other types of generic strategies.

A number of empirical studies have been conducted to test the validity of Porter's (1980, 1985) generic strategies. The debates lie in two principal areas. In the first area, empirical investigations contradict the prospect on the pursuit of more than one generic strategy (Miller, 1992; White, 1986). The key point is that low cost and differentiation strategies are incompatible. Many researchers support the argument that, for higher business performance, an organisation has to choose either the low cost or the differentiation as a prior strategy, rather than both (Porter, 1985; Faulkner and Bowman, 1995). In the second area, some other researchers argue against Porter (1985) in his assertion of using a single generic strategy. They emphasise that a firm can pursue low cost and differentiation simultaneously and the combination of both strategies can also result in higher business performance (Chang and Wang, 1999; Proff, 2000).

Regardless of the above debates, a number of researchers (Helms et al., 1997; Yamin et al., 1999; Wright et al., 1990) support both schools of thought and suggest that organisations should deploy generic competitive strategies that best suit their circumstances. In this study, a taxonomic framework for generic business strategies has been generated based on conceptual theories and contemporary empirical studies. Four basic generic strategies are defined as low-cost, differentiation, hybrid and no-purpose (Figure 6.8).

Figure 6.8 The Matrix of Generic Competitive Strategies

Lowering cost	Differentiating business	
	Yes	No
Yes	Hybrid	Low-cost
No	Differentiation	No-purpose

Based upon Porter's (1980) taxonomy

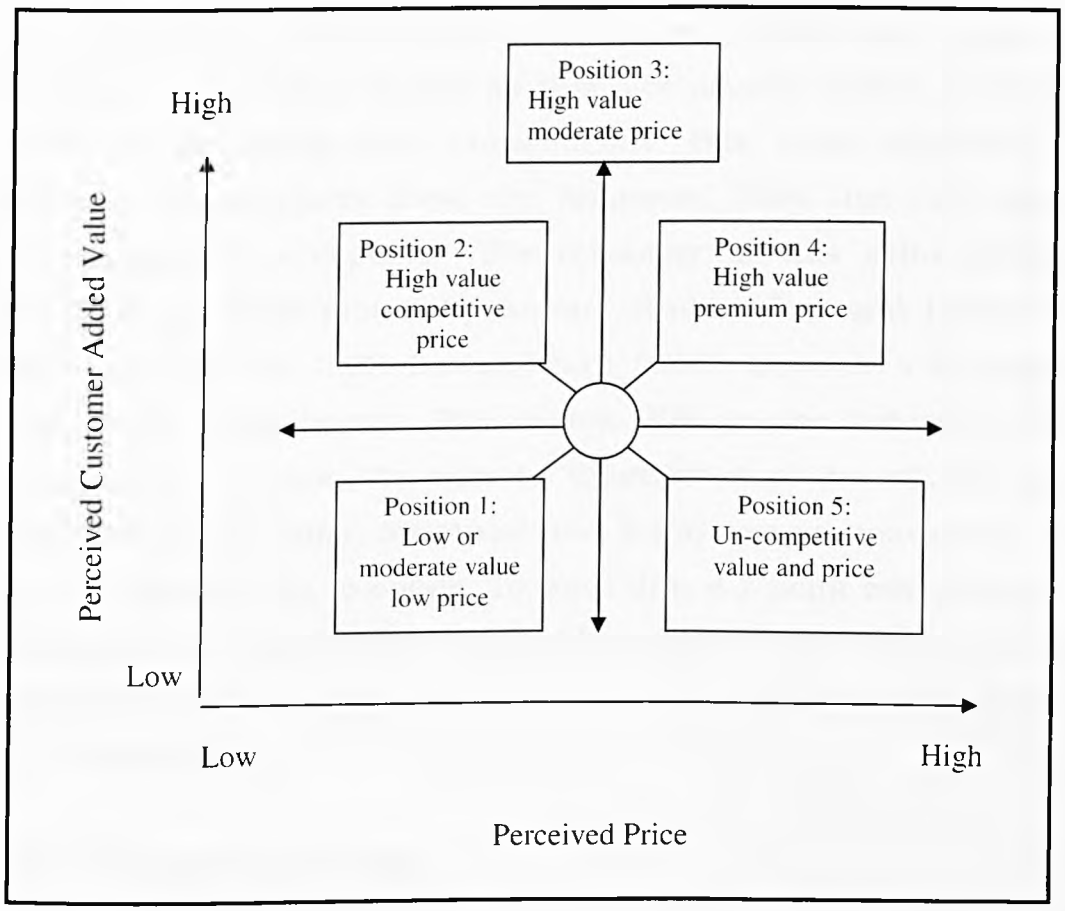
As Yamin et al. (1999) demonstrate, differentiation strategy aims at achieving, even at considerable cost, a superior quality throughout the value chain and creating the image of an unique feature; while the emphasis of a low-cost strategy is on lowering cost more than competitors wherever possible. A hybrid strategy means that a firm seeks to deploy more than one of the generic strategies and achieves cost leadership and differentiation simultaneously (Johnson and Scholes, 1999; Proff, 2000; Porter, 1980). If a firm fails to develop its strategy in at least one of the three directions or, is inconsistent in pursuing the generic strategies, and achieves no competitive advantage, the firm has no distinctive strategy (Hunt, 2000). Such firms are described as no-purpose strategy organisations.

6.5.4 Bowman's Model: Strategy Clock of Strategic Competitive Positions

According to Porter (1985), competitive advantage is the underlying concept of generic strategies. All organisations are in a competitive position in relation to each other as they compete either for customers or for resources (Johnson and Scholes, 1999). Because of the characteristics of the service sector within the oil and gas industry, firms compete mainly for customers (i.e. operators). In order to understand an organisation's strategic position within which it attains competitive advantage, Bowman's strategy clock (Johnson and Scholes, 1999), which is advanced by Faulkner and Bowman

(1995) as Customer Matrix, has been developed further in this study (Figure 6.9).

Figure 6.9 Strategic Competitive Positions



Two basic dimensions of the strategy clock are defined as Perceived Customer Added Value (PCAV) and perceived price. The PCAV is conceptualised by Faulkner and Bowman (1995) as Perceived Use Value. In this study, the PCAV refers to the senior managerial perceptions on the degree of the value that their businesses create to meet the satisfaction of customers. Perceived price refers to the level of price charged by firms for their products or services. In order to simplify, five basic competitive positions are defined as: high value premium (i.e. above the moderate level) price; high value moderate

price; high value competitive (i.e. below the moderate level) price; low or moderate value low price; and un-competitive value and price.

6.5.5 Measuring Strategic Performance

It is difficult to access directly organisational archive data such as financial or marketing figures as they are usually viewed as being sensitive and confidential. Consequently, this study employed a subjective measurement (Dess and Robinson, 1984) that calls upon the managerial perceptions. The reliability of this self-reporting approach has been proved by various studies (Tan and Litschert, 1994; Luo and Tan, 1998; Luo and Park, 2001). However, a five-point Likert scale (from bottom 20% to top 20% in the industry) was inappropriate because the relevant information of the oil and gas service sector in China, Singapore and Malaysia was unavailable or hard for respondents to obtain. To solve this, a 7-point interval scale was drawn from Ramanujam and Venkatraman's (1987) work, with 1 indicating much less or worse and 7 indicating much more or better (see Appendix B).

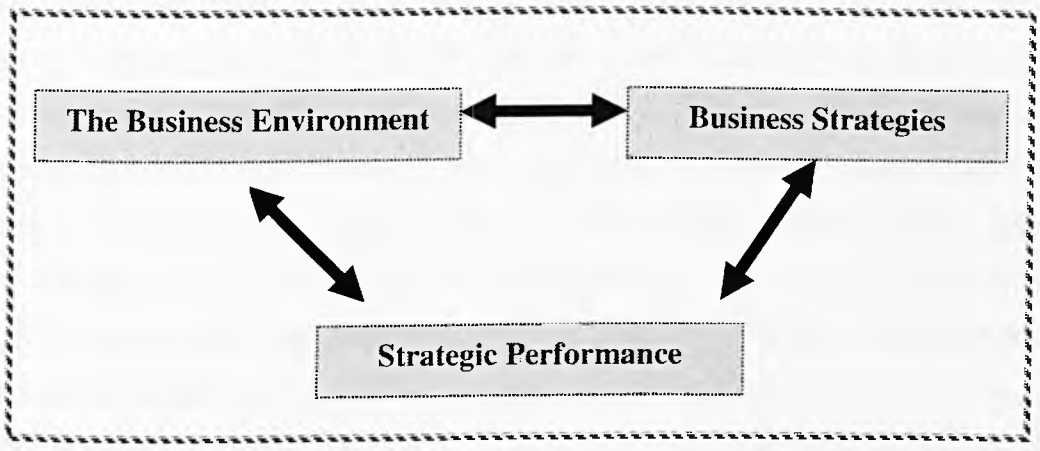
6.5.6 The ESP Framework

The research for establishing the link among the environmental uncertainty, strategy and performance has long been asserted in conceptual work in strategic management (Miles and Snow, 1978; Porter, 1980). More recently, empirical evidence of the existence and the nature of this link in various management disciplines have been explored. In their work, Kotha and Nair (1995) examine the roles played by the environment and realised strategies on performance. Similar research conducted by Tan and Litschert (1994) and Parnell, et al. (2000), Ramanujam and Venkatraman (1987) have studied the relationship between strategic planning and performance. Venkatraman and Presott (1990) also test the proposition of a positive

performance impact of environment-strategy coalignment. Some of the studies have extended further to research in operations (Ward, et al., 1995; Badri, et al., 2000) and sales (Slater and Olson, 2000).

In this study, the unique relationships between the two variables amongst the business environment, business strategies and strategic performance will be examined. That is, the unique correlation or difference relationships between the business environment and business strategies, the business environment and strategic performance, and between business strategies and strategic performance will be analysed. Figure 6.10 illustrates this principle for examining the three variables.

Figure 6.10 The ESP – Environment, Strategy and Performance - Model



6.6 Broader Literature Search

Broader literature search is now shifting towards the relationships between the business environment, strategy and performance. Most work has been carried out to examine strategy and performance correlations. Researchers (e.g. Wright, et al. 1995; Croteau and Bergeron, 2001; Parnell, et al. 2000) have not only attempted to classify business strategies into typologies but also studied more

effectively relations between strategy and other variables like performance. A common observation is that the more specific the type of business strategy adopted by an organisation, the better the organisational performance. However, there should be a negative link for the Reactor type, which means that Balancers are high performers while Reactors are low performers (Parnell, et al. 2000). In their work, Croteau and Bergeron (2001) also discover that there is a positive link between strategic activities and performance for Prospectors whereas there is a negative link for Reactors. Slater and Olson (2000) focus on the evidence that Prospectors, Analysers and Defenders can achieve superior performance when implementing strategies appropriately.

In this field of studies, empirical evidence has also been gathered in China. Tan and Litschert (1994) find that defensive-oriented strategies are related to higher overall performance. Luo and Tan (1998) further prove that both Defender and Analyser strategies are positively and significantly related to the Chinese firms' financial performance. Luo and Park (2001) provide evidence showing that the Analyser orientation organisations yield a high performance, while the Prospector and Defender orientations lead to poor financial performance when mismatching with a highly dynamic and complex Chinese market. Since similar empirical research in the oil and gas service sector is rare, this study sought to examine the typology of business strategy and also correlate this with the assessment of managerial perceptions of strategic performance.

Besides, Porter (1985) suggests that a firm achieving cost leadership or differentiation may potentially obtain above-average profitability performance. The rewards of achieving simultaneously cost leadership (which implies lower costs) and differentiation (which leads to premium prices) are also great because the firm gains extra benefits (Porter, 1980). Several researchers provide evidence to

support Porter that a company adopting its strategy in a hybrid direction outperforms businesses pursuing a single generic strategy (Chan and Wong, 1999; Proff, 2000; Wright et al. 1990). Researchers (Rainer and Chaharbaghi, 1995) have realised that business performance depends not only on the formulation and successful implementation of a given strategy but also on the process by which competitive positions are created or maintained. In their opinion, successful performance can be achieved through forming the basis of differentiation. Hambrick (1983) has pointed out that, in a dynamic industry environment, the low cost strategy would be unlikely to be found. It has been discovered that the business environment in an East Asian country like China is dynamic (Tan and Lischert, 1994) and competition within the oil and service industry in the region is fierce. What is more, for a firm pursuing the lowest cost, information on cost levels of competitors is usually very difficult to obtain (Faulkner and Bowman, 1995).

The strategic situation of a firm is extremely poor when it develops its strategy in a way that has no distinctive emphasis (Porter 1980, 1985). Porter suggests further that such a firm is almost guaranteed low profitability because firms deploying low-cost, differentiation or hybrid strategies are able to sustain a stronger position and compete better in any segment. However, researchers (Porter, 1980; Faulkner and Bowman, 1995) also point out that, although a firm may have no distinctive emphasis on any generic strategies for achieving competitive advantage, it can still attain a satisfactory performance, notably through earning attractive profits. There may be two reasons for this. First, the structure of its industry is highly favourable or secondly, the other firms in the industry do not adopt successfully any generic strategies. Nevertheless, in the long-term, those firms that have not made a choice between the generic strategy alternatives will be exposed when an industry becomes mature and competition is fierce (Faulkner and Bowman, 1995).

Based on these debates, three assumptions can be relevant for further investigations. First, for oil and gas service companies in East Asia, a low-cost generic strategy may not be a preferred option for senior management. Second, having a generic strategy such as low-cost or differentiation or hybrid yields the firm a higher level of strategic performance; and pursuing none of these three generic strategies (no-purpose) produces a relatively poor strategic performance. Third, hybrid organisations outperform those competing mainly with either low-cost or differentiation strategy.

Furthermore, Helms et al. (1997) have pointed out that a firm's success is associated with the possession of strategic advantages, rather than strict adherence to Porter's generic strategies. They insist that the more competitive advantages a firm holds the better the business performance it receives. Hence, one more assumption can be explored further: organisations that aim for the position of high value with competitive price outperform companies in other categories of competitive positions.

Finally, several hundred empirical studies in strategic management have examined the correlations between strategy and performance but most work has been found to investigate strategy-performance by excluding the role played by the business environment (Kotha and Nair, 1995). Li's research (2001) on Chinese township enterprises provides the evidence that their businesses have been forced to develop coping strategies to deal with the significant level of uncertainty and adversity of the business environment. Few researchers (Venkatraman and Prescott, 1990; Tan and Litschert, 1994; Luo and Park, 2001) have attempted to provide empirical evidence of the environment-strategy-performance paradigm. On the whole, empirical studies examining the relative impact of strategy and environment on performance in East Asian industries are rare.

Consequently, it is worthwhile to explore the interface between environment and strategy and the coalignment between environment and performance.

6.7 Testing the Applicability of the Models

After a review of the strategic management literature pertaining to the content of strategies, the variables of business environmental dimensions and business strategic characteristics as well as overall indicators of strategic performance are summarised. Some of the relationships among these variables are explored. Based on the classification of variables generated by this author and the conceptual developments and research findings to date, a number of propositions about the perceived business environment, appropriate business strategies and the associated strategic performance are then proposed.

6.7.1 Propositions Relating to Perceived Business Environment

The present study is exploratory as there is no readily available conceptual framework that has been utilised and tested in the identified industrial sector. In order to portray a picture of managerial perceptions of the business environment in East Asia, the propositions relating to the first research objective (see Chapter 1) can be summarised as follows:

Proposition 1: The six environmental sectors – technology, regulation, economics, customers, suppliers and competitors – can be defined as the key task environmental sectors as they will be perceived by oil and gas service executives to be significant for the growth of their businesses in East Asia.

This proposition can be examined from four perspectives. First, each of the six task environmental factors will be perceived to be important for the growth of the businesses of the oil and gas service companies in East Asian countries like China, Singapore and Malaysia. Second, the impact of each of the six task environmental factors on the growth of the businesses of the oil and gas service companies in the three selected countries will tend to be strong. Third, for oil and gas service sector in East Asia, the degree of the influences of task environmental factors will vary (e.g., customers are perceived to be more important than suppliers and the impact of customers will be stronger than that of suppliers). Fourth, the degree of importance of an environmental factor will be associated with the degree of the impact of that environmental factor (i.e. the higher the degree of the impact of the environment factors on the growth of an organisation, the higher the degree of importance attached to it).

Proposition 2: For oil and gas service companies that operate in East Asian countries like China, Singapore and Malaysia, the nature of the business environment will be perceived to be uncertain.

Proposition 3: Oil and gas service companies' executives in East Asia perceive that the business environment in which they operate will be dynamic, complex and hostile.

Proposition 4: The perceived environmental uncertainty will be associated with the perceived environmental complexity, dynamism and hostility.

Proposition 5: The perceived environmental uncertainty will be associated with the influences of the task environmental factors.

Proposition 6: The level of perceived environmental complexity, dynamism and hostility will be associated with the influence of the

task environmental factors for the oil and gas service sector in East Asia.

Hence, this proposition can be examined in terms of three aspects. First, the greater the numbers or heterogeneity (diversity) of environmental sectors, the higher the degree of the environmental complexity. Second, the higher the degree of unpredictability of the environmental sectors, the higher the degree of the environmental dynamism. Third, the higher the degree of the difficulties of resource (tangible and intangible) availability and resource deterrence (competition and relationships with directly environmental agencies), the higher the degree of the perceived hostility.

6.7.2 Propositions Relating to Business Strategies

Firms adopt different strategic orientation for achieving short-term profitability or long-term success. In this study, based on the managerial identifications, organisations will be able to be categorised into five major strategic categories: Prospector, Defender, Analyser, Balancer and Reactor. Firms which emphasise market penetration, a single technological score, and seek stability and control in their operations to achieve maximum efficiency are classified as Defenders and firms which seek to exploit new product and market opportunities are identified as Prospectors. Organisations which operate in two types of product-market domains, one relatively stable, the other changing, and capitalize on the best of both of the preceding strategic types, are identified as Analysers. Balancers are firms which combine the strategic characteristics of Analyser, Defender and Prospector. They operate in three separate product-market spheres: stressing established products and buyers (Defender); welcoming technological changes only if they have explicitly yielded promising products for competitors (Analyser); and initiating technological change (Prospector). Firms that lack

consistency in strategic options are classified as Reactors. In order to construct a picture of business practice of service firms operating in East Asia, the propositions relating to the second research objective (see Chapter One) can be summarised as follows:

Proposition 7: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, the managerial perceptions of their business strategies will be different.

This proposition can be investigated by examining three aspects. First, the majority of the oil and gas service organisations in East Asian countries like China, Singapore and Malaysia will seek to adopt a Balancer or Analyser strategy whereas a Reactor strategy will not be an option preferred by senior management. Second, the majority of these organisations will pursue a Differentiation-oriented strategy, whereas a Low-cost generic strategy will not be an option preferred by senior management. Third, the majority of the organisations will be keen on a strategic position of high value competitive price whereas the minority will fall into a category of un-competitive price and value.

6.7.3 Propositions Relating to the Relationships among Environment, Strategy and Performance

Oil and gas service companies which operate in China, Singapore and Malaysia perceive the degree of business environmental uncertainty to be different. Defenders tend to perceive the business environment as certain; Analysers stress both stability and flexibility; Prospectors perceive the business environment as uncertain and Balancers also accept an uncertain environment. Reactors don't have consistent and stable views on environment. Firms that are consistently profitable over a period of time may have made more accurate interpretations of the environment. The higher the degree of the alignment that is achieved between the business strategic orientation and the perceived

environment, the better the performance of organisations (Hawkin, 1995). In order to achieve the third research objective, which is to evaluate the reliability of the developed frameworks applied in a non-Western business environment like East Asia, relevant propositions are developed as below.

Proposition 8: For oil and gas service organisations operating in East Asia, the managerial perceptions of the business environmental uncertainty will vary in associating with the types of their strategic orientations.

It can be assumed that firms adopting a Prospector, Analyser or Balancer strategy will have a higher level of the perceived environmental uncertainty than if they had chosen a Defender strategy and that the higher level of perceived uncertainty will be associated with Multiple strategy organisations such as Balancers or Analysers.

Proposition 9: There will be a relationship between the perceived business environment and strategic performance for oil and gas service organisations operating in East Asia.

This proposition can be examined when based upon the assumption that a higher degree of strategic performance is correlated with a higher degree of perceived environmental uncertainty, complexity, hostility and dynamism.

Proposition 10: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, strategic performance will be associated with their business strategic orientations.

Hence, several basic assumptions can be proposed for the investigation of this proposition. Firstly, Balancers and Analysers will outperform organisations in other categories of strategic orientations; having a Reactor character will yield the organisation a relatively poor strategic performance; and strategic performance of Defenders and Prospectors will stand in the middle among the five groups of organisations. Secondly, having a generic strategy such as Low-cost or Differentiation or Hybrid yields the firm a higher level of strategic performance, whilst pursuing none of these three generic strategies (No-purpose) produces a relatively poor strategic performance. Hybrid (dual) strategies organisations will outperform those competing mainly with either Low-cost or Differentiation strategy. Firms with a Differentiation strategy will outperform those with a Low-cost strategy. Thirdly, high value competitive price organisations will outperform companies in other categories of competitive position; and un-competitive value and price organisations will be guaranteed to have a relatively poor strategic performance.

6.8 Summary

This chapter illustrates the initial emergent models pertaining to the perceived business environment and business strategies. Then, a broader range of reviewing previous work was carried out. In order to define the significance of conducting an empirical work, it also provides criticisms of existing models and frameworks advanced by previous researchers. Based on the completed theoretical literature review, new models and frameworks were developed for the empirical investigation of this study. Finally, ten propositions relating to the three research objectives (see Chapter 1) emerged.

CHAPTER 7

PRELIMINARY FINDINGS

This chapter intends to portray a picture of the oil and gas service sector in the three East Asian countries: China, Singapore and Malaysia. The first task of result presentations is to determine the pattern in which cases are distributed on each variable in the data file. Hence, this chapter focuses on descriptive analysis. In order to assess the statistical significance of various assumptions or hypotheses about a single variable pertaining to the business environment and business strategy, univariate statistics is also utilised.

Descriptive statistics are calculated including sample size (n), typical score (means or medians) and how the scores are dispersed around the typical score (standard deviations). This is done for all the variables in section II and III of the survey questionnaire. To analyse the background information on company profiles, industry segment and business activities in East Asia, frequency distributions are used. In addition, the histogram graph is drawn up to examine the skewness of some variables. To evaluate the significance of each of the environmental sectors, the one-sample chi-square test is computed. To evaluate differences in medians among the managerial perceptions of the importance or impact of six task environmental factors, Friedman's tests are conducted.

7.1 Background Context

Questions related to the organisational background are based on a category scale. The type of data measured is nominal and therefore

relevant types of descriptive analysis are frequency tables and proportions. The results are presented in three areas: company profiles, industrial segments of the energy service sector and business activities in East Asia.

7.1.1 Company Profiles

This part of the questionnaire includes category data which are measured by a nominal-level scale; the researcher used frequency SPSS subprograms to present the raw count of cases for each value. Among 98 participating organisations (Table 7.1), 39 are independent companies, 41 are divisional or subsidiary companies, 18 are operating or business units and of these, one is a regional office, with 31 organisations situated in China, 39 in Singapore, 21 in Malaysia and 7 in other countries such as Thailand, Indonesia, UK, etc. Those companies located outside China, Singapore and Malaysia operated businesses in these three countries, but their business strategic decisions were made at the headquarters elsewhere.

Regarding the organisational size in terms of full time employees, 39 organisations have fewer than 50 full time (or equivalent) employees while 16 are large or very large size organisations with 500 or more than 500 employees. Most of the participating organisations are classified as medium and large[1] organisations with 50 or more employees (61.2 per cent).

[1] In China, a small enterprise refers to one which is owned individually, or by a collective of working people, who participate in the democratic management of their own workplace. In many countries, organisations with fewer than 500 employees are defined as small and medium size enterprises; and organisations with fewer than 50-100 employees are defined as small enterprises (Lu, 1999). In this study, the small size enterprises refer to organisations with fewer than 50 employees; medium size enterprises refer to organisations with employees from 50 to 499; and large size organisations refer to those with 500 or more employees.

Table 7.1 Frequency: Participating Organisations Operating in East Asia (n=98)

	Frequency	Percent
Legal Status Category		
Division/Subsidiary Companies	41	41.8
Independent Companies	39	39.8
Operating/Business Units	18	18.4
Country Where Based		
Singapore	39	39.8
China	31	31.6
Malaysia	21	21.4
Other Countries	7	7.1
Full Time Employees		
1-49	39	39.8
50-199	20	20.4
200-499	19	19.4
500-2999	16	16.3
3000 or more	4	4.1
Years Since Present Business Was Formed		
5 Years or more	92	93.9
<5 Years	6	6.1
Ownership Category		
Wholly Foreign Owned	38	38.8
Joint Venture	22	22.4
Wholly Domestic Private/Individual	15	15.3
Domestic Share Holding/Public Limited Companies	13	13.2
Wholly Domestic State Owned	10	10.2
Respondent's Position		
Senior Manager	62	63.3
Regional Manager or Business Head	30	30.6
Functional Head	6	6.1

A large majority of the organisations had operated for five or more since their existing businesses were formed (93.9 per cent). Only six participating organisations had operated businesses for less than five years.

Most of the respondent organisations are wholly foreign owned or joint ventures (61.2 per cent); a considerable proportion are domestic organisations (38.8 per cent), including wholly domestic state owned, wholly domestic private or individual owned and domestic share holding or public limited companies. Three of the domestic organisations

indicated that their ownership is PTY Ltd. (case SG012), proprietary (case CN005), and foreign majority with domestic private (case ML014). PTY Ltd is the normal designation for Private Limited Liability companies in Singapore. It is the same as LTD in the UK (Radwanski, 2003). The ownership category result shows a fact that the characteristics of service organisations is internationalisation or globalisation as the majority within the oil and gas service sector in East Asia were linked to foreign investment.

Regarding managerial positions of the participating respondents, 63.3 per cent are senior managers (i.e., managing directors, general managers, CEOs or presidents) and 30.6 per cent are managers at an organisational middle management level (i.e. regional sales or operating or division managers, organisational business development managers). In the context of this study, these middle level executives are regional heads and than can be regarded as at a senior management level in the region of East Asia. Besides, a small proportion of responses are from functional heads such as organisational marketing or sales or operations or commercial managers (6.1 per cent).

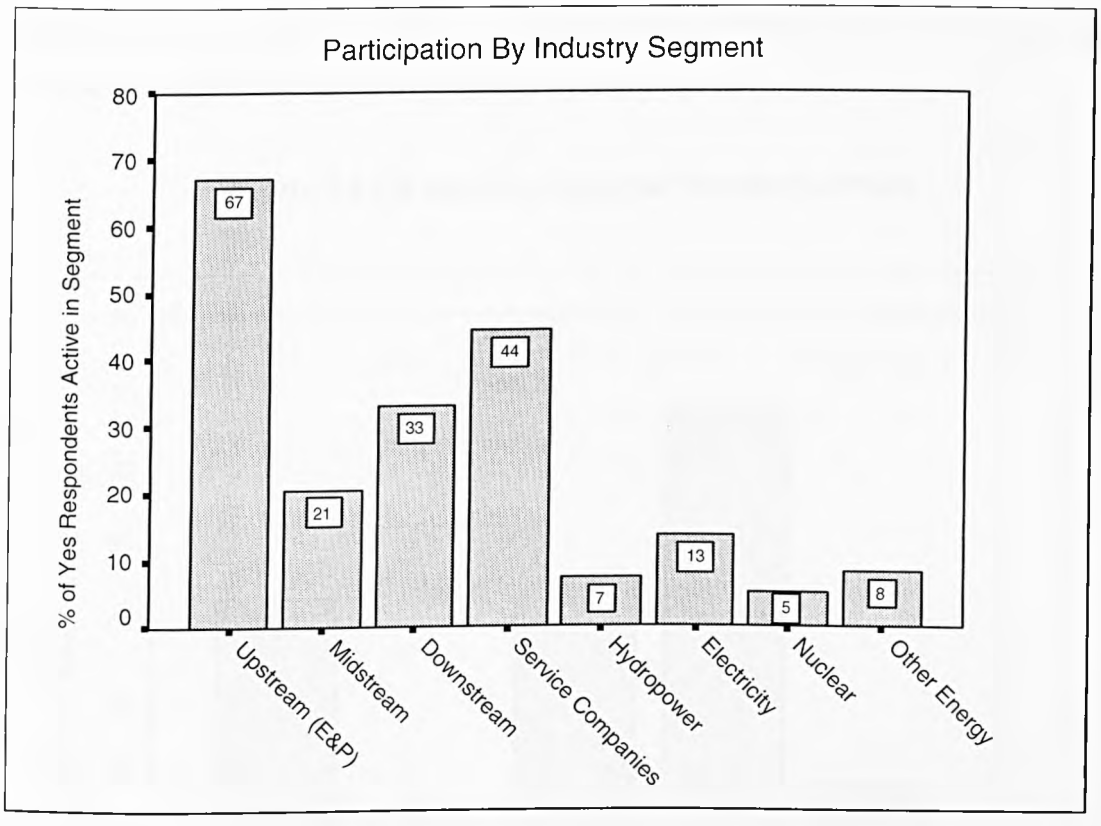
At this stage, it is decided to use the 98 participating organisations for environmental analysis. However, when doing strategy related data analysis, the six functional managers' responses will be excluded; and when doing strategic performance related analysis, eleven organisations that had less than five years in their existing businesses and had functional managers responses will be excluded.

7.1.2 Industrial Segments of the Energy Service Sector

Adopting the concept generated by Simmons and Company International (2000), a model for assigning service companies into different oil and gas service segments was developed. From the SPSS simple bar chart, the results pertaining to the participating

organisations' service activities within the energy industry are reported in Figure 7.1.

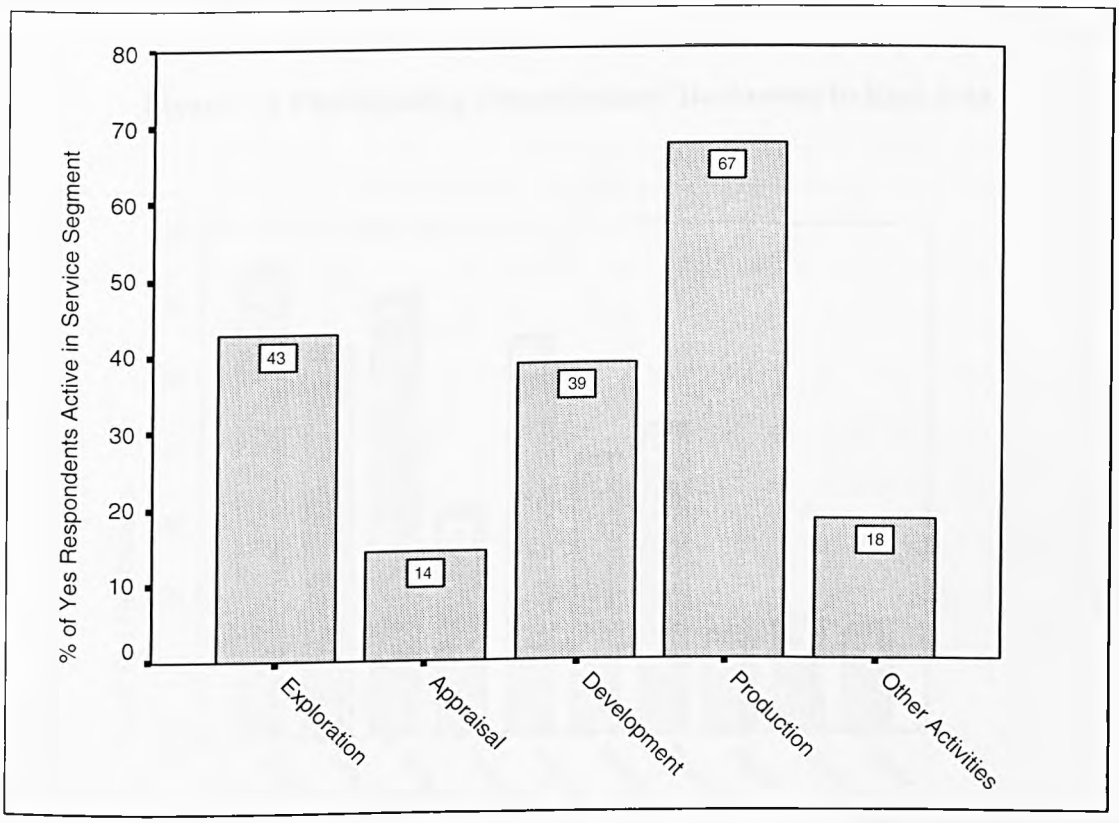
Figure 7.1 Energy Industry Services Segmentation



Amongst the 98 participating organisations, most focused their businesses on serving the upstream oil and gas industry (67 per cent); near half provided services to other oil and gas services companies (44 per cent); 21 per cent are involved in serving midstream oil and gas transportation; and 33 per cent in serving downstream oil and gas refining or processing and marketing. The business involvement with respect to energy services outside the oil and gas industry is considerable. 7 per cent of these service organisations served the hydropower industry, 13 per cent served the electrical industry, 5 per cent served nuclear and 8 per cent served other energy sectors such as wave, coal and wind power.

In addition, for the 98 participating organisations' upstream service activities (Figure 7.2), most of them served oil production (67 per cent), 43 per cent served exploration and 39 per cent provided services to development (including completions). The smallest proportion was engaged in serving appraisal activities (14 per cent). Noticeably, a minority of the participating organisations served other oil and gas sectors outwith upstream activities (18 per cent).

Figure 7.2 Oil and Gas Upstream Service Activities

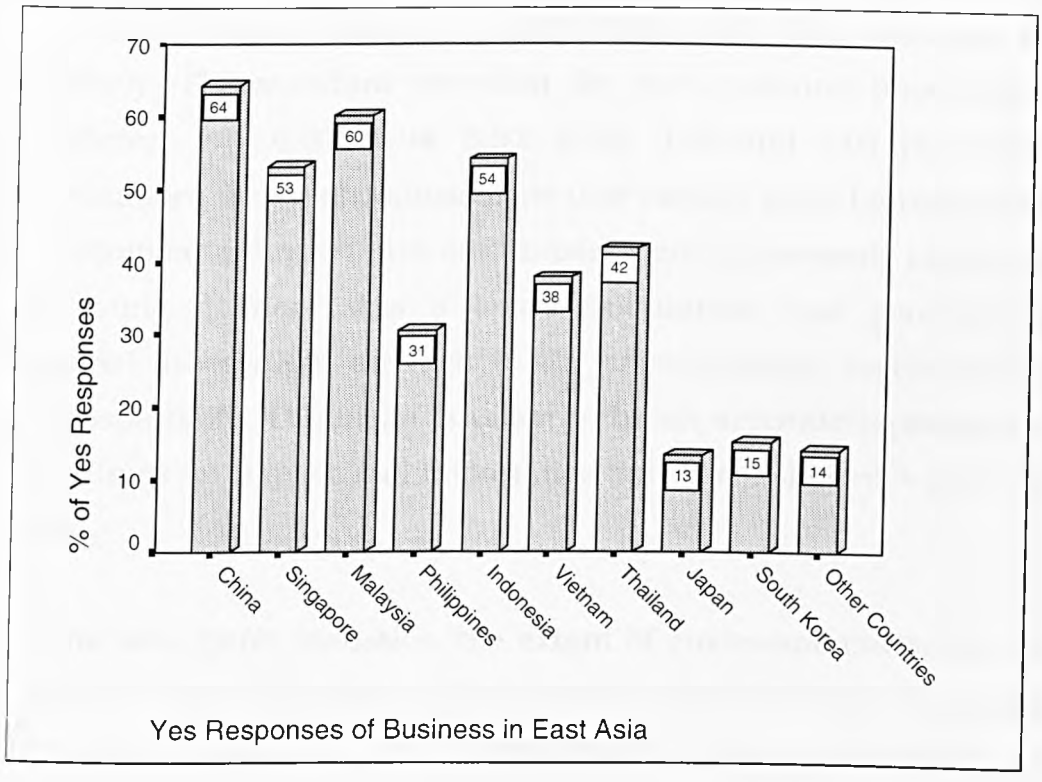


7.1.3 Business Activities in East Asia

The service activities of the participating organisations were widely distributed in various countries and regions throughout East Asia (Figure 7.3). For one organisation, its businesses may be carried out in more than one country. Consequently, the majority of the 98 participating organisations had operated businesses mainly in China,

Singapore, Malaysia and Indonesia (64, 53, 60 and 54 per cent respectively). A considerable proportion of the organisations had conducted their services in Philippines, Vietnam and Thailand (31, 38 and 42 per cent respectively). A small proportion of them carried out businesses in Japan and South Korea (13 and 15 per cent respectively). Besides, 14 per cent of these organisations had operated businesses in other East Asian countries or regions such as Brunei (e.g. cases SG036, ML002 and OT005), Taiwan (e.g. case SG003), Hong Kong (e.g. case ML017), Maldives, Myanmar (e.g. cases ML008 and OT005) and also Azerbaijan (e.g. case ML021).

Figure 7.3 Participating Organisations' Businesses in East Asia



7.2 Task Environmental Sectors

The six environmental factors – technological, regulatory, economic, customers, suppliers and competitors – form a task environment confronting the daily and direct business operations of oil and gas

organisations. They will be perceived by oil and gas service executives to be significant for the growth of their businesses in East Asia (Proposition 1, see Chapter 6). In order to investigate this Proposition, the significance of an environmental factor is evaluated in two dimensions. The first dimension is its importance and second dimension is its impact on the growth of the service organisation's businesses in East Asia.

7.2.1 Assumptions of Importance and Impact

The researcher has tabulated the minimum, maximum, mean (M), and standard deviations for importance and impact of the environmental variables. The figures in Table 7.2 show that the standard deviation for environmental impact varies, s = 0.92, 0.98, 0.90, 0.80, 0.93 and 0.99 respectively. The standard deviation for environmental importance is also different, s = 0.97, 1.04, 0.97, 0.76, 0.88 and 1.01 respectively. These standard deviation values show that ratings given by respondents for environmental importance and impact were consistently close to the mean rating. There was a small fluctuation, but generally the managerial assessment on each of the environmental sectors did not vary substantially. The mean is taken to be an accurate representation of the ratings on impact and importance and is considered a good fit of the data.

From the descriptive statistics, the extent of environmental impacts on the growth of their business in East Asia was found to vary. The impact of economic, customers' and competitors' factors was strong and especially, with the customers' factor having the strongest impact (Mean = 3.96, 4.29 and 3.57). The technological, regulatory and suppliers' factors were perceived to be moderate and the suppliers' factor had the least significant impact on the businesses of these organisations (M = 3.37, 3.01 and 2.64).

Table 7.2 Frequency: Importance and Impact of Environmental Factors (N=98)

	Minimum	Maximum	Mean	Std. Deviation
Economic Impact	1.00	5.00	3.96	0.92
Technological Impact	1.00	5.00	3.38	0.98
Regulatory Impact	1.00	5.00	3.01	0.90
Customers' Impact	2.00	5.00	4.29	0.80
Competitors' Impact	1.00	5.00	3.57	0.93
Suppliers' Impact	1.00	5.00	2.63	0.99
Economic Importance	1.00	5.00	3.90	0.97
Technological Importance	1.00	5.00	3.28	1.04
Regulatory Importance	1.00	5.00	3.02	0.97
Customers' Importance	2.00	5.00	4.42	0.76
Competitors' Importance	1.00	5.00	3.51	0.88
Suppliers' Importance	1.00	5.00	2.69	1.01

With respect to the importance of environmental conditions, senior managers perceived some environmental sectors as having a higher level of importance than others. The customers' factor was seen as the most important (M = 4.42) and the economic and competitors' factors were important (M = 3.90 and 3.51) for them when operating in East Asia. The technological and regulatory factors were perceived to be less important (M = 3.28 and 3.02) than the above three factors. Suppliers' influence was the least important (M = 2.70) among the six task environmental factors.

It is observed that the rank of environmental impact is the same as the rank of environmental importance. Amongst six environmental factors, the impact of the customers' factor was perceived to be the strongest, and this environmental factor was also perceived to be the most important; the impact of the suppliers' factor was perceived to be the least, and the importance of this environmental influence was also perceived to be the least. The significance of the findings derived from this result is that oil clients could be identified as a critical predictor of environmental influences for oil and gas service organisations in East

Asia. The oil clients related data such as their preference for price and their demand for existing and new products or services or for the quality of products or services should be used as lead indicators to determine the required approaches of service deliveries or the establishment of competitive positions for various businesses.

7.2.2 Examining Task Environmental Sectors

Two categories of the importance assessment are combined. The first combined category is "important, very important and most important" and the second one is "not important and slightly important". The researcher wants to test the assumption that the participating oil and gas service organisations' executives are more likely to choose the first combined category when asked to assess the degree of environmental importance from the five defined categories.

A one-sample chi-square test was conducted to assess whether executives perceive that each of the six task environmental factors would have a strong impact on and would be seen as important for the growth of oil and gas service businesses in East Asia. The hypothesised proportion for the combined category of "not and slightly important" or "important, very important and most important" is 0.50 (1 out of 2 combined categories). The expected frequency is 49 [= (0.50) (98)] for "important, very important and most important".

For the importance of economic, technological, regulatory, competitors' and customers' factors, the results indicate that the sample proportions are significantly different from the hypothesised values of 0.5 (Table 7.3). For instance, customers' importance $\chi^2 = 90.163$ (df = 2), $p < 0.001$. The observed frequencies of 11 and 87 tend to support the original assumption that executives perceive the customer factor to be important. Similarly, the results provide significant evidence to support

the view that the economic, technological, regulatory, competitors are important environmental factors.

Table 7.3 One-Sample Chi-Square Test: Importance of Environmental Sectors

Economic	Observed N	Expected N	Residual
not or slightly important	9	49.0	-40.0
important, very important or most important	89	49.0	40.0
Technological			
not or slightly important	22	49.0	-27.0
important, very important or most important	76	49.0	27.0
Regulatory			
not or slightly important	26	49.0	-23.0
important, very important or most important	72	49.0	23.0
Customer			
not or slightly important	2	49.0	-47.0
important, very important or most important	96	49.0	47.0
Competitors			
not or slightly important	11	49.0	-38.0
important, very important or most important	87	49.0	38.0
Suppliers			
not or slightly important	47	49.0	-2.0
important, very important or most important	51	49.0	2.0
Total	98		

Test Statistics

	Economic Importance	Technological Importance	Regulatory Importance	Customer Importance	Competitors Importance	Suppliers Importance
Chi-Square[a]-	65.306	29.755	21.592	90.163	58.939	0.163
df	1	1	1	1	1	1
Asymp. Sig.	0.000	0.000	0.000	0.000	0.000	0.686

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.0.

For the suppliers' importance assessment, the sample proportions are very similar to each other, 47 for "not or slightly important" and 59 for "important, very important or most important" categories, and χ^2 = 0.163 (df = 1), p = 0.686. The follow up tests with equal expected frequencies show a significant difference in proportion between "not important" and "slightly important". The significant result is due to the number of executives in "slightly important" category, which is significantly greater than the number of executives in "not important" category. The results suggest that the suppliers' sector is still considered important for most oil and gas service organisations in East

Asia but the level of its importance is lower than that of the other task environmental factors.

In summary, the results of the test were significant for the economic, technological, regulatory, customers and competitors sectors. The proportion of executives who perceived these factors as important was much greater than the hypothesised proportion of 0.50, while the proportion of perceiving the factors as slightly important was less than the hypothesised proportion of 0.50. The test indicates that the proportion of executives who perceived that these environmental factors were important did differ significantly from the proportion of executives who perceived it as not or slightly important. What is more, the majority of respondents perceived that the suppliers' factor was important and the test was significant between "not important" and "slightly important". Hence, the results support the assumption that each of the six task environmental factors are important for the growth of oil and gas service businesses in China, Singapore and Malaysia (see Chapter 1 and 6).

Similarly, the researcher also wants to test the assumption that these executives are more likely to choose the categories of "strong and very strong" when asked to assess the degree of the impact of the six environmental factors from five categories. The rest of the five categories are "non-existent or very weak, weak and moderate". Three categories are adopted when assessing the impact of six environmental sectors. The hypothesised values for the combined categories of "non-existent or very weak and weak", "moderate" and "strong and very strong" are 1/3, 1/3 and 1/3. The expected frequency is 32.7 [= (1/3) (98)] for "strong or very strong" impact. The analysis shows that observed proportions do differ significantly from the hypothesised values of 1/3, 1/3 and 1/3 (Table 7.4).

Table 7.4 One-Sample Chi-Square Test: Impact of Environmental Sectors

Economic	Observed N	Expected N	Residual
non-existent/very weak and weak	5	32.7	-27.7
moderate	25	32.7	-7.7
strong and very strong	68	32.7	35.3
Technological			
non-existent/very weak and weak	15	32.7	-17.7
moderate	39	32.7	6.3
strong and very strong	44	32.7	11.3
Regulatory			
non-existent/very weak and weak	26	32.7	-6.7
moderate	46	32.7	13.3
strong and very strong	26	32.7	-6.7
Customers			
non-existent/very weak and weak	3	32.7	-29.7
moderate	12	32.7	-20.7
strong and very strong	83	32.7	50.3
Competitors			
non-existent/very weak and weak	10	32.7	-22.7
moderate	33	32.7	0.3
strong and very strong	55	32.7	22.3
Suppliers			
non-existent/very weak and weak	46	32.7	13.3
moderate	32	32.7	-0.7
strong and very strong	20	32.7	-12.7
Total	98		

Test Statistics

	Economic Impact	Technological Impact	Regulatory Impact	Customers' Impact	Suppliers' Impact	Competitors' Impact
Chi-Square[a]	63.449	14.714	8.163	117.571	10.367	31.000
df	2	2	2	2	2	2
Asymp. Sig.	0.000	0.001	0.017	0.000	0.006	0.000

a 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 32.7.

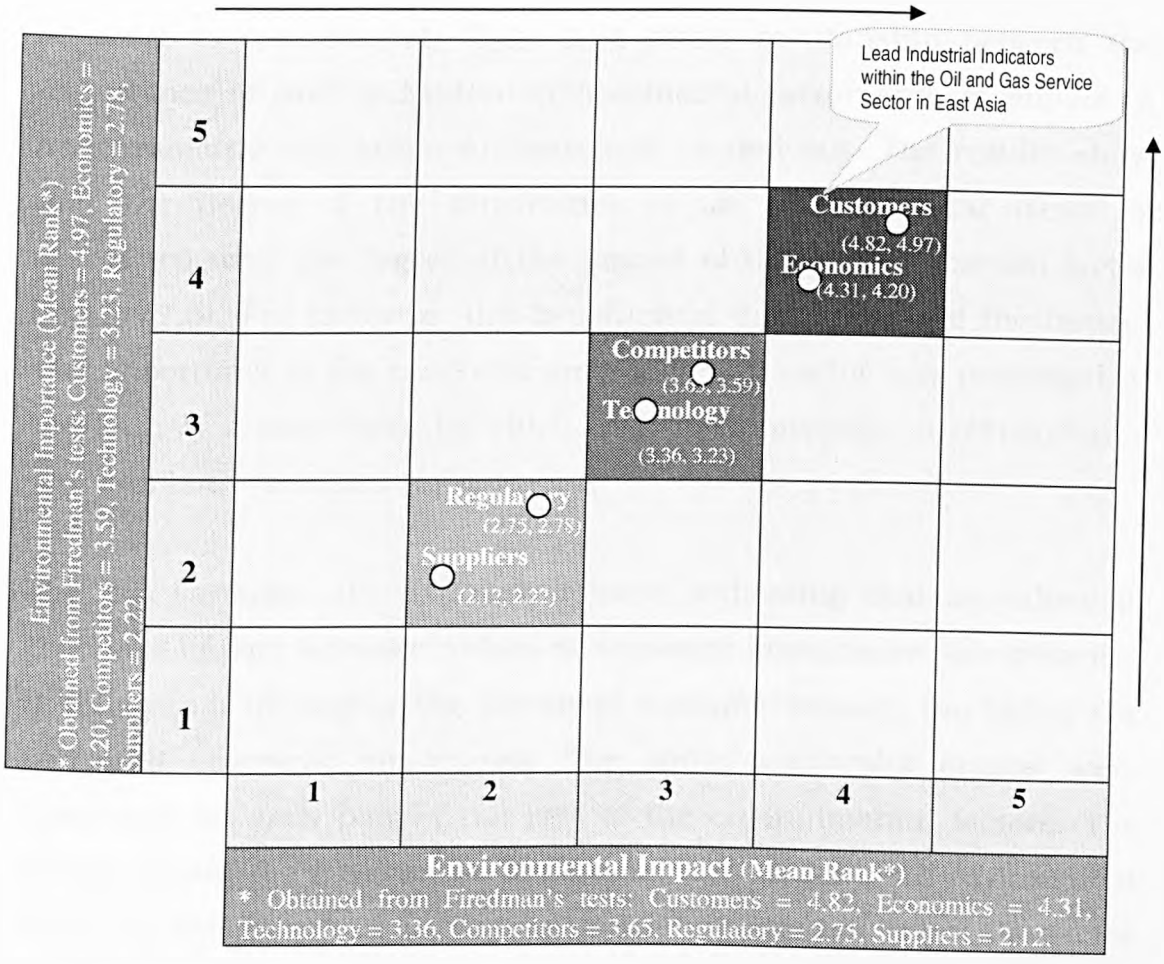
From the observed proportions, the initial significant results of the impact of economic, technological, customers and competitors are due to the number of executives in the combined category of "strong and very strong". The significant result of regulatory is however due to the number of executives in the moderate category and for suppliers, it is due to the number in the "non-existent or very weak and weak" category. For instance, for customers' impact $\chi^2 = 117.571$ (df = 2), $p < 0.001$. The observed frequencies of 3, 12 and 83 support the original assumption that customers affect the growth of oil and gas service businesses in East Asia strongly. For suppliers' impact assessment, $\chi^2 =$

10.367 (df = 2), p = 0.006, yet the observed frequencies of 46, 32 and 20 tend not to support the original assumption that the suppliers have a strong impact on oil and gas service businesses. This might be the reason why the earlier results show that quite a number of executives regarded the suppliers' factor as slightly important. For similar reasons, the results also disprove the assumption that the regulatory factor would have a strong effect on the services businesses in East Asia. Rather, the observed results indicate that the impact of the regulatory factor is moderate. Hence, the results tend to support assumption that the impact of the customers', economic, technological and competitors' factors would be strong for oil and gas service businesses growing in East Asia.

7.2.3 A Hypothetical Approach of Lead Industrial Indicators

In order to evaluate differences in medians among the managerial perceptions on the importance or impact of six task environmental factors, the non-parametric Friedman's tests were also conducted. The tests were significant, $\chi^2 = 159.9$ (df = 5), $p < 0.001$ for the environmental importance and $\chi^2 = 156.3$ (df = 5), $p < 0.001$ for the environmental impact. Furthermore, the value of mean rank for the importance of customers sector is 4.97, the highest among the six environmental factors; the mean rank of the importance of suppliers is 2.22, the lowest among the six environmental factors. For the mean ranks of environmental impact, the highest value is customers' (4.82) and the lowest mean rank value is suppliers' (2.12). The result of mean ranks is consistent with the results demonstrated above (Section 7.4.1). Using these mean rank values of the environmental importance and impact, a hypothetical approach of the lead industrial indicators matrix can be generated (Figure 7.4).

Figure 7.4 Mean Ranks (Impact, Importance) and Lead Industrial Indicators



Obviously, the managerial perceptions on environmental influences differed significantly: the impact of customers is stronger than that of suppliers and customers are more important than suppliers for oil and gas service organisations in East Asia. Consequently, senior management may devote more attention to customers rather than suppliers when scanning and assessing the task environmental conditions for strategic decisions. From the emerged ranking positions presented in Figure 7.4 for each of the six task environmental sectors, customers', economic, competitors' and technological factors can be regarded as the lead indicators within the oil and gas service sector in the three selected countries.

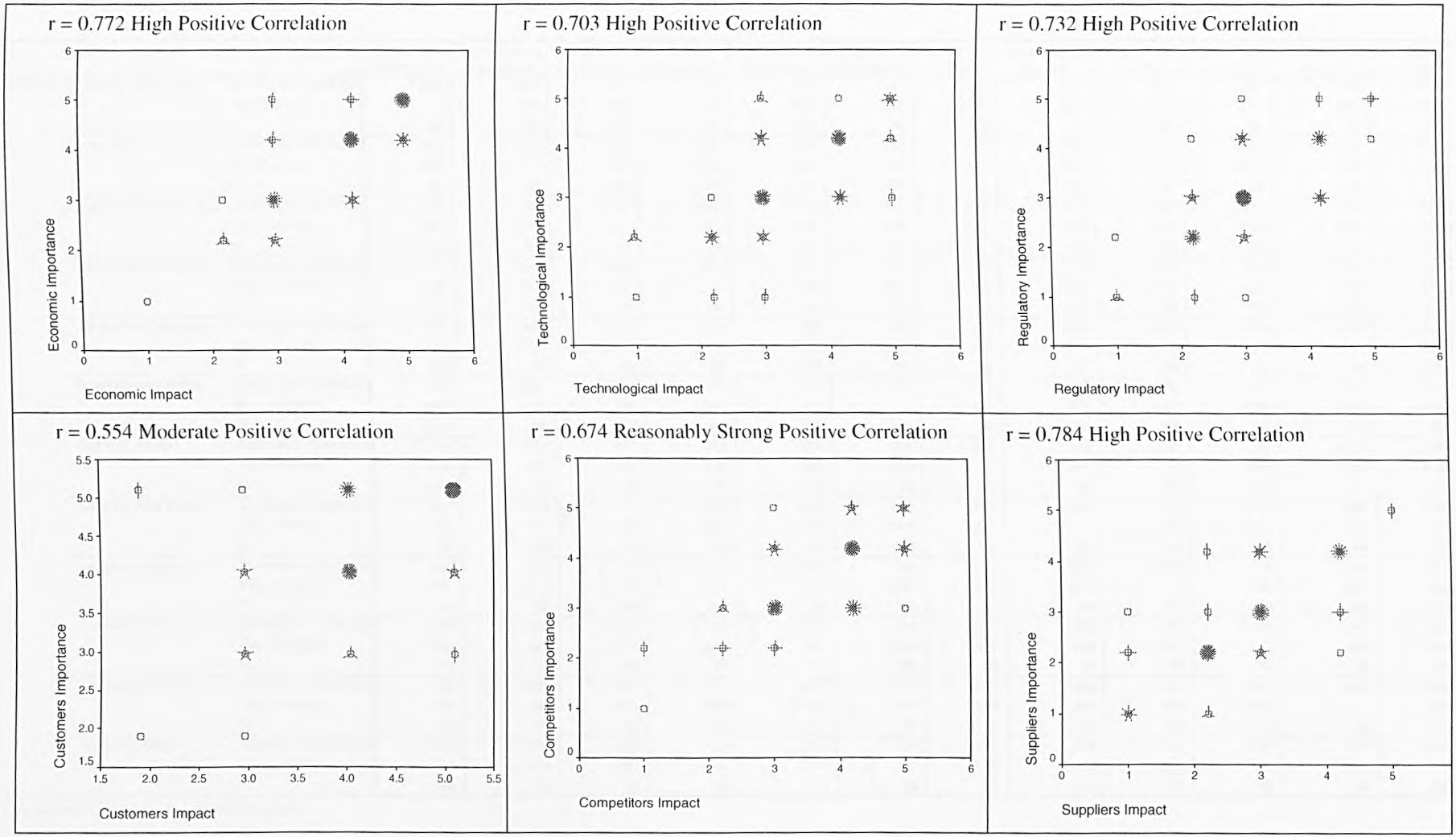
7.2.4 Importance and Impact Correlation

In order to test whether there is a direct relationship between the importance of each individual environmental factor and its impact, a nonparametric correlation analysis was carried out. The results show that the degree of the importance of an environmental factor is associated with the degree of the impact of that environmental factor (Figure 7.5). For instance, the hypothetical data regarding the impact and importance of the economic environmental sector was presented in the form of a scatterplot in which each dot represents a respondent's score on both variables.

The two variables are positively related, indicating that as values of economic impact increase, values of economic importance also increase. It shows that the higher the perceived economic impact, the higher the perceived economic importance. The same scatterplot graphs were computed for each pair of the rest of the environmental factors. The results obtained are the same: the greater the impact of an environment factor on the growth of an organisation, the more important the factor perceived by the oil and gas service organisations' executives.

The non-parametric Correlation Matrix (Table 7.5) shows the correlation between pairs of variables. A value close to +1 indicates a perfect positive association, and a value close to −1 indicates a strong negative association whilst a value close to 0 indicates no statistical association. In this analysis, the values of 0.772, 0.703, 0.732 and 0.784 between importance and impact of economics, technology, regulatory, and suppliers respectively suggest a strong positive association between these pairs of two variables. The value of 0.674 suggests a reasonably strong positive association between these two variables for the competitors' sector. The value of 0.554 suggests a moderate positive association between the two variables for the customers' sector.

Figure 7.5 Pattern of the Relationships between Importance and Impact of Each of the Six Task Environmental Factors



Note: the more cases, the more petals

Table7.5 Correlations between Importance and Impact of the Task Environmental Sectors

Correlations

			Economic Importance	Technological Importance	Regulatory Importance	Customers Importance	Competitors Importance	Suppliers Importance	Economic Impact	Technological Impact	Regulatory Impact	Customers Impact	Competitors Impact	Suppliers Impact
Spearman's rho	Economic Importance	Correlation Coefficien	1.000	.252*	.150	-.160	.082	-.047	.772**	.253*	.059	-.052	.034	.004
		Sig. (2-tailed)	.	.012	.142	.116	.422	.647	.000	.012	.566	.613	.741	.971
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Technological Importance	Correlation Coefficien	.252*	1.000	.166	-.044	.035	.083	.226*	.703**	.184	.062	-.026	.052
		Sig. (2-tailed)	.012	.	.103	.670	.735	.415	.025	.000	.070	.542	.796	.614
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Regulatory Importance	Correlation Coefficien	.150	.166	1.000	-.030	.251*	.164	.027	.013	.732**	-.011	-.051	.030
		Sig. (2-tailed)	.142	.103	.	.767	.013	.106	.791	.899	.000	.917	.621	.767
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Customers Importance	Correlation Coefficien	-.160	-.044	-.030	1.000	.031	.157	-.158	-.071	-.073	.554**	.060	.119
		Sig. (2-tailed)	.116	.670	.767	.	.764	.122	.120	.489	.475	.000	.560	.244
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Competitors Importance	Correlation Coefficien	.082	.035	.251*	.031	1.000	.343**	.020	.043	.102	-.072	.674**	.285**
		Sig. (2-tailed)	.422	.735	.013	.764	.	.001	.843	.671	.316	.482	.000	.004
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Suppliers Importance	Correlation Coefficien	-.047	.083	.164	.157	.343**	1.000	.071	.000	.149	.014	.212*	.784**
		Sig. (2-tailed)	.647	.415	.106	.122	.001	.	.490	.998	.144	.888	.036	.000
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Economic Impact	Correlation Coefficien	.772**	.226*	.027	-.158	.020	.071	1.000	.169	-.026	-.092	-.106	.025
		Sig. (2-tailed)	.000	.025	.791	.120	.843	.490	.	.097	.796	.365	.299	.810
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Technological Impact	Correlation Coefficien	.253*	.703**	.013	-.071	.043	.000	.169	1.000	.057	.049	.089	.184
		Sig. (2-tailed)	.012	.000	.899	.489	.671	.998	.097	.	.579	.634	.385	.069
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Regulatory Impact	Correlation Coefficien	.059	.184	.732**	-.073	.102	.149	-.026	.057	1.000	.098	-.044	.062
		Sig. (2-tailed)	.566	.070	.000	.475	.316	.144	.796	.579	.	.335	.667	.544
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Customers Impact	Correlation Coefficien	-.052	.062	-.011	.554**	-.072	.014	-.092	.049	.098	1.000	.045	.081
		Sig. (2-tailed)	.613	.542	.917	.000	.482	.888	.365	.634	.335	.	.660	.430
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Competitors Impact	Correlation Coefficien	.034	-.026	-.051	.060	.674**	.212*	-.106	.089	-.044	.045	1.000	.297**
		Sig. (2-tailed)	.741	.796	.621	.560	.000	.036	.299	.385	.667	.660	.	.003
		N	98	98	98	98	98	98	98	98	98	98	98	98
	Suppliers Impact	Correlation Coefficien	.004	.052	.030	.119	.285**	.784**	.025	.184	.062	.081	.297**	1.000
		Sig. (2-tailed)	.971	.614	.767	.244	.004	.000	.810	.069	.544	.430	.003	.
		N	98	98	98	98	98	98	98	98	98	98	98	98

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

Hence, the results support the researcher's assumption that the degree of the importance of an environmental sector is associated with the degree of the impact of that environmental factor. The higher the degree of impact of an environmental factor, the higher the degree of its importance of that environmental factor. Overall, Proposition 1 that six task environmental factors are significant for the growth of oil and gas service businesses in East Asia is supported by the research results.

7.3 Perceived Business Environmental Conditions

This section attempts to investigate Proposition 2 that, for oil and gas service companies that operate in East Asian countries like China, Singapore and Malaysia, the nature of the business environment is uncertain. It also seeks to prove the contention of Proposition 3 that the business environment in which the service organisations operate in East Asia is dynamic, complex and hostile.

7.3.1 Preliminary Observations of Environmental Dimensions

The SPSS Output below (Table 7.6) shows the table of descriptive statistics for the four variables, viz. complexity, hostility, dynamism and uncertainty, providing an insight into the perceptions of these environmental dimensions. As the exploratory nature of the analysis, the mean is employed as a hypothetical value (Field, 2000) for the measure of central tendency. From the table, on average, the participating executives perceived that the business environment in which they operated in East Asia was uncertain (M = 4.17), complicated (M = 5.04) and dynamic (M = 5.22). However, for the perceived environmental hostility, the environment tended to be benign (M = 3.81) for service organisations to conduct their businesses in the region.

Table 7.6 Perceptions of Environmental Dimensions in East Asia (N=98)

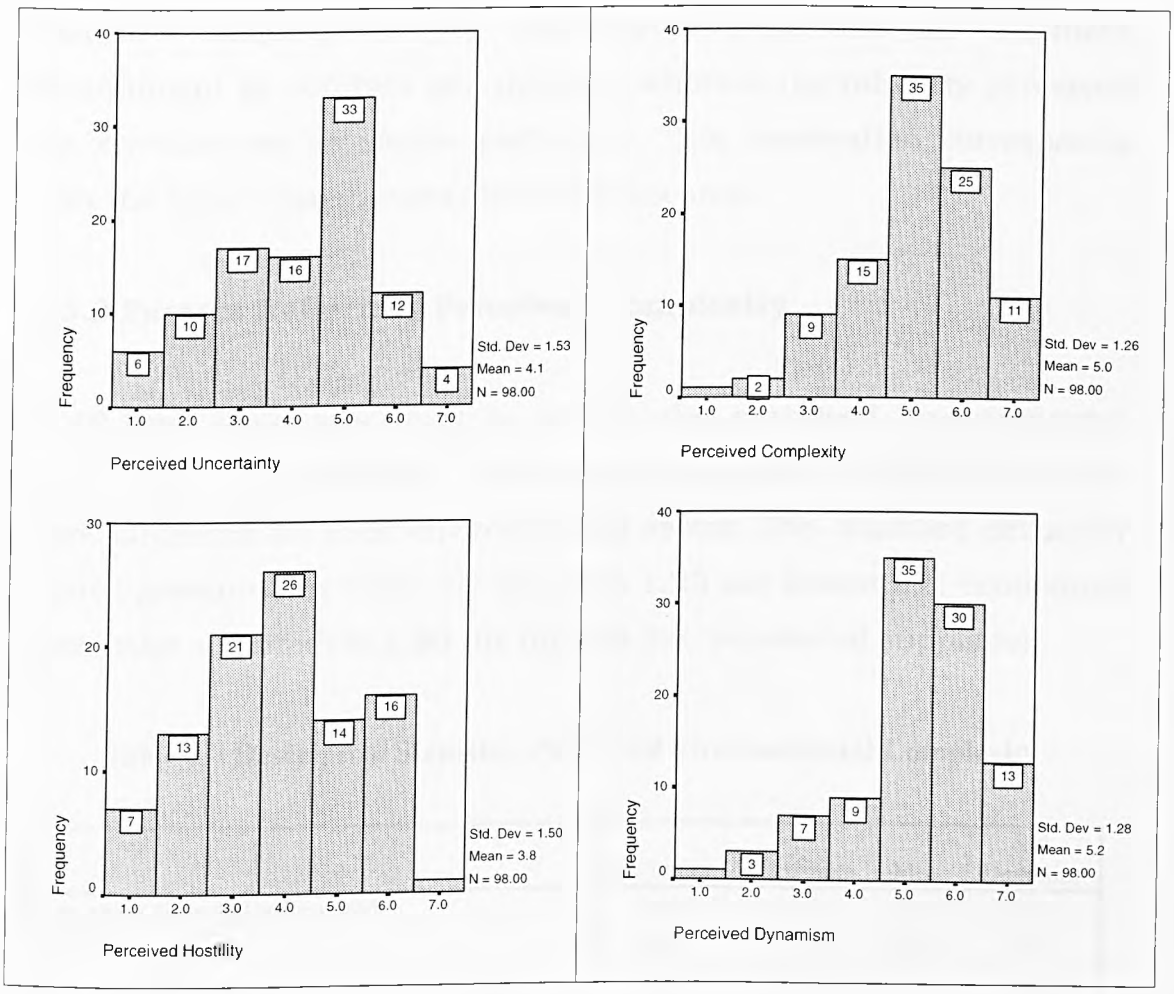
	Perceived Complexity	Perceived Hostility	Perceived Dynamism	Perceived Uncertainty
Mean	5.04	3.81	5.20	4.14
Std. Error of Mean	0.13	0.15	0.13	0.15
Median	5.00	4.00	5.00	4.50
Mode	5.00	4.00	5.00	5.00
Std. Deviation	1.26	1.50	1.28	1.53
Variance	1.59	2.26	1.63	2.33
Skewness	-0.58	-0.05	-0.88	-0.35
Std. Error of Skewness	0.24	0.24	0.24	0.24
Range	6.00	6.00	6.00	6.00
Minimum	1.00	1.00	1.00	1.00
Maximum	7.00	7.00	7.00	7.00

At this stage, the intention (demonstrated in Proposition 2) that the nature of the business environment is perceived to be uncertain is supported preliminarily. However, Proposition 3 (that oil and gas service companies' executives in East Asia perceive that the business environment in which they operate will be dynamic, complex and hostile) has gained limited support from the preliminary results.

Relationships between individual factors and the perceived environmental dimensions will be examined further in Chapter 8. In the following sections, factors in association with the perceived complexity, dynamism and hostility are examined.

For environmental uncertainty, the z-score of skewness is -0.35/0.24 = -1.46. For perceived dynamism, the z-score of skewness is -0.88/0.24 = -3.67. For environmental complexity and hostility, the z-scores of skewness are -2.42 and -0.21 respectively. As a z value above 1.96 is considered significantly different from chance to be problematic (Field, 2000), it is clear that the dynamism and complexity scores are negatively skewed, indicating a pile-up of scores on the right of the distributions and hence most respondents gave high scores, except for hostility. The following presents barcharts of each of the four variables with the normal distribution overlaid (Figure 7.6).

Figure 7.6 Making Sense of the Nature of the Business Environment



The graphs displayed in Figure 7.6 represent various scenarios. First, it looks as if the uncertainty score is somewhat normally distributed. In this sense, a few (4) respondents perceived the business environment as very uncertain and a few (4) perceived it as very certain, but half of the respondents' (49) perceptions on the environment turned out to be uncertain. Secondly, the hostility scores are distinctive because this distribution is fairly clearly not normal and there are two peaks indicative of two modes. This suggests that the respondents' opinion towards the environmental hostility was divided: most respondents perceived that the environment was pleasant (41.8 per cent); 26.5 per cent of the respondents felt it was at a middle situation between pleasant and unpleasant; whereas 21.6 per cent

perceived that it was an unpleasant environment. Finally, complexity and dynamism tests produced very negatively skewed data, indicating that the majority of the respondents perceived the business environment as complex and dynamic whereas the minority perceived the environment as simple and static. This observation corresponds with the earlier discussions about the z-scores.

7.3.2 Factors Reflecting Perceived Complexity

A 10-item scale was used to assess the perceived environmental complexity. The minimum, maximum, mean and standard deviation were tabulated for each environmental sector. The standard deviation values presented in Table 7.7 are from 1.23 the lowest (i.e. economics knowledge required) to 1.80 the highest (i.e. number of suppliers).

Table 7.7 Descriptive Statistics: Perceived Environmental Complexity

	Minimum	Maximum	Mean	Std. Deviation
Economics Knowledge Required	1.00	7.00	4.77	1.23
Technological Level	2.00	7.00	5.09	1.36
The Similarity of Industrial Products/Services	1.00	7.00	3.51	1.59
Government Regulations, Legislation and Policies	1.00	7.00	4.34	1.51
Number of Oil and Gas Clients	1.00	7.00	4.30	1.64
Needs and Preferences of Oil and Gas Clients	1.00	7.00	3.22	1.53
Number of Suppliers	1.00	7.00	3.92	1.80
Similarity of Supply Conditions by Suppliers	1.00	7.00	3.80	1.55
Number of Firms within the Industry Sector	1.00	7.00	3.26	1.75
Scope of Firms within the Industry Sector	1.00	7.00	5.03	1.59

These values are relatively high compared to the mean. The ratings for the assessment of environmental complexity are clearly spread from the mean, that is, for some respondents, very high ratings (e.g. 7 indicating the greatest complexity of an environmental factor) were given and for others, the ratings were very low (e.g. 1 indicating the simplest situation of the same environmental factor). As the standard

deviations are far away from zero, the mean may be a poor fit of the data. In spite of this, the mean can be used as a hypothetical value.

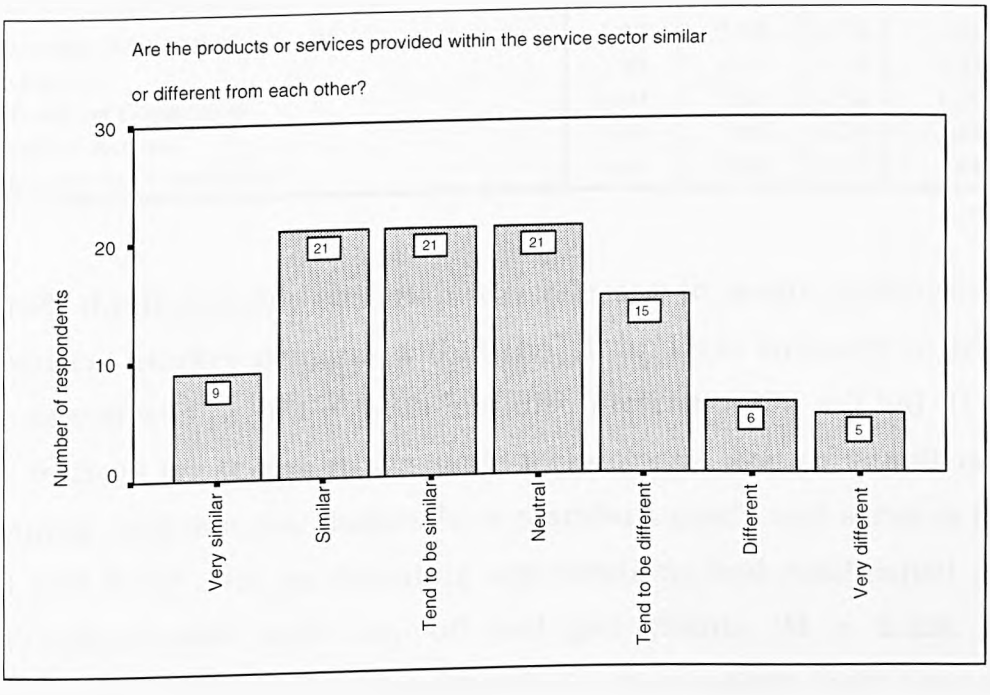
An approach to interpreting the mean value is developed as follows. As introduced in Section 2.3.2 of Chapter 2, the weight of 1 is assigned to the response of the most favourable attitude on the statement anchored at the beginning (positive adjectives); the weight of 7 is assigned to the response of strongest agreement indicating the most favourable attitude on the statement anchored at the end (negative adjectives); 4 is the point assigned to the neutral attitude on that statement. If the mean is above 4, hypothetically, the perception is associated with the right statement showing the level of complexity; if below 4, it is associated with the left statement showing the extent of simplification. By doing this, the observed results emerge as below.

Five environmental influences show the levels of complexity (Table 7.5). The knowledge required for understanding the economic situation in the region where they operated was complicated (M = 4.77). The government regulations, legislation and policies tended to be sophisticated (M = 4.34). The level of technology involved in the oil and gas service sector was high (M = 5.09). The number of customers whom they served within the oil and gas industry tended to be large (M = 4.30). The scope of companies within the service sector in which they operated was extensive as they came from all over the world (M = 5.03).

On the other hand, five other issues appear to show the simplification of the environmental influences. The observed results show that the needs and preferences of the oil and gas clients whom they serve were similar (M = 3.51). Both the number of firms within the industry sector and the number of suppliers tended to be small (M = 3.26 and 3.92). In this circumstance, the niche market was shared or dominated mainly by few firms. Supply conditions (e.g. price, quality, speed or

service) provided by their suppliers tended to be similar (M = 3.80). In addition, using a simple barchart (Figure 7.7), more than half of the respondents thought that, within the service industrial sector in which they operated, the products or services offered to clients were similar to each other.

Figure 7.7 Similarity of Industrial Products or Services



7.3.3 Factors Reflecting Perceived Hostility

Thirteen items were used to assess the perceived environmental hostility, which was also measured by tabulating the minimum, maximum, mean and standard deviation. For the same reason as stated in the above section, the appropriated measure of central tendency is the mean value. The method employed in the above section was used to demonstrate the hypothetical means. The details on the distributions for each of these items could also be reported by using a simple barchart. To simplify, the results are summarised in Table 7.8.

Table 7.8 Descriptive Statistics: Perceived Environmental Hostility

	Minimum	Maximum	Mean	Std. Deviation
Size of Market Demand	1.00	7.00	3.32	1.48
Changing of Market Demand	1.00	6.00	3.34	1.19
Access to Available Technologies	1.00	7.00	3.73	1.44
National Government Regulations and Legislation	1.00	7.00	4.03	1.36
Local Government Policies	1.00	7.00	4.14	1.31
Relationship with Government	1.00	7.00	4.13	1.40
Levels of Key Customers Switching to Competitors	1.00	7.00	4.66	1.46
Relationship with Customers	1.00	6.00	2.29	1.06
Access to Suppliers for Materials or Goods	1.00	7.00	3.01	1.32
Relationship with Suppliers	1.00	5.00	2.70	1.02
Entry Barriers	1.00	6.00	3.14	1.37
Rivalry among Competitors	1.00	7.00	4.54	1.49
Competitive Actions	1.00	7.00	4.29	1.44
Relationship with Competitors	1.00	7.00	4.17	1.44

Overall, the favourable situation was relevant to seven environmental influences. Market demand within the oil and gas industry to which they served was big (M = 3.32) and also increasing (M = 3.34). It was easy to have an access to available technologies and to suppliers for obtaining available raw materials or standard goods and services (M = 3.73 and 3.01). The participating organisations had established good relationships with their key oil and gas clients (M = 2.29). The relationships between the participating organisations and their key suppliers also tended to be supportive (M = 2.70). Entry barriers to the oil and gas service sector in which they operate were slightly high (M = 3.14) and this situation could discourage new competitors from entering into existing industrial sectors.

The following three environmental influences made the environment unfavourable to the oil and gas service organisations. First, the respondent executives perceived that it was easy for their key customers to switch to another competitor's products or services (M = 4.67). Second, competitive actions adopted by firms within the service sector might tend to be unreasonable (M = 4.29), indicating that some firms imitated the changes or innovations created by leading firms

which could be very concerned to see the situation that they were followed closely by their competitors. Third, the rivalry among the competitors within the service sector in which they operate was turbulent (M = 4.54). In the last circumstance, as service firms within a niche industrial sector provide similar products or services to their common oil clients, competitions were largely based on price. Some service companies such as labour services in South China conducted a fierce price war. However, lowering price was not considered an appropriate approach for obtaining contracts as it could cause quality problems. Operators in China preferred to take both prices and previous quality performance in consideration when they evaluated bidding proposals.

Several environmental influences could be interpreted as having a neutral impact on the service organisations. National government regulations and legislation in the region could benefit some organisations while limiting other firms' service businesses (M = 4.03); for those firms holding a neutral opinion, some governmental policies brought benefits whereas some restricted businesses. Similarly, local level government policies (e.g. Customs or administrative bureaus) could have both negative and positive influences on the oil service companies' businesses (M = 4.14). Some of the participating organisations had a close relationship with government some were distant from the government whereas the others were neither distant nor close to the government (M = 4.13). The relationship of some participating organisations with their competitors was collaborative, and the relationship of some other participating organisations with their competitors was un-collaborative, while some organisations had a neutral relationship (i.e. neither bad nor good) with competitors (M = 4.17). A conspicuous observation emerges that the majority of oil and gas service organisations in East Asia had amicable relations with their competitors and stayed peacefully with each other although the competition could be very strong.

7.3.4 Factors Reflecting Perceived Dynamism

Eighteen items were used to measure the level of environmental dynamism and the means were used to provide hypothetical connotations of the data. From descriptive statistics shown in Table 7.9, apart from the fact that the influence of changes in competitive price appeared to be at a neutral point between predictable and unpredictable (M = 4.04), most of the factors in the six environmental sectors stayed about the same from year to year.

Table 7.9 Descriptive Statistics: The Perceived Environmental Dynamism

	Minimum	Maximum	Mean	Std. Deviation
Customer Demand for Existing Products/Services	1.00	7.00	3.01	1.39
Customer Demand for New Products/Services	1.00	6.00	3.50	1.38
Customer Demand for Higher Quality or More Service	1.00	7.00	2.93	1.47
Customer Preference for Lower Prices	1.00	7.00	2.31	1.39
Changes in Competitive Price	1.00	7.00	4.04	1.54
Competitors' Quality Improvement	1.00	7.00	3.51	1.18
Competitors' Introduction of New Products/Services	1.00	7.00	3.69	1.39
Suppliers Rising Prices	1.00	7.00	3.43	1.36
Suppliers Quality Reduction	1.00	7.00	3.85	1.27
Suppliers Introduction of New Materials or Standard Products	1.00	7.00	3.69	1.18
Changes in Oil and Gas E&P Level	1.00	7.00	3.76	1.74
Changes in Well Counts	1.00	7.00	3.47	1.44
Changes in Rig Counts	1.00	7.00	3.64	1.49
Technological Changes	1.00	6.00	3.26	1.11
Rate of Technological Diffusion	1.00	6.00	3.52	1.28
Changes in National Regulations and Legislation	1.00	7.00	3.76	1.51
Changes in Local Government Policies	1.00	7.00	3.80	1.55

The predictable customer influences were: demand for existing products or services (M = 3.01) and for new products or services (M = 3.50); demand for higher quality or more services (M = 2.93); and customers' preference for lower prices (M = 2.31). For the competitive sector, improvement in quality of products or services by competitors and competitors' introduction of new products or services appeared to be predictable (M = 3.51 and 3.69). Service organisations were able to predict their suppliers' rising prices (M = 3.43), the reduction in quality of suppliers' goods and services (M = 3.85) as well as suppliers' introduction of new materials or standard products (M = 3.69). For

regulatory influences, the participating organisations appeared to have advance warning of changes in government regulations, policies and legislation at both national and local levels (M = 3.76 and 3.80). The industry economic factors such as oil and gas exploration and production, well counts and rig activities in the East Asian region were predictable (M = 3.27, 3.64 and 3.27). The service firms were also able to forecast technological changes in the service sector and the rate of technological diffusion throughout the sector (M = 3.27 and 3.52). Obviously, the above results show that the unpredictability doesn't reflect the perceived dynamism. Senior executives perceived the environment as dynamic yet they were able to predict dynamic changes occurring in the six environmental sectors.

7.4 Enacted Business Environment: Business Strategies

In this section, it seeks to investigate Proposition 7 that, for oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, the managerial perceptions of their business strategies will be different. Based on the theoretical frameworks generated in Chapter 6, the participating organisations can be categorised into different strategic groups.

7.4.1 Generic Business Strategies Employed by Oil and Gas Service Firms

The present study allocates strategic orientations for businesses based on Miles and Snow's (1978) theory and an approach developed by Parnell, et al. (2000). A business was categorised as pursuing the strategy reflected by the highest number of its responses and was firstly assigned into the categories of Defender, Prospector and Reactor. When there was a tie between Defender and Prospector strategies, the business was assigned as an Analyser. When there was a tie among three non-Reactor strategies, the business was classified

as a Balancer. To distinguish the characteristics of a Balancer from those of an analyser, the business should indicate its capability of "adapting to" and "creating" changes or innovation simultaneously. Finally, when there was a tie between the Reactor and one or two other strategies, the business was classified as a Reactor.

Table 7.10 Strategic Orientation Assignment

	Frequency	Percent
Defender	4	4.1
Prospector	5	5.1
Analyser	59	60.2
Balancer	17	17.3
Reactor	13	13.3
Total	98	100.0

By carrying out the above procedure case by case, the 98 participating oil and gas service organisations were assigned as 17 Balancers, 59 Analysers, 5 Prospectors, 4 Defenders and 13 Reactors (Table 7.10). A big majority of the participating organisations had developed well-defined strategies guiding their business practice in East Asia (86.6 per cent). Most of the participating organisations were Analysers (60.2 per cent) and the fewest organisations were Defenders (4.1 per cent).

7.4.2 Trends of Pursued Competitive Strategies

An approach categorising competitive strategies was developed based upon Porter's typology. If firms compete on the basis of highest quality or differentiate themselves from competitors in the industry, they are assigned to the category of Differentiation organisations; if firms compete based on the lowest cost in the industry, they are categorised as Low-cost organisations. If firms pursue both the lowest possible cost and the highest possible quality or a unique feature and are able to compete simultaneously based on both the lowest cost and differentiated business, they are classed as Hybrid organisations. If firms pursue one competitive strategy while are also able to compete

based on the combined competitive advantages, the firms are still assigned to a Hybrid strategy (e.g., case SG023). In contrast, if firms seek to attain both cost leadership and differentiation yet fail to achieve a strategy in either direction, they are assigned to the category of No-purpose organisations. If firms pursue one type of strategy but in fact appear to have other types of competitive advantages, these firms are also No-purpose organisations (e.g., case ML004). If firms pursue a Hybrid strategy while failing to achieve either Low-cost or Differentiation, they are assigned to an associated strategy - either one of the two basic competitive strategies.

Table 7.11 Competitive Strategies of the Participating Service Organisations

	Frequency	Percent
Low Cost	5	5.1
Differentiation	48	49.0
Hybrid	36	36.7
No-purpose	9	9.2
Total	98	100.0

By carrying out above procedures, the 98 participant oil and gas service organisations were classified into 48 Differentiation, 36 Hybrid, 5 Low-cost and 9 No-purpose organisations (Table 7.11). Overall, nearly half of the participating firms deployed a Differentiation-oriented competitive strategy (49 per cent) and a minority of firms pursued a Low-cost strategy (5.1 per cent), which was obviously not a preferred option selected by senior management of oil and gas service companies operating in East Asia. The result supports this researcher's contention that one of the typical attributes of the oil and gas service industry is differentiation.

7.4.3 A Picture of Strategic Competitive Positions

A scatter graph was used to plot the profile of price level and Perceived Customer Added Value (PCAV). As explained earlier, in order to obtain

a value of PCAV, the average value of five variables (i.e. products or service quality valued by customers, reliability of technology, safety performance of products or services, speed of response to clients' requirements and price that customers are willing to pay) was adopted. In order to eliminate a self-report bias, the mean of the perceived PCAV was used as the central tendency in the service industrial sector.

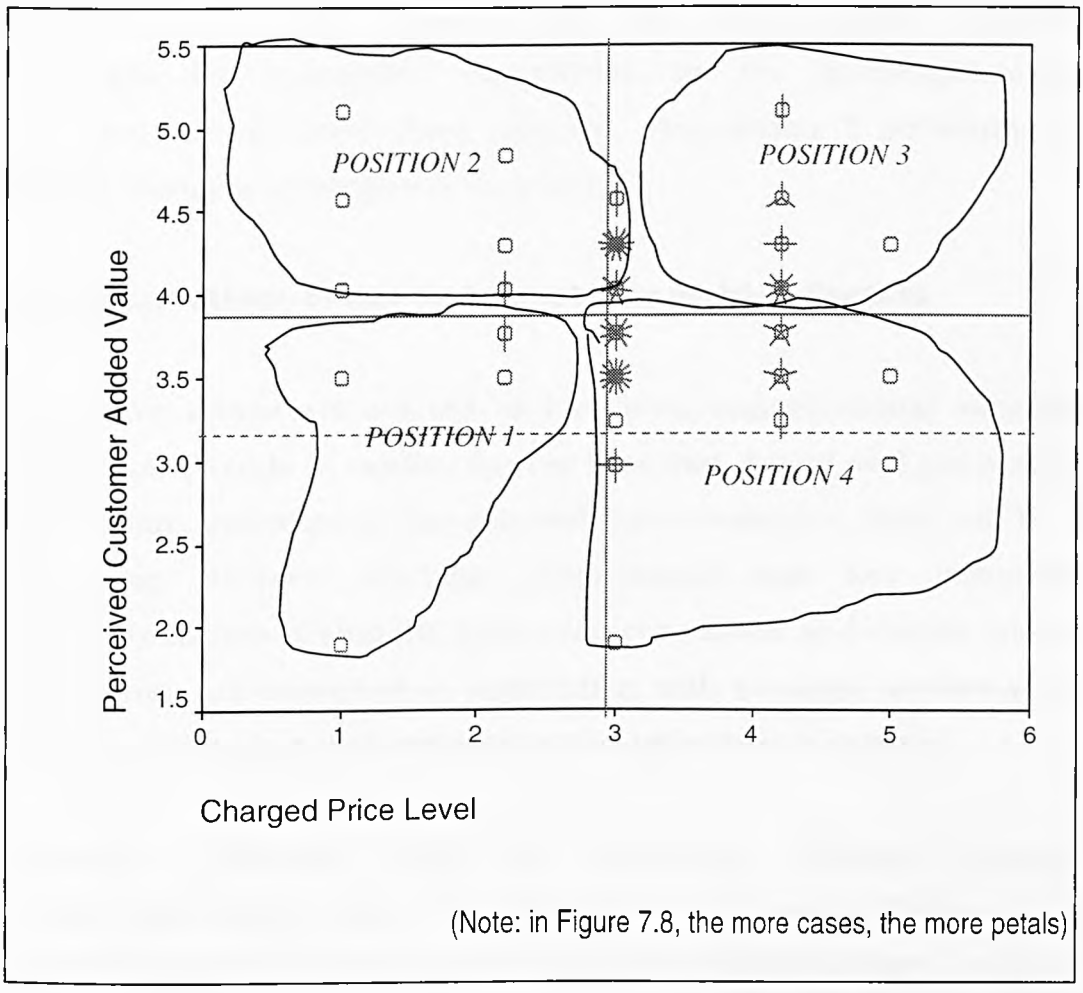
By carrying out the above procedure, it was possible to categorise five clusters of strategic competitive positions for the participating organisations. The five positions are defined as: high value premium (i.e. above the moderate level) price, high value moderate price, high value competitive (i.e. below the moderate level) price, low or moderate value low price and un-competitive value and price.

Table 7.12 Strategic Competitive Positions of the Participating Organisations

Competitive Positions	Competitive Strategy	Frequency	Percent
Low (or moderate) value competitive price	Low cost	5	5.1
High value competitive (lower than moderate) price	Hybrid	7	7.1
High value moderate price	Hybrid	28	28.6
High value premium price	Differentiation	33	33.7
Un-competitive value and price	No-purpose	25	25.5
Total		98	100.0

Using frequency statistics, the results presented in Table 7.12 show that, among 98 participating organisation, 33 were at a high value premium price competitive position, 28 high value moderate price, 7 high value competitive (lower than moderate price), 5 low (or moderate) value competitive price, and 25 un-competitive value and price. To simplify, four clusters of competitive positions were obtained (Figure 7.8).

Figure 7.8 Scatterplot: Emerged Strategic Competitive Positions



Position 1 indicates "No frills" (Johnson and Scholes, 1999) group, comprising organisations which were likely to target the Low-cost low-added-value sector, in which they believed that they would not be defended by their competitors. The price of their products or services was lower than the moderate industrial level and brought limited added value prospects. For organisations at Position 2, the quality, reliability, and safety performance of their products or services and their speed of response to clients' requirements was higher than the moderate industrial levels. They could sell their products or services at a relatively competitive price. They combined both price and value advantages. In Position 3, organisations sought to establish a premium price by providing products or services which had unique features

within their particular market segments. Position 4 indicates the organisations which employed strategies "destined for ultimate failure" (Johnson and Scholes, 1999) as they had neither value nor price advantages for successful competition in the marketplace. In conclusion of the above three sections, Proposition 7 pertaining to different business strategies is supported.

7.4.4 Observations of Key Industrial Competitive Factors

Competitive issues are related to long-term organisational success. This section intends to explore further that that, for oil and gas service organisations operating in the selected three countries, there will be a relationship between strategic performance and key industrial competitive factors. Using the Spearman correlation and rho (r) values, these factors are examined in association with strategic performance. As the prediction is not directional, a two-tailed test is selected.

A matrix is displayed giving the correlation coefficient between strategic performance and each of the five competitive factors. It is found that there is a significant position relationship between strategic performance and each of the five competitive features. For products' or services' quality valued by customers, $r = 0.25$, $p = 0.022$; for reliability of technologies of products or services, $r = 0.26$, $p = 0.018$; for safety performance of products and services, $r = 0.22$, $p = 0.044$; for speed of response to customers, $r = 0.25$, $p = 0.021$; and for price that customers are willing to pay, $r = 0.24$, $p = 0.025$ (Table 7.12). As all correlation coefficient values are positive, it can be concluded that as the level of a competitive advantage improves, there is a corresponding improvement in strategic performance. Hence, the assumption that there is a relationship between strategic performance and the defined competitive factors is supported.

Table 7.12 Key Industrial Competitive Factors and Strategic Performance

Correlations

			Quality Valued by Customers	Reliability of (Products/ Services) Technology	Safety Performance of Products/ Services	Speed of Response to Clients' Requires	Price that Customers Are Willing to Pay	Strategic Performance
Spearman's rho	Quality Valued by Customers	Correlation Coefficient	1.000	.496**	.567**	.290**	.264*	.246*
		Sig. (2-tailed)	.	.000	.000	.007	.015	.022
		N	87	85	85	85	85	87
	Reliability of (Products/Services) Technology	Correlation Coefficient	.496**	1.000	.441**	.013	.150	.256*
		Sig. (2-tailed)	.000	.	.000	.906	.171	.018
		N	85	85	85	85	85	85
	Safety Performance of Products/Services	Correlation Coefficient	.567**	.441**	1.000	.434**	.266*	.219*
		Sig. (2-tailed)	.000	.000	.	.000	.014	.044
		N	85	85	85	85	85	85
	Speed of Response to Clients' Requires	Correlation Coefficient	.290**	.013	.434**	1.000	.209	.250*
		Sig. (2-tailed)	.007	.906	.000	.	.055	.021
		N	85	85	85	85	85	85
	Price that Customers Are Willing to Pay	Correlation Coefficient	.264*	.150	.266*	.209	1.000	.244*
		Sig. (2-tailed)	.015	.171	.014	.055	.	.025
		N	85	85	85	85	85	85
	Strategic Performance	Correlation Coefficient	.246*	.256*	.219*	.250*	.244*	1.000
		Sig. (2-tailed)	.022	.018	.044	.021	.025	.
		N	87	85	85	85	85	87

**. Correlation is significant at the .01 level (2-tailed).

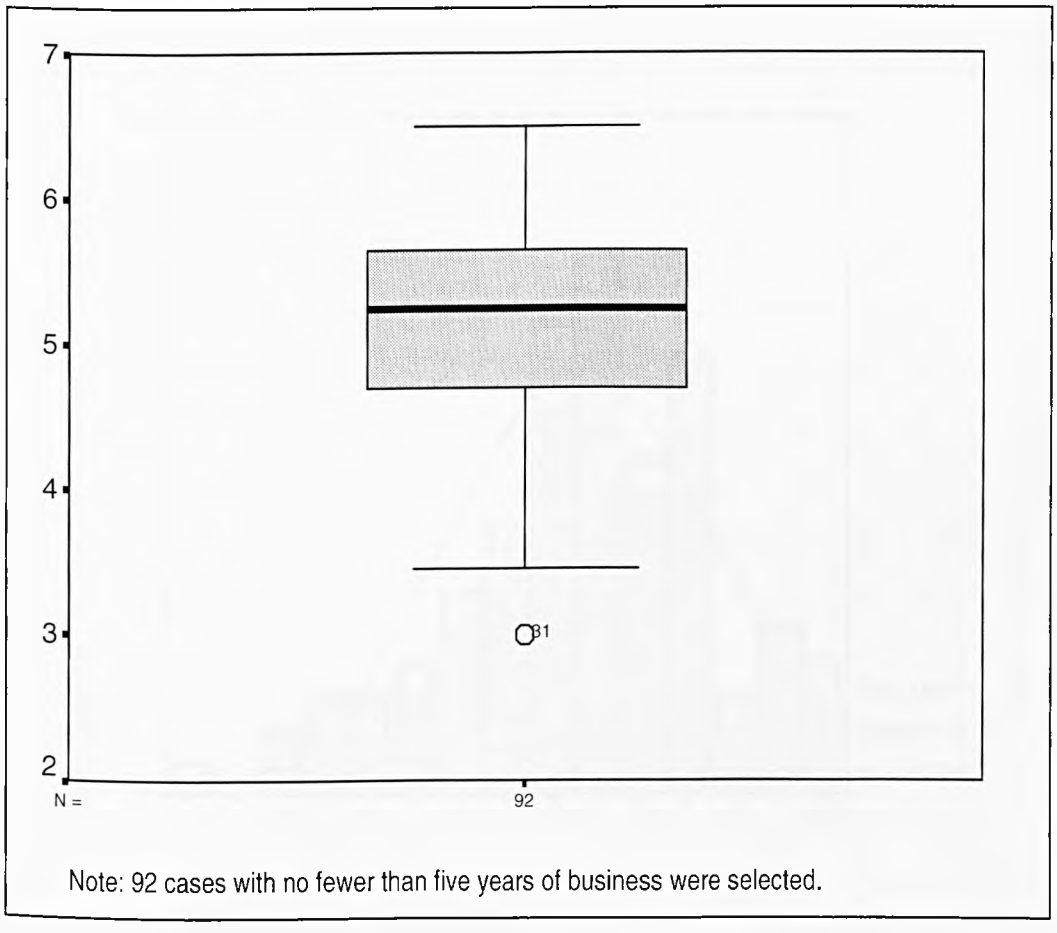
*. Correlation is significant at the .05 level (2-tailed).

Note: 11 Organisations which had been in their existing businesses for less than five years and had functional managers' responses were excluded.

7.5 Strategic Performance

The data were measured by using an interval scale. The Boxplot (Figure 7.9) for the strategic performance looks moderately symmetrical as the box is almost in the middle of the whiskers and median is only slightly above the middle of the box. This suggests that these data are only very slightly skewed and therefore the mean may be employed as the appropriate measure of central tendency (Kerr, et al., 2002)

Figure 7.9 Boxplot: Strategic Performance of the Participating Organisations

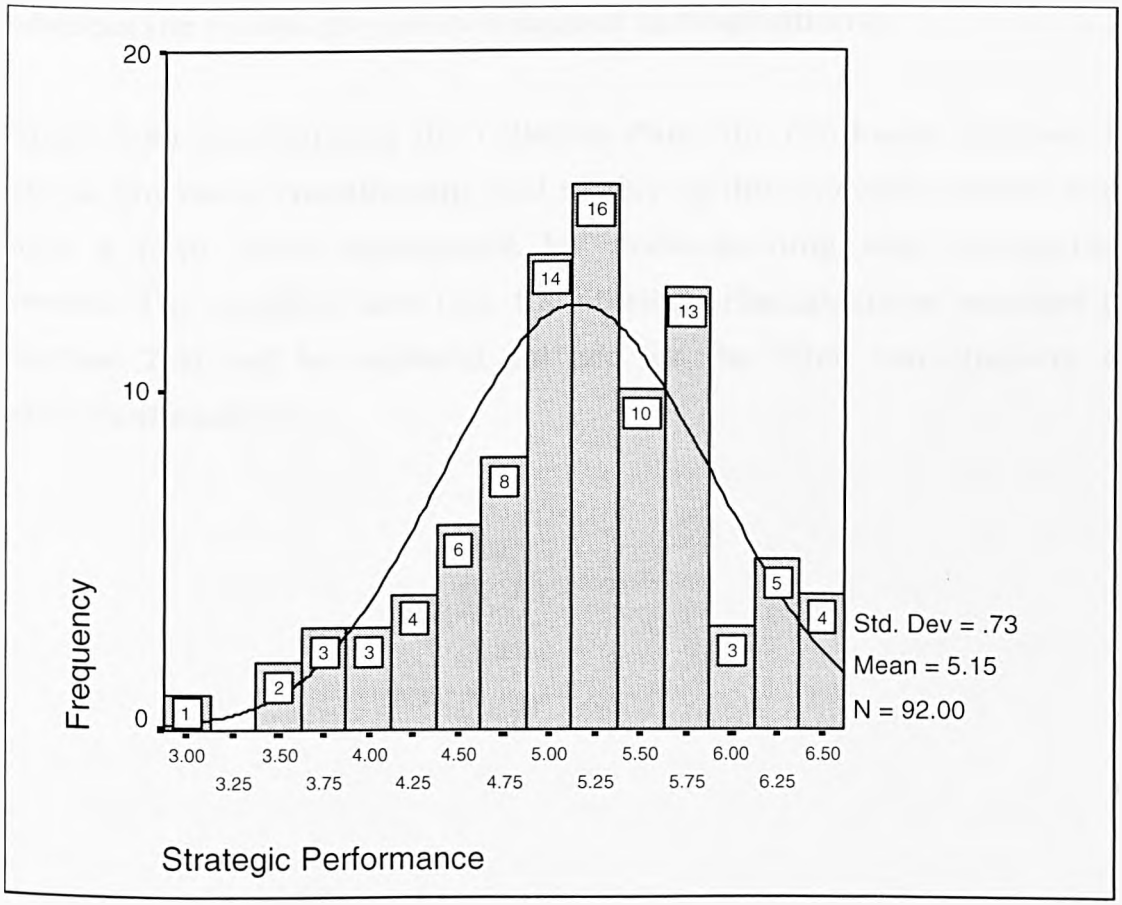


Note: 92 cases with no fewer than five years of business were selected.

Through Explore and Histogram descriptive statistics, an overall assessment of range, minimum, maximum, mean, standard derivations for the strategic performance of each of the 20 items has also been calculated. This helps to construct a picture presenting further a general trend of strategic performance within the industry. Overall, the

performance of participating organisations in each examined area became better. Using Histogram descriptive statistics, Figure 7.10 presents the distribution of strategic performance scores. The mean of the strategic performance of the 92 participating organisations with no fewer than five years of business is 5.15, indicating that more than half (the majority) of them had improved their strategic performance over a period of five years. This reflects a favourable status of oil and gas service organisations operating in China, Singapore and Malaysia.

Figure 7.10 Histogram: The Assessment of Individual Strategic Performance



7.6 Summary

This chapter is concerned with a preliminary analysis pertaining to four major contents: the background content, the perceived business environment, business strategies and strategic performance. Base on the preliminary results derived from descriptive statistics, this chapter has displayed a basic understanding on strategic management issues for the oil and gas service sector in East Asia.

While proceeding this preliminary analysis process, propositions such as 1, 2, 3 and 7 are examined. At this initial analytical stage, some conclusions can be drawn: Proposition 1, 2 and 7 are supported whereas the results give limited support to Proposition 3.

Apart from summarising the collected data, the conducted analysis is also a process of transforming and modifying the collected primary data into a form more appropriate for understanding and interpreting results. The modified data (e.g. the strategic classifications emerged in Section 7.4) will be explored further for the later two chapters of statistical analysis.

CHAPTER 8
RESEARCH RESULTS

Following the preliminary results obtained in Chapter 7, this chapter moves on to further business statistical analysis in three main phases. It starts from examining the relationships regarding the perceived business environmental characteristics. Next, the relationships pertaining to the associations between two variables (i.e. environment and strategy; strategy and performance, environment and performance) are evaluated. Then, the differences or similarities of the managerial perceptions of the business environment and strategic performance amongst different strategic options are presented.

Bivariate analysis (Kerr, et al. 2002) are applied to assess the relationships or conduct significance tests for the comparison of similarities and differences of various categories. As the data are categorical or ordinal and are not normally distributed, non-parametric methods are applied in this part of the analysis. The results pertaining to the three variables are observed and discussed. As four propositions have been investigated in Chapter 7, the rest of the propositions are examined in this chapter.

To test cognitive coherence between the perceived business environment uncertainty and the perceived dynamism, hostility and complexity, the Spearman correlation and chi-square tests are used. To evaluate the relationship between the two variables among the three dimensions of the perceived business environment, business strategic orientations and strategic performance, the Spearman correlation and Crosstabs with two-way contingency table analysis and chi-square tests are employed. To test the differences of the perceived environmental

uncertainty and strategic performance by strategic groups, the Kruskal-Wallis tests are applied. A number of Boxplot graphs and Scatter diagrams are also applied to highlight the pattern of differences and correlations.

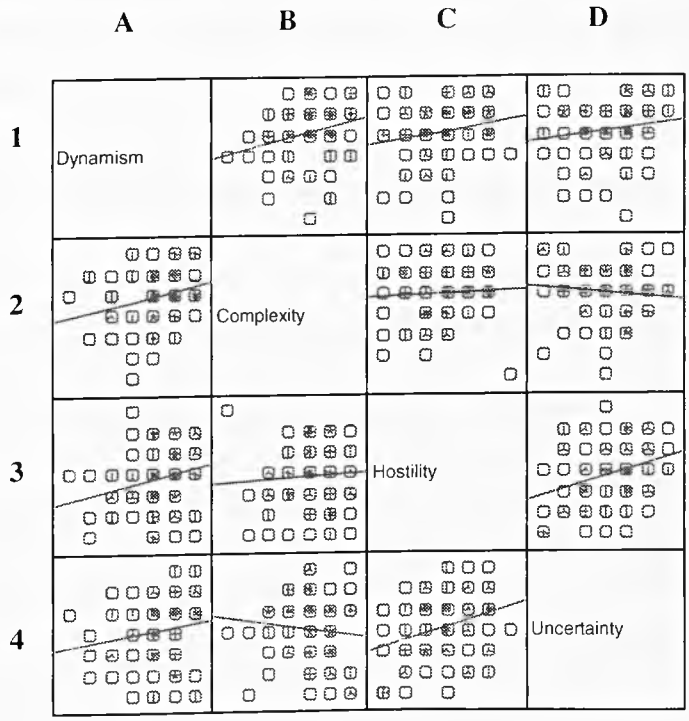
8.1 Assessment of the Business Environment in East Asia

This part of the analysis was conducted from three major aspects. Firstly, it looks at whether the perceived environmental uncertainty is associated (positively or negatively) with the perceived environmental complexity, dynamism and hostility (Proposition 4). Secondly, it intends to examine how the perceived environmental uncertainty is associated with the influence of the variables within the six task environmental sectors (Proposition 5). Thirdly, it investigates how the perceived complexity, dynamism and hostility are associated with the various environmental variables (Proposition 6). In order to do the analysis, Spearman's correlation coefficients between the two variables among the environmental characters or factors are computed.

8.1.1 Perceived Environmental Uncertainty, Complexity, Dynamism and Hostility

Before conducting correlation analyses, a scatterplot graph is plotted to look at the general trend of the data. The twelve scatterplots in Figure 8.1 represent the various combinations of each variable plotted against each other variable. Hence, the grid references represent the plots such as: A4: Perceived Uncertainty (Y) vs. Perceived Dynamism (X); C4: Perceived Uncertainty (Y) vs. Perceived Hostility (X); A2: Perceived Complexity (Y) vs. Perceived Dynamism (X) and A3: Perceived Hostility (Y) vs. Perceived Dynamism (X).

Figure 8.1 Perceived Uncertainty, Complexity, Dynamism and Hostility Correlations



(note: the more cases, the more petals)

The six scatterplots below the diagonal of the matrix are the same plots as the ones above the diagonal but with axes reversed (Field, 2000). Based on the perceptible slope shown in the matrix, there seems to be a relationship for at least three pairs of variables: the first pair is between the perceived uncertainty and the perceived dynamism; the second pair is between the perceived uncertainty and the perceived hostility; and the third one is between the perceived dynamism and the perceived complexity. It is observed that the perceived uncertainty is positively related to the perceived hostility and the perceived dynamism. Meanwhile, the perceived hostility and complexity also have a positive association with the perceived dynamism.

Having taken a preliminary glance at the data, the correlation analysis is carried out. In order to examine further whether the perceived environmental uncertainty is associated with the perceived environmental complexity, hostility and dynamism, Spearman's rho (r)

values are computed. The prediction is that the perceived uncertainty would correlate with the perceived complexity, dynamism or hostility. This hypothesis is not directed and so a two-tailed test should be selected (Field, 2000).

Table 8.1 Perceived Uncertainty, Complexity, Dynamism and Hostility

Correlations

			Percived Complexity	Perceived Dynamism	Perceived Hostility	Perceived Uncertainty
Spearman's rho	Percived Complexity	Correlation Coefficient	1.000	.236*	.064	-.144
		Sig. (2-tailed)	.	.019	.530	.157
		N	98	98	98	98
	Perceived Dynamism	Correlation Coefficient	.236*	1.000	.234*	.209*
		Sig. (2-tailed)	.019	.	.020	.039
		N	98	98	98	98
	Perceived Hostility	Correlation Coefficient	.064	.234*	1.000	.269**
		Sig. (2-tailed)	.530	.020	.	.007
		N	98	98	98	98
	Perceived Uncertainty	Correlation Coefficient	-.144	.209*	.269**	1.000
		Sig. (2-tailed)	.157	.039	.007	.
		N	98	98	98	98

*. Correlation is significant at the .05 level (2-tailed).

**. Correlation is significant at the .01 level (2-tailed).

The results (Table 8.1) show that the perceived uncertainty has a 0.209 correlation with the perceived dynamism, and a 0.269 correlation with the perceived hostility. The correlation coefficients in these samples are low but significant (p = 0.039 and 0.007). The correlation between the perceived uncertainty and complexity is not significant (p = 0.157). Hence, when the perceived hostility and dynamism are high, the perceived uncertainty also tends to be high. Another observation can be found that the perceived dynamism is associated with the perceived complexity (r = 0.236, p = 0.019) and the perceived hostility (r = 0.234, p = 0.02). In this sense, the higher the degree of the perceived uncertainty, complexity or hostility, the higher the degree of the perceived dynamism.

Hence it has proved the assumption that the higher the degree of the perceived environmental dynamism and hostility, the higher the degree of perceived uncertainty. However, the results do not support the assumption that there is a relationship between the perceived

complexity and the perceived uncertainty. This is consistent partially with the Item Analysis results presenting in Appendix A that only these four items are not considered as reliable to measure the perceived environmental uncertainty. In the context of this study, no enough evidence can be given to prove that only the three environmental dimensions (perceived complexity, dynamism, and hostility) alone can reflects the perceived uncertainty. Thus, the research results give limited support to Proposition 4. As a consequence, the perceived environmental uncertainty is measured further by assessing factors in the task environmental sectors below.

8.1.2 Perceived Environmental Uncertainty and Environmental Factors

Spearman's correlation coefficients are computed among the perceived environmental uncertainty, numbers and heterogeneity (i.e. the complexity characteristics), unpredictability (i.e. the dynamism characteristics) and resource difficulties and deterrence (i.e. the hostility characteristics) of six task environmental sectors. The results of the correlation analyses presented in Table 8.2 show that 19 correlations were statistically significant at the 0.05 or 0.01 levels. The significant relationships between the environmental uncertainty and each of the individual environmental factors gave coefficients ranging from 0.221 to 0.401, showing low positive correlations.

Regarding the numbers and heterogeneity (or the emerged complexity) of the environmental sectors, the environmental uncertainty is associated with government regulations, legislation and policies ($r = 0.221$, $p = 0.029$) and the supply conditions by suppliers ($r = 0.226$, $p = 0.026$). The results suggest that the more complicated the government regulations, legislations and policies in the region where a service organisation operates in East Asia, or the more different the supply conditions (e.g. price, quality, speed or service) provided by the

organisation's suppliers, the higher the degree of the perceived environmental uncertainty.

Table 8.2 Correlations: Perceived Uncertainty and Environmental Factors

			Uncertainty
Spearman's rho	Uncertainty	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
	Government Regulations, Legislation and Policies	Correlation Coefficient	.221*
		Sig. (2-tailed)	.029
	Similarity of Supply Conditions by Suppliers	Correlation Coefficient	.226*
		Sig. (2-tailed)	.026
	Levels of Key Customers Switching to Competitors	Correlation Coefficient	.244*
		Sig. (2-tailed)	.015
	Relationships with Customers	Correlation Coefficient	.242*
		Sig. (2-tailed)	.016
	Access to Suppliers for Materials or Goods	Correlation Coefficient	.245*
		Sig. (2-tailed)	.016
	Relationships with Suppliers	Correlation Coefficient	.262*
		Sig. (2-tailed)	.010
	Rivalry among Competitors	Correlation Coefficient	.276*
		Sig. (2-tailed)	.006
	Competitive Actions	Correlation Coefficient	.209*
		Sig. (2-tailed)	.039
	Relationships with Competitors	Correlation Coefficient	.229*
		Sig. (2-tailed)	.023
	Customer Demand for Existing Products/Services	Correlation Coefficient	.307*
		Sig. (2-tailed)	.002
	Customer Demand for Higher Quality or More Service	Correlation Coefficient	.270
		Sig. (2-tailed)	.007
	Changes in Competitive Price	Correlation Coefficient	.291*
		Sig. (2-tailed)	.004
	Suppliers Quality Reduction	Correlation Coefficient	.401**
		Sig. (2-tailed)	.000
	Changes in Oil and Gas E&P Level	Correlation Coefficient	.380**
		Sig. (2-tailed)	.000
	Changes in Well Counts	Correlation Coefficient	.230*
		Sig. (2-tailed)	.024
	Changes in Rig Counts	Correlation Coefficient	.283*
		Sig. (2-tailed)	.006
	Rate of Technological Diffusion	Correlation Coefficient	.282*
		Sig. (2-tailed)	.005
	Changes in National Regulations and Legislation	Correlation Coefficient	.301**
		Sig. (2-tailed)	.003
	Changes in Local Government Policies	Correlation Coefficient	.250*
		Sig. (2-tailed)	.013

* Correlation is significant at the .05 level (2-tailed).
** Correlation is significant at the .01 level (2-tailed).

Pertaining to the difficulties of resource availability and resource deterrence (i.e. the emerged hostility), the perceived uncertainty is

associated with seven factors: key customers switching to competitors ($r = 0.244$, $p = 0.015$), customer's relationship ($r = 0.242$, $p = 0.016$), access to suppliers for materials or goods ($r = 0.245$, $p = 0.016$), relationship with suppliers ($r = 0.262$, $p = 0.01$), rivalry among competitors ($r = 0.276$, $p = 0.006$), competitive actions ($r = 0.209$, $p = 0.039$) and competitor's relationship ($r = 0.229$, $p = 0.023$). Hence, the difficulties of resource availability and resource deterrence in the six task environmental sectors may be the occasion of the business environmental uncertainty. If the level of perceived hostility (difficulty) of each of these seven environmental factors becomes higher, the degree of the business environmental uncertainty perceived by the service executives also tends to be higher.

For the environmental unpredictability (i.e. the emerged dynamism characteristics) the perceived uncertainty is associated with ten environmental factors. These uncertainty related variables include: customer demand for existing products or services ($r = 0.307$, $p = 0.002$), customer demand for higher quality or more service ($r = 0.27$, $p = 0.007$), changes in the competitors' competitive price ($r = 0.291$, $p = 0.004$), the reduction of suppliers' quality ($r = 0.401$, $p < 0.001$), changes in the oil and gas exploration and production level ($r = 0.38$, $p < 0.000$), changes in well counts ($r = 0.23$, $p = 0.024$), changes in rig counts ($r = 0.283$, $p = 0.006$), rate of technological diffusion ($r = 0.282$, $p = 0.005$), changes in national regulations and legislation ($r = 0.301$, $p = 0.003$) and changes in local government policies ($r = 0.25$, $p = 0.013$).

The above results suggest that any unpredictability of the changes emerging in the six task environment sectors (i.e. regulatory, technological, economical, customers, competitors and suppliers) may result in the uncertainty of the business environment in which service organisations operate. If the level of the unpredictability of each of these environmental factors becomes higher, the degree of the business

environmental uncertainty perceived by the service executives also tends to be higher.

Hence, four comments can be addressed. Firstly, the more easily the customers switch to another competitor's products or services, the higher the degree of the environmental uncertainty. Secondly, the perceived environmental uncertainty is also associated with the nature of organisational relationships. The better the relationships with clients, or the more supportive the relationships with suppliers, or the more collaborative the relationships with competitors, the higher the level of the environmental certainty perceived by the service executives. Thirdly, when access to suppliers for obtaining available raw material or standard goods and services is more difficult, the perceived uncertainty also becomes higher. Fourthly, when the rivalry among the competitors within the service sector in which an organisation operates is more turbulent, or competitive actions adopted by firms within the service sector are more unreasonable, the managerial perceptions on the business environment tend to be more uncertain.

The above results provide evidence to support the assumption that the perceived uncertainty is associated with individual environmental factors. In general, the greater the diversity (in numbers of customers, suppliers and technology, etc) associated with an environmental factor, the higher the degree of the perceived environmental uncertainty. The higher the degree of perceived environmental unpredictability, the higher the degree of the perceived environmental uncertainty. The higher the degree of the difficulties with regard to resources availability and resource deterrence, the higher the degree of the perceived environmental uncertainty. Proposition 5 is supported by these results.

8.1.3 Perceived Environmental Dimensions and Associated Environmental Factors

Spearman's rho values indicating the perceived environmental complexity and associated environmental factors are presented in Table 8.3. The perceived complexity has a significant correlation with the variable of "economic knowledge required" ($r = 0.396$, $p < 0.001$), a significant correlation with the variable of "technological level" ($r = 0.386$, $p < 0.001$), and a significant correlation with the variable of "customers' needs and preferences" ($r = 0.226$, $p < 0.001$). This is consistent with the findings obtained in Chapter 7.

There is a tie between the perceived environmental complexity and the sophisticated economic knowledge required, the technological level and diversification of customers' needs and preferences. This means that the more sophisticated the knowledge required to understand the economic situation, the more complex the perceived business environment; the higher the degree of the level of technology involved in the oil and gas service sector in which an organisation operates, the more complex the perceived business environment; and the more different the needs and preferences of the oil and gas clients whom the organisation serves, the more complex the perceived business environment. A conclusion can thereby be reached. For the oil and gas service organisations in East Asian countries like China, Singapore and Malaysia, the perceived environmental complexity is associated with the level of technologies existing in the industry, the customer related factors and oil economic conditions.

Spearman's rho values indicating the perceived environmental hostility and associated environmental factors are presented in Table 8.4. The results show that the perceived hostility has a positive correlation with the variable of "relationships with customers" ($r = 0.354$, $p < 0.001$); and a positive correlation with the variable of "rivalry among competitors" ($r = 0.284$, $p < 0.001$).

Table 8.3 Perceived Complexity and Environmental Factors

Correlations

			Complexity	Economics Knowledge Required	Technological Level	Similarity of Industrial Products/ Services	Government Regulations, Legislation and Policies	Number of Oil and Gas Clients	Needs and Preferences of Oil and Gas Clients	Number of Suppliers	Similarity of Supply Conditions by Suppliers	Number of Firms within the Industry Sector	Scope of Firms within the Industry Sector
Spearman's rho	Complexity	Correlation Coefficien	1.000	.396**	.386**	.104	.063	-.130	.226*	.068	.089	.140	.085
		Sig. (2-tailed)	.	.000	.000	.310	.536	.201	.026	.507	.383	.169	.407
		N	98	98	98	98	98	98	98	97	97	98	98
	Economics Knowledge Required	Correlation Coefficien	.396**	1.000	.390**	-.011	.099	-.060	.240*	.310**	.034	.240*	-.044
		Sig. (2-tailed)	.000	.	.000	.916	.333	.555	.017	.002	.738	.017	.669
		N	98	98	98	98	98	98	98	97	97	98	98
	Technological Level	Correlation Coefficien	.386**	.390**	1.000	-.034	.046	.029	.188	.251*	.061	-.039	.109
		Sig. (2-tailed)	.000	.000	.	.741	.649	.779	.064	.013	.555	.701	.284
		N	98	98	98	98	98	98	98	97	97	98	98
	Similarity of Industrial Products/Services	Correlation Coefficien	.104	-.011	-.034	1.000	.075	-.005	.282*	.013	.081	.273*	-.246*
		Sig. (2-tailed)	.310	.916	.741	.	.464	.959	.005	.900	.430	.007	.015
		N	98	98	98	98	98	98	98	97	97	98	98
	Government Regulations Legislation and Policies	Correlation Coefficien	.063	.099	.046	.075	1.000	-.059	.124	.046	.114	.034	-.037
		Sig. (2-tailed)	.536	.333	.649	.464	.	.562	.224	.657	.268	.739	.715
		N	98	98	98	98	98	98	98	97	97	98	98
	Number of Oil and Gas Clients	Correlation Coefficien	-.130	-.060	.029	-.005	-.059	1.000	.018	.193	-.006	.076	-.084
		Sig. (2-tailed)	.201	.555	.779	.959	.562	.	.858	.058	.953	.459	.411
		N	98	98	98	98	98	98	98	97	97	98	98
	Needs and Preferences of Oil and Gas Clients	Correlation Coefficien	.226*	.240*	.188	.282*	.124	.018	1.000	-.006	-.008	.164	-.071
		Sig. (2-tailed)	.026	.017	.064	.005	.224	.858	.	.956	.940	.106	.486
		N	98	98	98	98	98	98	98	97	97	98	98
	Number of Suppliers	Correlation Coefficien	.068	.310**	.251*	.013	.046	.193	-.006	1.000	.306**	.346**	.028
		Sig. (2-tailed)	.507	.002	.013	.900	.657	.058	.956	.	.002	.001	.788
		N	97	97	97	97	97	97	97	97	97	97	97
	Similarity of Supply Conditions by Suppliers	Correlation Coefficien	.089	.034	.061	.081	.114	-.006	-.008	.306**	1.000	.227*	-.073
		Sig. (2-tailed)	.383	.738	.555	.430	.268	.953	.940	.002	.	.025	.475
		N	97	97	97	97	97	97	97	97	97	97	97
	Number of Firms within the Industry Sector	Correlation Coefficien	.140	.240*	-.039	.273*	.034	.076	.164	.346**	.227*	1.000	.059
		Sig. (2-tailed)	.169	.017	.701	.007	.739	.459	.106	.001	.025	.	.566
		N	98	98	98	98	98	98	98	97	97	98	98
	Scope of Firms within the Industry Sector	Correlation Coefficien	.085	-.044	.109	-.246*	-.037	-.084	-.071	.028	-.073	.059	1.000
		Sig. (2-tailed)	.407	.669	.284	.015	.715	.411	.486	.788	.475	.566	.
		N	98	98	98	98	98	98	98	97	97	98	98

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

Table 8.4 Perceived Hostility and Environmental Factors

Correlations

		Hostility	Size of Market Demand	National Government Regulations and Legislation	Local Government Policies	Relationship with Government	Levels of Key Customers Switching to Competitors	Relationship with Customers	Access to Suppliers for Materials or Goods	Relationship with Suppliers	Entry Barriers	Rivalry among Competitors	Competitive Actions	Relationship with Competitors
Spearman's rho Hostility	Correlation Coefficien	1.000	.107	.142	-.011	.026	.019	.354**	.173	.105	.095	.284*	.139	.149
	Sig. (2-tailed)	.	.292	.164	.916	.797	.851	.000	.092	.308	.354	.005	.171	.143
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Size of Market Demand	Correlation Coefficien	.107	1.000	.237*	.319**	.281**	-.085	.443**	.148	.291**	.172	-.092	-.027	.288**
	Sig. (2-tailed)	.292	.	.019	.001	.005	.407	.000	.151	.004	.089	.367	.789	.004
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
National Government Regulations and Legislation	Correlation Coefficien	.142	.237*	1.000	.526**	.189	.147	.147	.156	-.026	.187	.181	.199*	.080
	Sig. (2-tailed)	.164	.019	.	.000	.063	.150	.148	.130	.799	.066	.074	.050	.431
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Local Government Policies	Correlation Coefficien	-.011	.319**	.526**	1.000	.370**	.173	.147	.082	.064	.250*	.094	.192	.057
	Sig. (2-tailed)	.916	.001	.000	.	.000	.089	.147	.429	.535	.013	.359	.059	.575
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Relationship with Government	Correlation Coefficien	.026	.281**	.189	.370**	1.000	.247*	.303**	.057	.197	.129	-.029	.065	.159
	Sig. (2-tailed)	.797	.005	.063	.000	.	.014	.002	.578	.054	.207	.774	.527	.118
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Levels of Key Customer Switching to Competitor	Correlation Coefficien	.019	-.085	.147	.173	.247*	1.000	.023	-.060	-.050	-.055	.286*	.083	.039
	Sig. (2-tailed)	.851	.407	.150	.089	.014	.	.820	.564	.630	.592	.004	.419	.704
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Relationship with Customers	Correlation Coefficien	.354**	.443**	.147	.147	.303**	.023	1.000	.038	.441**	.082	-.055	.046	.226*
	Sig. (2-tailed)	.000	.000	.148	.147	.002	.820	.	.713	.000	.423	.590	.652	.026
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Access to Suppliers for Materials or Goods	Correlation Coefficien	.173	.148	.156	.082	.057	-.060	.038	1.000	.268**	.206*	.265*	.188	.169
	Sig. (2-tailed)	.092	.151	.130	.429	.578	.564	.713	.	.008	.044	.009	.066	.100
	N	96	96	96	96	96	96	96	96	96	96	96	96	96
Relationship with Suppliers	Correlation Coefficien	.105	.291**	-.026	.064	.197	-.050	.441**	.268**	1.000	.089	-.003	-.048	.277**
	Sig. (2-tailed)	.308	.004	.799	.535	.054	.630	.000	.008	.	.389	.975	.645	.006
	N	96	96	96	96	96	96	96	96	96	96	96	96	96
Entry Barriers	Correlation Coefficien	.095	.172	.187	.250*	.129	-.055	.082	.206*	.089	1.000	.158	.198	.162
	Sig. (2-tailed)	.354	.089	.066	.013	.207	.592	.423	.044	.389	.	.120	.051	.112
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Rivalry among Competitors	Correlation Coefficien	.284**	-.092	.181	.094	-.029	.286**	-.055	.265*	-.003	.158	1.000	.505**	.322**
	Sig. (2-tailed)	.005	.367	.074	.359	.774	.004	.590	.009	.975	.120	.	.000	.001
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Competitive Actions	Correlation Coefficien	.139	-.027	.199*	.192	.065	.083	.046	.188	-.048	.198	.505**	1.000	.434**
	Sig. (2-tailed)	.171	.789	.050	.059	.527	.419	.652	.066	.645	.051	.000	.	.000
	N	98	98	98	98	98	98	98	96	96	98	98	98	98
Relationship with Competitors	Correlation Coefficien	.149	.288**	.080	.057	.159	.039	.226*	.169	.277**	.162	.322**	.434**	1.000
	Sig. (2-tailed)	.143	.004	.431	.575	.118	.704	.026	.100	.006	.112	.001	.000	.
	N	98	98	98	98	98	98	98	96	96	98	98	98	98

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

As such, the better the relationships of an oil and gas service organisation with its key oil and gas clients, the more pleasant the business environment perceived by its senior executives; the more turbulent the rivalry among the competitors within the service sector of an organisation, the more unpleasant the business environment perceived by the senior executives of the organisation. Hence, the perceived environmental hostility is associated with relevant customers' and competitors' conditions.

To examine the perceived dynamism and associated environmental factors, Spearman's rho values are presented in Table 8.5. The results also indicate that the perceived dynamism is significantly associated with the oil and gas economic conditions. The perceived dynamism has a 0.215 significant correlation with the variable of "changes in oil and gas E&P (Exploration and Production) level" ($p = 0.034$); a 0.261 significant correlation with the variable of "changes in rig counts" ($p = 0.011$); and a 0.174 marginally significant correlation with the variable of "changes in well counts" ($p = 0.087$). As a result, if the unpredictability of changes in the oil and gas E&P levels, well counts and rig counts becomes higher, the business environment in which a service organisation operates is perceived to be more dynamic.

It is found that the perceived environmental dynamism has nothing to do with the variables of the other task environmental sectors, as their associations shown in the table are not significant. This means that, from year to year, even though details of changes in the regulatory, technological, customers', suppliers' and competitors' conditions cannot be forecast, each of the remaining task environmental sectors is not subject to a dynamic situation. The final conclusion is that, for the oil and gas service organisations in East Asian countries like China, Singapore and Malaysia, the perceived environmental dynamism is in association with the unpredictability of the oil economic conditions.

Table 8.5 Correlations: Perceived Dynamism and Environmental Factors

			Perceived Dynamism
Spearman's rho	Perceive Dynamism	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	98
	Customer Demand for Existing Products/Services	Correlation Coefficient	-.036
		Sig. (2-tailed)	.721
		N	98
	Customer Demand for New Products/Services	Correlation Coefficient	-.137
		Sig. (2-tailed)	.180
		N	98
	Customer Demand for Higher Quality or More Service	Correlation Coefficient	-.149
		Sig. (2-tailed)	.142
		N	98
	Customer Preference for Lower Prices	Correlation Coefficient	.059
		Sig. (2-tailed)	.562
		N	98
	Changes in Competitive Price	Correlation Coefficient	-.009
		Sig. (2-tailed)	.933
		N	98
	Competitors' Quality Improvement	Correlation Coefficient	.017
		Sig. (2-tailed)	.867
		N	98
	Competitors' Introduction of New Products/Services	Correlation Coefficient	.143
		Sig. (2-tailed)	.160
		N	98
	Suppliers Rising Prices	Correlation Coefficient	-.070
		Sig. (2-tailed)	.495
		N	97
	Suppliers Quality Reduction	Correlation Coefficient	.086
		Sig. (2-tailed)	.401
		N	97
	Suppliers Introduction of New Materials or Standard Products	Correlation Coefficient	-.011
		Sig. (2-tailed)	.913
		N	97
	Changes in Oil and Gas E&P Level	Correlation Coefficient	.215*
		Sig. (2-tailed)	.034
		N	98
	Changes in Well Counts	Correlation Coefficient	.174(a)
		Sig. (2-tailed)	.087
		N	97
	Changes in Rig Counts	Correlation Coefficient	.261*
		Sig. (2-tailed)	.011
		N	95
	Technological Changes	Correlation Coefficient	-.011
		Sig. (2-tailed)	.918
		N	97
	Rate of Technological Diffusion	Correlation Coefficient	.150
		Sig. (2-tailed)	.142
		N	97
	Changes in National Regulations and Legislation	Correlation Coefficient	.016
		Sig. (2-tailed)	.872
		N	98
	Changes in Local Government Policies	Correlation Coefficient	-.017
		Sig. (2-tailed)	.867
		N	98

(a) Correlation is marginally significant at the 0.10 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed).

** Correlation is significant at the .01 level (2-tailed).

Based upon the above analysis, the level of perceived environmental complexity, dynamism and hostility is associated with the influences of the task environmental factors for the oil and gas service sector in East Asia. Hence, Proposition 6 is supported by the research results.

8.2 Business Environment and Strategic Alignment

For oil and gas service organisations operating in East Asia, the managerial perceptions of the business environmental uncertainty will vary in associating with the types of business strategies (Proposition 8). In order to investigate the assumptions regarding the association between the strategic options and the perceived environmental uncertainty, the chi-square tests with Crosstabs are applied. Where appropriate, to test the strength of association, Cramer's v values are used as each of the two variables has more than two categories.

8.2.1 Perceived Uncertainty with Generic Business Strategies

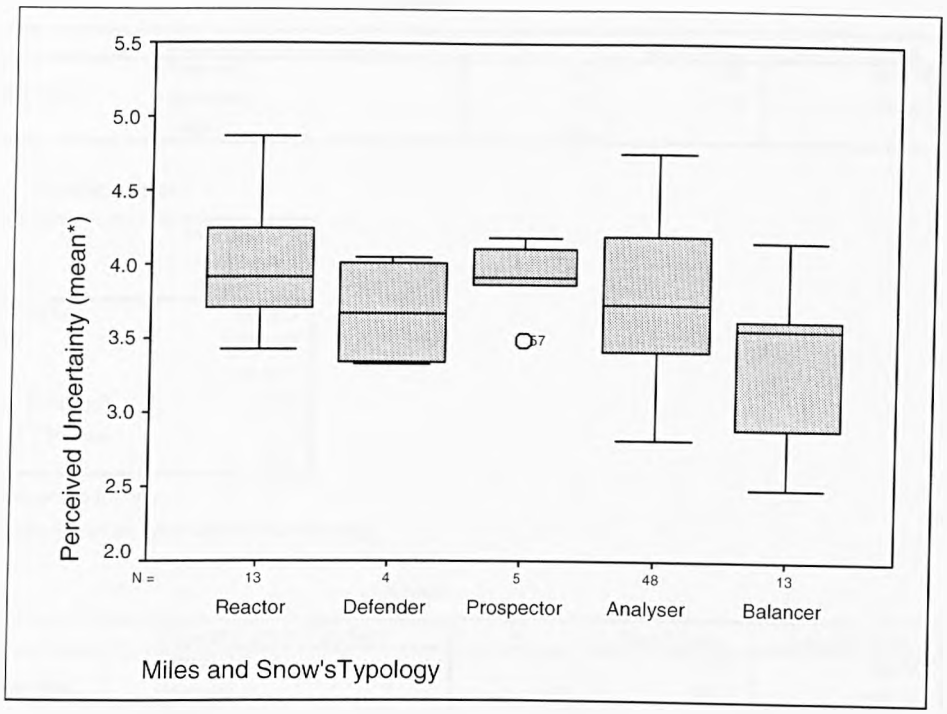
In this section, the comparison of perceived uncertainty amongst strategic groups is explored firstly. It is assumed that for oil and gas service organisations pursuing different strategies, their perceptions of the environmental uncertainty would be different. There are five strategic groups of the independent variable. The five groups are defined as: Group 1 – Reactors, Group 2 – Defenders, Group 3 – Prospectors, Group 4 – Analysers and Group 5 – Balancers. The null hypothesis is that all the medians of the perceived environmental uncertainty are equal.

In order to examine whether the perceived environmental uncertainty differed for the participating service organisations with different strategic options, a Boxplot graph is used to explore the results informatively (Figure 8.2a). Balancers appeared to have a relatively lower degree of perceived environmental uncertainty than that of the organisations in other strategic

categories as they had lowest medians. Reactors and Prospectors tended to have a higher level of perceived uncertainty. The managerial perception of Defenders and Analysers on the environmental uncertainty was relatively lower than that of Reactors and Prospectors.

The Kruskal-Wallis test (Figure 8.2b) indicates that there is a marginally significant difference in the medians, χ^2 (4, N = 83) = 8.308, p = 0.081. This means that the hypothesis that all the medians of perceived environmental uncertainty amongst different strategic groups are equal can be rejected at the 10 per cent significant level. Because the overall test is significant, pairwise comparisons among the five groups were conducted. Using the Mann-Whitney U tests (Figure 8.2c), three pairs of comparisons between the two of the five groups are significant different: Group 5 and 1, 3, 4 respectively. No significant results were obtained to prove significant differences between Group 2, the Defenders and Group 5, the Balancers. Obviously, Balancers had a significantly different perception of the environmental uncertainty from the organisations in other categories of business strategies. Compared with Reactors, Prospectors and Analysers, the degree of environmental uncertainty perceived by Balancers was lower. However, Balancers and Defenders shared similar views on the degree of the perceived uncertainty. As a result, Balancers felt relatively more comfortable with the business environment than Prospectors, Reactors and Analysers did. The results do not provide sufficient evidence to reject the hypothesis that medians of the perceived environmental uncertainty amongst Reactor, Defender, Prospector and Analyser strategic groups are equal. This suggests that for organisations having any of the four types of strategies, their managerial perceptions on the uncertainty of the business environment may not be dissimilar.

Figure 8.2a Boxplot:
Comparisons of Perceived Uncertainty with Generic Business Strategies



(* In order to obtain a picture to better distinguish different levels of the perceived uncertainty by Miles and Snow's typology, the mean value of the assessment of environmental factors is adopted for assigning the perceived uncertainty).

Figure 8.2b Kruskal-Wallis Test:
Perceived Uncertainty and Generic Business Strategies (N = 83)[c]

Ranks

	Miles and Snow Typology	N	Mean Rank
Perceived Uncertainty (mean)	Reactor	13	52.65
	Defender	4	35.50
	Prospector	5	50.70
	Analyser	48	42.71
	Balancer	13	27.38
	Total	83	

Test Statistics [a,b]

	Perceived Uncertainty (mean)
Chi-Square	8.308
df	4
Asymp. Sig.	.081

a. Kruskal Wallis Test

b. Grouping Variable: Miles and Snow Typology

c. Organisations which were less than five years old were omitted as it was decided to evaluate strategic performance over the period of at least five years. In order to avoid a biased assessment, responses of the functional managers and from other countries were also omitted. As a result, totally 83 organisations were selected to run this test.

Figure 8.2c Mann-Whitney U Tests: Generic Business Strategies and Perceived Uncertainty

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Perceived Uncertainty (mean)	Reactor	13	17.27	224.50
	Balancer	13	9.73	126.50
	Total	26		

Test Statistics [b]

	Perceived Uncertainty (mean)
Mann-Whitney U	35.500
Wilcoxon W	126.500
Z	-2.514
Asymp. Sig. (2-tailed)	.012
Exact Sig. [2*(1-tailed Sig.)]	.010[a]

a. Not corrected for ties.

b. Grouping Variable: Miles and Snow Typology

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Perceived Uncertainty (mean)	Prospector	5	13.10	65.50
	Balancer	13	8.12	105.50
	Total	18		

Test Statistics [b]

	Perceived Uncertainty (mean)
Mann-Whitney U	14.500
Wilcoxon W	105.500
Z	-1.776
Asymp. Sig. (2-tailed)	.076
Exact Sig. [2*(1-tailed Sig.)]	.075[a]

a. Not corrected for ties.

b. Grouping Variable: Miles and Snow Typology

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Perceived Uncertainty (mean)	Analyser	48	33.45	1605.50
	Balancer	13	21.96	285.50
	Total	61		

Test Statistics [a]

	Perceived Uncertainty (mean)
Mann-Whitney U	194.500
Wilcoxon W	285.500
Z	-2.070
Asymp. Sig. (2-tailed)	.038

a. Grouping Variable: Miles and Snow Typology

A two-way contingency table analysis is conducted to evaluate whether strategic options are related to the different levels of the environmental uncertainty (Table 8.6). Most of Prospectors (60 per cent), Analysers (52.5 per cent) and Reactors (61.5 per cent) perceived that the business environment was uncertain. If the two categories of Defenders and Prospectors are combined, then the results show that most of the single strategic type perceived that the business environment was uncertain (i.e. 55.6 per cent of Defenders and Prospectors). Conversely, most of Balancers (52.9 per cent) - nine out of seventeen - perceived that the business environment was certain.

Before moving on to look at the test statistics it is vital to check that the assumption for chi-square has been met (Field, 2000). The assumption is that in 5×3 tables, all expected counts should be greater than 5. When looking at the expected counts in the crosstabulation table, it is clear that the smallest expected count is 0.70 (for Defenders which perceived the business environment at the neutral point between certain and uncertain).

This value is much smaller than 5 due to the very small numbers in the categories of Defenders and Prospectors. In total, nine cells (60 per cent) have expected counts less than 5 and so the assumption has not been met. In order to resolve this, combining categories of each variable for more data becomes necessary to boost the proportion of cases falling into each category.

The combined categories of the first variable are non-multiple business strategy users (i.e. Prospectors, Defenders and Reactors) and multiple business strategy users (i.e. Balancers and Analysers); the combined categories of the second variable are uncertainty (i.e. tend to be uncertain, uncertain and very uncertain) and not uncertain (i.e. neutral, tend to be certain, certain and very certain).

Table 8.6 Selected SPSS Output for Strategies-Environment Relations

Miles and Snow Typology * Perceived Uncertainty Crosstabulation

			Perceived Uncertainty			
			tend to be uncertain, uncertain, very unceratain	neutral between certain and uncertain	very certain, certain, tend to be certain	Total
Miles and Snow Typology	Reactor	Count	8	2	3	13
		Expected Count	6.5	2.1	4.4	13.0
		% within Miles and Snow Typology	61.5%	15.4%	23.1%	100.0%
		% within Perceived Uncertainty	16.3%	12.5%	9.1%	13.3%
		% of Total	8.2%	2.0%	3.1%	13.3%
	Defender	Count	2	1	1	4
		Expected Count	2.0	.7	1.3	4.0
		% within Miles and Snow Typology	50.0%	25.0%	25.0%	100.0%
		% within Perceived Uncertainty	4.1%	6.3%	3.0%	4.1%
		% of Total	2.0%	1.0%	1.0%	4.1%
	Prospector	Count	3	1	1	5
		Expected Count	2.5	.8	1.7	5.0
		% within Miles and Snow Typology	60.0%	20.0%	20.0%	100.0%
		% within Perceived Uncertainty	6.1%	6.3%	3.0%	5.1%
		% of Total	3.1%	1.0%	1.0%	5.1%
	Analyser	Count	31	9	19	59
		Expected Count	29.5	9.6	19.9	59.0
		% within Miles and Snow Typology	52.5%	15.3%	32.2%	100.0%
		% within Perceived Uncertainty	63.3%	56.3%	57.6%	60.2%
		% of Total	31.6%	9.2%	19.4%	60.2%
	Balancer	Count	5	3	9	17
		Expected Count	8.5	2.8	5.7	17.0
		% within Miles and Snow Typology	29.4%	17.6%	52.9%	100.0%
		% within Perceived Uncertainty	10.2%	18.8%	27.3%	17.3%
		% of Total	5.1%	3.1%	9.2%	17.3%
Total		Count	49	16	33	98
		Expected Count	49.0	16.0	33.0	98.0
		% within Miles and Snow Typology	50.0%	16.3%	33.7%	100.0%
		% within Perceived Uncertainty	100.0%	100.0%	100.0%	100.0%
		% of Total	50.0%	16.3%	33.7%	100.0%

A chi-square test (Table 8.7) was used to determine whether there is an association between two categorical variables (i.e. generic strategic directions and the perceived environmental uncertainty). As the significance value is 0.247 then the hypothesis that the variables are independent is not rejected and the hypothesis that they are in some way related cannot be accepted. Hence, generic business strategies do not provide any hints

whether or not the perceived business environment could be uncertain. The obtained results are thereby not able to support Proposition 8 that, for oil and gas service organisations operating in East Asia, managerial perceptions of the business environmental uncertainty vary in associating with the types of their strategic orientations.

Table 8.7 Perceived Uncertainty - Types of Business Strategy Crosstabulation

			Types of Business Strategy		
			Non-multiple Business Strategy	Mutiple Business Strategy	Total
Perceived Uncertainty	uncertainty	Count	13	31	44
		Expected Count	10.6	33.4	44.0
		% within Perceived Uncertainty	29.5%	70.5%	100.0%
		% within Miles and Snow Simplify	59.1%	44.9%	48.4%
		% of Total	14.3%	34.1%	48.4%
	not uncertainty	Count	9	38	47
		Expected Count	11.4	35.6	47.0
		% within Perceived Uncertainty	19.1%	80.9%	100.0%
		% within Miles and Snow Simplify	40.9%	55.1%	51.6%
		% of Total	9.9%	41.8%	51.6%
Total		Count	22	69	91
		Expected Count	22.0	69.0	91.0
		% within Perceived Uncertainty	24.2%	75.8%	100.0%
		% within Miles and Snow Simplify	100.0%	100.0%	100.0%
		% of Total	24.2%	75.8%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.340[b]	1	.247		
Continuity Correction[a]	.833	1	.361		
Likelihood Ratio	1.344	1	.246		
Fisher's Exact Test				.328	.181
Linear-by-Linear Association	1.325	1	.250		
N of Valid Cases	91				

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.64.

8.2.2 Perceived Uncertainty with Competitive Strategies and Strategic Positions

A two-way contingency table analysis was conducted to evaluate whether generic competitive strategies were related to the different levels of the environmental uncertainty (Table 8.8). It was observed that most of Differentiation organisations perceived that the business environment was uncertain (56.3 per cent); and most of the participating organisations which perceived the business environment as uncertain pursued a Differentiation strategy (55.1 per cent). Three out of five Low Cost organisations and five out nine No-purpose organisations perceived the business environment as uncertain. For Hybrid organisations, the managerial views on the business environment were fragmented as 38.9 per cent of the organisations fell into the uncertainty category, 33.3 per cent fell into the certainty category and 27.8 per cent in the neutral point category. In short, most of the organisations in each category of competitive strategies perceived the business environment as having an uncertain character.

However, six cells (50 per cent) in the above 4×3 crosstabulation table were seen to have expected counts less than five and so the assumption that all expected counts should be greater than five has not been met in this case. Even though the categories were combined, the number of expected counts was still not enough for a reliable chi-square test. Hence, whether there is an association between two categorical variables of competitive strategies and the perceived environmental uncertainty cannot be examined. There is not enough evidence to prove the hypothesis that the two variables (competitive strategies and the levels of perceived uncertainty) are independent and the hypothesis that they are in some way related.

To examine whether there is a relationship between the strategically competitive positions and the perceived environmental uncertainty, the same contingency table was applied. Similarly, the assumption that all expected counts should be greater than five has not been met because four cells (33.3 per cent) have expected counts less than five. Even combing

categories, the number of expected counts was also not enough for a reliable chi-square test. As such, the hypothesis that the two variables (strategic positions and the levels of perceived uncertainty) are independent cannot be investigated as well.

Table 8.8 Selected SPSS Output for Competitive Strategies - Environment Relations

Competitive Strategy By Porter * Perceived Uncertainty Crosstabulation

			Perceived Uncertainty			
			tend to be uncertain, uncertain, very unceratain	neutral between certain and uncertain	very certain, certain, tend to be certain	Total
Competitive Strategy By Porter	Low Cost	Count	3	0	2	5
		Expected Count	2.5	.8	1.7	5.0
		% within Competitive Strategy By Porter	60.0%	.0%	40.0%	100.0%
		% within Perceived Uncertainty	6.1%	.0%	6.1%	5.1%
		% of Total	3.1%	.0%	2.0%	5.1%
	Differentiation	Count	27	5	16	48
		Expected Count	24.0	7.8	16.2	48.0
		% within Competitive Strategy By Porter	56.3%	10.4%	33.3%	100.0%
		% within Perceived Uncertainty	55.1%	31.3%	48.5%	49.0%
		% of Total	27.6%	5.1%	16.3%	49.0%
	Hybrid	Count	14	10	12	36
		Expected Count	18.0	5.9	12.1	36.0
		% within Competitive Strategy By Porter	38.9%	27.8%	33.3%	100.0%
		% within Perceived Uncertainty	28.6%	62.5%	36.4%	36.7%
		% of Total	14.3%	10.2%	12.2%	36.7%
	No-purpose	Count	5	1	3	9
		Expected Count	4.5	1.5	3.0	9.0
		% within Competitive Strategy By Porter	55.6%	11.1%	33.3%	100.0%
		% within Perceived Uncertainty	10.2%	6.3%	9.1%	9.2%
		% of Total	5.1%	1.0%	3.1%	9.2%
Total		Count	49	16	33	98
		Expected Count	49.0	16.0	33.0	98.0
		% within Competitive Strategy By Porter	50.0%	16.3%	33.7%	100.0%
		% within Perceived Uncertainty	100.0%	100.0%	100.0%	100.0%
		% of Total	50.0%	16.3%	33.7%	100.0%

By means of the above two methods, the same findings pertaining to the perceived uncertainty and strategy alignment can be reached: no evidence can be provided to support the assumption that the perceived uncertainty vary when applying different strategic types; or in other words, none of the

business generic strategies or competitive positions was found to be significantly related to the perceived environmental uncertainty. Hence, no matter what generic strategic directions a service organisation follows or no matter what competitive strategies it pursues, the level of the perceived environmental uncertainty might not be associated with the strategic options adopted. No significant relationship between the perceived uncertainty and strategic competition positions can be proved. Conclusions drawn from the findings indicate that there is no evidence to reveal a relationship between strategic options and perceived environmental uncertainty. Consequently, the results also fail to prove the contention of Proposition 8 that there is a relationship between the perceived business environmental uncertainty and types of business strategic options.

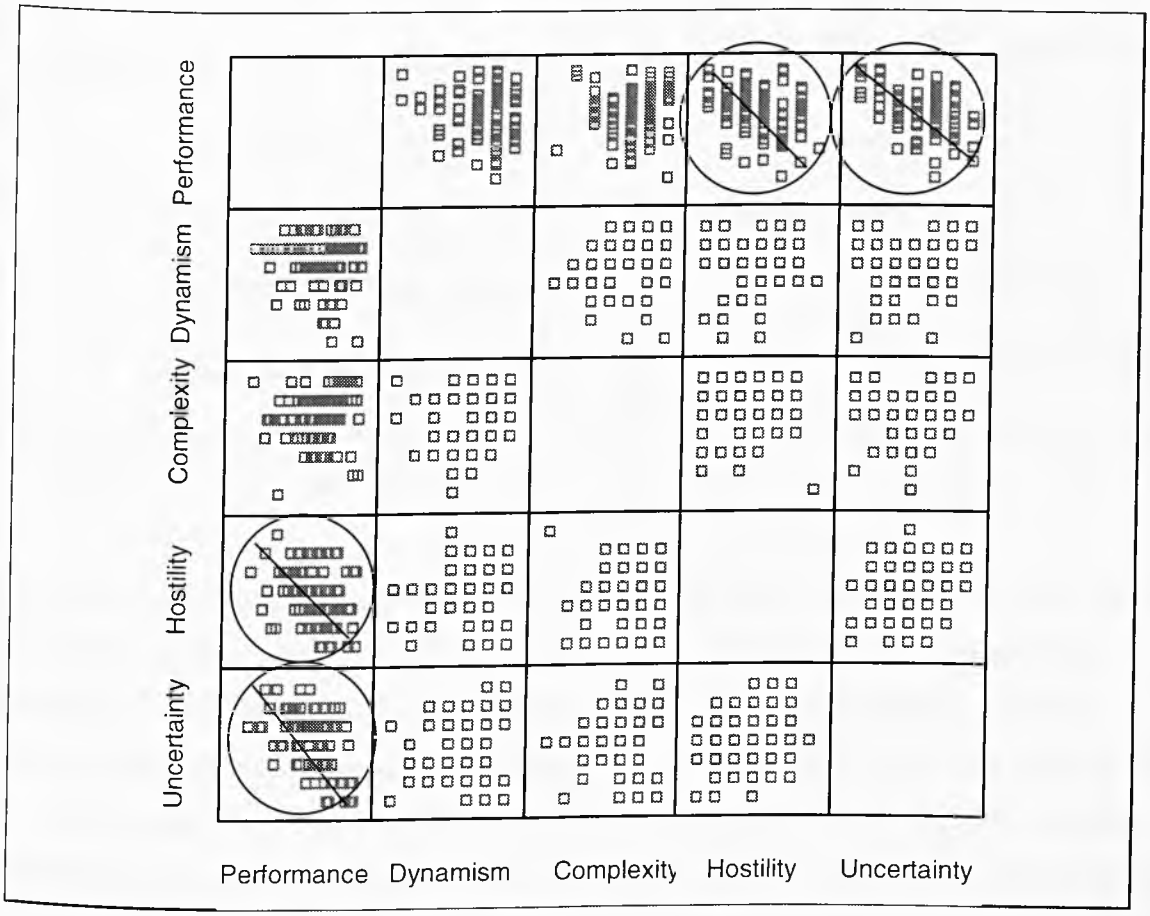
8.3 Environment and Strategic Performance Relationship

This section is concerned with the examination of Proposition 9 that there will be relationships between the perceived business environment and strategic performance for oil and gas service organisations operating in East Asia. In order to evaluate whether the perceived environmental uncertainty, complexity, dynamism and hostility are associated with strategic performance, Spearman's correlations were processed. Since the two variables were ordinal data, the Spearman rank-order correlation coefficient was computed.

8.3.1 Environmental Characteristics and Strategic Performance

The results can be presented by a Scatterplot graph shown in Figure 8.3. It displays the result that there is a negative relationship between strategic performance and the perceived environmental hostility and uncertainty (slope down), yet there is no relationship between strategic performance and the perceived environmental dynamism and complexity.

Figure 8.3 Cluster Scatterplot: Perceived Environment and Strategic Performance



It was predicted that strategy performance would correlate significantly with the perceived environmental uncertainty, complexity, dynamism and hostility. Thereby, the test for these variables should be two-tailed. SPSS Output provides a matrix of the correlation coefficients for the five variables (Table 8.10). There is a significant negative correlation between the strategic performance and the perceived environmental uncertainty ($r = -0.412$, $p < 0.001$). The strategic performance is also negatively related to the perceived hostility ($r = -0.324$, $p = 0.001$). Hence, it can be confidently stated that the relationship between strategic performance and the perceived uncertainty or hostility is legitimate.

Table 8.10 Environmental Characteristics and Strategic Performance Relationships

Correlations

			Perceived Uncertainty	Perceived Hostility	Percived Complexity	Perceived Dynamism	Strategic Performance
Spearman's rho	Perceived Uncertainty	Correlation Coefficient	1.000	.269**	-.144	.209*	-.412*
		Sig. (2-tailed)	.	.007	.157	.039	.000
		N	98	98	98	98	98
	Perceived Hostility	Correlation Coefficient	.269**	1.000	.064	.234*	-.324*
		Sig. (2-tailed)	.007	.	.530	.020	.001
		N	98	98	98	98	98
	Perceived Complexity	Correlation Coefficient	-.144	.064	1.000	.236*	.137
		Sig. (2-tailed)	.157	.530	.	.019	.179
		N	98	98	98	98	98
	Perceived Dynamism	Correlation Coefficient	.209*	.234*	.236*	1.000	-.042
		Sig. (2-tailed)	.039	.020	.019	.	.684
		N	98	98	98	98	98
	Strategic Performance	Correlation Coefficient	-.412**	-.324**	.137	-.042	1.000
		Sig. (2-tailed)	.000	.001	.179	.684	.
		N	98	98	98	98	98

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

Since the significance value for their association coefficient is less than 0.01, the results provide sufficient evidence to reject the hypothesis that the perceived environmental uncertainty or the perceived hostility is independent of strategic performance. This indicates that as the degree of the perceived environmental uncertainty increases, the level of strategic performance decreases. On the other hand, as the managerial perception of the business environment becomes more pleasant, there is a coordinated improvement in strategic performance. Conversely, the significance value for the correlation coefficient between strategic performance and the perceived complexity or the perceived dynamism is more than 0.10. Therefore, the hypothesis that the perceived environmental complexity or dynamism is independent of strategic performance cannot be rejected.

8.3.2 Findings of Environment and Performance Relationship

There is a significant relationship between strategic performance and the perceived environmental uncertainty or the perceived hostility. As the correlations are negative, it can be concluded that as the degree of perceived uncertainty decreases, there is a corresponding improvement in strategic performance. As such, the results do not support the assumption that the higher the degree of perceived environmental uncertainty, the higher the

degree of strategic performance. For the same reason, the results also do not support the assumption that the greater the degree of the perceived environmental hostility, the stronger the strategic performance. No sufficient evidence was provided to reject the hypothesis that the perceived environmental complexity or dynamism is not associated with strategic performance ($p > 0.05$). Hence, the findings fail to provide evidence to support the assumption that the degree of perceived complexity or perceived dynamism is related to the level of strategic performance. Overall, the results support partially Proposition 9 that there is a relationship between the perceived business environmental dimensions and strategic performance for oil and gas service organisations operating in East Asia. Strategic performance is negatively related to the perceived environmental uncertainty or hostility. In this sense, the higher the perceived environmental uncertainty or hostility, the weaker the strategic performance.

8.4 Comparisons of Strategic Performance amongst Strategic Groups

In this section, attention is paid to examine Proposition 10 that, for oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, strategic performance will be associated with their business strategic orientations.

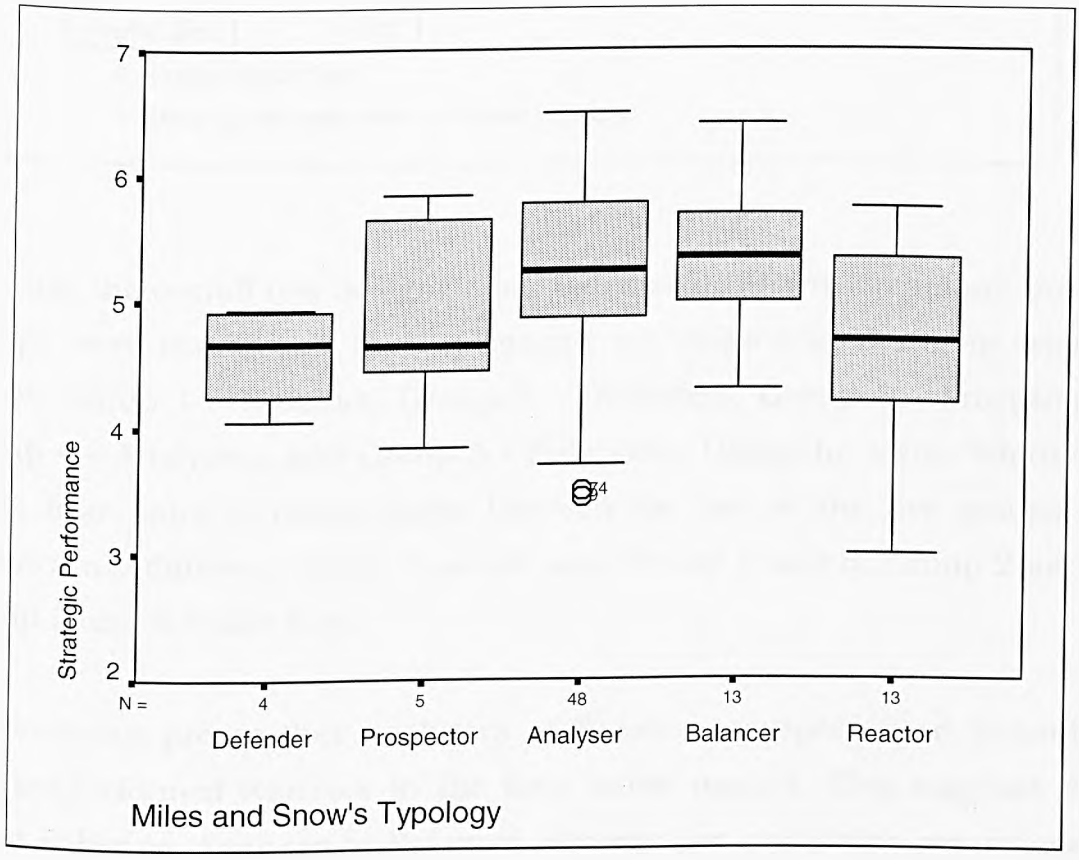
8.4.1 Strategic Performance with Generic Business Strategies

It was assumed that, for oil and gas service organisations pursuing different strategies, their strategic performances would be different. In order to examine whether strategic performance differed for the participating service organisations with different strategic options, the Kruskal Wallis Tests were applied. Where appropriate, follow-up pairwise Mann-Whitney U tests were applied if the overall test was significant. Before conducting the significance

test, a Boxplot graph was used to portray a basic picture of the differences (Figure 8.4a).

The strategic performance of Analysers and Balancers appeared to be generally higher than the organisations in other strategic categories as they had higher medians and quartiles. It is observed that having a Reactor strategy did not give the organisations a relatively poor strategic performance. Rather, organisations with Defender and Prospector strategies appeared to perform poorly.

Figure 8.4a Boxplot: Generic Business Strategies and Strategic Performance



The Kruskal-Wallis test (Table 8.4b) indicates that there is a marginally significant difference in the medians, $\chi^2 = 8.712$ (df = 4), p = 0.059. This means that the hypothesis that all the medians of strategic performance amongst different strategic groups are equal can be rejected at the 10 per cent significant level.

Table 8.4b Strategic Performance of Generic Business Strategies

Ranks

	Miles and Snow Typology	N	Mean Rank
Strategic Performance	Reactor	13	30.92
	Defender	4	19.75
	Prospector	5	34.50
	Analyser	48	45.44
	Balancer	13	50.12
	Total	83	

Test Statistics[a,b]

	Strategic Performance
Chi-Square	9.070
df	4
Asymp. Sig.	.059

a. Kruskal Wallis Test

b. Grouping Variable: Miles and Snow Typology

Because the overall test is significant, pairwise comparisons among the five groups were conducted. The five groups are defined in the same way as above: Group 1 – Reactors, Group 2 – Defenders, Group 3 – Prospectors, Group 4 – Analysers, and Group 5 – Balancers. Using the Mann-Whitney U tests, four pairs of comparisons between the two of the five groups are significantly different: Group 1 and 4, and Group 1 and 5, Group 2 and 4, Group 2 and 5 (Table 8.4c).

The evidence proves that Analysers or Balancers outperformed Defenders and outperformed Reactors in the East Asian market. This suggests that using either an Analyser or Balancer strategy can guarantee organisations better success than those using a Defender or Reactor strategy.

Table 8.4c: Mann-Whitney U Tests for Generic Business Strategies and Strategic Performance

I Group 1 and 4

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Strategic Performance	Reactor	13	22.69	295.00
	Analyser	48	33.25	1596.00
	Total	61		

Test Statistics [a]

	Strategic Performance
Mann-Whitney U	204.000
Wilcoxon W	295.000
Z	-1.903
Asymp. Sig. (2-tailed)	.057

a. Grouping Variable: Miles and Snow Typology

II Group 1 and 5

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Strategic Performance	Reactor	13	10.46	136.00
	Balancer	13	16.54	215.00
	Total	26		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	45.000
Wilcoxon W	136.000
Z	-2.027
Asymp. Sig. (2-tailed)	.043
Exact Sig. [2*(1-tailed Sig.)]	.044[a]

a. Not corrected for ties.

b. Grouping Variable: Miles and Snow Typology

III Group 2 and 4

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Strategic Performance	Defender	4	11.38	45.50
	Analyser	48	27.76	1332.50
	Total	52		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	35.500
Wilcoxon W	45.500
Z	-2.079
Asymp. Sig. (2-tailed)	.038
Exact Sig. [2*(1-tailed Sig.)]	.034[a]

a. Not corrected for ties.

b. Grouping Variable: Miles and Snow Assignment

IV Group 2 and 5

Ranks

	Miles and Snow Typology	N	Mean Rank	Sum of Ranks
Strategic Performance	Defender	4	3.63	14.50
	Balancer	13	10.65	138.50
	Total	17		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	4.500
Wilcoxon W	14.500
Z	-2.439
Asymp. Sig. (2-tailed)	.015
Exact Sig. [2*(1-tailed Sig.)]	.010[a]

a. Not corrected for ties.

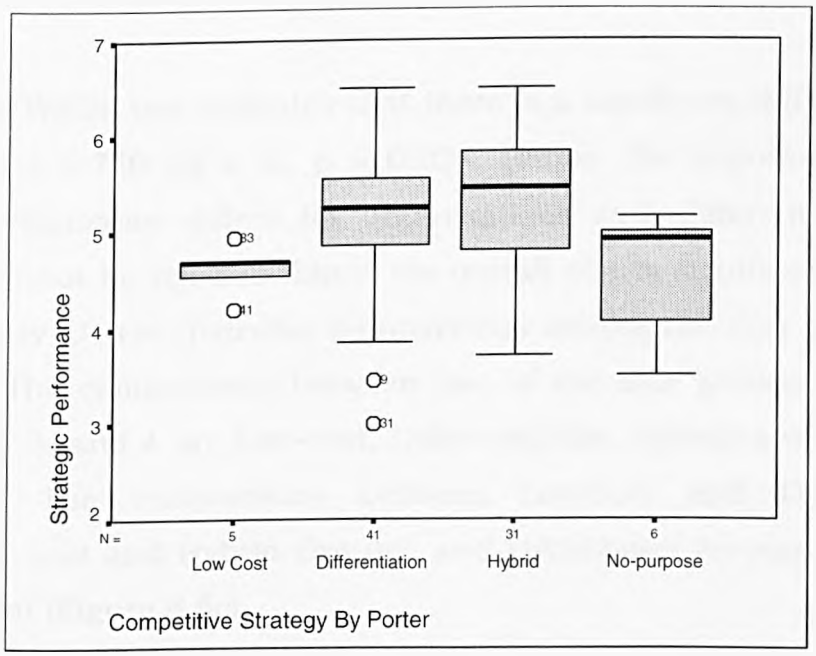
b. Grouping Variable. Miles and Snow Assignment

The results do not provide sufficient evidence to reject the hypothesis that the medians of strategic performance amongst Defender, Prospector and Reactor strategic groups are equal. This suggests that there are no differences of strategic performance if an organisation pursues a Defender, or a Prospector or a Reactor strategy. What is more, no significant results were obtained to prove the differences between Prospectors and Analysers or between Prospectors and Balancers. Hence, having a Prospector strategy does not yield an organisation a significantly different strategic performance compared with Analysers or Balancers.

8.4.2 Strategic Performance with Competitive Strategies

A Boxplot graph (Figure 8.5a) shows that among the four competitive strategies, Hybrid organisations had a relatively higher strategic performance whereas Low-cost organisations performed relatively poorly. Differentiation organisations had a sound performance and No-purpose organisations did not perform the worst even though they did not adopt any competitive strategies. Low-cost organisations appeared to perform more poorly than No-purpose organisations.

Figure 8.5a Boxplot: Generic Competitive Strategies and Strategic Performance



It was assumed that for the sample organisations that adopted different competitive strategies, the strategic performance would not be the same. In order to examine whether strategic performance is different with various competitive strategies, the Kruskal Wallis tests were applied. The results are shown in Figure 8.5b.

Table 8.5b Kruskal-Wallis Test: The Performance of Generic Competitive Strategies

Ranks

	Competitive	N	Mean Rank
Strategic Performance	Low Cost	5	20.60
	Differentiation	41	42.07
	Hybrid	31	48.82
	No-purpose	6	24.08
	Total	83	

Test Statistics[a,b]

	Strategic Performance
Chi-Square	9.750
df	3
Asymp. Sig.	.021

a. Kruskal Wallis Test

b. Grouping Variable: Competitive Strategy By Porter

The Kruskal-Wallis test indicates that there is a significant difference in the medians, $\chi^2 = 9.750$ (df = 3), $p = 0.021$. Hence, the hypothesis that the strategic performance differs for organisations with different competitive strategies cannot be rejected. Since the overall test is significant, using the Mann-Whitney U test, pairwise comparisons among the four groups were conducted. The comparisons between two of the four groups were made. Groups 1, 2, 3, and 4 are Low-cost, Differentiation, Hybrid and No-purpose respectively. The comparisons between Low-cost and Differentiation Groups, Low-cost and Hybrid Groups, and Hybrid and No-purpose Groups are significant (Figure 8.5c).

Table 8.5c Mann-Whitney U Test: Competitive Strategies and Performance

Ranks

	Competitive	N	Mean Rank	Sum of Ranks
Strategic Performance	Low Cost	5	11.60	58.00
	Differentiation	41	24.95	1023.00
	Total	46		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	43.000
Wilcoxon W	58.000
Z	-2.102
Asymp. Sig. (2-tailed)	.036
Exact Sig. [2*(1-tailed Sig.)]	.034[a]

a. Not corrected for ties.

b. Grouping Variable: Competitive Strategy By Porter

Ranks

	Competitive	N	Mean Rank	Sum of Ranks
Strategic Performance	Low Cost	5	9.60	48.00
	Hybrid	31	19.94	618.00
	Total	36		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	33.000
Wilcoxon W	48.000
Z	-2.038
Asymp. Sig. (2-tailed)	.042
Exact Sig. [2*(1-tailed Sig.)]	.041[a]

a. Not corrected for ties.

b. Grouping Variable: Competitive Strategy By Porter

Ranks

	Competitive	N	Mean Rank	Sum of Ranks
Strategic Performance	Hybrid	31	20.63	639.50
	No-purpose	6	10.58	63.50
	Total	37		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	42.500
Wilcoxon W	63.500
Z	-2.082
Asymp. Sig. (2-tailed)	.037
Exact Sig. [2*(1-tailed Sig.)]	.035[a]

a. Not corrected for ties.

b. Grouping Variable: Competitive Strategy By Porter

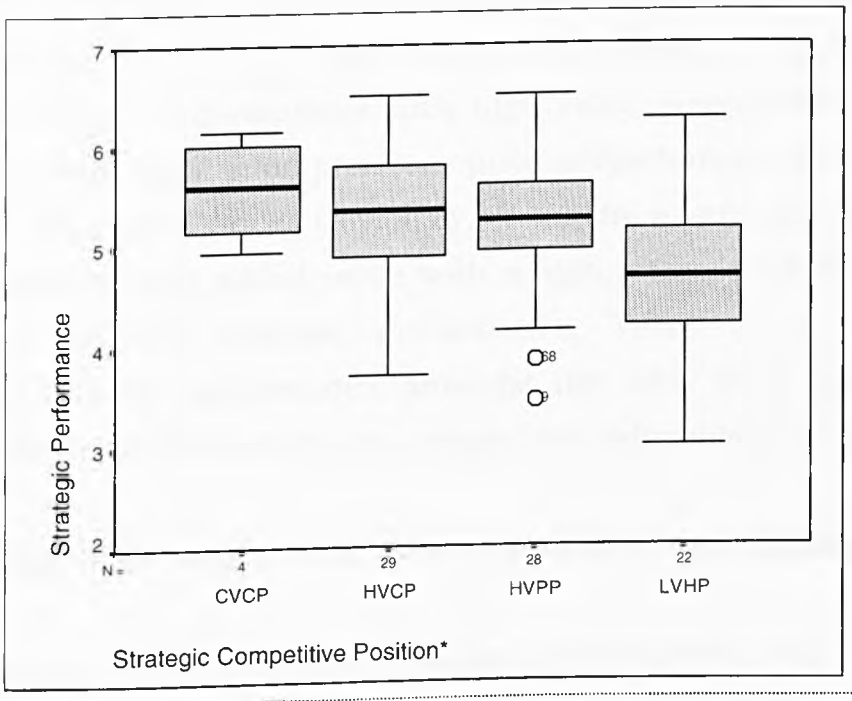
The significant results prove that Differentiation or Hybrid organisations outperformed Low-cost organisations. This finding suggests that the Low-cost strategy should not be an ideal option for service organisations within the oil and gas industry. Meanwhile, Hybrid organisations also outperformed those without any competitive strategies. There is no significant evidence to prove that strategic performance differs between No-purpose and Low-cost or Differentiation organisations. This indicates that those organisations not pursuing any competitive strategies may perform in a similar way as those pursuing a Low-cost or Differentiation strategy. For similar reasons, Differentiation organisations did not perform significantly differently from Hybrid organisations.

8.4.3 Strategic Performance with Strategic Positions

It was also assumed that strategic performance varied when organisations had been in different strategic positions in the marketplace. To test the differences of strategic performance, the same tests as above were conducted. A Boxplot diagram was used for preliminary exploration of the results (Figure 8.6a).

From the Boxplot graph, it is observed that organisations with competitive price low or moderate value produced the highest performance, while un-competitive value and price organisations were in the category of the lowest strategic performance. Strategic performance for organisations with high value and competitive or premium price stood in the middle. The overall Kruskal-Wallis test indicates that there is a significant difference in the medians, $\chi^2 = 11.722$ (df = 3), $p = 0.008$ (Table Figure 8.6b). Hence, strategic performance for organisations in different strategic positions varied.

Figure 8.6a Boxplot: Strategic Positions and Strategic Performance



* CVCP: competitive price and low or moderate value; HVCP: high value competitive price; HVPP: high value premium price; LVHP: un-competitive value and price

Figure 8.6b Kruskal-Wallis Test: Strategic Performance of Strategic Positions

Ranks

	Strategy Clock	N	Mean Rank
Strategic Performance	low (or moderate) value competitive price	4	57.88
	high value competitive (low and moderate price)	29	48.29
	high value premium price	28	44.43
	un-competitive value and price	22	27.73
	Total	83	

Test Statistics[a,b]

	Strategic Performance
Chi-Square	11.722
df	3
Asymp. Sig.	.008

a. Kruskal Wallis Test

b. Grouping Variable: Strategy Clock

Pairwise comparisons by the Mann-Whitney U test between two of the four groups were also made (Figure 8.6c). Three pairs of comparisons are significant. Low or moderate value with competitive (low and moderate) price organisations, organisations with high value competitive price, and organisations with high value premium price outperformed those with un-competitive value and price. Obviously, being in a strategic position of providing low customer added value with a high price will definitely bring organisations a poor strategic performance. There is no significant difference in strategic performance amongst the other three categories of strategic positions apart from the un-competitive value and price situation.

8.4.4 Findings of Strategic Performance with Strategic Options

In summary, the results partially support the assumption that Balancers and Analysers outperform Defenders or Reactors. The analysis fails to prove that Reactors are associated with a relatively poor strategic performance and the strategic performance of Defenders and Prospectors stands in the middle among the five categories of strategic orientations. The results do not support the assumption that having a generic competitive strategy yields the organisation a higher level of strategic performance, while pursuing none of the three generic competitive strategies produces a relatively poor strategic performance. The assumption that Hybrid organisations yield a higher level of strategic performance than Low-cost and Non-purpose strategic groups was partially proved.

Meanwhile, the initial assumption that Hybrid organisations outperform Differentiation organisations was not proved. The assumption that firms with a Differentiation strategy outperform those with a Low-cost strategy was supported. This finding suggests that a Differentiation strategy is a more appropriate option than a Low-cost strategy for service organisations operating in East Asia.

Figure 8.6c Mann-Whitney U test for Strategic Positions and Performance

Ranks

	Strategy Clock	N	Mean Rank	Sum of Ranks
Strategic Performance	high value premium price	28	30.05	841.50
	un-competitive value and price	22	19.70	433.50
	Total	50		

Test Statistics [a]

	Strategic Performance
Mann-Whitney U	180.500
Wilcoxon W	433.500
Z	-2.494
Asymp. Sig. (2-tailed)	.013

a. Grouping Variable: Strategy Clock

Ranks

	Strategy Clock Positions	N	Mean Rank	Sum of Ranks
Strategic Performance	low (or moderate) value competitive price	4	20.75	83.00
	un-competitive value and price	22	12.18	268.00
	Total	26		

Test Statistics [b]

	Strategic Performance
Mann-Whitney U	15.000
Wilcoxon W	268.000
Z	-2.064
Asymp. Sig. (2-tailed)	.039
Exact Sig. [2*(1-tailed Sig.)]	.039[a]

a. Not corrected for ties.

b. Grouping Variable: Strategy Clock Positions

Ranks

	Strategy Clock	N	Mean Rank	Sum of Ranks
Strategic Performance	high value competitive (low and moderate) price	29	31.43	911.50
	un-competitive value and price	22	18.84	414.50
	Total	51		

Test Statistics [a]

	Strategic Performance
Mann-Whitney U	161.500
Wilcoxon W	414.500
Z	-2.999
Asymp. Sig. (2-tailed)	.003

a. Grouping Variable: Strategy Clock

The finding supports the assumption that organisations falling into the category of low value high price would have a poorer strategic performance than other organisations. The results do not support the assumption that organisations with a high value competitive (low and moderate) price position would outperform companies in the other three categories of competitive positions. Overall, the statistics show that Proposition 10 supported the thesis that the good or bad strategic performance is associated with certain strategic orientations adopted for the service businesses in East Asia. Based on the results, three points can be reached. First, better strategic performance is associated with Balancer or Analyser strategies rather than with other types of strategy. Second, better strategic performance is associated with Differentiation–oriented strategies rather than with other types of competitive strategy. Third, poorer strategic performance is associated with low customer added value premium prices rather than with other types of strategic competition position.

8.6 Summary

In this chapter, relationships among the perceived business environment, strategic options and strategic performance were explored. The completed analysis measured the correlation between the types of strategies pursued by the participating organisations and strategic performance, by taking account of the perceived environmental uncertainty. This was carried out in terms of three aspects. First, it discovered the alignment between the perceived uncertainty and strategic options. Next, it established the relationships between strategies and the associated strategic performance. Then, the correlations between the perceived environment and strategic performance were generated. For these three steps, Spearman's rho values and the Kruskal Wallis tests were applied. Following Chapter 7, the rest of ten propositions were examined continuously. Propositions 5 and 6 were shown to be well grounded whereas Propositions 4, 9 and 10 were not. In addition, evidence was not able to prove Proposition 8.

CHAPTER 9

CROSS-NATIONAL COMPARISONS: CHINA, SINGAPORE AND MALAYSIA

Following the examination of individual variables and their relationships evaluated in the previous two chapters, this chapter is moving on to the comparisons of single variables and relations among various variables across the three selected East Asian countries. Responses provided by seven respondents whose organisations were not based in China, Singapore and Malaysia are excluded from the main part of comparative analysis. The research results obtained in this chapter provide supplementary evidence to prove the ten proposed research propositions.

In order to explore the differences or similarities for variables in different countries, Mann-Whitney test of two medians, Kruskal-Wallis test of k medians, and chi-squared test of Cross-tabulation contingency table are performed to report the results of company profiles, the perceived business environment and business strategic orientations. In addition, analysis of variance (ANOVA) of k means and multiple comparison tests (Tukey) to identify significant differences are calculated for the results report of strategic performance.

9.1 Cross-National Comparisons: Company Profiles

To compare the differences for companies' background information across the three selected countries, cross tabulations are applied to detect significant trends.

9.1.1 Legal Status and Employees

Looking at the legal status in the three countries, most of the 39 independent organisations are from China (53.8 per cent), among the 41 divisional or subsidiary organisations, the majority are from Singapore (48.8 per cent) and half of the 18 operating or business units are from Singapore (50 per cent). Among the 31 China-based participating organisations, most are independent organisations (67.7 per cent) and among the 29 Singapore-based organisations, more than half are operating or business units (51.3 per cent). For the 21 Malaysia-based organisations, nearly half of those are divisional and subsidiary companies (47.6 per cent).

Regarding the full-time employees (Table 9.1), the common feature in these three countries is that proportion of organisations with employees between 50 and 199 is small in each individual country, with 25.8 per cent in China, 23.1 per cent in Singapore and 14.3 per cent in Malaysia. The majority the 39 organisations with fewer than 50 employees and most of the 20 organisations with employees between 50 and 199 are from Singapore (46.2 per cent and 45 per cent respectively). For the 39 medium to large organisations (with 200 or more employees), the frequency is fragmented, with 38.5 per cent from China, 30.3 per cent from Singapore and 23.1 per cent from Malaysia.

When looking into individual countries, for the China category, nearly half of the 31 organisations had 200 or more full time (or equivalent) employees (48.4 per cent). The majority of the 39 Singapore based organisations had fewer than 50 employees (46.2 per cent). In Malaysia, the proportion of the organisations with 200 or more full time employees equals the proportion of the

organisations with fewer than 50 employees (both are 42.9 per cent).

Table 9.1 Full Time Employees - Country Where Based Crosstabulation

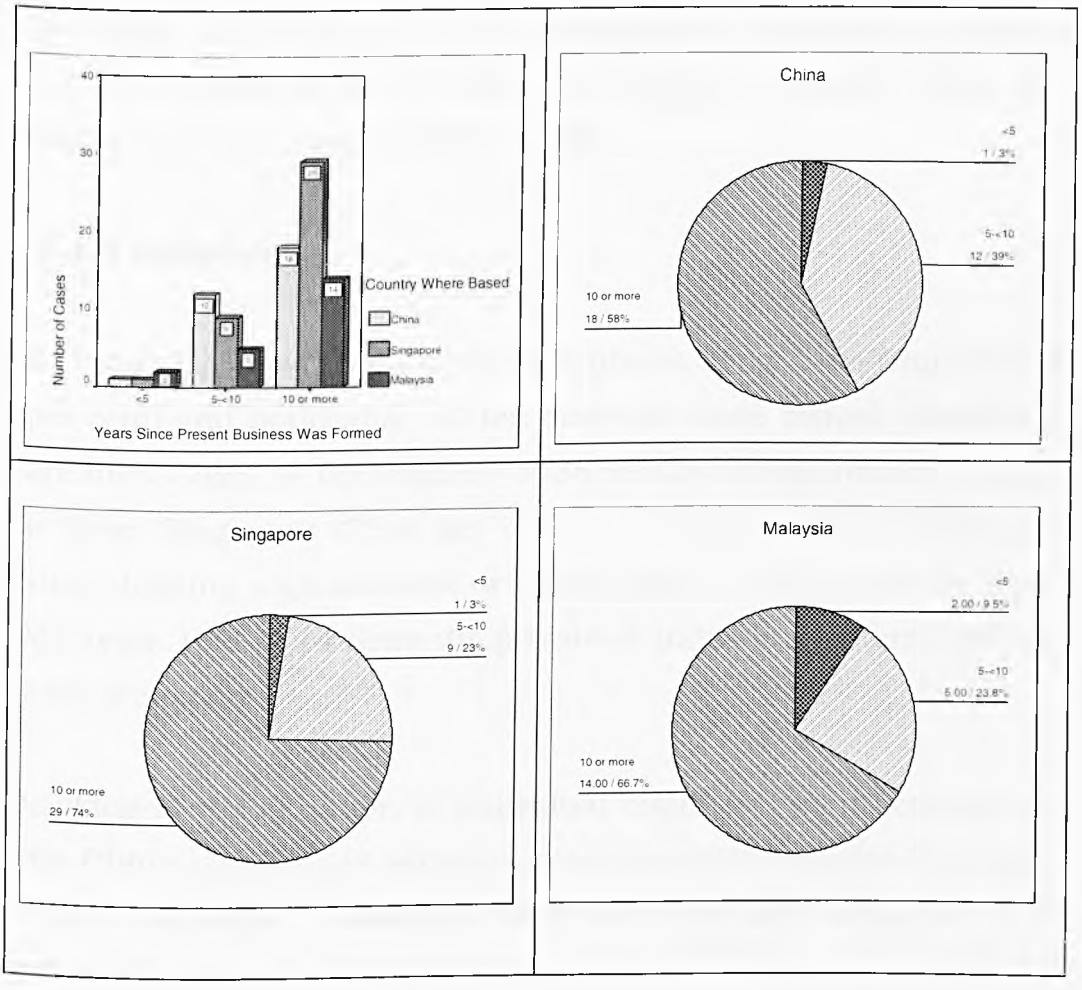
			Country Where Based				
			China	Singapore	Malaysia	Other	Total
Full Time Employees	1-49	Count	8	18	9	4	39
		% within Full Time Employees	20.5%	46.2%	23.1%	10.3%	100.0%
		% within Country Where Based	25.8%	46.2%	42.9%	57.1%	39.8%
	50-199	Count	8	9	3		20
		% within Full Time Employees	40.0%	45.0%	15.0%		100.0%
		% within Country Where Based	25.8%	23.1%	14.3%		20.4%
	200-499	Count	4	8	6	1	19
		% within Full Time Employees	21.1%	42.1%	31.6%	5.3%	100.0%
		% within Country Where Based	12.9%	20.5%	28.6%	14.3%	19.4%
	500-2999	Count	8	3	3	2	16
		% within Full Time Employees	50.0%	18.8%	18.8%	12.5%	100.0%
		% within Country Where Based	25.8%	7.7%	14.3%	28.6%	16.3%
	3000+	Count	3	1			4
		% within Full Time Employees	75.0%	25.0%			100.0%
		% within Country Where Based	9.7%	2.6%			4.1%
Total		Count	31	39	21	7	98
		% within Full Time Employees	31.6%	39.8%	21.4%	7.1%	100.0%
		% within Country Where Based	100.0%	100.0%	100.0%	100.0%	100.0%

Hence, it is observed that organisations with more than 200 employees are essential in China. Unlike China, small entities (fewer than 50 employees) form an important proportion of service organisations located in Singapore; whereas in Malaysia, organisations are either small size or medium large size mainly. In each of three countries, entities with employees in the category of from 50 to 199 tend to have a small proportion if the category of organisational size is divided into three groups: from 1 to 49, from 50 to 199 and 200 or more.

9.1.2 Organisational Age

From Figure 9.1, most of the organisations with their age of ten or more were from Singapore; whereas for the organisations between five and ten years in age, most were from China. A common trend shows that, in each of the three countries, a big majority of the oil and gas service organisations was more than five years old, with 97 per cent in both China and Singapore and 90.5 per cent in Malaysia.

Figure 9.1 A Comparison of Organisational Age



The proportion of the Singapore based organisations which were more than ten years old in age is bigger (74 per cent) than the

proportion of the China and Malaysia based organisations at the same age (55 per cent and 66.7 per cent respectively). Since the proportion of organisations with fewer than five years in their existing businesses is small, it is considered that the statistical results on managerial perceptions pertaining to strategic performance will be reliable if this category is excluded.

In general, the offshore oil and gas service industry appears to have a longer history than those of China and Malaysia. Meanwhile, for organisations which were between five and ten years old in age, the proportion in China is bigger (39 per cent) than the proportion in Singapore (23 per cent) and Malaysia (23.8 per cent). It proves further the fact that the offshore oil and gas service businesses were carried out earlier in Singapore than the businesses were carried out in China.

9.1.3 Ownership

In Table 9.2, most of the 21 joint ventures come from China (61.9 per cent) and noticeably, all ten domestic state owned companies are from China. A big majority of 38 wholly foreign owned entities is from Singapore (75.8 per cent) and six out of 13 domestic share-holding organisations or public limited companies are from Malaysia. Half of 14 domestic private or individual enterprises are from Singapore.

Looking at the situation in individual countries, joint ventures in the China oil and gas service sector are more popular (41.9 per cent) than those in Malaysia (23.8 per cent) and Singapore (7.7 per cent).

Table 9.2 Ownership Category - Country Where Based Crosstabulation

			Country Where Based			
			China	Singapore	Malaysia	Total
Ownership Category	Wholly Domestic State Owned	Count	10			10
		% within Ownership Category	100.0%			100.0%
		% within Country Where Based	32.3%			11.0%
		% of Total	11.0%			11.0%
	Wholly Domestic Private/Individual	Count	3	7	4	14
		% within Ownership Category	21.4%	50.0%	28.6%	100.0%
		% within Country Where Based	9.7%	17.9%	19.0%	15.4%
		% of Total	3.3%	7.7%	4.4%	15.4%
	Wholly Foreign Owned	Count	2	25	6	33
		% within Ownership Category	6.1%	75.8%	18.2%	100.0%
		% within Country Where Based	6.5%	64.1%	28.6%	36.3%
		% of Total	2.2%	27.5%	6.6%	36.3%
	Joint Venture	Count	13	3	5	21
		% within Ownership Category	61.9%	14.3%	23.8%	100.0%
		% within Country Where Based	41.9%	7.7%	23.8%	23.1%
		% of Total	14.3%	3.3%	5.5%	23.1%
	Domestic Share Holding/Public Limited Company	Count	3	4	6	13
		% within Ownership Category	23.1%	30.8%	46.2%	100.0%
		% within Country Where Based	9.7%	10.3%	28.6%	14.3%
		% of Total	3.3%	4.4%	6.6%	14.3%
Total		Count	31	39	21	91
		% within Ownership Category	34.1%	42.9%	23.1%	100.0%
		% within Country Where Based	100.0%	100.0%	100.0%	100.0%
		% of Total	34.1%	42.9%	23.1%	100.0%

Wholly foreign owned entities are dominant within the offshore oil and gas service industrial sector in Singapore (64.1 per cent). For Malaysia, the types of ownership for the oil and gas service organisations are fragmented: the service sector is a mixture of wholly domestic private companies (19 per cent), wholly foreign owned entities (28.6 per cent), joint ventures (23.8 per cent) and domestic share holding organisations or public limited companies (28.6 per cent). This fact shows that a joint venture is a preferred approach which can be adopted in China. Hence, an effective entry strategy for the foreign service organisations to enter into

the China's market is to set up a joint venture with Chinese partners.

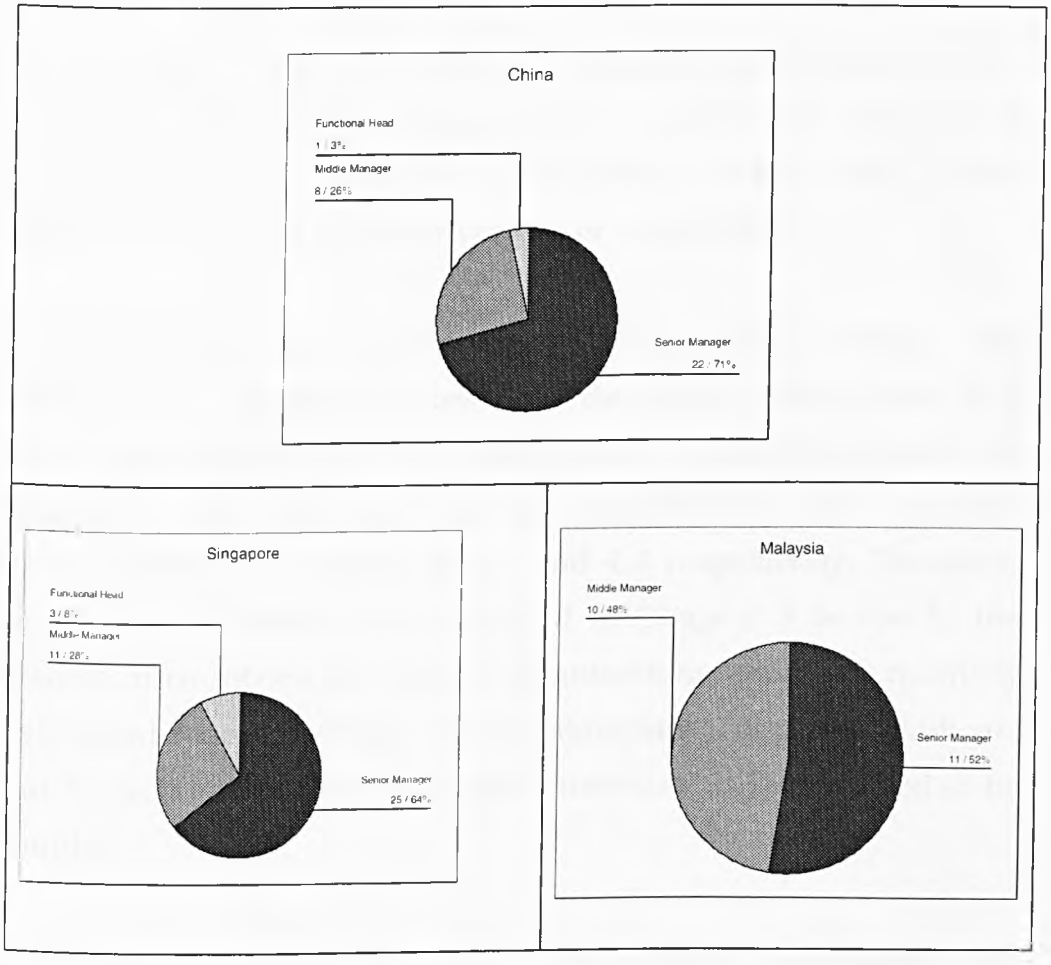
Contrasting Singapore and Malaysia, the Chinese government has played a business role in the offshore oil and gas service sector. Singapore and Malaysia appeared to have a free competitive market with a lesser governmental interference in oil service businesses. This is very true as China is a socialist economy whereas both Malaysia and Singapore follow an economic system of capitalism. Furthermore, Singapore is indeed a favourable place where foreign companies considered establishing their own regional headquarters.

9.1.4 Respondents Management Positions

The management positions of respondents are presented in Figure 9.2. In each of the above three countries, most of the respondents are senior executives, with 71 per cent for the China group, 64 per cent for Singapore and 52 per cent for Malaysia. The middle level managers refer to those who were business development managers or regional heads of operating or business units. They form the second large proportion of respondents in each country, with 26 per cent in China, 29 per cent in Singapore and 42 per cent in Malaysia. Particularly, for the respondents from Malaysia, apart from senior executives, the rest were middle managers.

Only four out of 91 participating respondents were functional heads (i.e. marketing, regional sales or operating managers), with one from China and three from Singapore, 4 per cent of the total. Since the proportion of functional managers, it is considered that the statistical results on managerial perceptions pertaining to strategic performance will be reliable if this category is excluded.

Figure 9.2 Respondents' Managerial Positions in China, Singapore and Malaysia



9.2 Cross-National Comparisons: Environmental Dimensions

9.2.1 The Perceived Business Environment in China, Singapore and Malaysia

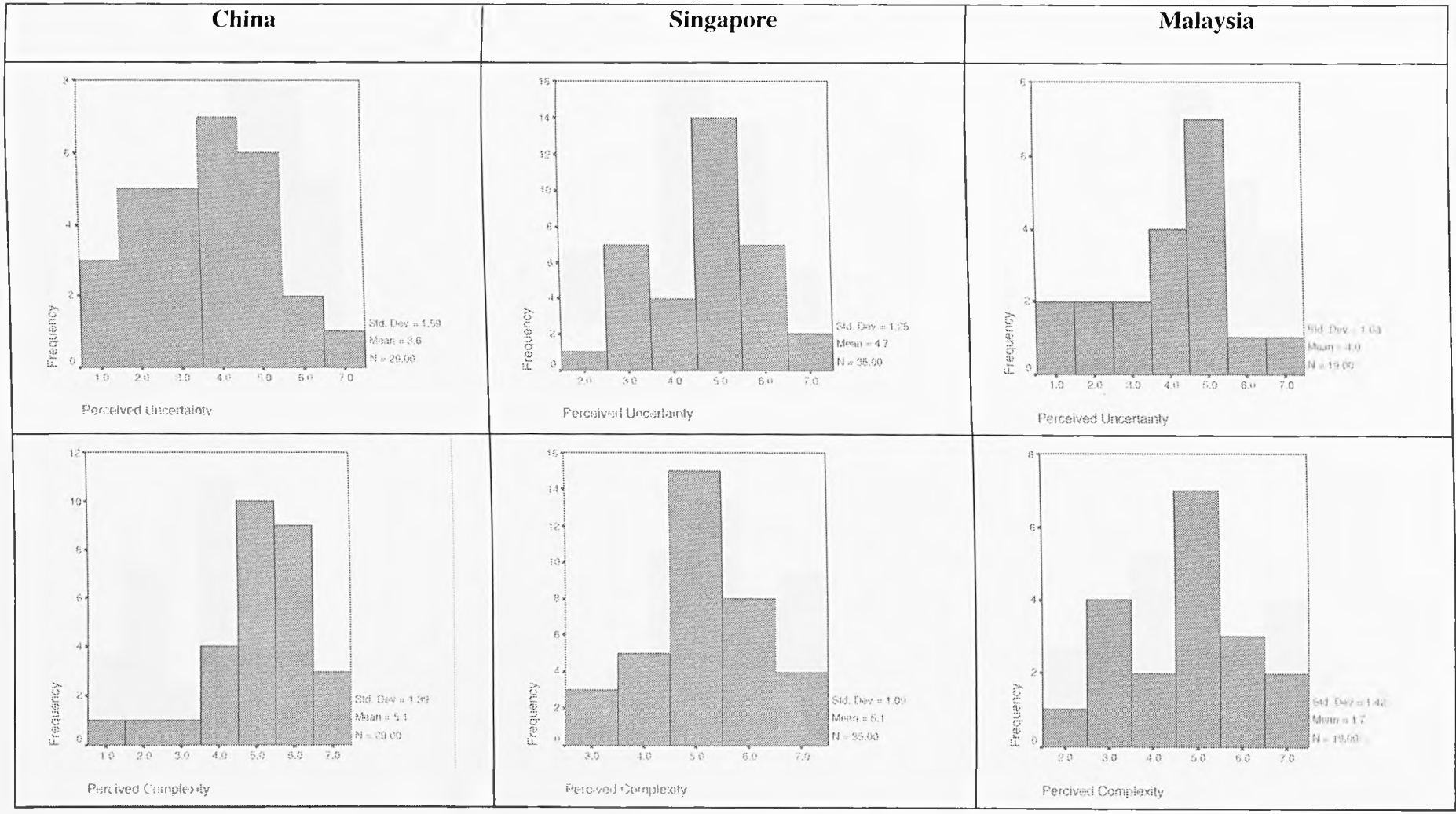
In order to emphasise the differences and similarities pictorially among the items, Figure 9.3 shows the barcharts of the environmental dimensions' variables split according to the country where the service organisations were located. First, the distribution of the perceived environmental uncertainty scores appears to be normal. This result explains the observations made in Chapter 7 that the overall uncertainty score is normally

distributed. It is observed that the perceived uncertainty in China is the lowest (mean = 3.6) whereas in Singapore, the managerial perception on the degree of environmental uncertainty is the highest (mean = 4.7). The Malaysia organisations' executives have a neutral view on the environmental uncertainty (mean = 4) indicating that the business environment in which they operate cannot be perceived as either certain or uncertain.

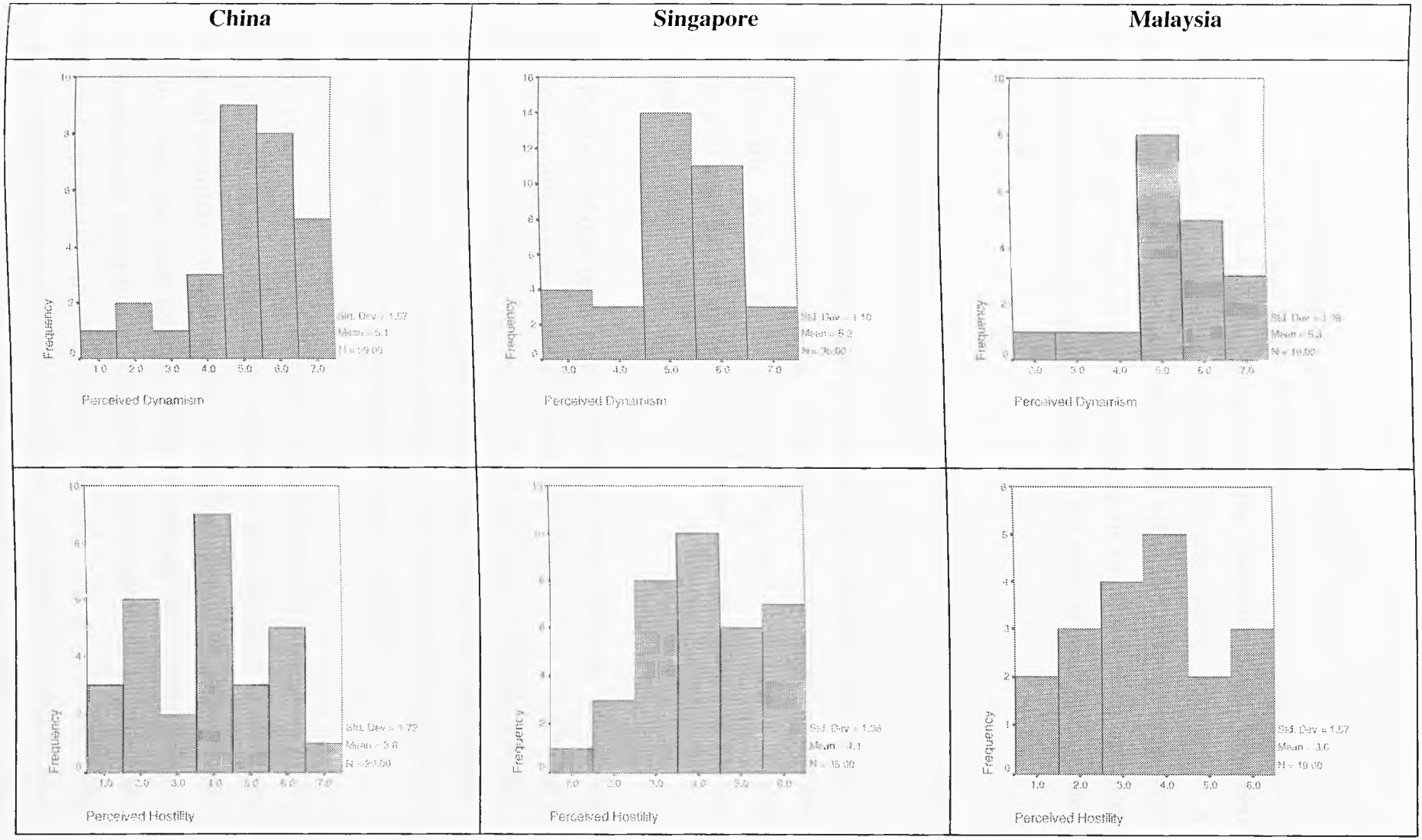
For the perceived environmental complexity scores, the distribution is negatively skewed in the China group (there is a larger concentration at the higher end of scores) whereas the Singapore and Malaysia based organisations are normally distributed around a mean of 5.1 and 4.7 respectively. Therefore, the overall negatively skew observed in Chapter 7 is due to the mixture of countries (the China organisations affect the normally distributed scores of Singapore and Malaysia). The results indicate that in each country, the business environment is perceived to be complex.

Nevertheless, for the perceived environmental dynamism, the distribution is negatively skewed in both the China and Malaysia groups yet the Singapore organisations are normally distributed around of mean of 5.2. Hence, the China and Malaysia based organisations contribute the overall negative skew observed in Chapter 7. It is observed that, in each country, the business environment is perceived to be dynamic. When looking at the distribution of perceived environmental hostility scores, all the distributions are bimodal (i.e. there are two peaks indicative of two modes). It seems that regardless of the country, there is always a split between organisations' executives: they are either pleased (one mode at 2 or 3 indicating pleasant conditions) or unpleased (one mode at 6 indicating unpleasant conditions) with the business environment in which they operate.

Figure 9.3 Distributions of the Perceived Business Environment for the Service Organisations in China, Singapore and Malaysia



(Figure 9.3 Continuing)



However, for Singapore and Malaysia, there is a great concentration of executives' perceptions around the higher mode (the peak is taller) at 4 indicating the neutral point between pleasant and unpleasant. In each of the three countries, a common feature shows that less than half of the respondents were displeased with the business environment in which they operate, suggesting they are favourable places for the oil and gas service businesses.

9.2.2 Comparisons of Environmental Dimensions in China, Singapore and Malaysia

As this researcher intended to compare the median differences of the perceived environmental conditions among three countries groups, the overall Kruskal-Wallis tests are conducted firstly (Table 9.3) and follow-up tests are carried out by using the Mann-Whitney U test.

The Kruskal-Wallis tests indicate that in each country, there is no significant difference in the medians of dynamism $x^2 = 0.259$ (df = 2), $p = 0.878$; complexity, $x^2 = 2.991$ (df = 2), $p = 0.224$; hostility, $x^2 = 1.098$ (df = 2), $p = 0.578$. In contrast, the same tests show a significant difference in the medians of the perceived uncertainty $x^2 = 6.991$ (df = 2), $p = 0.030$ in these three countries.

There is no evidence to suggest that the managerial perceptions on environmental complexity, dynamism and hostility in the three selected countries are dissimilar. If speaking strictly, these results fail to reject the null hypothesis that managerial perceptions on environmental complexity, dynamism and hostility in the three selected countries are dissimilar. In order to prove similarity, bigger samples are need. Nonetheless, the observed results may indicate that executives in China, Singapore and Malaysia share

similar views on the environmental complexity, dynamism and hostility.

Table 9.3 Kruskal-Wallis Test:
The Perceived Business Environment in China, Singapore and Malaysia

Ranks

	Country Where Based	N	Mean Rank
Perceived Dynamism	China	31	46.95
	Singapore	39	44.45
	Malaysia	21	47.48
	Total	91	
Percived Complexity	China	31	49.81
	Singapore	39	47.40
	Malaysia	21	37.79
	Total	91	
Perceived Hostility	China	31	43.40
	Singapore	39	49.28
	Malaysia	21	43.74
	Total	91	
Perceived Uncertainty	China	31	55.16
	Singapore	39	40.06
	Malaysia	21	43.50
	Total	91	

Test Statistics[a,b]

	Perceived Dynamism	Percived Complexity	Perceived Hostility	Perceived Uncertainty
Chi-Square	.259	2.991	1.098	6.991
df	2	2	2	2
Asymp. Sig.	.878	.224	.578	.030

a. Kruskal Wallis Test

b. Grouping Variable: Country Where Based

Because the overall test for the perceived environmental uncertainty is significant, pairwise comparisons among the three groups of countries should be conducted. The selected SPSS results are presented below (Table 9.4). Only the comparison between China and Singapore is significant. It suggests that senior executives in Singapore had rather different views from those in China: the degree of perceived uncertainty in Singapore was much higher than the degree of perceived uncertainty in China. However, no evidence is given to show the views in

Malaysia were dissimilar to those in Singapore or China. As such, executives in Malaysia might share similar opinions to those either in Singapore or China.

Table 9.4 Mann-Whitney Test:
The Perceived Environmental Uncertainty in China and Singapore

Ranks

	Country Where Based	N	Mean Rank	Sum of Ranks
Perceived Uncertainty	China	31	27.73	859.50
	Singapore	39	41.68	1625.50
	Total	70		

Test Statistics[a]

	Perceived Uncertainty
Mann-Whitney U	363.500
Wilcoxon W	859.500
Z	-2.911
Asymp. Sig. (2-tailed)	.004

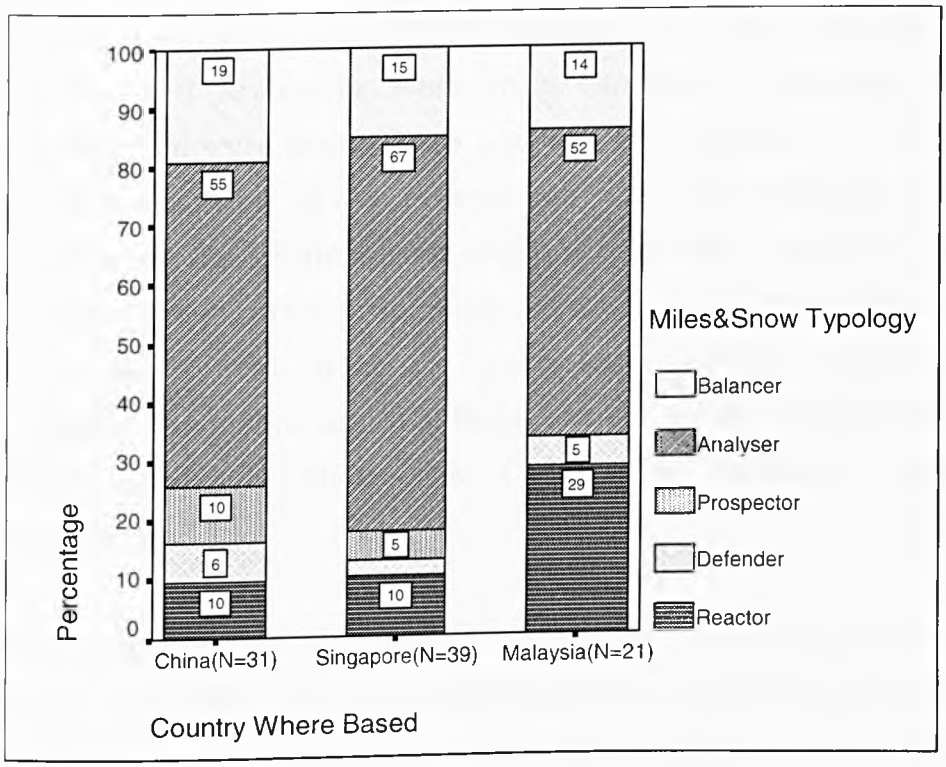
a. Grouping Variable: Country Where Based

9.3 Cross-National Comparisons: Strategic Options

9.3.1 Business Strategies Employed in China, Singapore and Malaysia

The following Clustered Bar chart (Figure 9.4) shows the trends of strategic orientations in the three selected countries. The similarity over the three countries is that most organisations were Balancers or Analysers with few adopting a Defender strategy in the country where they operate. The proportion of Balancers and Analysers was higher in Singapore (82 per cent) than in China (74 per cent) or Malaysia (66 per cent). A crosstabulation table is attached in Figure 9.4 to demonstrate further the research results.

Figure 9.4 Business Strategic Directions in China, Singapore and Malaysia



Miles and Snow * Country Where Based Crosstabulation

			Country Where Based			Total
			China	Singapore	Malaysia	
Miles and Snow	Reactor	Count	3	4	6	13
		% within Miles and Snow Simplify	23.1%	30.8%	46.2%	100.0%
		% within Country Where Based	9.7%	10.3%	28.6%	14.3%
	Defender	Count	2	1	1	4
		% within Miles and Snow Simplify	50.0%	25.0%	25.0%	100.0%
		% within Country Where Based	6.5%	2.6%	4.8%	4.4%
	Prospector	Count	3	2		5
		% within Miles and Snow Simplify	60.0%	40.0%		100.0%
		% within Country Where Based	9.7%	5.1%		5.5%
	Analyser or Balancer	Count	23	32	14	69
		% within Miles and Snow Simplify	33.3%	46.4%	20.3%	100.0%
		% within Country Where Based	74.2%	82.1%	66.7%	75.8%
Total		Count	31	39	21	91
		% within Miles and Snow Simplify	34.1%	42.9%	23.1%	100.0%
		% within Country Where Based	100.0%	100.0%	100.0%	100.0%

The proportions of the service organisations which adopted Balancer or Analyser strategies in China, Singapore and Malaysia were 0.333, 0.464 and 0.203 respectively. The majority of Balancers and Analysers were from Singapore. Amongst four Defenders, two were from China and one from Singapore and one from Malaysia. None of five Prospectors was from Malaysia, three of those were the China based organisations and two were from Singapore. The greatest proportion of Reactors was from Malaysia (0.462) and fewest Reactors were from China (0.231). In conclusion, Singapore organisations were more likely to conduct multiple strategies than the China and Malaysia based organisations.

Initially, five categories were designed for assigning business strategies. In order to obtain more expected count (ideally greater than 5) in the crosstabulation table and reliable chi-square test results, the categories of business strategies were recoded into two combined categories: using multiple business strategies (i.e. they were either Balancers or Analysers) or not using multiple business strategies (i.e. they were Defenders, Prospectors or Reactors).

The two-way contingency table analysis was conducted to evaluate the association between strategic types and country locations (Table 9.5). The business strategic orientation followed by an organisation was found to have no significant association with the country in which the organisation situated, Pearson χ^2= 1.831 (df = 2), p = 0.40. Hence, countries and business strategic options were found to have no significant association.

Table 9.5 Using Multiple Strategies-Country Where Based Crosstabulation

			Country Where Based			
			China	Singapore	Malaysia	Total
Using Multiple Strategies?	Yes	Count	23	32	14	69
		Expected Count	23.5	29.6	15.9	69.0
		% within Using Multiple Strategies	33.3%	46.4%	20.3%	100.0%
		% within Country Where Based	74.2%	82.1%	66.7%	75.8%
		% of Total	25.3%	35.2%	15.4%	75.8%
	No	Count	8	7	7	22
		Expected Count	7.5	9.4	5.1	22.0
		% within Using Multiple Strategies	36.4%	31.8%	31.8%	100.0%
		% within Country Where Based	25.8%	17.9%	33.3%	24.2%
		% of Total	8.8%	7.7%	7.7%	24.2%
Total		Count	31	39	21	91
		Expected Count	31.0	39.0	21.0	91.0
		% within Using Multiple Strategies	34.1%	42.9%	23.1%	100.0%
		% within Country Where Based	100.0%	100.0%	100.0%	100.0%
		% of Total	34.1%	42.9%	23.1%	100.0%

Chi-Square Tests

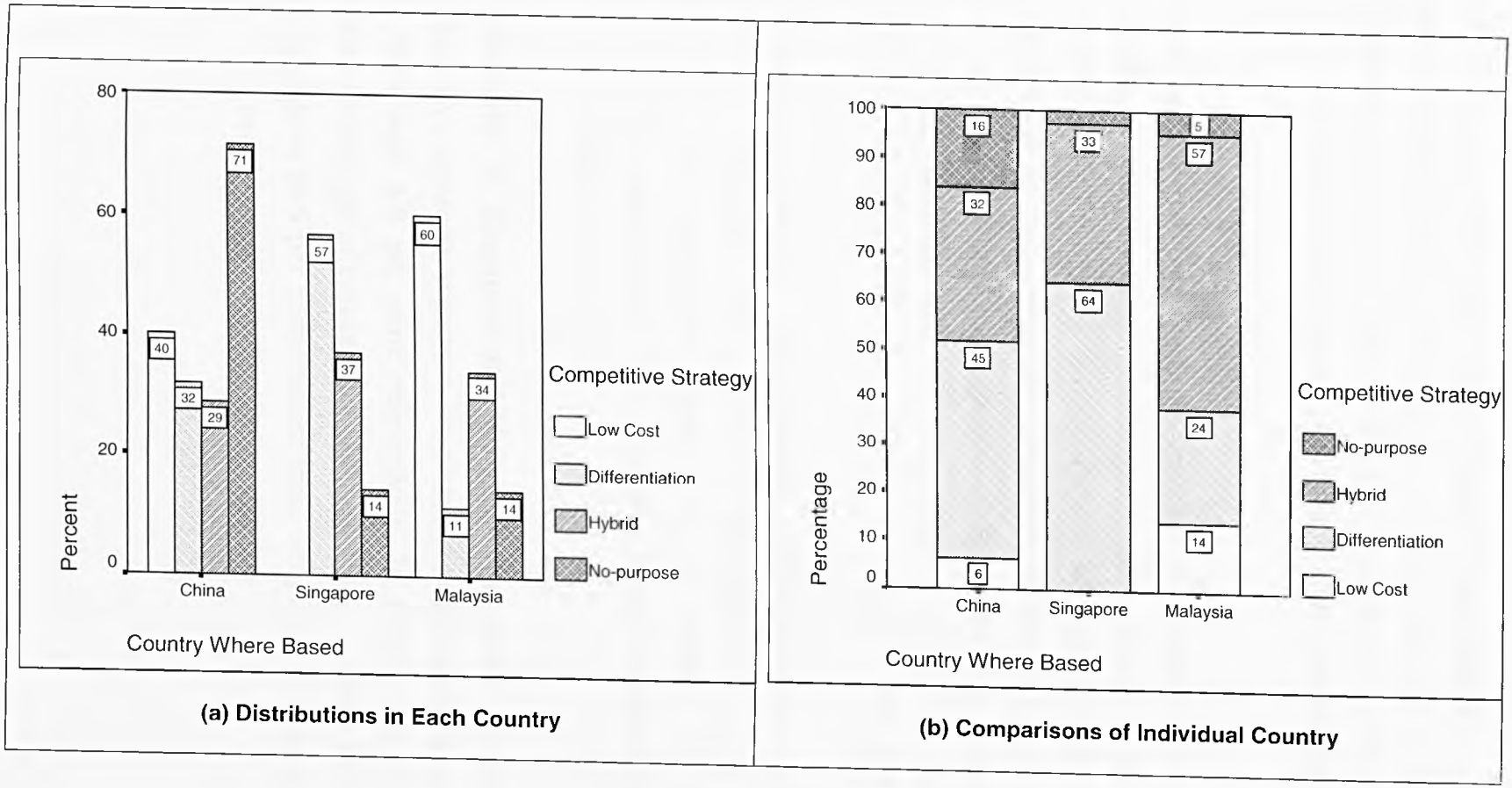
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.831	2	.400
N of Valid Cases	91		

a 0 cells (.0per cent) have expected count less than 5. The minimum expected count is 5.08.

9.3.2 Competitive Strategies in China, Singapore and Malaysia

In order to present the results better, a Bar chart is applied (Figure 9.5). Figure 9.5 compares the differences of competitive strategies applied in three selected countries. In Singapore, most organisations emphasise creating a unique feature within the industry (64 per cent).

Figure 9.6 Distributions and Comparisons of Competitive Strategies Applied in Three Countries



The majority of the China based organisations emphasise differentiating themselves from competitors (45.2 per cent). However, in Malaysia, most of the 19 organisations were keen on a combined advantage such as pursuing a Hybrid strategy (57.1 per cent).

Likewise, the two-way contingency table was presented to provide a picture of similarities or differences with respected competitive strategies used in China, Singapore and Malaysia (Table 9.6). The proportions of the service organisations which adopted a Hybrid strategy toward China, Singapore and Malaysia were 0.286, 0.371 and 0.343 respectively. For the category of a Differentiation strategy, the associated proportions were 0.318, 0.568 and 0.114.

Obviously, most of Differentiation organisations were from Singapore. Besides, no Low-cost organisations were found operating in Singapore. Five out of seven No-purpose organisations were from China, one was from Singapore and one was from Malaysia.

Additionally, in Singapore and Malaysia, the lowest percentage of competitive strategic type was No-purpose organisations, with 2.6 per cent and 4.8 per cent respectively. In China, however, the lowest percentage of competitive strategies was found as Low-cost organisations (6.5 per cent) rather than No-purpose organisations (16.1 per cent).

Table 9.6 Competitive Strategy by Porter - Country Where Based Crosstabulation

			Country Where Based			
			China	Singapore	Malaysia	Total
Competitive Strategy By Porter	Low Cost	Count	2	0	3	5
		Expected Count	1.7	2.1	1.2	5.0
		% within Competitive Strategy By Porter	40.0%	.0%	60.0%	100.0%
		% within Country Where Based	6.5%	.0%	14.3%	5.5%
		% of Total	2.2%	.0%	3.3%	5.5%
	Differentiation	Count	14	25	5	44
		Expected Count	15.0	18.9	10.2	44.0
		% within Competitive Strategy By Porter	31.8%	56.8%	11.4%	100.0%
		% within Country Where Based	45.2%	64.1%	23.8%	48.4%
		% of Total	15.4%	27.5%	5.5%	48.4%
	Hybrid	Count	10	13	12	35
		Expected Count	11.9	15.0	8.1	35.0
		% within Competitive Strategy By Porter	28.6%	37.1%	34.3%	100.0%
		% within Country Where Based	32.3%	33.3%	57.1%	38.5%
		% of Total	11.0%	14.3%	13.2%	38.5%
	No-purpose	Count	5	1	1	7
		Expected Count	2.4	3.0	1.6	7.0
		% within Competitive Strategy By Porter	71.4%	14.3%	14.3%	100.0%
		% within Country Where Based	16.1%	2.6%	4.8%	7.7%
		% of Total	5.5%	1.1%	1.1%	7.7%
Total		Count	31	39	21	91
		Expected Count	31.0	39.0	21.0	91.0
		% within Competitive Strategy By Porter	34.1%	42.9%	23.1%	100.0%
		% within Country Where Based	100.0%	100.0%	100.0%	100.0%
		% of Total	34.1%	42.9%	23.1%	100.0%

Note: As 50 per cent of cells have expected count less than 5, and the minimum expected count is 1.2, the resulting p-value for the overall chi-square test may not be trustworthy and hence the coefficient value of chi-square test is not applied.

In summary, the similarity in the three countries is that the majority of the organisations did endeavour to pursue a differentiation-oriented strategy that sought to emphasise a unique feature of their businesses and differentiate themselves from others. Singapore organisations were more likely to seek to achieve a differentiation character than China and Malaysia organisations did.

9.3.3 Strategic Positions for Service Organisations in China, Singapore and Malaysia

The same two-way contingency table analysis was used to evaluate the situation regarding competitive positions in the three selected countries (Table 9.7). The observed results are shown in Figure 9.6.

Table 9.7 Strategy Clock Positions - Country Where Based Crosstabulation

			Country Where Based			
			China	Singapore	Malaysia	Total
Strategy Clock Positions	low (or moderate) value competitive price	Count	1	0	3	4
		Expected Count	1.4	1.7	.9	4.0
		% within Strategy Clock Positions	25.0%	.0%	75.0%	100.0%
		% within Country Where Based	3.2%	.0%	14.3%	4.4%
		% of Total	1.1%	.0%	3.3%	4.4%
	high value competitive (low and moderate) price	Count	8	13	11	32
		Expected Count	10.9	13.7	7.4	32.0
		% within Strategy Clock Positions	25.0%	40.6%	34.4%	100.0%
		% within Country Where Based	25.8%	33.3%	52.4%	35.2%
		% of Total	8.8%	14.3%	12.1%	35.2%
	high value premium price	Count	10	19	2	31
		Expected Count	10.6	13.3	7.2	31.0
		% within Strategy Clock Positions	32.3%	61.3%	6.5%	100.0%
		% within Country Where Based	32.3%	48.7%	9.5%	34.1%
		% of Total	11.0%	20.9%	2.2%	34.1%
	un-competitive value and price	Count	12	7	5	24
		Expected Count	8.2	10.3	5.5	24.0
		% within Strategy Clock Positions	50.0%	29.2%	20.8%	100.0%
		% within Country Where Based	38.7%	17.9%	23.8%	26.4%
		% of Total	13.2%	7.7%	5.5%	26.4%
Total		Count	31	39	21	91
		Expected Count	31.0	39.0	21.0	91.0
		% within Strategy Clock Positions	34.1%	42.9%	23.1%	100.0%
		% within Country Where Based	100.0%	100.0%	100.0%	100.0%
		% of Total	34.1%	42.9%	23.1%	100.0%

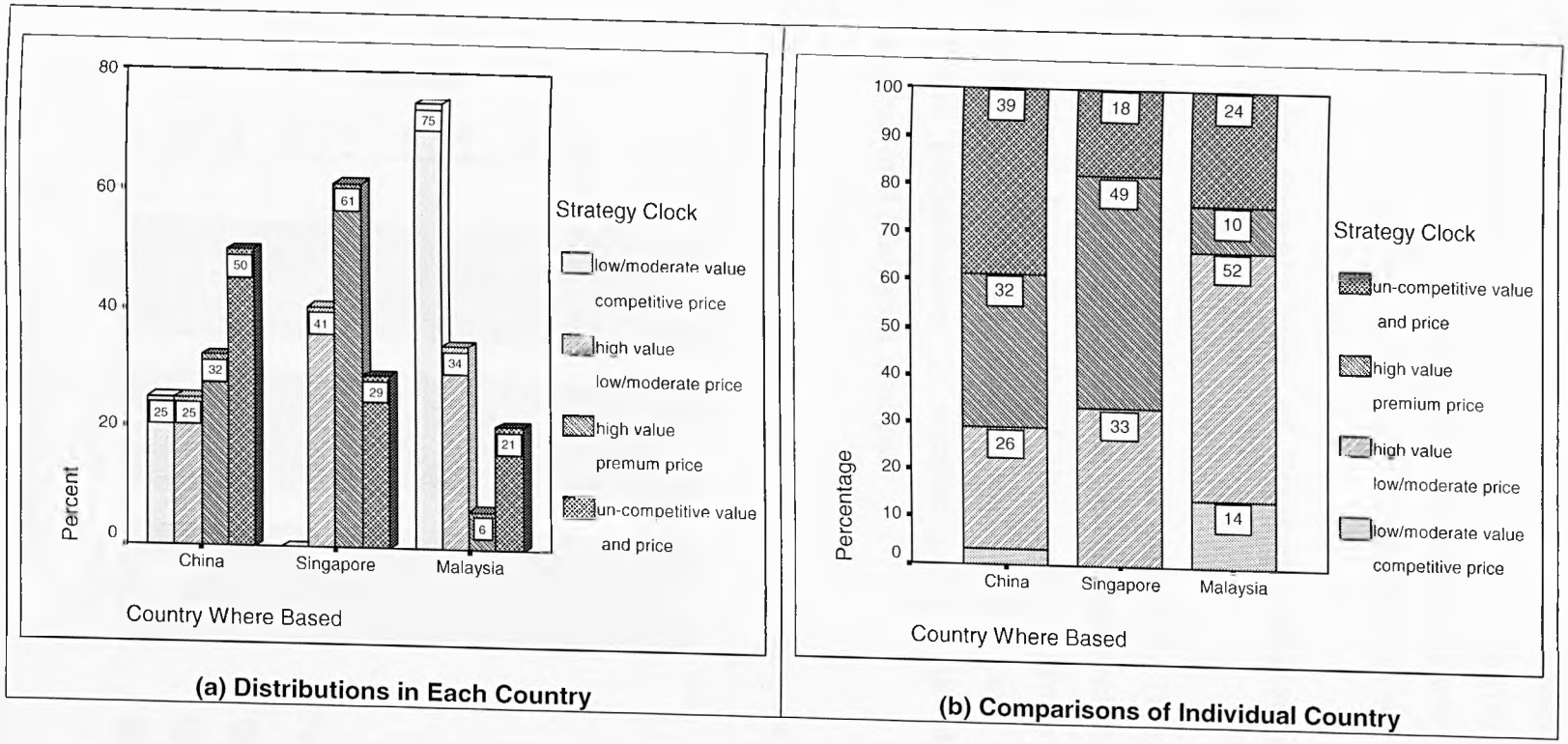
Note: As 25 per cent of cells have expected count less than 5, and the minimum expected count is 0.92, the resulting p-value for the overall chi-square test may not be trustworthy and hence the coefficient value of chi-square test is not applied.

Singapore organisations appeared to have better strategic positions than the China and Malaysia based organisations. Most of the high value premium organisations (61.3 per cent) were from Singapore. Most organisations following a strategy destined for ultimate failure with both un-competitive price and value were from China (50 per cent) and the majority of the high value competitive price organisations were from Singapore (41 per cent). None of four organisations with low or moderate value and competitive price was from Singapore, whereas three of those were from Malaysia and one was from China.

In Singapore, the majority of the organisations fell into the category of high value premium price organisations (48.7 per cent). Most of the Malaysia organisations pursued a combined advantage of high value and competitive (low and moderate) price (52.4 per cent). For China, the organisations pursued mainly three types of strategic positions and the majority fell into the group of un-competitive price and value (38.7 per cent).

In short, there was nothing in common in terms of competitive positions in these three countries. In this sense, the strategic approaches adopted by oil and gas service organisations for competing businesses in the region of East Asia varied greatly in their nature. Notably, organisations in Singapore appeared to be in a better competitive position compared with those in China and Malaysia.

Figure 9.6 Distributions and Comparisons of Strategic Positions in Three Countries



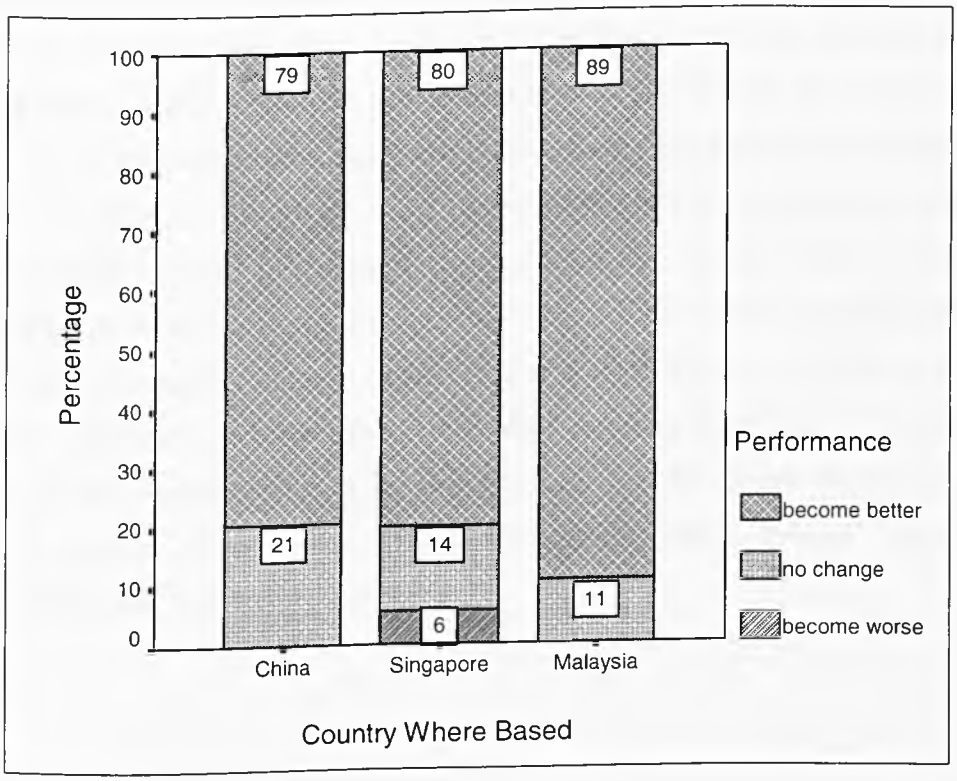
9.4 Cross-National Analysis of Strategic Performance

An overall one-way analysis of variance (ANOVA) was applied for the assessment of whether the means on strategic performance were significantly different among the country groups. Where appropriate, Post Hoc multiple comparisons were conducted in an instance where the variances are assumed as equal.

9.4.1 An Overall View of Strategic Performance in China, Singapore and Malaysia

The resulting chart is shown in Figure 9.7. There was a marked difference between the "become better" bar and "become worse" or "no change" bars in each of the country group. For the China based organisations, most (79 per cent) had improved their strategic performance. A similar pattern is observed for the Singapore and Malaysia groups.

Figure 9.7 Strategic Performance in China, Singapore and Malaysia



It is noticed that the low performance (become worse) bar only appeared in the Singapore group. The no change bar for the China group is larger than both the Singapore and Malaysia groups. This indicates that a higher proportion of organisations in China than that in Singapore and Malaysia had made no improvements in their strategic performance.

Furthermore, the hypothetical mean values can be used to depict roughly the level of strategic performance. If the mean value is less than 3.5, hypothetically, the organisation is assigned as a low (i.e. become worse) performance type; if the mean is between 3.5 and less than 4.5, the organisation is assigned as a medium (i.e. no change) performance type; if the mean is above 4.5, the organisation is assigned as a high (i.e. become better) performance type (see Table 9.8).

From Table 9.8, 23 out of the 29 organisations' strategic performance had become better in China, with the mean of 5.51; 28 out of 35 organisations' strategic performance had improved in Singapore, with a slightly lower mean of 5.18; and in Malaysia, 17 out of 19 organisations had improved their strategic performance, with the highest mean of 5.53. In total, only two Singapore based organisations had performed worse, with the mean value of 3.23. Six China based organisations, five Singapore based organisations and two Malaysia based organisations had made no changes in their strategic performance, with the mean values of 4.15, 4.09 and 3.98 respectively. The differences in the level of strategic performance across the three countries were tested by the following ANOVA tests.

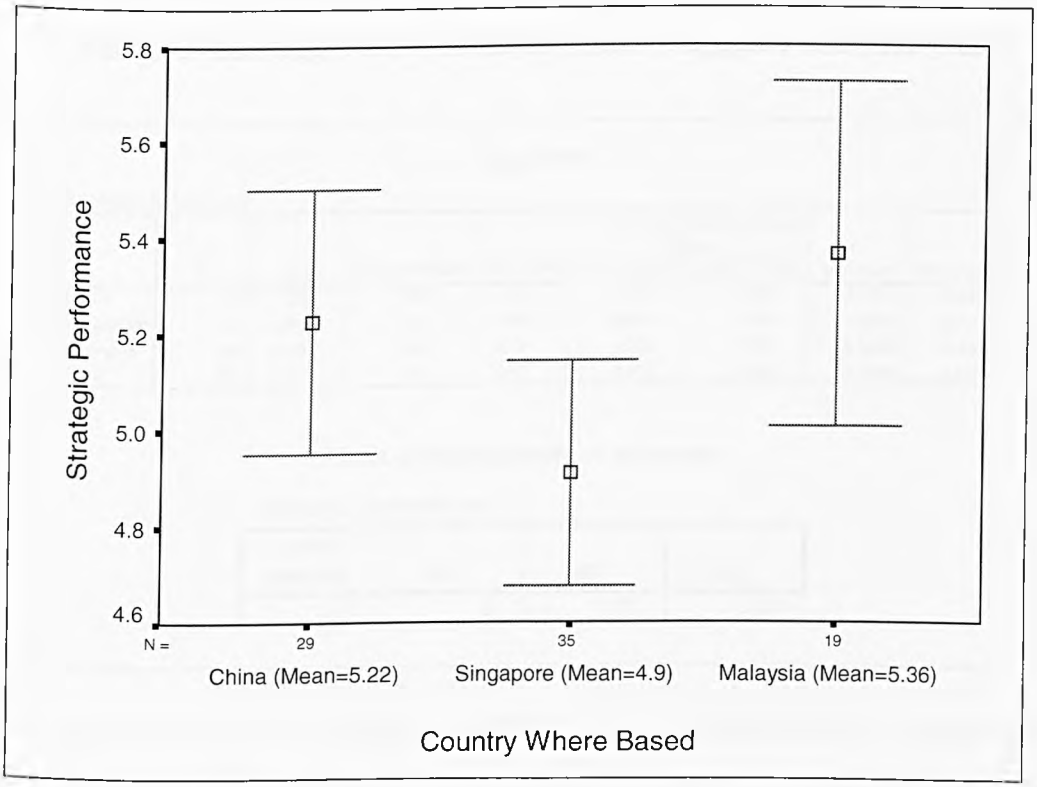
Table 9.8 Performance Classification of Organisations in China, Singapore and Malaysia

Hypothetical Mean Levels	Levels of Strategic Performance	Country where Based						Total
		China		*Singapore*		*Malaysia*		
		Number of Firms	*Mean of Performance*	*Number of Firms*	*Mean of Performance*	*Number of Firms*	*Mean of Performance*	
Become Worse (Mean less than 3.5)	**Low**			2	3.23			2
No Change (Mean between 3.5 and 4.5)	**Medium**	6	4.15	5	4.09	2	3.98	13
Become Better (Mean greater than 4.5)	**High**	23	5.51	28	5.18	17	5.53	68
	Total	29	5.22	35	4.90	19	5.36	83

9.4.2 Comparisons of Strategic Performance in the Three Selected Countries

First, the ANOVA results are depicted using the error bar chart to show the distributions of the strategic performance across the country groups (Figure 9.8). The error bar chart was used only as a rough guide to the data. From this chart, the means plots show the different levels of strategic performance. The mean value of strategic performance for China (5.22) and Malaysia (5.36) based organisations is greater than that for Singapore based organisations (4.90), suggesting that China and Malaysia organisations outperformed Singapore organisations. It is also observed that all of the error bars overlap indicating that there are no between-group differences.

Figure 9.8 Comparisons of Strategic Performance in China, Singapore and Malaysia



From the table of descriptive statistics (Table 9.9), the means corresponding to the results shown in the error bar chart are obtained. In addition, standard deviations and standard errors are presented. China, Singapore and Malaysia had standard deviations of 0.72, 0.68 and 0.75 respectively. They are all relatively small compared to the mean. It means that, in each of the three selected countries, managerial ratings for organisational strategic performance were consistently close to the mean ratings. In each case, there was a small fluctuation, but generally the strategic performance did not vary. As such, the mean is an accurate representation of strategic performance ratings and a good fit of the data. As all the mean values are above 4 (mean = 5.22, 4.90 and 5.36 in China, Singapore and Malaysia respectively), in each selected country organisations had improved their strategic performance over the five-year period examined. This is consistent with the results obtained in Chapter 7.

Table 9.9 Strategic Performance in China, Singapore and Malaysia

Descriptives

Strategic Performance

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
China	29	5.227	.723	.134	4.951	5.502	3.8500	6.4000
Singapore	35	4.910	.678	.115	4.677	5.142	3.0000	6.0000
Malaysia	19	5.366	.748	.172	5.005	5.726	3.5000	6.5000
Total	83	5.125	.727	.080	4.966	5.284	3.0000	6.5000

Test of Homogeneity of Variances

Strategic Performance

Levene Statistic	df1	df2	Sig.
.396	2	80	.674

The next part is a summary table of the Levene's test to examine whether the variances of the groups of three countries' may be equal. The SPSS Output shows that the Levene's test is insignificant ($p > 0.05$) then the null hypothesis that the variances

are equal should not be rejected. As such, the variances of China, Singapore and Malaysia groups are identical.

This means that organisations in each of the three countries tended to have a similar variation in assessment of their strategic performance. Hence, in each individual country, organisations had similar trends: the strategic performance had become better over the period of the five years examined. However, the level of the improvement in strategic performance of organisations i n different countries may vary and this is examined by applying the ANOVA tests below.

In the ANOVA scenario (Table 9.10), the output represents the results with respect to the differences of strategic performance in different countries. Although, as said earlier, the error bar plot indicated that no difference would be found, the overall ANOVA is considered marginally significant, F = 2.77 (df = 2), p = 0.068. Arguably, the null hypothesis that there are no differences among the groups can be rejected. This indicates that for organisations located in various countries, the levels of their strategic performance differ.

Table 9.10 Differences of Strategic Performance in Three Selected Countries

ANOVA

Strategic Performance

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.025	2	1.513	3.002	.055
Within Groups	40.316	80	.504		
Total	43.341	82			

Since the ANOVA test was significant the follow up Post Hoc multiple comparisons' tests to see which groups differed were

carried out. As said above, the variances of China, Singapore and Malaysia groups are identical, Tukey's test was applied (Table 9.11). It is clear that each group of subjects is compared to all of the remaining groups. For each pair of groups the difference between group means is displayed, including the standard error and the significance level (at a 90 per cent confidence interval) of that difference.

The China group is compared to the Singapore and Malaysia groups and reveals a non-significant difference (Sig. is greater than 0.10). These comparisons indicated that the strategic performance for organisations situated in China did not differ from those situated in Singapore and Malaysia. When comparing the Singapore based organisations with the Malaysia based organisations, however, there is a marginally significant difference (Sig. is less than 0.10). This observation shows that the Malaysia based organisation outperformed significantly the Singapore based organisations.

Table 9.11 also shows the results of Tukey's test, which displays subsets of groups that have the same (similar) means. Therefore, the Tukey creates two subsets of groups with statistically similar means. The first subset contains the Singapore and Malaysia groups (indicating that these two groups have the similar means) whereas the second subset contains the China and Malaysia groups. These results demonstrate that the Singapore group has a similar mean to the China group but not to the Malaysia group; and the China group has a similar mean to both Singapore and Malaysia groups. In other words, the only groups that have significantly different means are the Singapore and Malaysia groups.

Table 9.11 Post Hoc Tests for Strategic Performance in Different Countries

Multiple Comparisons

Dependent Variable: Strategic Performance
Tukey HSD

(I) Country Where Based	(J) Country Where Based	Mean Difference (I-J)	Std. Error	Sig.	90% Confidence Interval	
					Lower Bound	Upper Bound
China	Singapore	.317293	.1782582	.183	-.053866	.688452
	Malaysia	-.138748	.2095258	.786	-.575010	.297514
Singapore	China	-.317293	.1782582	.183	-.688452	.053866
	Malaysia	-.456041*	.2022920	.068	-.877241	-.034840
Malaysia	China	.138748	.2095258	.786	-.297514	.575010
	Singapore	.456041*	.2022920	.068	.034840	.877241

*. The mean difference is significant at the .10 level.

Strategic Performance

	Country Where Based	N	Subset for alpha = .10	
			1	2
Tukey HSD[a,b]	Singapore	35	4.909749	
	China	29	5.227041	5.227041
	Malaysia	19		5.365789
	Sig.		.248	.762

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 25.932.

b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

9.5 Cross-National Correlations Comparisons

In Chapter 8, the relationships were set up between the two variables of strategies and performance or the perceived business environment and performance; whereas no relationships were set up between the two variables of the perceived business environment and strategic options. This section intends to compare the differences of those established associations in various country groups.

9.5.1 Cross-National Strategy-Performance Association

The relationship of two variables - business strategies and strategic performance – is examined in this section. The crosstabulation table is applied and it contains the number of

cases that falls into each combination of categories. It is split into three: data for the China group, data for the Singapore group and data for the Malaysia group (Table 9.12).

9.5.1.1 Summarise Data

Initially, there are five categories for business strategies and seven ordinal categories for strategic performance. In order to obtain a more reliable outcome (ideally expected count greater than 5) in the crosstabulation table, the categories of business strategies and strategic performance are recoded. For business strategies, there are two combined categories of whether or not multiple business strategies are used: yes (i.e. they were either Balancers or Analysers) or no (i.e. they were Defenders, Prospectors or Reactors). Three combined categories for the level of strategic performance are formed as: become better (including tend to be better, better and much better categories), no change and become worse (including tend to be worse, worse, much worse categories).

(i) China

In total, the 21 China based organisations used multiple business strategies (72.4 per cent of the total). Of those, 18 organisations' strategic performance had become better (85.7 per cent of the total that used multiple strategies) and only three organisations' strategic performance remained the same (14.3 per cent of the total that used multiple strategies) over a five-year period. Eight organisations did not use any types of multiple business strategies such as Balancer or Analyser strategies (27.6 per cent of the total). Of those, five organisations' strategic performance had become better (62.5 per cent of the total that did not use multiple strategies) and only three organisations' strategic performance remained the same (37.5 per cent of the total that did not use

multiple strategies) over a five-year period. In summary, regardless of the selection of using multiple businesses strategies, most of the China based organisations had improved performance (79.3 per cent of the total). Furthermore, a lot more organisations in China employed multiple business strategies (72.4 per cent) than did not (27.6 per cent).

(ii) Malaysia

For the Malaysia group, the data can be summarised in a similar way and the results observed are similar to the China group. In total 12 of the Malaysia based organisations used multiple business strategies (63.2 per cent of the total). Of those, 11 organisations' strategic performance had become better (91.7 per cent of the total that used multiple strategies) and only one organisation's strategic performance remained the same (8.3 per cent of the total that used multiple strategies) over a five-year period. Seven organisations did not use any types of multiple business strategies such as Balancer or Analyser strategies (36.8 per cent of the total). Of those, six organisations' strategic performance had become better (85.7 per cent of the total that did not use multiple strategies) and only one organisations' strategic performance remained the same (14.3 per cent of the total that did not use multiple strategies) over a five-year period.

Hence, more of the Malaysia based organisations employed multiple business strategies (i.e. either Balancers or Analysers) (63.2 per cent) than those that did not (i.e. Defenders, Prospectors or Reactors) (36.8 per cent). In both categories, a large majority had improved their strategic performance. In short, organisations operating in Malaysia appeared to have improved strategic performance over the years no matter whether or not they chose to use multiple business strategies (89.5 per cent of the total).

Table 9.12 Multiple Strategies - Strategic Performance - Country Where Based Crosstabulation

Country Where Based				Strategic Performance: become worse	Strategic Performance: no change	Strategic Performance: become better	Total
China	Multiple Strategies?	Yes	Count		3	18	21
			Expected Count		4.3	16.7	21.0
			% within Multiple Strategies?		14.3%	85.7%	100.0%
			% within Strategic Performance		50.0%	78.3%	72.4%
			% of Total		10.3%	62.1%	72.4%
		No	Count		3	5	8
			Expected Count		1.7	6.3	8.0
			% within Multiple Strategies?		37.5%	62.5%	100.0%
			% within Strategic Performance		50.0%	21.7%	27.6%
			% of Total		10.3%	17.2%	27.6%
	Total		Count		6	23	29
			Expected Count		6.0	23.0	29.0
			% within Multiple Strategies?		20.7%	79.3%	100.0%
			% within Strategic Performance		100.0%	100.0%	100.0%
			% of Total		20.7%	79.3%	100.0%
Singapore	Multiple Strategies?	Yes	Count	1	2	25	28
			Expected Count	1.6	4.0	22.4	28.0
			% within Multiple Strategies?	3.6%	7.1%	89.3%	100.0%
			% within Strategic Performance	50.0%	40.0%	89.3%	80.0%
			% of Total	2.9%	5.7%	71.4%	80.0%
		No	Count	1	3	3	7
			Expected Count	.4	1.0	5.6	7.0
			% within Multiple Strategies?	14.3%	42.9%	42.9%	100.0%
			% within Strategic Performance	50.0%	60.0%	10.7%	20.0%
			% of Total	2.9%	8.6%	8.6%	20.0%
	Total		Count	2	5	28	35
			Expected Count	2.0	5.0	28.0	35.0
			% within Multiple Strategies?	5.7%	14.3%	80.0%	100.0%
			% within Strategic Performance	100.0%	100.0%	100.0%	100.0%
			% of Total	5.7%	14.3%	80.0%	100.0%
Malaysia	Multiple Strategies?	Yes	Count		1	11	12
			Expected Count		1.3	10.7	12.0
			% within Multiple Strategies?		8.3%	91.7%	100.0%
			% within Strategic Performance		50.0%	64.7%	63.2%
			% of Total		5.3%	57.9%	63.2%
		No	Count		1	6	7
			Expected Count		.7	6.3	7.0
			% within Multiple Strategies?		14.3%	85.7%	100.0%
			% within Strategic Performance		50.0%	35.3%	36.8%
			% of Total		5.3%	31.6%	36.8%
	Total		Count		2	17	19
			Expected Count		2.0	17.0	19.0
			% within Multiple Strategies?		10.5%	89.5%	100.0%
			% within Strategic Performance		100.0%	100.0%	100.0%
			% of Total		10.5%	89.5%	100.0%

(iii) Singapore

An extra category of the level of strategic performance appears in the summary data for the Singapore group. In total 28 Singapore based organisations used multiple business strategies (80 per cent of the total). Of those, 25 organisations' strategic performance had become better (89.3 per cent), two organisations' strategic performance remained the same (7.1 per cent) and one indicated that its strategic performance became worse (3.6 per cent). Seven organisations did not use any type of multiple business strategies (20 per cent of the total). Of those, 3 organisations' strategic performance had become better (42.9 per cent), three organisations' strategic performance remained the same (42.9 per cent) and one had performed worse (14.3 per cent) over a five-year period.

In summary, when multiple business strategies were employed, most Singapore organisations performed better, but when multiple business strategies were not introduced, most Singapore organisations did not perform better (their performance either remained the same or became worse). However, regardless of strategic performance they could achieve, a large majority of organisations used multiple business strategies.

9.5.1.2 Significant Differences of Strategy-Performance Association in the Selected Countries?

The chi-square test (Table 9.13) examines whether there is an association between two categorical variables: the level of strategic performance and whether the organisations used multiple strategies or not. The Pearson chi-square statistic tests whether the two variables are independent.

Table 9.13 Chi-Square Tests[a,e]: Strategy and Performance Association

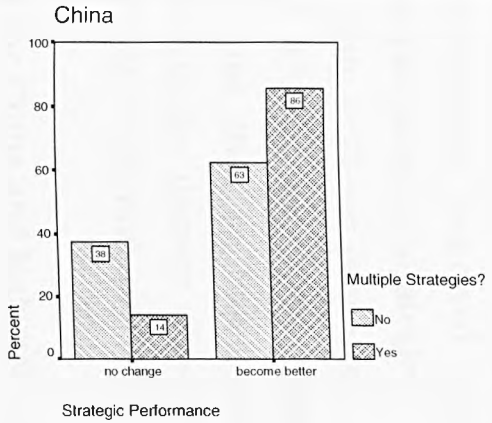
Country where Based		Value	df	Asymp. Sig. (2-sided)
China[b]	Pearson Chi-Square	1.903	1	0.168
	N of Valid Cases	29		
Singapore[c]	Pearson Chi-Square	7.634	2	0.022
	N of Valid Cases	35		
Malaysia[d]	Pearson Chi-Square	0.166	1	0.683
	N of Valid Cases	19		

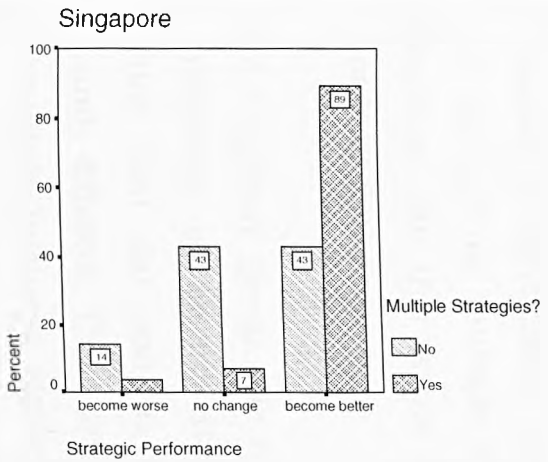
a Computed only for a 2x2 table
b 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.66.
c 4 cells (66.7%) have expected count less than 5. The minimum expected count is .40.
d 2 cells (50.0%) have expected count less than 5. The minimum expected count is .74.
e More than 20 per cent of expected frequencies below 5, the result may be a loss of statistical power. Proportionately small differences in cell frequencies could result in statistically significant associations between variables (Field, 2000). For these reasons, the observed results are only used as exploratory findings for the study.

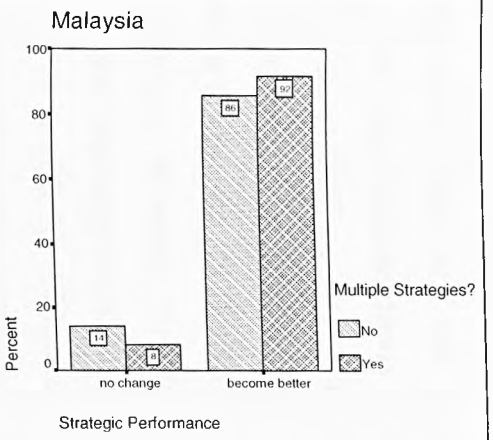
For both the China and Malaysia groups, the chi-square statistic is observed to be insignificant ($p > 0.05$), indicating that the level of strategic performance is not affected by whether multiple strategies would be used. This finding reflects the fact that the level of strategic performance for the China and Malaysia groups was identical in the two strategic options. On the contrary, for the Singapore group, the chi-square statistic observed is significant ($p < 0.05$), and the hypothesis that the variables are independent could be rejected. This means that in Singapore strategic performance was in some way associated with the choice of business strategies. Better strategic performance is significantly associated with multiple business strategies whereas poor strategic performance is associated with those users of non-multiple business strategies.

Figure 9.9 highlights these differences: the proportion of levels of strategic performance in the two strategic conditions is opposite for the Singapore group, but identical in the China and Malaysia groups.

Figure 9.9 Cramer's Statistics: the Comparisons of Strategic Performance with Different Business Strategies in China, Singapore and Malaysia







Symmetric Measures

Country where Based			Value	Approx. Sig.
China	Nominal by Nominal	Phi	.256	.168
		Cramer's V	.256	.168
	N of Valid Cases		29	
Singapore	Nominal by Nominal	Phi	.467	.022
		Cramer's V	.467	.022
	N of Valid Cases		35	
Malaysia	Nominal by Nominal	Phi	.094	.683
		Cramer's V	.094	.683
	N of Valid Cases		19	

For the Singapore group, the Cramer's statistic is 0.467 out of a possible maximum value of 1. This represents a relatively strong association between the level of strategic performance and whether the organisations used multiple strategies or not. This value is significant ($p < 0.05$) indicating that strength of the relationship is significant. For the China and Malaysia groups, Cramer's statistic is 0.256 and 0.094 respectively, indicating the association between the two variables is weak for China and Malaysia organisations. The probability that this value is a chance result is 0.168 for China and 0.683 for Malaysia. These results confirm what the chi-square test shows: the level of strategic performance is significantly related to whether an organisation uses or doe not use multiple strategies for the Singapore based organisations, but this is not true for the China and Malaysia based organisations.

For the Singapore group, the trend of strategic performance (i.e. the proportion of organisations that became better to the proportion that did not) in the two strategic conditions is significantly different. This significant finding reflects the fact that when multiple business strategies are introduced as a formal strategic process, the big majority (89 per cent) of Singapore based organisations improved their strategic performance. When multiple business strategies are not used, the opposite is true (the majority – 57 per cent - had not improved strategic performance and 43 per cent had improved strategic performance). This indicates that in Singapore, it appears that an association between the degrees of strategic performance (two levels) and whether or not multiple strategies (two options) were used.

For the China and Malaysia based organisations, there is not such a significant result. In both strategic categories, the majority of the firms had improved their strategic performance (86 per cent for

Yes and 63 per cent for No in China; 92 per cent for Yes and 86 per cent for No in Malaysia).

9.5.1.3 Findings of Strategy-Performance Association in the Selected Countries

In each individual country, the majority of organisations used multiple strategies. Regardless of strategies pursued, the majority of China and Malaysia based organisations had a better strategic performance. However, in Singapore, for those employing multiple strategies the majority had improved their performance, yet when multiple strategies were not used, the majority had not improved their strategic performance at all.

It can be assumed that in Singapore, the type of strategic options provides significant impacts on strategic performance for service organisations: the higher level of strategic performance is associated with multiple strategies and the lower level of strategic performance is associated with non-multiple strategies. The type of strategy, on the other hand, does not influence organisations' strategic performance in China and Malaysia: service organisations can achieve a sound strategic performance no matter what types of strategy are selected.

As too few numbers of cases for some categories (e.g. become worse) were obtained, there is an inevitable limitation of the research results. In this sense, no conclusions can be drawn based upon the observed results. More cases are needed if seeking to prove the significance of the findings in individual countries.

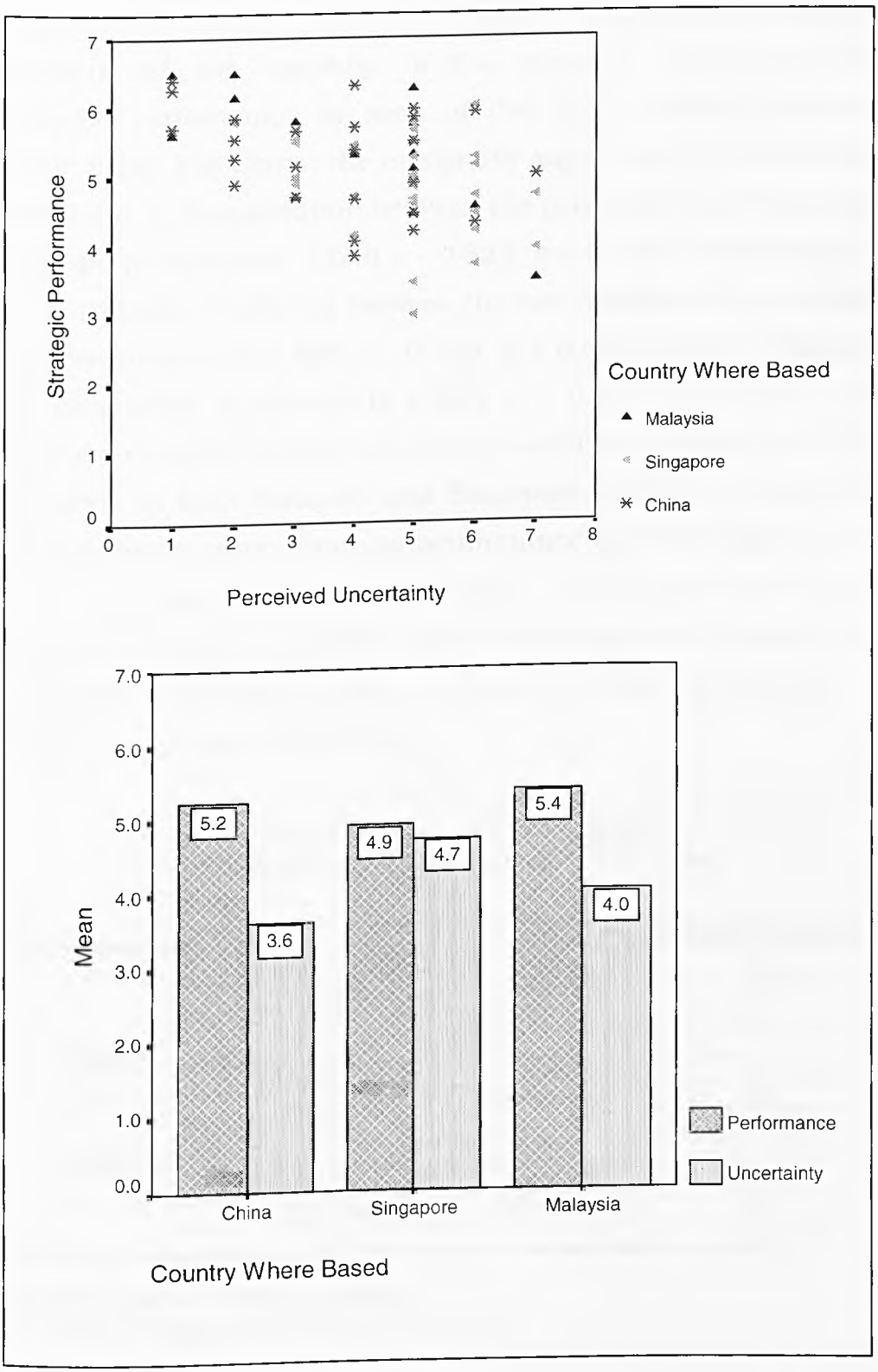
9.5.2 Cross-National Environment-Performance Relationships

9.5.2.1 Exploring data

The resulting scatterplot is shown in Figure 9.10. First, there seems to be some general trends in the data such that the higher levels of strategic performance are associated with lower levels of perceived environmental uncertainty. Second in each individual country, the scatterplot shows that the perception of the environmental uncertainty is fairly fragmented. However, the majority of organisations had improved strategic performance (there are very few cases that had strategic performance levels below 3, which means, becoming worse). Third, another noticeable trend in these data is that none of the three countries had cases having a strategic performance of becoming much worse (strategic performance below 2).

Amongst the three selected countries, for the China and Malaysia groups, the perceived environmental uncertainty was at a relatively low level (mean = 3.6 and 4.0 respectively) yet they achieved a relatively high level of strategic performance (mean = 5.2 and 5.4 respectively). For the Singapore group, the perceived environmental uncertainty was the highest (mean = 4.7) and the Singapore based organisations had a relatively poorer strategic performance than that of the other two countries' groups (mean = 4.9). These observed results indicate a pattern that, when making a comparison amongst individual countries in an East Asia context, higher levels of strategic performance are associated with lower levels of perceived environment uncertainty; while lower levels of strategic performance are associated with higher levels of environmental uncertainty.

Figure 9.10 Exploring Data:
Perceived Uncertainty and Performance Relationship



9.5.2.2 Environment-Performance Correlation Comparisons

A matrix is displayed giving the Spearman correlation coefficient between the two variables of the perceived uncertainty and strategic performance in each of the three selected countries (Table 9.14). For China, the marginally significant result indicates that there is an association between the perceived uncertainty and strategic performance, r (29) = - 0.323, p = 0. 087. For Singapore, the correlation coefficient between the two variables of uncertainty and performance is r (35) = - 0.375, p = 0.027; and for Malaysia, the correlation coefficient is r (35) = - 0.629, p = 0.004. The significance value for this correlation coefficient is less than 0.05; therefore, in both Malaysia and Singapore, there is a significant relationship between strategic performance and the degree of the perceived environmental uncertainty. As all correlations are negative, it can be concluded that as the degree of environmental uncertainty decreases, there is a corresponding improvement in levels for strategic performance.

Table 9.14 Spearman Correlations:
Perceived Uncertainty and Strategic Performance

Country where Based			Strategic Performance
China	Correlation Coefficient	**Perceived**	-.323
	Sig. (2-tailed)	**Uncertainty**	.087**
	N		29
Singapore			
	Correlation Coefficient	**Perceived**	-.375
	Sig. (2-tailed)	**Uncertainty**	.027*
	N		35
Malaysia			
	Correlation Coefficient	**Perceived**	-.629
	Sig. (2-tailed)	**Uncertainty**	.004*
	N		19

* Correlation is significant at the .05 level (2-tailed).
** Correlation is marginally significant at the .10 level (2-tailed).

Furthermore, amongst the three countries, the association for the China group is similar with the Singapore group but is weaker

than the Malaysia group. The Singapore and China groups had a weak correlation coefficient whereas the Malaysia group showed a strong correlation between strategic performance and environmental uncertainty. This means, when the degree of perceived environmental uncertainty decreases at a same level, the corresponding improvement of strategic performance is different: the China based organisations improved in a manner similar to Singapore organisations; the Malaysia based organisations show a greater improvement in strategic performance than China and Singapore organisations.

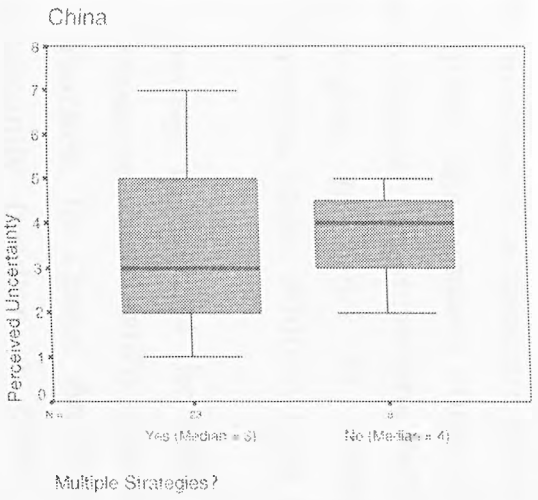
9.6 Cross-National Comparisons: Differences

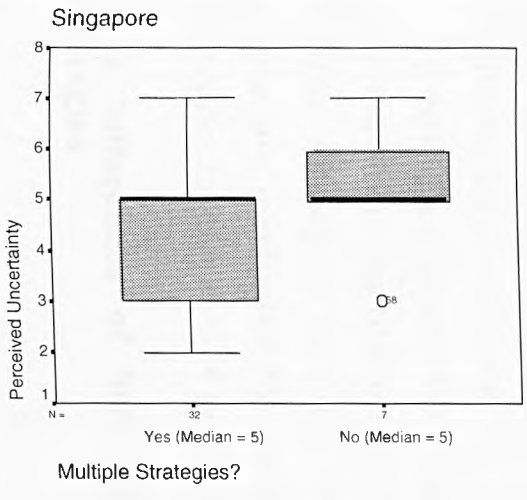
Having compared the differences of correlations in each of the three countries, we now proceed to compare the differences in levels of perceived environmental uncertainty and strategic performances for organisations employing various strategies. In order to gauge the situation more precisely, the five categories of business strategies are also merged into two. Balancers and Analysers are combined to form a category of using multiple strategies; Prospectors, Defenders and Reactors are combined together into the second category of not using multiple strategies.

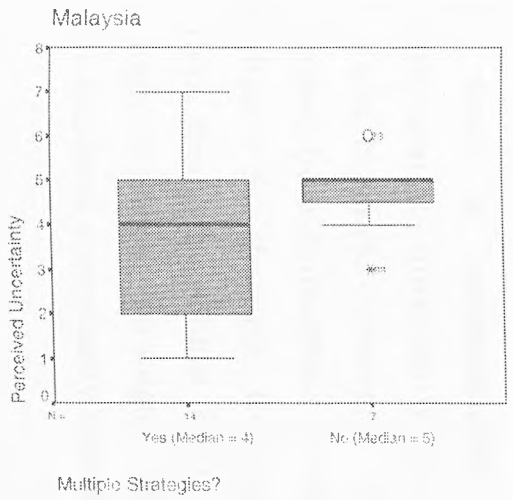
9.6.1 Differences of Environmental Uncertainty with Business Strategies

A Boxplot graph was displayed (Figure 9.11). When using the median as a measure of central tendency, it is observed that organisations in China using multiple business strategies such as Analysers or Balancers perceived a lower level of environmental uncertainty (median = 3) than those without multiple business strategies such as Prospectors, Defenders or Reactors (median = 4).

Figure 9.11 Business Strategies and Associated Perceived Environmental Uncertainty in China, Singapore and Malaysia







Test Statistics[b,c]

	Perceived Uncertainty
Mann-Whitney U	78.500
Wilcoxon W	354.500
Z	-.619
Asymp. Sig. (2-tailed)	.536
Exact Sig. [2*(1-tailed Sig.)]	.550[a]

a. Not corrected for ties.
b. Grouping Variable: Multiple Strategies?
c. Country Where Based = China

Test Statistics[b,c]

	Perceived Uncertainty
Mann-Whitney U	70.000
Wilcoxon W	598.000
Z	-1.596
Asymp. Sig. (2-tailed)	.110
Exact Sig. [2*(1-tailed Sig.)]	.131[a]

a. Not corrected for ties.
b. Grouping Variable: Multiple Strategies?
c. Country Where Based = Singapore

Test Statistics[b,c]

	Perceived Uncertainty
Mann-Whitney U	34.500
Wilcoxon W	139.500
Z	-1.118
Asymp. Sig. (2-tailed)	.264
Exact Sig. [2*(1-tailed Sig.)]	.287[a]

a. Not corrected for ties.
b. Grouping Variable: Multiple Strategies?
c. Country Where Based = Malaysia

The Malaysia group shows exactly the same trend with respect to the level of environmental uncertainty: the degree of environmental uncertainty perceived by organisations using multiple business strategies is lower (median = 4) than that perceived by organisations not using multiple business strategies (median = 5). However, the Singapore group shows a different pattern from the China group. Regardless of whether or not multiple business strategies were used, the level of perceived environmental uncertainty is same (both medians are 5).

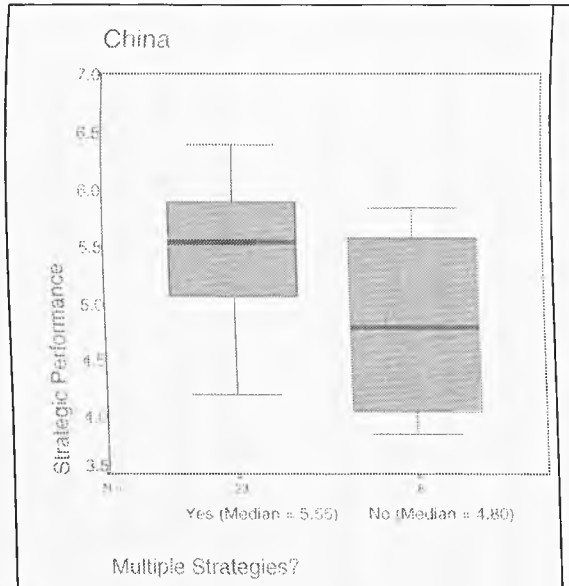
When conducting Mann-Whitney tests, none of the differences is significant, for the China group, $p = 0.536$; for the Malaysia group, $p = 0.264$. This means that there is no significant difference of perceived environmental uncertainty between using and not using multiple strategies. In other words, though different strategic options are conducted by organisations, it does not make any differences for the level of perceived uncertainty.

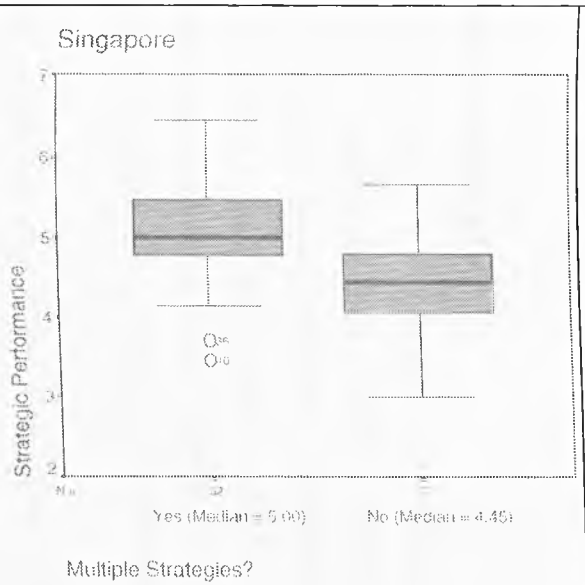
9.6.2 Differences of Strategic Performance with Business Strategies

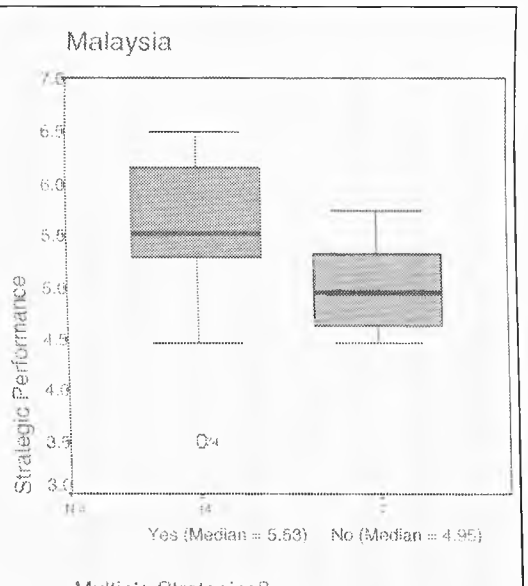
A graph displaying a Boxplot was presented (Figure 9.12). Using the median as a measure of central tendency, in each of three countries, the common character is that Balancers or Analysers outperformed organisations with Prospector, Defender or Reactor strategies. In order to examine the significance of these differences, Mann-Whitney tests were carried out.

Obviously, in each of the three countries, the level of strategic performance varied when conducting different business strategic approaches. In China, Analysers and Balancers outperformed significantly (median = 5.55) organisations with Prospector, Defender or Reactor strategic directions (median = 4.45), $p = 0.04$.

Figure 9.12 Business Strategies and Associated Performance in China, Singapore and Malaysia







Test Statistics[b,c]

	Strategic Performance
Mann-Whitney U	46.500
Wilcoxon W	82.500
Z	-2.057
Asymp. Sig. (2-tailed)	.040
Exact Sig. [2*(1-tailed Sig.)]	.038[a]

a. Not corrected for ties.

b. Grouping Variable: Multiple Strategies?

c. Country Where Based = China

Test Statistics[b,c]

	Strategic Performance
Mann-Whitney U	51.500
Wilcoxon W	79.500
Z	-2.216
Asymp. Sig. (2-tailed)	.027
Exact Sig. [2*(1-tailed Sig.)]	.024[a]

a. Not corrected for ties.

b. Grouping Variable: Multiple Strategies?

c. Country Where Based = Singapore

Test Statistics[b,c]

	Strategic Performance
Mann-Whitney U	25.000
Wilcoxon W	53.000
Z	-1.795
Asymp. Sig. (2-tailed)	.073
Exact Sig. [2*(1-tailed Sig.)]	.079[a]

a. Not corrected for ties.

b. Grouping Variable: Multiple Strategies?

c. Country Where Based = Malaysia

For the Singapore group, organisations using multiple strategies also outperformed significantly (median = 5.00) organisations not using multiple strategies (median = 4.45), p = 0.027. In Malaysia, the strategic performance of Analysers or Balancers was better (median = 5.53) than that of the other three strategic types (median = 4.95) and this difference is marginally significant, p = 0.073. These results are consistent with the observation demonstrated above. It can be concluded that appropriate strategic options should be essentially relevant to a better performing business.

9.7 Summary

This chapter has compared differences and similarities across the three selected East Asian countries: China, Singapore and Malaysia. Non-parametric analytical techniques are applied mainly for analysis. More evidence can be obtained from the statistical results of the three individual countries and then to prove further some of the proposed research propositions.

In each of the three countries, the business environment is perceived as complex, dynamic and pleasant. China appears to have a certain business environment and the situation of the environmental uncertainty in Malaysia is neutral (i.e. neither certain nor uncertain). Only in Singapore, the managerial perception of the business environment is uncertain.

The participating organisations can be classified into different strategic groups in individual countries. Among those, the Singapore based organisations are more likely to employ Balancer or Analyser strategies and are more likely to seek to achieve a differentiation character than the China and Malaysia based organisations. For strategically competitive positions, the majority

of Singapore organisations fall into the category of high value premium price. In Malaysia, the organisations are mainly keen on a combined competitive advantage with high value competitive price. The majority of China organisations are categorised into the group of un-competitive price and value. In addition, for organisations in each individual country, their strategic performances become better over the period examined.

The key findings also indicate that a higher strategic performance is associated with a lower level of perceived environmental uncertainty regardless of strategic types used in each of the three countries.

CHAPTER 10
CONCLUSIONS AND RECOMMENDATIONS

In this study, effective business strategies for the energy service industry in an East Asian business environment have been researched. This chapter attempts to summarise the results of the survey questionnaires from the 98 oil and gas service organisations operating in China, Singapore and Malaysia. It then discusses the findings derived from the research results. Verifications of propositions are illustrated. It also demonstrates the contributions of the current study to the theoretical and empirical literature. The implications of the research findings for organisations operating in East Asia are explored and limitations of the current study are considered. The chapter also points to directions along which further research may be conducted.

10.1 General Findings of the Research Results

Regarding an overall picture of the participating service organisations' background, several points can be made. First, China's oil and gas service sector is comprised mainly of independent entities; by contrast, divisional companies and subsidiaries play a vital role in the oil and gas service economies of Singapore and Malaysia. Second, while large organisations are an important feature in China, small entities form a large proportion of service organisations located in Singapore. In Malaysia, organisations are either small size or large size. Third, the results support the fact that the offshore oil and gas service businesses were established earlier in Singapore than in China. Fourth, joint ventures in the China oil and gas service sector

are more popular than in both Malaysia and Singapore. Foreign companies consider Singapore to be a favourable place for establishing their own regional headquarters. Finally, the big majority of the respondents in each individual country are senior managers or regional heads who were in charge of businesses.

10.1.1 Oil and Gas Service Organisations

Service organisations are divided mainly into independent entities, divisional or subsidiary companies, operating or business units. In China, the oil and gas service sector is comprised mainly of independent entities; and amongst the three countries, most of independent organisations are from China. Hence, independent entities appear to be more popular than other types when operating service business in this country. On the other hand, divisional companies and subsidiaries play a vital role in the oil and gas service economy of Singapore and Malaysia. In addition, among the three countries, most of divisional or subsidiary organisations and most of operating or business units are from Singapore. As many of those are foreign owned, Singapore is perceived to be a favourable place for international organisations to operate "remotely". This observation is consistent with the point made in Chapter 3 that Singapore is the preferred hub for international service organisations in East Asia.

The service sector consists of large or very large size organisations with 500 or more full-time employees and small and medium organisations with fewer than 500 employees. In detail, medium to large organisations (50 or more employees) are essential in China whereas small entities (fewer than 50 employees) form an important proportion of service organisations located in Singapore and Malaysia. Especially, in Malaysia, organisations are either small size or medium size. In each of these three countries, medium entities

(from 50 to 199 employees) tend to make up a small proportion of the total.

A notable finding shows that most of divisional or subsidiary organisations and most of operating or business units are from Singapore whereas most of independent organisations are from China. This indicates that independent entities are more popular than other types of entities in China; whereas divisional companies and subsidiaries play a vital role in the oil and gas service economy in Singapore and Malaysia. As many of divisional companies and subsidiaries in Singapore are foreign owned, Singapore is perceived to be a favourable place for international organisations to operate "remotely" and this country is deemed a preferred hub for international service organisations.

At the time of the survey, a large majority of the service organisations have been in their existing businesses for five or more years. In particular, the offshore service organisations are older in Singapore than those in China, indicating a longer industrial development of that small and prosperous country.

Wholly foreign owned or joint ventures are the majority in East Asia. There is also a considerable proportion of indigenous organisations which consist of wholly domestic state owned, wholly domestic private or individual owned, and domestic share holding or public limited companies. China prefers joint ventures. Hence, an effective entry strategy for foreign service organisations wishing to enter into the Chinese market is to set up a joint venture with Chinese partners. Moreover, in contrast with Singapore and Malaysia, the Chinese government has played a business role in the offshore oil and gas service sector. This is because China has a socialist economy whereas Malaysia and Singapore, having a capitalist system, operate a relatively open economy with lesser governmental interference in oil

service businesses. Furthermore, it has been the policy of Singapore to market itself as a favourable place for foreign investors to establish regional headquarters.

10.1.2 Business Activities

Offshore oil and gas service organisations serve not only the oil and gas industry, but also the other energy industries like hydropower, electricity, and nuclear. In this sense, such enterprises can be regarded as energy service organisations. The upstream service activities usually offer services throughout the four industrial sectors of exploration, appraisal, development and production; some may be even involved in serving other oil and gas industrial sectors outwith their upstream activities.

Service activities are widely distributed in various countries and regions throughout East Asia and a service organisation may carry out its business in more than one country. China, Singapore, Malaysia and Indonesia are the most fruitful markets for international oil and gas service businesses but that of China dwarfs all other nations in the region of East Asia.

10.1.3 A Picture of the Service Sector in East Asia

Overall, for the nature of the perceived business environment, the perceived environmental uncertainty in China is low and in Malaysia, it tends to be at a neutral point, whereas in Singapore the business environment is perceived as uncertain. The degree of the perceived environmental uncertainty in Singapore is higher than in the other two selected countries and was significantly greater than that perceived by the China group (see Figure 9.3 in Chapter 9).

With respect to business strategies, countries and business strategic options are found to have no significant association. The common feature is that organisations appear to adopt the use of multiple strategies. Another similarity in the three countries is that most of the organisations did endeavour to pursue a differentiation strategy to emphasise a unique feature of their businesses and differentiate themselves from their competitors. Singapore organisations are more likely to seek to achieve a differentiation character than China and Malaysia organisations do. What is more, nothing is found to be common with respect to the strategic approaches adopted by oil and gas service organisations for competing businesses in the three selected countries.

No significant differences in strategic performance are found for the groups between China and Malaysia or between China and Singapore; the results for strategic performance are significant between the groups of Malaysia and Singapore because the Malaysia group outperformed the Singapore group significantly.

10.2 Key Findings of the Research Results

Manderson (2000), the chief executive officer at ASCO plc – an Aberdeen logistics oil and gas service company, suggests that the economic situation was the most important factor because it indicates the state of the markets and controls the level of activities. It is clear that for oil service organisations, if there were not any oil and gas activities, they will not go to the market place to conduct business. In addition, the power of the buyer means market and economic background and hence is the most significant. Buyers' power is very strong to any service firms and, in this buyer-seller relationship, oil clients are dominant in terms of their relative scale of suppliers (i.e. the number of suppliers is big).

In this study, the six task environmental sectors, namely, economics, technology, regulatory, customers, competitors and suppliers, are considered by executives as important for the growth of their businesses in the region. Amongst these sectors, economic, technological, customers' and competitors' factors have a relatively strong impact whereas the regulatory factors are likely to have a moderate impact on the business growth in the region. The suppliers' impact is more likely to be weak. In addition, the impact of customers is the strongest and this factor is therefore perceived as the most important one. Conversely, the impact of suppliers is the weakest and the suppliers' factor is less important.

The four environmental sectors of customers, economics, competitors and technologies are therefore considered significant for oil and gas service businesses in East Asia. Hence, executives within the oil and gas service sector in East Asia should have close attention to these four task environmental sectors and see them as key indicators when formulating strategies. Particularly, senior management should devote more attention to customers than suppliers when scanning and assessing the task environmental conditions for strategic decisions.

In Singapore, environmental factors do not affect some service companies directly but the effects they have on the industry do, as more legislation is put in place to try and control the industry. It becomes more expensive for companies to operate and then they have less cash margin, so they spend less. Even with the price of oil at its present high, this situation is not seen changing significantly in the future (Croy, 2000). In China, on the other hand, the survival of oilfields means that service firms survive. For suppliers and service companies, oil price, the number of offshore fields, new discoveries and new projects were regarded as very crucial indicators (Tan, 13 August 2000).

The competition within the offshore service industry is not very strong. The service industry is fragmented and for this reason direct comparisons are difficult (Manderson, 2000). Croy (2000) said the same thing: "Service and supply is dominated by a few major companies, whether in Kuala Lumpur, Beijing, Timbuktu, Houston or Alaska. The slack is taken up by local companies, who still have, in the main, to depend on the major companies to provide equipment, materials etc". Although on the lower end of the supply and service chain there is a lot of competition, with companies coming and going, established companies compete on a "swings and roundabouts" approach. They can't cover all the bases, so they are prepared to forfeit one contract to pick up some other contract they may feel happier in doing (Croy, 2000).

10.2.1 The Perceived Business Environment

Manderson (2000) also suggests that the service industry is highly uncertain in North Sea. The industry is very dynamic because of oil price instability, which strongly influences oil and gas industry activity. What is more, the service sector used to be simple but is becoming more complex as it has taken more and more responsibilities from the oil and gas companies. Many service companies have been set up and a large number are very specialised. This situation makes the industry complex. The same scenario may be seen in China, Singapore and Malaysia.

As discovered in Chapter 7, senior executives who participated in the survey perceive the business environment for the oil and gas service businesses in East Asia as complex and dynamic. However, the managerial perceptions on environmental hostility tend to be benign when conducting their businesses in the region. Compared with China, the level of perceived business environmental uncertainty in

Singapore tends to be higher. This may be related to the following reasons. The number of oil and gas clients in China was large whereas in Singapore, the number of the clients was small. The market demand for the oil and gas service industry perceived by senior executives was small in Singapore (as there are no production operations in this country), whilst in China, it was perceived to be big. Competitive actions adopted by firms within the service sector were more unreasonable in Singapore than in China. For instance, a fierce price war is more likely to be conducted in Singapore and firms are more likely to imitate their competitors there. Furthermore, customer demand for new products or services, changes in oil and gas exploration and production levels, changes in well counts and in rig counts were more unpredictable in Singapore than in China. Despite of the fact that the business environment in Singapore and Malaysia is relatively abrasive, access to available technologies was easier in Singapore and Malaysia whereas in China it was more difficult to get technologies needed by the service organisations.

The offshore oil and gas industry business environment in the South China Sea in 2000 teetered between unstable and stable due to the small market, which, at the time, consisted of five FPSOs (Floating Production Storage and Off Loading Vessel), eight platforms and four subsea wells (collectively producing 250,000 bpd). There were only five oil companies and the scale of service business to the oil industry was not big. Stable means that each oilfield operator adheres to an annual expenditure plan intended to achieve its operational objectives. For example, flight services for crew change, supply boats for weekly cargo transportation, diesel for fuel, catering for offshore personnel, and etc. This makes it possible to forecast the market. Each service firm could find out an oil company's next annual plan through "guanxi" (personal relationship) and accordingly, make it its plans to gain businesses. Unstable refers to the need to spend extra on emergency repairs which occur every year. This kind of

expenditure is much higher than spending that has been budgeted. For instance, although in 2000 CACT (CNOOC, Agip, Chevron and Texaco Operators Group) budgeted 1.2 million US dollars for maintenance, the extra expenditure for that year was over 6 million US dollars for the repair of a 12-inch subsea pipeline damaged by fishing nets. The other oil companies have suffered the same problems as CACT had (Tan, 13 August 2000).

Regarding the business environmental situation in Singapore, Croy (2000), the editor of PetroMin Hydrocarbon Asia (2000), wrote: "The oil and gas industry has survived the ups and down of the global economy, stock market crashes, fuel crises, etc., but it always comes back on top. There are so many influences in the industry that it is always in a state of flux, but it always seems to get back on an even keel. Right now, things are about as stable as can be expected. I don't believe that the industry itself is complex to understand. The causes and effects may be complex, but not the industry".

Barriers to entry into the industry in the provision of sophisticated logistics services are high because it requires special knowledge, relevant experience and up to date information (Manderson, 2000). Others such as Croy (2000) prove this point: "We are obviously always on the lookout for rivals, but we are so entrenched in this area that any competitor would find it difficult to enter the arena and challenge us". He also told: "To start up an oil company costs a lot of financing. To become a service or supply company to the oil and gas industry is relatively cheap (e.g. cost about half million dollars though). A lot of people start up what is called 'Farm-in' companies. They know enough about the industry to attract venture capital, through 'farming into' a project by a major oil company who will 'sell' a share of their project. If they 'buy-in' a large enough share, they can actually become operators, eventually becoming an oil company in their own right. Main barrier would be money – it's always money!"

Such high obstacles for new entrants to join the service industry may make the industrial environment less hostile for existing companies within the industry.

10.2.2 The Enacted Environment: Business Strategic Options

Firstly, organisations can be split up in terms of different business strategic orientations. Five groups can be assigned as Prospectors, Defenders, Balancers, Analysers and Reactors. This study shows that most of the service organisations employ well-defined strategies guiding their business practice in East Asia. The Analyser strategy is the most popular option selected by service organisations and most of organisations used multiple strategies (i.e. Balancers and Analysers). On the whole, executives avoid the Defender strategy.

Defender organisations attempt to devote attention to the operational efficiency of their existing businesses while avoiding rapid adjustments in the organisational structure of their methods of operation. They tend to ignore developments outside established businesses and focus on well-defined customers groups with a full set of products or services. Prospectors seek to initiate changes in their industrial sector and lead innovation in the development of new products or services. Such organisations offer a broad range of products or services to the markets they serve and grow mainly through product and market development as well as diversification.

Organisations following Analyser strategic orientations tend to adapt rapidly to the changes developed by others. Some of their products or services and markets are stable while others are changing. The essential feature of Balancers is that they combine the characteristics of Defender, Prospector and Analyser. There are three types of scenario with regard to their attitudes towards change: they seldom make a rapid adjustment for their existing businesses, but they are

also able to adapt to changes created by others and meanwhile, they are capable of initiating changes within the industry.

Reactor organisations have the following attributes that weaken organisational strategic performance. First, their management or structure is not linked to the established strategy in an appropriate manner. Secondly, they adhere to existing structures or methods of operation, even though these are no longer relevant to environmental conditions. Thirdly, they frequently perceive crucial changes occurring but are not always ready to respond. Finally, they make changes only when forced to do so by pressures.

According to Croy (2000), when events of oil activities developed in the 1990s, the drive in business was to consolidate, down-size and increase asset value. Exxon realised this when they decided to merge with Mobil, BP did the same with Amoco and Arco. The net effect was to increase asset value, which determined market value. Service companies did the same thing. As the oil companies merged, there became fewer clients for the service companies to work for, but more work. Schlumberger, Halliburton, BJ Services, vigorously pursued acquisitions to increase their net asset value and broad their range of services. They also have the necessary resources to develop higher technology R&D (Research and Development), something smaller companies find difficult to do. Croy (2000) comments: "It is an interesting situation in the sense that as the oil companies merge, they become so big that they lose interest in the smaller offerings in the oil field – it would cost too much for them to develop the infrastructure to handle small fields or reservoirs, leaving a gap into which upstart, smaller oil companies can fit. The same thing with the service companies – smaller operations will evolve to meet the needs of the smaller oil companies who could not cope with the costs of the bigger service companies. It has happened before, in 1973, in 1980

and in the later 1980s, so there is no reason to believe it will not happen again".

Furthermore, there are four categories for assigning the service organisations' competitive strategies: Low-cost, Differentiation, Hybrid (or Dual) and No-Purpose. In this study, a Differentiation-oriented competitive strategy is the major strategic selection whereas a Low-cost strategy is not a preferred choice within the industry. This is supported by each of the three countries.

In each country, most of the organisations endeavour to pursue a differentiation-oriented strategy that seeks to emphasise a unique feature of the business. Moreover, a higher proportion of Singapore organisations than of China and Malaysia organisations are keen on differentiating themselves from others. The result supports this researcher's contention that one of the typical attributes of the oil and gas service industry in East Asia is differentiation.

A Differentiation strategy aims at achieving, even at a considerable cost, a superior quality throughout the value chain and creating the image of a unique feature. The emphasis of a Low-cost strategy is on lowering cost more than competitors wherever possible. A Hybrid strategy means that a firm seeks to deploy more than one of the generic strategies and achieves cost leadership and differentiation simultaneously. If a firm fails to develop its strategy in at least one of the three directions, or is inconsistent in pursuing the generic strategies, and achieves no competitive advantages, the firm has no distinctive strategy and such firms are then defined as No-purpose strategy organisations.

In addition, from a strategic aspect, service organisations can be categorised in terms of five competitive positions: high value premium (i.e. above the moderate level) price; high value moderate price; high

value low (i.e. below the moderate level) price; low or moderate value low price; and un-competitive value and price. The most frequent situation is the position with high customer added value, moderate or premium prices.

Technology is pushing out the smaller operators as it becomes more and more expensive to compete with the "big brothers". Technology in the oilfield usually comes with fairly hefty price tag (Croy, 2000). Both national and international contractors provide services to oil clients in offshore China. Local contractors normally offer high labour low technology services such as small-scale fabrication, including offshore structures. Foreign contractors offer low labour high technology services to support operations, subsea inspection, engineering machinery overhaul, etc. In this regard, Chinese contractors are less competitive compared with international organisations due to their relatively less advanced knowledge of offshore technologies.

On the other hand, the competition is sometimes largely based on pricing, for instance, in a logistics industrial sector, as competitors always imitate what industry leaders have done (Manderson, 2000). In a Singapore case, Croy (2000) says: "If anyone can do what we do, cheaper, they would have to cut their own throat to do so. Risk capital to start up an operation like ours would run into several million dollars – I doubt if there are people around with that kind of money, willing to get involved in this type of business. If someone did take the risk, we would do as we always do, out-survive them".

Nevertheless, managers both in oil companies and service companies admitted that conducting a price war could destroy the industrial structure and no one would benefit from this type of practice. Offering low prices is not the way to gain contracts as it is this approach which causes the quality problems. In China, oil operators

take both price and previous quality performance into consideration when they evaluate bidding proposals (Tan, 13 August 2000). Such buyer power has forced significant adjustments in the way that Chinese based organisations operate.

When comparing the three countries, the majority of the Singapore and Malaysia based organisations pursue a combined advantage of high value and competitive (low and moderate) price. For China, the majority of the organisations are in the group of un-competitive price and value. To boot, the strategic position of Singapore organisations appear to be better than that of China based organisations as most of the high value premium organisations are from Singapore and the majority of the organisations following a strategy destined for ultimate failure with both un-competitive price and value are from China. Nevertheless, there is nothing significantly in common in terms of strategic competitive positions. In this sense, the strategic positions pursued by oil and gas service organisations for competing businesses in the region of East Asia are fragmented.

10.2.3 Strategic Performance

Overall, the oil and gas service organisations have improved their strategic performance over the period examined, indicating a favourable situation for this industrial sector in East Asian countries like China, Singapore and Malaysia. The general results are proved in each of the three countries. Particularly, organisations in Malaysia outperform Singapore organisations and perform at a similar level to those located in China. The reasons that Malaysian organisations outperform Singapore organisations could be strong government support or easier access to oil clients as they are closer to oilfields than Singapore based organisations. The reasons behind this need to be investigated in future research.

In addition, the service organisations may be less comfortable with their strategic performance relating to price competitiveness improvement, their capability of influencing customers' purchasing decisions, as well as their innovation speed and implementation of changes. Conversely, the best performance improvement is in the increase of total assets and of the confidence to achieve growth.

Since the market place is a congenial environment where organisations can perform well, the situation encourages service organisations, especially those international ones that take brave steps to gain an entry into the market place. As the industry grows, more and more energy service entities such as those separate from indigenous or foreign based oil organisations are becoming members of this big family to serve the oil and gas industry in the region.

10.2.4 Business Environment, Business Strategy and Strategic Performance Relationships

In each of the three countries, different strategic options do not make any differences for the level of perceived uncertainty but a higher strategic performance is associated with a lower level of perceived environmental uncertainty regardless of strategic types. Strategic performance is found to be associated with business strategies: multiple strategic options are related significantly to a higher level of performance. This finding is supported by the Singapore group only. Hence, the type of strategy selected provides impacts significantly on strategic performance for service organisations: the higher level of strategic performance is related to the use of multiple strategies and the lower level of strategic performance is associated with non-multiple strategies.

10.2.5 Does Perceived Environmental Uncertainty Have an Alignment with Business Strategies?

Obviously, Balancers have a significantly different perception of the environmental uncertainty from the organisations in other categories of business strategies. Compared with Reactors, Defenders, Prospectors and Analysers, the degree of environmental uncertainty perceived by Balancers is lower. As a result, Balancers may be relatively more comfortable with the business environment than other groups. The results do not provide sufficient evidence to reject the hypothesis that the levels of perceived environmental uncertainty amongst Reactor, Defender, Prospector and Analyser strategic groups are equal. This suggests that organisations having any of the four types of strategies may share similar views on the environmental uncertainty. Nonetheless, since the perceived business environment has not been proved completely to have an alignment with business strategies, whether or not strategic options are the results of managerial responses to the business environment in which they operate still needs further study. Overall, in each of the three countries, different strategic options do not make any differences for the level of perceived uncertainty.

10.2.6 Are Strategic Options Associated with Strategic Performance?

Amongst the various strategic directions followed by businesses, the levels of their strategic performance differ. Defender organisations are not associated with a higher level of strategic performance yet Prospectors' strategic performance appears to be better than Defenders. Analysers are associated with a sound strategic performance and the Balancer organisations have an ideal strategic performance. Organisations with a high level of strategic performance are not a Reactive type. Rather, organisations in a low strategic performance context are inclined to embrace a Reactor strategy. This

suggests that organisations following a Reactor strategic direction tend to obstruct organisational strategic performance.

Nevertheless, the general results are supported partially by the service organisations in the three countries. Regardless of strategic types, organisations in both China and Malaysia are likely to improve their strategic performance. As such, there is not a significant linkage between business strategies and strategic performance in the above two countries. In Singapore, however, the observed results show that only those companies using multiple strategies are likely to have an improved strategic performance; and when multiple strategies are not used, most have not improved their strategic performance at all. Hence, organisations adopting multiple strategies appear to outperform others and poorer strategic performance is associated with those which do not use multiple business strategies.

In conclusion, the level of strategic performance is related to whether or not an organisation will use multiple strategies for the Singapore based organisations, but this is not true for the China and Malaysia based organisations. In Singapore, the higher level of strategic performance is associated with using multiple strategies and the lower level of strategic performance is associated with not using non-multiple strategies. On the other hand, in China and Malaysia, service organisations can achieve a sound strategic performance, no matter what types of strategies are selected for their businesses. Since multiple strategies like Balancers or Analysers appear to offer oil and gas service organisations better strategic performance, these strategies are most appropriate for managerial selection in an East Asian context.

From the above results, two additional points can be made. Firstly, the industrial structure of the offshore oil and gas service in China and Malaysia is still at its developing period. The industry in China

and Malaysia is not as mature as in Singapore since the age of latter's organisations is greater. For firms operating in China and Malaysia at this present stage, they should be more aware of external environmental issues instead of strategic issues. In other words, conducting formal strategic approaches, at least at this stage, is not of the highest priority in these two countries. It is worthwhile to generate suitable frameworks or models further for operating in a developing-industry context.

Secondly, Singapore is a country, which had its industrial development earlier than others, using multiple strategies and pursuing multiple competitive advantages that are essential for business success. This indicates the direction of managerial movements within the industry in East Asia. When industry development in China and Malaysia reaches the same stage as Singapore, formal strategic processes and selections for carrying out businesses for a long-term success become crucial.

10.2.7 Are Environmental Dimensions Related to Strategic Performance?

The environment and strategic performance relationship was examined in Chapter 8. There is a significant relationship between strategic performance and the perceived environmental uncertainty or the perceived hostility. As the correlations are negative, it can be concluded that as the degree of perceived uncertainty decreases, there is a corresponding improvement in strategic performance. As such, the results do not support the assumption that the higher the degree of perceived environmental uncertainty, the higher the degree of strategic performance. Findings derived from each of the three countries lead to the same conclusions. The perceived environmental uncertainty is associated with the strategic performance: the higher the degree of environmental uncertainty, the lower the level of strategic performance achieved. For the same reason, the results also

do not support the assumption that the greater the degree of the perceived environmental hostility, the stronger the strategic performance. Quite the reverse, strategic performance was negatively related to the perceived environmental hostility.

10.3 Emerging Findings

It is found that, for oil and gas service entities in East Asia, the degree of importance of an environmental factor is associated with the degree of the impact of that environmental factor. It means that the higher the degree of the impact of the environment factors on the growth of an organisation, the higher the degree of importance attached to it. Some other emerging findings are summarised below.

10.3.1 Perceived Uncertainty and Environmental Dimensions

The perceived environmental uncertainty can be evaluated by examining two environmental characteristics or dimensions: the perceived dynamism and hostility. For oil and gas service organisations in East Asian countries like China, Singapore and Malaysia, the perceived uncertainty is associated with the perceived dynamism and hostility but not associated with the perceived complexity. When the level of environmental dynamism and hostility increases, the level of environmental uncertainty is also augmented, whereas any change of environmental complexity does not have an impact on environmental uncertainty.

Although the perceived business environment has been dynamic from year to year, service company executives are able to forecast the changes within their industrial sectors as all environmental factors are predictable. Hence, the overall assessment of unpredictability doesn't reflect the perceived dynamism in this study. Additionally, the perceived environmental dynamism is also correlated positively to the

perceived dynamism and hostility. In this sense, the higher the degree of the perceived complexity or hostility, the higher the degree of the perceived dynamism.

10.3.2 Perceived Environmental Characteristics and Associated Factors

First, the perceived complexity is found to be associated with the three factors of economic, technological and customers' conditions. Second, the perceived dynamism is associated with only one factor in the economic sector: the higher the level of unpredictability of rig counts, the higher the degree of the perceived dynamism. The perceived environmental dynamism has no relationship with the variables of the other task environmental sectors. This means that, from year to year, even though the changes in the regulatory, technological, customers', suppliers' and competitors' sectors cannot be forecast, each of these remaining task environmental sectors is not subject to a dynamic situation. Hence, for the oil and gas service organisations in East Asian countries like China, Singapore and Malaysia, the perceived environmental dynamism is not correlated with the unpredictability of the rest five task environmental conditions. Third, with reference to the perceived hostility, it is associated with relevant customers' and competitors' conditions. The more distant the relationships with clients or the more turbulent the competitions, the higher the degree of perceived hostility.

It can therefore be concluded that the economic, technological, competitors' and customers' conditions are more essential than regulatory and suppliers' influences in contributing to the nature of the three business environmental characteristics.

10.3.3 Emerged Environmental Characteristics in Task Environmental Sectors

The perceived environmental uncertainty can be evaluated by examining not only the perceived dynamism and hostility but also each individual environmental factor. Nineteen environmental factors are relevant to the perceived uncertainty throughout the six task environmental sectors. Amongst these, two factors (government regulations, legislation and policies; similarity of supply conditions by suppliers) pertain to the number and heterogeneity of the environmental sectors (named as the emerged complexity).

Ten factors are relevant to the level of unpredictability (named as the emerged dynamism). As such, the emerged dynamism contains the unpredictability of changes in the customer demand for existing products or services and for higher quality or more service; competitive prices; suppliers' quality reduction; oil and gas exploration and production levels, well counts and rig counts; rate of technological diffusion; national regulations and legislation and local government policies.

Seven factors are concerned with the difficulties of resource availability and resource deterrence (named as the emerged hostility). Hence, the emerged hostility is associated with the levels of key customers switching to competitors; relationships with customers, suppliers and competitors; access to materials or goods; and rivalry among competitors. These environmental influences made the environment unfavourable to the oil and gas service organisations. For instance, it is easy for key customers to switch to another competitor's products or services. Competitive actions adopted by firms within the service sector are unreasonable due to the imitations of the changes or innovations created by leading firms. Then the rivalry among the competitors within the service sector becomes turbulent because of fierce price combats for gaining contracts.

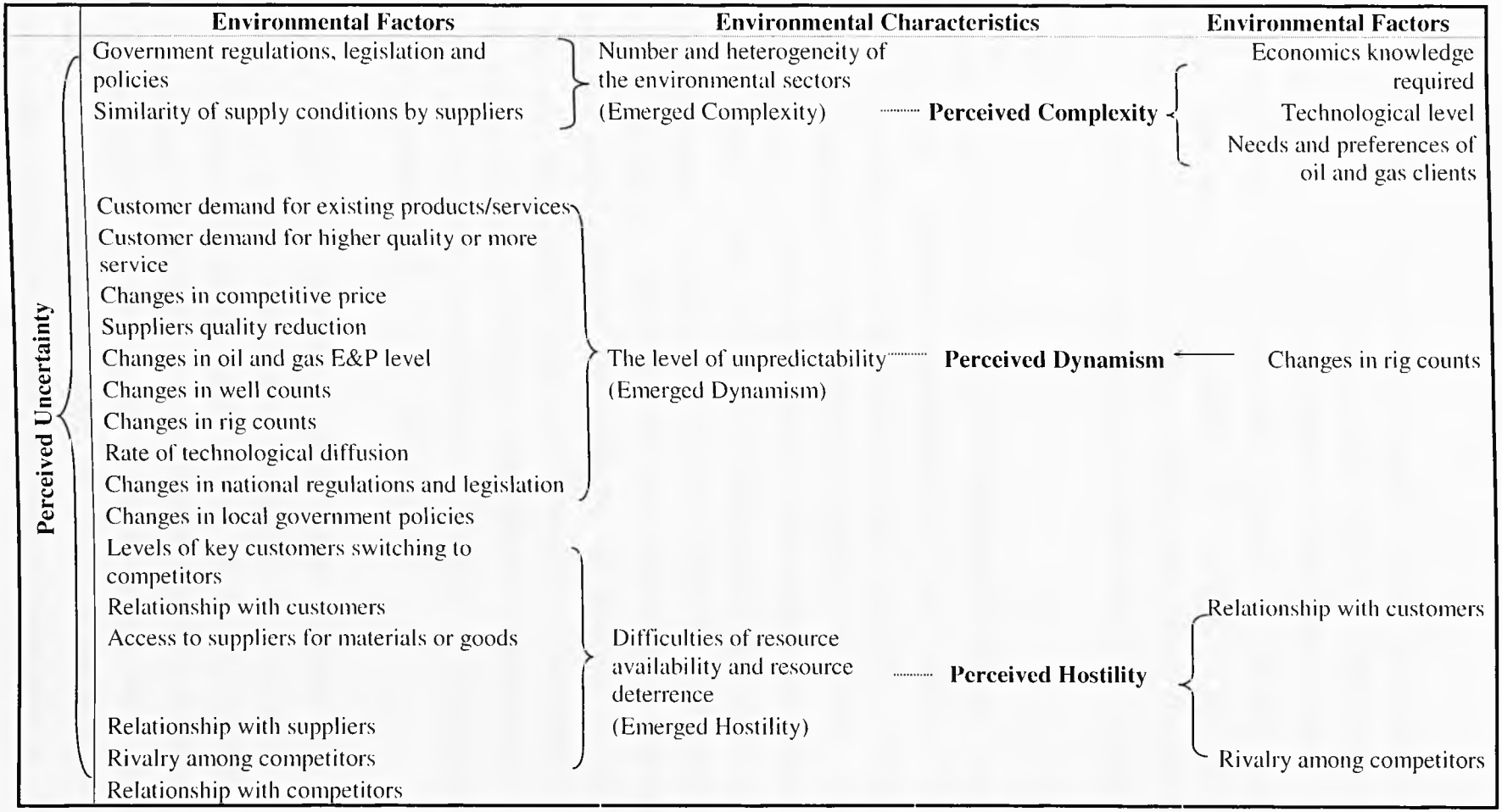
Despite the fierce competitions amongst competitors, oil and gas service organisations in East Asia manage to retain amicable relations with their competitors and stay peaceful with each other.

10.3.4 Observations between Emerged and Perceived Environmental Characteristics

A relationship map regarding the environmental uncertainty, complexity, dynamism and hostility as well as the environmental factors has been generated and constructed by this author. As shown in Figure 10.1, there are some overlaps between the perceived dynamism and emerged dynamism as well as between the perceived hostility and emerged hostility. Conversely, the perceived complexity and emerged complexity do not have any factors in common. Government regulations, legislation and policies and special conditions insisted on by suppliers are associated with environmental uncertainty yet not associated with environmental complexity. The knowledge of economics required and the industrial technological level, as well as the needs and preferences of oil and gas clients, are associated with the environmental complexity yet not associated with the environmental uncertainty. This may suggest that the perceived complexity and its associated environmental factors do not make a direct contribution to the perceived environment uncertainty in the context of the oil and gas service sector in East Asian countries like China, Singapore and Malaysia.

From the above observations and discussions, it is concluded that, for oil and gas service organisations operating in the region of East Asia, not only should environmental dimensions be considered carefully but also individual environmental influences in order to obtain an accurate interpretation of the business environment. Senior management can make the right strategic decisions for their businesses only if they gain a proper insight into the business environment in which they operate.

Figure 10.1 Environmental Characteristics and Associated Factors



10.3.5 Strategic Performance and Key Competitive Factors

In this study, five elements were identified as the key competitive factors based upon strategic management literature and discussions with the oil and gas service organisations' executives in East Asia. The five competitive factors are: the products' or services' quality valued by customers, the reliability of products' or services' technology, the products' or services' safety performance, the speed of response to clients' requirements and the price that the customer is willing to pay.

It was proved that there is a positive relationship between strategic performance and customer willingness to pay prices, safety performance, and the perceived customer value of quality. The higher the degree of product or services quality valued by customers, or the higher the degree of safety performance, or the higher the price the customer is willing to pay, the better the strategic performance that a service organisation achieves. It was not proved that strategic performance would be associated with the technological reliability and response speed. Hence, the reliability of product or service technology and the speed of response to clients' requirements have not been found to relate to strategic performance. Verification of this proposition calls for more focused research on each of environmental factors in association with strategic performance.

In short, a higher level of strategic performance is associated with better quality of products and services valued by customers, the willingness of customers to pay higher prices, the greater reliability of product or service technology and the higher speed of response to clients' requirements. As these competitive characters are positively associated with strategic performance, they can be regarded as the key competitive factors for conducting service businesses in East Asia.

10.4 Discussions of Findings and Proposition Verifications

This section summarises the responses of the 98 organisations as a group in the light of the ten propositions. The first three propositions and propositions 7 were examined in Chapter 7; propositions 4, 5, 6, 8, 9 and 10 were examined in Chapter 8; additional evidence pertaining to the ten propositions in the three selected countries was provided in Chapter 9. The statistical significance levels in relation to the questionnaire responses were also calculated in Chapter 7, 8 and 9. Results emerged show that some of the statistical findings were significant at the 0.01 or 0.05 levels or marginally significant at the 0.10 level whereas other findings were not statistically significant.

Proposition 1 The six environmental sectors – technology, regulation, economics, customers, suppliers and competitors – can be defined as the key task environmental sectors which oil and gas service executives perceive to be significant for the growth of their businesses in East Asia.

The research results support this contention. Firstly, it is demonstrated that each of the six task environmental factors has been important for oil and gas service companies' businesses in East Asia. Secondly, the economical, technological, customers' and competitors' factors have had a strong impact on the growth of their businesses in the region. In contrast, the impact of regulatory factors has been more likely to be moderate and the impact of suppliers has been more likely to be weak. Especially, the customers' factor has the strongest impact on businesses and it is thus considered as extremely important.

Proposition 2 For oil and gas service companies that operate in East Asian countries such as China, Singapore and Malaysia, the nature of the business environment will be uncertain.

The research results support this proposition. Overall, the business environment in which the service organisations operate is slightly uncertain. Amongst the three countries, the perceived uncertainty is supported by the Singapore groups. The perceived environmental uncertainty in China is the lowest and the business environment is perceived to be certain in that country. Generally, Malaysia organisations' executives have a neutral view on the environmental uncertainty indicating that the business environment in which they operate can be perceived as neither certain nor uncertain.

Proposition 3 Oil and gas service organisations' executives in East Asia perceive that the business environment in which they operate will be complex, dynamic and hostile.

This proposition is supported in part by the research. Significant statistical evidence proved that the business environment for the oil and gas service sector is complex and dynamic. The perceived complexity and dynamism are supported by the results emerged from each of the three countries. It is also perceived that the business environment is pleasant for operating businesses in East Asia. However, in each of the three countries, there is always a split between organisations' executives: they are either pleased or unpleased with the business environment in which they operate. In particular, for Singapore and Malaysia, executives' perceptions tend to have a neutral view between pleasant and unpleasant towards the environmental hostility.

Proposition 4 The perceived environmental uncertainty will be associated with the three environmental dimensions of perceived complexity, dynamism and hostility.

The research results give limited support to Proposition 4. It has been proved that the perceived uncertainty is positively related to the perceived dynamism and hostility. The results show that the higher the degree of the perceived environmental dynamism and hostility, the higher the degree of perceived uncertainty. Moreover, the results do not support the initial assumption that there is a relationship between the perceived complexity and the perceived uncertainty.

Proposition 5 The perceived environmental uncertainty will be associated with the influences of the task environmental factors.

The results support this proposition. It is proved that the perceived environmental uncertainty has a positive correlation with the number or diversity (heterogeneity) of environmental factors. For example, the results suggest that the more complicated the government regulations, legislations and policies in the region where a service organisation operates in East Asia, or the more different the supply conditions (e.g. price, quality, speed or service) provided by the organisation's suppliers, the higher the degree of the perceived environmental uncertainty.

The unpredictability of the changes emerging in the six task environment sectors (i.e. regulatory, technological, economic, customers, competitors and suppliers) is correlated to the perceived environmental uncertainty. It is evident that the higher the degree of the unpredictability of environmental factors, the higher the degree of environmental uncertainty. If the level of unpredictability of certain environmental factors becomes higher, the degree of the business

environmental uncertainty perceived by service executives also tends to be higher.

The results also indicate that the greater the degree of the difficulties of resource (tangible and intangible) availability or resource deterrence (e.g. industry rivalry and relationships with clients), the higher the degree of perceived environmental uncertainty. For the associated environmental factors, if the level of perceived hostility becomes higher, the degree of perceived uncertainty also tends to be higher.

In conclusion, the perceived uncertainty is associated with individual environmental factors. Hence, the greater the diversity (in numbers of customers, suppliers and technology, etc) associated with an environmental factor, the higher the degree of the perceived environmental uncertainty. As also stated immediately above, the higher the degree of perceived environmental unpredictability, the higher the degree of the perceived environmental uncertainty; the higher the degree of the difficulties with regard to resources availability and resource deterrence, the higher the degree of the perceived environmental uncertainty.

Proposition 6 The perceived environmental complexity, dynamism and hostility will be associated with the influences of the task environmental factors for the oil and gas service sector in East Asia.

The results support this proposition. With respect to the three perceived environmental dimensions, they can be examined by looking at their associations with various environmental factors. First, the perceived complexity is associated with the three factors of economic, technological and customers' conditions. The more complicated the knowledge required for understanding the economic situation in the region, or the higher the levels of technology involved

in the oil and gas service sector, or the more diversity in the needs and preferences of oil and gas clients, the higher the level of perceived environmental complexity.

Second, the perceived dynamism is associated with only one factor in the economic sector: the higher the level of unpredictability of rig counts, the higher the degree of the perceived dynamism. The perceived environmental dynamism has no relationship with the variables of the other task environmental sectors. This means that, from year to year, even though the changes in the regulatory, technological, customers', suppliers' and competitors' sectors cannot be forecast, each of these remaining task environmental sectors is not subject to a dynamic situation. Hence, for the oil and gas service organisations in East Asian countries like China, Singapore and Malaysia, the perceived environmental dynamism is correlated with the unpredictability of the oil economic conditions.

Third, with reference to the perceived hostility, it is associated with relevant customers' and competitors' conditions. The more distant the relationships with clients or the more turbulent the competitions, the higher the degree of perceived hostility.

It can therefore be concluded that the economic, technological, competitors' and customers' conditions are more essential than regulatory and suppliers' influences in contributing to the nature of the three business environmental characteristics. This is consistent with the earlier results that the key environmental indicators are these four environmental sectors for service organisations in East Asia.

Proposition 7 For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, their business strategies will be different.

The results support this proposition. Service businesses can be assigned from three strategic aspects. First, organisations can be split up in terms of five strategic groups: Prospectors, Defenders, Balancers, Analysers and Reactors. Second, four competitive strategies of Low-cost, Differentiation, Hybrid (or Dual) and No-Purpose can be assigned for categorising service organisations. Third, organisations can be classified into five strategic competitive positions as presented in Chapter 7.

In addition, the majority of the organisations are Balancers or Analysers and the Defender (rather than Reactor) strategy is not an option preferred by senior executives who conduct businesses in East Asia. Similarly, the majority pursue Differentiation-oriented generic strategies and a Low-cost generic strategy is not an option preferred by senior management. There is not a significant majority in favour of assigning strategic competitive positions. This is in contrary to the author's earlier assumption that the majority of organisations are keen on a strategic position of high value competitive price whereas the minority fall into a category of un-competitive price and value.

Proposition 8 For oil and gas service organisations operating in East Asia, the managerial perceptions of the business environmental uncertainty will vary in associating with the types of their strategic orientations.

There is insufficient evidence to support this proposition. First, none of the business generic strategies was found to be significantly related to the perceived environmental uncertainty. Regardless of the generic strategic directions a service organisation follows, the category of the perceived environmental certainty and uncertainty was not found to be associated with the strategic options adopted. Second, there is also not enough evidence to prove the hypothesis

that the two variables of competitive strategies or strategic positions and the category of perceived uncertainty are in some way related. In each of the three countries, though different strategic options are conducted by organisations, it does not make any difference for the level of perceived uncertainty.

Conclusions drawn from the findings indicate that there is no significant relationship between strategic options and perceived environmental uncertainty. The current evidence fails to prove that the type of generic business strategies or strategic positions can provide any hints whether or not the perceived business environment could be uncertain.

Proposition 9 There will be relationships between the perceived business environmental dimensions and strategic performance for oil and gas service organisations operating in East Asia.

This proposition has gained limited support from the results. There is a significant relationship between strategic performance and the perceived environmental uncertainty or the perceived hostility. As the correlations are negative, it can be concluded that as the degree of perceived uncertainty or hostility decreases, there is a corresponding improvement in strategic performance.

Predominantly, results indicate a pattern that, when making a comparison amongst individual countries in an East Asian context, a higher level of strategic performance appears to be associated with a lower level of perceived environment uncertainty, while a lower level of strategic performance is associated with a higher environmental uncertainty. When the perceived uncertainty decreases at a same level, the corresponding improvement of strategic performance is different. China based organisations improve in the same way as Singapore organisations do, by contrast, Malaysia based

organisations have a greater improvement in strategic performance than organisations based in China and Singapore.

What is more, insufficient evidence was provided to support the hypothesis that perceived environmental complexity or dynamism is associated with strategic performance. Hence, the research indicates that perceived complexity or dynamism is not significantly related to strategic performance.

The findings fail to provide evidence to support the assumption that the degree of perceived complexity or perceived dynamism is related to the level of strategic performance. Overall, the results support Proposition 9 that there is a relationship between two perceived business environmental dimensions and strategic performance for oil and gas service organisations operating in East Asia: the higher the perceived environmental uncertainty or hostility, the weaker the strategic performance.

Proposition 10 For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, strategic performance will differ in association with their business strategic orientations.

The proposition has gained limited support from the research results. In each country, results show that appropriate strategic options should be essentially relevant to a better performing business. It is observed that Balancers and Analysers outperformed the other categories of organisations. However, the analysis does not to prove that Reactors are associated with a relatively poor strategic performance while the strategic performance of Defenders and Prospectors stands in the middle among the five categories of strategic orientations.

The assumption that Hybrid organisations perform better than other organisations was disproved. It has been found that Hybrid organisations yielded a higher level of strategic performance than Low-cost and Non-purpose strategic groups yet did not outperform Differentiation organisations. The results also show that having a generic competitive strategy of Low-cost or Differentiation or Hybrid does not yield the organisation a higher level of strategic performance, while pursuing none of the three generic competitive strategies (No-purpose) produces a relatively poor strategic performance. In addition, having a Differentiation strategy yields the service organisations in East Asia a higher strategic performance than Low-cost organisations.

Although organisations with high value competitive (i.e. low and moderate) price had a dual competitive advantage, they did not appear to perform better than organisations in all other categories of competitive positions. Organisations with un-competitive value and price appeared to perform poorly in China, Singapore and Malaysia. However, the evidence is not sufficient to prove that organisations with various strategic competitive positions would have different strategic performance.

Overall, the statistics partially supported the thesis that good or bad strategic performance is associated with certain strategic orientations currently adopted for the service businesses in East Asia. Three themes should be stressed. Firstly, better strategic performance is associated with Balancer or Analyser strategies rather than with other types of strategy. As such, multiple strategy organisations (Balancers and Analysers) will outperform non-multiple strategy organisations (Defenders, Prospectors and Reactors). Next, better strategic performance is associated with Differentiation – oriented strategies rather than with a Low-cost competitive strategy. Hence, a Differentiation strategy is a more appropriate option than a Low-cost

strategy for service organisations operating in East Asia. Finally, better strategic performance is associated with high customer added value premium prices rather than with other types of strategic competition position. Un-competitive value and price organisations are guaranteed to have a relatively poor strategic performance in each of the three selected countries.

10.5 Research Conclusions

In the introduction (Chapter 1) to this thesis, three objectives were proposed. These have now been achieved successfully and it is necessary to examine what conclusions can be drawn.

The first objective was to examine the dominant business environmental conditions which affect oil and gas service industry in China and, to a lesser extent, in Singapore and Malaysia. In the previous three chapters, it has been demonstrated that the research has portrayed a picture of the environmental uncertainty by evaluating environmental factors of the six task environmental sectors (i.e. customers, suppliers, competitors, regulatory, technology and economic) from three dimensions of complexity, dynamism and hostility. Propositions 1, 2, 3, 4, 5 and 6 presented above in this chapter provide detailed evidence to support this particular research objective.

The second objective was to empirically investigate strategies adopted by oil and gas service companies in response to the business environment(s) in which they operate. To classify oil and gas service organisations, Miles and Snow's (1978) taxonomy, Porter's typology and Bowman's model were generated for formulating a theoretical framework. Within the theoretical context, generic business strategies, competitive strategies employed and strategic positions

achieved by oil and gas service organisations were investigated. Proposition 7 provided evidence to support this research objective.

Service organisations pursued different business strategies in East Asia. Their businesses in East Asia can be assigned into different strategic groups that are classified as Defenders, Prospectors, Analysers, Balancers and Reactors. Furthermore, in order to achieve competitive advantages for businesses, their strategies varied and are categorised into four distinguished clusters in this study: Low-cost, Differentiation, Hybrid and No-purpose.

Additionally, there are five different strategic competitive positions for assigning the service organisations: high value premium price, high value moderate price, high value low price; low or moderate value low price as well as un-competitive value and price.

The final objective was to evaluate the reliability of the strategic theoretical frameworks based upon Western business practice applied in a non-Western business environment like East Asia. This objective has three foci: to evaluate the significance of environmental influences towards the service organisations' long-term strategic success; to identify the effective business strategies which should be employed in an East Asia context; and to observe how strategic options can be selected in responding to the business environment. Propositions 8, 9 and 10 are used to evaluate the third objective.

On the whole, firms that consistently outperform over a period may have made a more accurate interpretation of the business environment. They may be more confident in coping with the environmental influences. Hence, improved strategic performance is associated with the lower level of perceived environmental uncertainty. What is more, service organisations with an outstanding

performance in the East Asian business environment pursued multiple business strategies.

In the light of the empirical evidence, it can be concluded that some strategic theoretical frameworks based upon Western business practice can be applied. Conversely, some others cannot be applied directly in an East Asian context unless they are developed according to the local situation. In Singapore, the dominant players are foreign (mainly Western) organisations. Since the industrial sector in Singapore is mature and the organisational practice is relatively standardised or Westernised, the proposed strategic models based upon Western theories are more applicable there than in China and Malaysia.

Compared with Singapore, the history of the offshore oil and gas industrial development in China and Malaysia is shorter. In particular, the offshore service sector in China is fairly young as the Chinese government has conducted a process to reform the oil and gas industry since the 1990s. In fact, indigenous companies (which usually have a government background) play a vital role within the service sector in China and Malaysia. Hence, these two markets are non-Western standardised and one outcome is that the strategic applications were not working very well in China and Malaysia when this study were being carried out.

Consequently, in the context of China and Malaysia, the business environmental issues are crucial. It can be concluded that when initiating businesses in an immature or a non-Western standardised business environment in East Asia, senior executives should devote attention to significant environmental indicators and be confident in coping with the business environment. For the long-term, when the majority of organisations practice Western strategic management theories, the application of appropriate business strategies should be

essential for an outstanding strategic performance. This is the case from what we can see in Singapore.

10.6 Contributions and Implications of the Study

Overall, the merit of this study is that it should prove valuable to both business strategists (or those responsible for formulating strategy for business) and to researchers in academic, industrial and government spheres. Oil service organisations in East Asia in particular will find that the conclusions can assist them in devising profitable strategies for their businesses in the region. Moreover, having gathered empirical evidence from the interview and questionnaire survey of firms that operate in that area, this research will have made a significant addition to existing strategic management literature. This claim must, however, be substantiated by analysis of both the theoretical and methodological contribution together with a brief account on practical implications for the industry in East Asia.

10.6.1 Theoretical Contribution

This study has contributed new data to the theory of strategic management. It has looked at existing literature based on Western strategic models, frameworks and theories and examined them in Eastern contexts. Having completed the study, a better understanding of whether Western strategic theories can be adapted for successful application in East Asia is obtained. The following demonstrates how Western models could be adjusted for Eastern application.

First, in the strategic management literature pertaining to the business environment, most writings have addressed issues such as the industry driving forces, key success factors or major environmental indicators. Through this study, these themes can be

evaluated quantitatively by using available models developed by this researcher. Furthermore, the applications of relevant strategic management theories have been examined and evaluated in the context of the energy service industry in East Asia. This achievement enables the author to fill in the existing theoretical gap for the similar field of studies.

Second, the research results have observed that employing appropriate business strategies as defined in Western theory can yield organisations a good strategic performance. Strategic theories have been developed further to the extent that organisations with multiple business strategies outperform those without multiple business strategies in the context of the oil and gas service sector. Thus, the theory development and generated theoretical approach employed in this study are new contributions to knowledge.

10.6.2 Methodological Contribution

The methodological contribution derived from this study is also important. It is considered challenging for any researcher channelled into Western thinking to conduct empirical work in East Asia. This study developed a methodology for data collection and data analysis in China, Singapore and Malaysia. The combined research methodology designed for this study contains both qualitative and quantities attributes (see Figure 2.1 in Chapter 2). The methodology could be applied to other countries and industries in the region. In particular, the techniques employed in this study for cross-national comparisons can also be applied by researchers who wish to conduct similar work.

It was assumed that conducting empirical research into senior executives operating in the oil and gas service industry in China, Singapore and Malaysia would be a huge and very difficult task.

During the pilot study phase, it was found that senior managers might be puzzled about the purpose of the researcher's visits for interviewing and keenly aware of information confidentiality. In addition, the political sensitivities of senior managers in China, especially those in state-owned enterprises, may also contribute to the difficulties of conducting primary research in the country. Other crucial difficulties continually surfaced during the study. There was a lack of authoritative information on the East Asian oil and gas service sector and on the service organisations in China and Malaysia. Due to the continuous restructuring of the oil and gas industry in China, the total sample population was changing and therefore unknown. These difficulties are compounded by the fact that some Chinese senior managers were not familiar with using English and then the researcher had to communicate with respondents in Chinese when necessary.

This hostile research environment, plus the limited industrial and geographical applicability of existing theories in assessing the business environment and employing business strategies, led to the conclusion that the survey questionnaire method was the most appropriate.

There are two major aspects with respect to the use of the survey questionnaire. Firstly, the searcher has generated a contingency approach to gaining assess to the potential senior executive respondents. A range of industry contacts in China, Singapore and Malaysia was established for the accession to the potential respondents. Based upon the rapport established with the industry informants, the researcher then took the opportunity to ask for their knowledge or further information about the oil and gas service companies in the region of study. Eventually, a mail list was prepared for the questionnaire survey. Five hundred questionnaires were distributed to the senior managers via post, email and fax at the first

phase. At the second phase, following-up phone calls, mails and emails were made in an attempt to achieve the proposed response target. A response rate of 21.6 per cent (China, 18 per cent; Singapore, 23 per cent; and Malaysia, 14 per cent) has not only enabled the researcher to gain enough data for statistical analysis, but also prove the success of the use of this contingency approach. It was observed that indigenous managers in China and Malaysia are more likely to respond to someone with whom they are familiar or someone they know in advance or someone introduced by their existing middle contacts. In China's case, the middle person is also called "guanxi" (personal relationship). This sort of obstacle could be the reason behind the relatively lower response rates from China and Malaysia. In these two countries, more efforts such as direct phone calls should be made in order to get a response from senior executives.

Secondly, as the researcher intended to reveal a wide picture of the energy service industry in the selected countries, the survey questionnaire is believed to be more informative and comprehensive than a purely qualitative exercise such as a case study. In the survey carried out for this study, there was a common focus reflected in the ten propositions related to the nature of the business environment, strategies and performance. The purpose of these propositions was to ensure that all responses could generate a common approach towards the issues under scrutiny. Besides, it was also possible to provide evidence to verify the propositions derived from the literature.

10.6.3 Practical Implications for the Industry Sector in East Asia

The practical implication of this study is the contribution of knowledge to the industry. As the firms under investigation operate in East Asia, the findings from this research can enrich knowledge of the oil and gas and wider energy service industries and service sector

in particular. The findings help corporate senior management generate effective strategies to increase their ability to survive long-term in East Asia. Conclusions drawn from this study can be practically useful for industrial experts and management to tackle particular issues when formulating strategic options.

For oil and gas service organisations, they perceived that the business environment was uncertain. This scenario is supported by organisations in Singapore but different in China as the business environment was perceived as certain there. It is clear that oil and gas service organisations can achieve a better strategic performance when their perceptions on the level of the environmental uncertainty are lower. This finding is supported by each of the three countries. Multiple strategies such as Balancers and Analysers are very desirable for a consistent improvement in strategic performance. When applying a Reactor strategy in the environment they operate, there is a corresponding poor performance. This is also applicable for organisations in each of the three countries.

Above all, the approach used for the assessment of environmental uncertainty in this study helps senior executives to identify the environmental situations. Thereby, the most appropriate methods such as scenario planning or forecasting for formulating strategies can be taken into account after making accurate appraisal of the business environment.

10.7 Limitations of Present Study

The limitations of the methodology have already been outlined in Chapter 2. Nevertheless, in the interests of academic honesty, it seems appropriate to repeat in general terms, the limitations of the chosen methodology for the present study, although they do not appear to affect the conclusions adversely.

As the survey was used as a major method to collect primary data, it has the built-in limitations of the method. The survey sought to deal with managerial attitudes and perceptions as well as their contexts, but its ability to investigate the context was deemed to be limited. This is because there were limits to the number of variables to be analysed, the number of questions that could be asked, and the number of respondents that could be surveyed. Another limitation of postal questionnaires is that the survey results are not backed up by supporting evidence with more qualitative information which may contain in-depth details. As the questionnaire was structured, it constrained the freedom for respondents to provide information.

There are always limitations in the use of questionnaires. Managers, especially those in China, have a tendency to give positive rather than negative answers. Senior management would be able to scan and assess the environment for signals which can be fed into business strategic decisions yet middle or functional-level management might have a very parochial outlook on these relevant issues. As the survey confronted various cultural environments, executives may have different perceptions on the same subject. All these phenomena contribute to "response bias" (Zikmund, 2000). Some data are missing as there were cases where respondents did not answer the questions.

Another drawback common to survey research occurs when a company has been closed down, or addresses have been changed, or target respondents are away on business or holiday, or senior executives' secretaries cut off contacts. For instance, surveys are interfering. When making a phone call to get an access to the target respondents, middle channelled persons (e.g. secretaries or other staff) may interrupt and can be an obstacle for contacting senior executives. The middle people were aware of their bosses' time or

interests as well as companies' commercial confidentiality. Such awareness can potentially affect the responses from their organisations.

Finally, surveys require that reasonably large samples be taken. Location and time constraints made it difficult to obtain sufficient cases for each category of the classified groups. This limits the statistical analysis which was carried out later (in Chapter 8 and 9) in this study. On account of the lack of sufficient data for several statistical tests, some correlations between the categories of strategy options and strategic performance could not be examined. For the same reason, the tests were not able to prove the alignment between Porter's and Bowman's models, and that was why competitive strategies were analysed separately based upon the two models generated in this study. Moreover, when the whole sample was divided into sub-samples, the latter were unequal and very small in some cases. This gives difficulties in gaining significant statistical results.

In spite of these limitations, this researcher believes that they did not adversely affect the research results. Care was taken at each stage of the research process to reduce the drawbacks in the methods applied in the present study. First, in designing the survey questionnaire, one of the intentions was to construct the questionnaire in a way that respondents would be made unable to work out what were acceptable answers. This had been dealt with through the following perspectives. The survey questionnaire was arranged to begin with easy or general questions before moving into more difficult or sensitive and specific areas. Particularly, in the Induction part, participants were told there was no such thing as right or wrong, nor were there good or bad answers, what mattered was their thoughts. The subjects were therefore encouraged simply to respond by justifying from their own experience, how they felt about each topic. In addition, as the survey

questions were not designed to elicit commercially confidential information, executives were encouraged to be more open in answering questions. In order to eliminate question-ordering bias, questions pertaining the business environment and strategic orientations were also arranged in a random order.

Second, attempts were made to design questions in a "soft" rather than a "hard" manner. For instance, in order to evaluate any hostility perceived by management in a regulatory environment, the respondents were asked whether they had experienced benefits arising from government policies. They were not asked questions such as whether government policies were good or bad, or whether the government had a hostile attitude towards their businesses. Further more, in order to make a postal questionnaire more "user friendly" (Bourque and Fielder, 1995), a photograph of the researcher was included in the covering letter of the survey questionnaire. A Chinese version of the survey questionnaire was also prepared for the data collection in China because, in some cases, Chinese senior managers are not familiar with using English.

Third, much attention has been paid to examining the scales for internal consistency or reliability, especially to check response consistency. This was done through the inter-item analysis (Appendix A). In this analysis, Cronbach's coefficient alpha was calculated for each scale (dimension), as recommended for empirical research in business strategies by many researchers. For instance, the coefficient was 0.9247 for 20 items of strategic performance dimensions, showing a high level of consistency in responses and a high level of reliability of the 20 items designed. As such, all the 20 items can be used for the scale of performance assessment. On the whole, the test results showing that the alpha values exceeded by a comfortable margin of 0.5 to 0.6 the criterion which is generally considered adequate for exploratory work (Nunnally, 1978). These results provide

evidence to support the reliability of the scales designed in the survey questions under scrutiny.

In summary, having completed the pilot fieldwork, relevant approaches were designed and employed to reduce each error. Throughout the study, each research progress was made and dealt with carefully. More details concerning the drawbacks of postal questionnaires and how this researcher dealt with the associated problems arising from the questionnaire survey are also demonstrated in one of this researcher's previous papers (see Publication 2 in Volume Two of this thesis). To minimise the potential effects of these limitations, the reliability and validity of the research results, by applying advanced statistic tests, were also examined and related results are presented in Appendix A.

10.8 Recommendations for Future Research

First, generating a model to define environmental challenges and opportunities is considered worthwhile. This can be done by obtaining the importance and impact assessment of environmental factors. When the assessment of importance times the assessment of impact (negatively or positively), a figure can be obtained. If the figure is negative, it indicates an environmental challenge; if positive, it suggests an environmental opportunity. A hypothetical equation is presented below.

Importance of a factor × Impact of the factor (negative or positive)
= Challenges (if negative figures) or Opportunities (if positive figures)

Environmental factors with big negative or positive figures can be regarded or identified as the key environmental indicators. This researcher believes that the quantified environmental factors can be

used as assistance for the establishment of corporate and business strategies.

Second, a future study can also be carried out by developing a model to measure strategic performance. In this study, strategic performance was measured by self-report assessment. The assessment of strategic performance can be developed by combining the real organisational data. In order to achieve this, senior executives in an organisation can address what in their opinion the assessments of strategic performance should contain. Then the data pertaining to the performance issues can be collected through self-report assessment (primary data) and by gathering organisation records (secondary data). If the results derived from primary and secondary data tell different stories, depth studies can be carried out to explore the reasons further. This is a useful development for monitoring a strategic process.

Third, a framework pertaining to environmental factors and strategic performance can be considered further. Future work can be done by looking into the association between environmental factors and strategic performance. When a certain factor will be found to have a significantly strong association with strategic performance, it will be the dominant indicator for an organisation to take into account. This is an extremely important application if operating in a growing and developing business environment.

Fourth, relationships amongst environmental factors can be further explored. For example, as stated in Chapter 7, entry barriers to the oil and gas service sector were high. Further investigations can be carried out to find out which factors are associated significantly with the entry barriers: is it because of technological issues or something else? Relevant findings can help oil and gas service organisations' strategic decisions in the market place.

Fifth, since multiple strategies such as Analysers and Balancers outperform others, it will be worthwhile to study further the features of this type of organisation. An overall depth study on strategic issues of Analysers and Balancers can be conducted. It is important to find out which characteristics of the multiple strategy users are associated with a higher level of strategic performance. Besides, Analysers and Balancers can be categorised into smaller segments in order that various levels of strategic performance can be explored. The development of such a study will help organisations to select appropriate business strategies for themselves and improve their existing strategic settings.

Finally, further research can be carried out to develop a relationship model amongst three variables of the business environment, business strategy and strategic performance. For example, research can be conducted to answer these questions: Is it possible to examine whether the perceived uncertainty and strategic performance can be used as predictors to identify what strategies firms should employ? Do lower levels of environmental uncertainty and higher levels of strategic performance determine a multiple strategy? Alternatively, which environmental factors and strategic characters will deliver a sound strategic performance? In order to so, measurements designed for these three variables should be improved further.

At present, the thesis tells about the extent to which western concepts of strategy can be applied and little about the other critical, especially local, factors that managerial decisions may need to take into account. As acknowledged previously in the Introduction chapter, other environmental variables such as organisational structure, managerial effectiveness and cultural factors have also an impact on strategic effectiveness. Because of the nature the industry, the other external environmental factors as well as strategy

implementation and control were excluded from this study. The absence of these issues inevitably limits this thesis but they are suggested as the future avenues for potential further research. For instance, Hofstede's (1994) dimensions of national culture can be expanded in future research and it is worthwhile looking at how these dimensions affect strategic decisions within energy organisations operating in East Asia.

The current study focused on a quantitative approach - questionnaire survey - for data collection. Future research can be developed based on the current methodology (which was regarded suitable at this exploratory stage of the industry study) by giving more emphasis to qualitative methods such as case studies to collect data. In this way, the research will be enhanced by showing whether the qualitative material supports or contradicts the results derived from quantitative approaches. What is more, in-depth details of different cases will also make a thesis more interesting.

In conclusion, conducting further development for future research has two foci: external dominant issues such as environmental factors and internal dominant issues such as strategic characteristics in relation to strategic performance. The significance of such a development will not only contribute to theory but also benefit organisations' strategic practice for long-term success.

EFFECTIVE BUSINESS STRATEGIES FOR ENERGY SERVICE COMPANIES IN THE EAST ASIAN BUSINESS ENVIRONMENT

(II)

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6 "A study of business strategies for the energy service sector in the East Asian business environment", a Doctoral Colloquium paper, the 30th Annual Conference UK Chapter Academy of International Business, De Montfort University, England, April 2003.

PART THREE BIBLIOGRAPHY

PART ONE

APPENDICES

Appendix A

Validity and Reliability Assessment

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1. Introduction

This supplementary analysis attempts to achieve four aims. First, it pays attention to the validity of the research instrument – the survey questionnaire. Second, it intends to find another possible means to assigning groups for the participating organisations. Third, it also seeks to evaluate the reliability of survey responses and fourth, to examine the validity of the research results.

According to Zikmund (2000), two basis groups of multivariate techniques are classified: dependence methods and interdependence methods. Analysing dependence attempts to explain or predict the dependent variable(s) on the basis of two or more independent variables. The dependence methods are irrelevant to the purpose of this part of analysis and are thereby not considered here. Interdependence methods seek to classify (cases) by providing meaning to a set of variables or to seek to group things together. Each variable or classified variable subset is not supposed to predict or explain the others (Zikmund, 2000). The methods selected for analysis of interdependence are factor analysis and cluster analysis.

By doing factor analysis, the researcher can examine the validity of the domain constructs or dimensions developed in the survey questionnaire. Factor analysis detects the underlying dimensions designed in the survey questionnaire and observes constancy by finding variable constructs as well as evaluates the adopted analytical technique. It may also reduce dimensions to form factors that may have a regularity which is associated with the initial developed constructs. Hence, the validity of the constructs developed for the survey questionnaire can then be evaluated.

Cluster analysis is a generic term for a set of techniques which produce classifications from initially unclassified data. The logic of cluster analysis is to group individuals or objects on the bases of their similarity or distance from each other (Everitt, 1986). Zikmund (2000) suggests the cluster should have high internal (within cluster) homogeneity and high external (between cluster) heterogeneity. The reason for using clustering techniques is to establish the validity of this technique to classifying the responding organisations into five business strategic groups. By doing cluster analysis, a set of strategy classifications, for instance, can be generated. The researcher can then assess the agreement between business strategic typologies defined in Chapter 8 and the categories obtained from this statistical test so that whether cluster analysis is suitable for the assignment of strategic groups can be clarified.

Furthermore, inter-item analysis was used to check the scales for internal consistency or reliability, especially to check the consistency across response reliability. In this analysis, Cronbach's coefficient alpha was calculated for each scale (dimension), as recommended for empirical research in business strategies by many researchers. In addition, the Wilcoxon tests involve ranking all nonzero differences scores and then evaluating the mean of the positive and the mean of the negative ranks (Green, Salkind, and Akey, 2000). In order to check whether managers within the same organisation or the same respondent responding at different times have different views on their organisations, Wilcoxon tests were conducted by comparing the

research results of the control groups*. Hence, the associated research questions could be raised as: Does median concern for managers at a lower level differ from median concern for managers at a senior level within the same organisation, or does median concern for responses provided at the beginning of the survey differ from median concern for responses provided at the end of the survey by the same respondent?

Based upon the results derived from supplementary analysis, it is also expected to modify or clarify, where appropriate, the analytical techniques applied previously in chapter 7, 8, and 9, and to provide evidence to support the research results produced in these three previous chapters.

2. Validity of Research Instrument: Factor Analysis

There are three domain parts in the survey questionnaire: the business environment, business strategies and strategic performance. The objectives pursued in this factor analysis are: to define indicators of constructs and discuss whether they match the initial components; to identify dimensions for the existing measures; to select items or scales, where appropriate, to be included on a measure; and then to validate the scales, including dimensional validity from those scales. Three criteria were used to determine the number of factors to rotate: the scree test, the loading value, and the interpretability of the factor solution.

2.1 Environmental Sectors and Dimensions

This researcher has developed a number of sectors or categories to measure three environmental dimensions in the task environment. In this research, the three environmental dimensions that this researcher intended to investigate were complexity, dynamism, and hostility. It is assumed that, these three components can be regarded as a basis to build a scale that categorises the business environment and provides a rating for the degree of environmental uncertainty. Nevertheless, environmental factors in each of the three dimensions may also produce a resulting degree of the perceived uncertainty. This assumption will be investigated by the following tests.

45 items concerning managerial perceptions on the business environment in the survey questionnaire were developed. On the basis of the factor analysis, the information contained in the 45 variables can be summarised into a smaller number of factors. Where appropriate, some items may not be significant and can be deleted to revise the environmental measures. The research questions that have arisen for analysis may be: firstly, is there a single dimension or are multiple dimensions underlying the 45 environmental items; secondly, are there items not associated with the identified factors that might be eliminated from the measures because they are irrelevant?

* In this study, the control groups (Zikmund, 2000) encompass participating executives at a lower level of management position within a service organisation, from which two completed questionnaires were received, and those respondents who responded to the survey questionnaire twice.

Figure 1 Selected SPSS Output for Factor Extraction of Environmental Variables

(Communalities)

	Extraction
Perceive Dynamism	.812
Perceived Complexity	.680
Perceived Hostility	.729
Economics Knowledge Required	.790
Size of Market Demand	.803
Changing of Market Demand	.759
Technological Level	.734
Similarity of Industrial Products/Services	.789
Access to Available Technologies	.792
Government Regulations, Legislation and Policies	.737
National Government Regulations and Legislation	.724
Local Government Policies	.779
Relationship with Government	.652
Number of Oil and Gas Clients	.833
Needs and Preferences of Oil and Gas Clients	.742
Levels of Key Customers Switching to Competitors	.629
Relationship with Customers	.778
Number of Suppliers	.807
Similarity of Supply Conditions by Suppliers	.656
Access to Suppliers for Materials or Goods	.596
Relationship with Suppliers	.658
Number of Firms within the Industry Sector	.831
Scope of Firms within the Industry Sector	.711
Entry Barriers	.725
Rivalry among Competitors	.787
Competitive Actions	.718
Relationship with Competitors	.740
Perceived Uncertainty	.662
Customer Demand for Existing Products/Services	.742
Customer Demand for New Products/Services	.784
Customer Demand for Higher Quality or More Service	.735
Customer Preference for Lower Prices	.744
Changes in Competitive Price	.743
Competitors' Quality Improvement	.795
Competitors' Introduction of New Products/Services	.775
Suppliers Rising Prices	.771
Suppliers Quality Reduction	.727
Suppliers Introduction of New Materials or Standard Products	.786
Changes in Oil and Gas E&P Level	.860
Changes in Well Counts	.891
Changes in Rig Counts	.897
Technological Changes	.807
Rate of Technological Diffusion	.766
Changes in National Regulations and Legislation	.784
Changes in Local Government Policies	.815

Extraction Method: Principal Component Analysis.

Figure 2 Environmental Variables: Rotated Component Matrix (a)

	Component															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Changes in Well Counts	.903															
Changes in Rig Counts	.890															
Changes in Oil and Gas E&P Level	.836															
Local Government Policies		.845														
National Government Regulations and Legislation		.741														
Changes in Local Government Policies		.622			.307		-.340									
Changes in National Regulations and Legislation		.497			.427											
Relationship with Government		.424														-.414
Changing of Market Demand			.835													
Size of Market Demand		.361	.594													
Relationship with Customers			.520				-.372									
Relationship with Suppliers			.515							.376						-.312
Levels of Key Customers Switching to Competitors			-.388								-.349					
Competitive Actions				.761												
Rivalry among Competitors				.731												
Relationship with Competitors			.366	.619												
Entry Barriers				.358					.311						.330	
Access to Suppliers for Materials or Goods		.329		.358												
Rate of Technological Diffusion					.782											
Technological Changes					.719											
Scope of Firms within the Industry Sector					.413						-.377	-.380			.347	
Competitors' Introduction of New Products/Services						.818										
Competitors' Quality Improvement						.755										

(Figure 2 continuing)

	Component															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Suppliers Introduction of New Materials or Standard Products						.544	-.380									
Technological Level							.730									
Perceived Dynamism	.303						.536	-.374								
Economics Knowledge Required							.532						.434			
Customer Demand for New Products/Services								.802								
Customer Demand for Existing Products/Services								.699								
Number of Suppliers									.769							
Number of Firms within the Industry Sector									.676				.331			
Similarity of Supply Conditions by Suppliers									.647							
Suppliers Quality Reduction										.709						
Perceived Uncertainty										.666						
Customer Preference for Lower Prices											.807					
Customer Demand for Higher Quality or More Service								.519			.543					
Suppliers Rising Prices					-.304						.459		.347	.337		
Access to Available Technologies												.827				
Similarity of Industrial Products/Services							-.345					.694	.344			
Needs and Preferences of Oil and Gas Clients													.678			
Perceived Complexity													.667			
Number of Oil and Gas Clients														-.831		
Perceived Hostility			.322											.465		
Changes in Competitive Price															.707	
Government Regulations, Legislation and Policies																.763

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.
a Rotation converged in 31 iterations.

The SPSS data file of factor analysis has the scores on these variables for 98 managers engaged in the service businesses in East Asia. As all communalities in Figure 1 are above 0.5 with a range from 0.596 (i.e. the "access to suppliers for materials or goods" variable) to 0.897 (i.e. the "changes in rig counts"), the sample size of 98 organisations is regarded to be adequate (Field, 2000). By using a principal components method, variables were reduced to 16 factors. The extracted 16 separate underlying factors or components account for 75.5% of the variation among the 45 variables.

When rotated, these 16 dominant factors can be interpreted in Figure 2. From Figure 2, variables may be strongly positive contributors to some of 16 rotated factors whereas have a weak or negative contribution to the other factors. For example, changes in rig counts, changes in well counts, and changes in oil and gas E&P (exploration and production) level with the loading values of 0.903, 0.890 and 0.836 respectively are strong positive contributors to Factor 1. Factor 1 appears therefore to assess the predictability of the oil and gas economics related issues. The variable of "hostility" is a strong negative contributor with a loading of -0.831 to Factor 13. Some of the rotated factors contain a mixture of positive and negative variables. For example, Factor 3 and 5 are this kind of factors which contain the contrast between the set of positives and negatives. These immediate results provide an answer to the first analytical question that there are multiple dimensions underlying the 45 environmental items. However, 16 factors are far beyond the expected number which was proposed in terms of three environmental dimensions, or three environmental levels, or six environmental compositions. In Field's (2000) book, it is suggested that if a factor has four or more loadings greater than 0.6 then it is reliable regardless of sample size. From the results presented in Figure 2, none of the 16 factors has satisfied this condition. In which case, the 16 extracted factors should not be considered significant for interpreting a reasonable number of environmental components.

In order to form three possible dimensions, the researcher continued factor analysis by selecting to suppress absolute values less than 0.50 (Field, 2000) and by specifying the number of extracted factors as 3. Three factors were rotated using a varimax rotation procedure. After rotation, three components account for 28.8% of variation were obtained and Factor 1, 2 and 3 accounted for 11.1%, 9.1% and 8.5% of the item variance respectively. Three components extracted are presented in Figure 3. These factors are interpreted by naming them based on the size of the loadings. This researcher also decided that the emerged three factors containing associated items with a loading greater than 0.512 could be regarded as reliable.

From items 1 and 5, these variables are associated with the first component. From item 21 to 26, the relevant variables are associated with the second component. Variables between item 34 and 38 are associated with the third component. Noticeably, 29 of 45 variables don't seem to make important contributions as their absolute loading values are smaller than 0.5. They are insignificant contributors to the emerged particular factor. This result further provides the answers to the second analytical question that these items are not associated strongly with the emerged components and, if the emerged factors were employed as the domain dimensions, those items might be eliminated from the set of measures because they appear to be irrelevant.

Figure 3 Rotated Component Matrix (a)

		Component		
Item		1	2	3
1	Changes in National Regulations and Legislation	.785		
2	Changes in Local Government Policies	.776		
3	Rate of Technological Diffusion	.557		
4	Local Government Policies	.550		
5	Entry Barriers	.532		
6	Access to Suppliers for Materials or Goods			
7	Rivalry among Competitors			
8	Technological Changes			
9	Suppliers Introduction of New Materials or Standard Products			
10	Number of Firms within the Industry Sector			
11	Competitive Actions			
12	Similarity of Supply Conditions by Suppliers			
13	Perceived Uncertainty			
14	Customer Demand for Higher Quality or More Service			
15	Changes in Competitive Price			
16	National Government Regulations and Legislation			
17	Government Regulations, Legislation and Policies			
18	Customer Demand for Existing Products/Services			
19	Levels of Key Customers Switching to Competitors			
20	Scope of Firms within the Industry Sector			
21	Changes in Oil and Gas E&P Level		.645	
22	Changes in Well Counts		.631	
23	Changes in Rig Counts		.623	
24	Competitors' Introduction of New Products/Services		.577	
25	Needs and Preferences of Oil and Gas Clients		.528	
26	Competitors' Quality Improvement		.502	
27	Suppliers Quality Reduction			
28	Perceived Hostility			
29	Perceived Dynamism			
30	Suppliers Rising Prices			
31	Access to Available Technologies			
32	Similarity of Industrial Products/Services			
33	Customer Preference for Lower Prices			
34	Size of Market Demand			.731
35	Relationship with Customers			.593
36	Economics Knowledge Required			-.576
37	Perceived Complexity			-.541
38	Technological Level			-.505
39	Number of Suppliers			
40	Customer Demand for New Products/Services			
41	Relationship with Government			
42	Changing of Market Demand			
43	Relationship with Suppliers			
44	Relationship with Competitors			
45	Number of Oil and Gas Clients			

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.
a Rotation converged in 4 iterations.

Overall, the dimensionality of the 45 items from the environmental measures was analysed using principal component factor analysis. By examining the content of the three rotated components, the dimensions of willingness to donate are more likely to be in a disorder style. Variables in each of the components do not show common features on their own or appear to have similar characters in terms of three environmental dimensions (i.e. complexity, hostility and dynamism).

Furthermore, the cumulative percentage (28.8%) cannot present a domain proportion of the 45 items. Consequently, the rotated solution yielded three interpretable factors but they failed to generate theoretically matched components. The factor analysis result shows that this technique is not applicable when forming environmental dimensions. As a result, this researcher's initial contention that the business environment in an East Asian context can be assessed by examining perceived environmental complexity, dynamism and hostility may give greater insight into the determinants of environmental uncertainty.

2.2 Strategic Taxonomy

2.2.1 Examining the Measures Based on Miles and Snow's Theory

Based on Miles and Snow, the appropriate measures were constructed that assessed the range of product or service domains, product-market strategies, the attitude toward change; and the approach of managing change. 20 items were designed to deal with the variations of managerial perceptions in business strategies. A conceptual framework of five types of business strategies, namely, Defender, Prospector, Analyser, Balancer and Reactor, was developed (see Chapter 6).

The eigenvalues are listed for components 1 through 20 in Figure 4. By using principal components method, variables were reduced to 7 factors. As five types of business strategic orientations were generated by this researcher, it was decided to rotate five factors for analysis and variables with the loading value greater than 0.4* could be adopted. These 5 factors account for 53.6% of the variation. Factor 1, 2, 3, 4, and 5 account for 20.3%, 10.4%, 8.9%, 7.2% and 6.8% of the item variance respectively.

* As the exploratory nature of this factor analysis, a minimum loading value of 0.4 was selected although Field (2000) suggests that factors with 10 or more loadings greater than 0.40 are reliable if the sample size is greater than 150.

Figure 4 Factor Analysis: Generic Business Strategies

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.069	20.345	20.345	4.069	20.345	20.345	3.196	15.979	15.979
2	2.079	10.393	30.738	2.079	10.393	30.738	2.091	10.457	26.436
3	1.776	8.880	39.618	1.776	8.880	39.618	1.920	9.600	36.036
4	1.443	7.217	46.835	1.443	7.217	46.835	1.814	9.070	45.106
5	1.356	6.779	53.614	1.356	6.779	53.614	1.702	8.509	53.614
6	1.231	6.153	59.768						
7	1.110	5.549	65.317						
8	.937	4.686	70.003						
9	.833	4.163	74.166						
10	.748	3.741	77.907						
11	.710	3.550	81.457						
12	.650	3.250	84.707						
13	.608	3.039	87.746						
14	.506	2.531	90.277						
15	.407	2.033	92.310						
16	.379	1.895	94.205						
17	.344	1.721	95.927						
18	.314	1.568	97.495						
19	.294	1.469	98.964						
20	.207	1.036	100.000						

Extraction Method: Principal Component Analysis.

The rotated dominant variables are emphasised and interpreted in Figure 5. Factor 1 is the blend of issues of insisting on unsuitable managements (0.775), unable to respond to changes (0.758), rare rapid adjustment (0.709), ignoring development of outside existing business (0.660), unavailable management or structure (0.523) and a contrast negative variable of clear articulated business strategies (-0.545). It is indicated that item 5 is negatively associated with the rest of the first six items which form Factor 1. This special item suggests that organisations classified in the category of factor 1 do not have a clear articulated business strategy.

Figure 5 Business Strategic Orientations: Rotated Component Matrix(a)

		Component				
Item		1	2	3	4	5
1	Insist on Unsuitable Managements	.775				
2	Unable to Respond to Changes	.758				
3	Rare Rapid Adjustment	.709				
4	Ignore Development of Outside Existing Business	.660	.315			
5	Clear Articulated Business Strategies	-.545	.376			
6	Unavailable Management or Structure	.525	-.405			-.331
7	Serve Well Defined Customers		.732			
8	Offer a Full Set of Products/Services		.519	.304		
9	Develop Related Business		.517	.309		
10	Operational Efficiency Focus	-.309	.373			
11	Diversification			.732		
12	Stable and changing Products/Services and Markets			.630		
13	Market Development	-.307		.496		
14	Increasing Existing Products/Services in Current Markets		.375	.461		
15	Innovation				.817	
16	Product Development				.718	
17	Create Changes	-.386			.496	
18	Adapt to Changes					.786
19	Forced to Change			-.330		-.653
20	Broad Range Products/Services		.328		.363	.405

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.
a Rotation converged in 10 iterations.

Factor 2 is compounded by three variables. Serving the well-defined customers is a strong position contributor (0.732) whereas offering a full set of products (0.519) and services and developing related business (0.517) are moderate positive contributors to this factor. Factor 3 is a mixture of variables of having both stable and changing products or services and markets (0.630), increasing existing products or services in current markets (0.461), market development (0.496) and diversification strategy 0.732).

Factor 4 is a combination of innovation strategy (0.817), product development strategy (0.718) and creating changes (0.496). The variable of adapting to changes is a strong positive contributor (0.786), forcing to change is a moderate negative contributor (-0.653) and a broad range products or services is a moderate positive contributor (0.405) to factor 5. Hence, organisations fell into the category of factor 5 show the sign of adapting aggressively to the changes developed by others rather than reacting passively to make changes when forced to do so. Besides, the variable of operational efficiency focus does not have a loading value greater than 0.40 and this item may be considered to be negligible and may then be omitted from the factor groups.

It is observed that variables emerged in each component are very similar to the features defined for five business strategic orientations. Factor 1 presents a number of Reactors' characters; factor 2 shows similar features which Defenders contain; factor 3 appears to be relevant to Analysers; factor 4 seems to have Prospectors' characteristics; and factor 5 has a specific feature (i.e. adapting to changes) defined for Balancers. The results of these generated five components support the concepts designed by this researcher for assigning strategic directions pursued by organisations at a business level. In addition, it emerges that factor analysis may be an appropriate technique in assisting researchers who wish to develop the constructs of strategic taxonomy.

2.2.2 Examining the Measures Based on Porter's Framework

8 items were used as the measures to assess generic competitive strategies by looking at three dimensions: low cost, differentiation and hybrid strategies. Variables reduced to three factors by Principal Components Method (Figure 6). These three factors account for 70.3% of the variation. Factor 1, 2 and 3 account for 34.2%, 18.8% and 17.4% of the item variance respectively.

Factor 1 is the combination of competing based on high quality (0.844) competing based on differentiation (0.831), seeking to high quality (0.768) and seeking to differentiate (0.742). Factor 2 is the combination of seeking to achieve cost leadership (0.904) and compete based on cost leadership (0.878). Factor 3 is combined by two variables: emphasising quality, price, unique features or other products (services) attributes depending on the business activity concerned (0.832); switching between emphasising factors such as quality, unique features, price or other products or services attributes within a single business activity.

According to the features that each of the factors has, Factor 1 and 2 can be titled as Differentiation and Cost Leadership whereas factor 3 can be named as Hybrid. These results support the initial set up of the three basic dimensions for generic competitive strategies. It indicates further that factor analysis is a useful approach for generating the constructs of competitive strategies and the validated constructs can help to assign organisations in competitive terms.

Figure 6 Factor Analysis: Generic Competitive Strategies

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.735	34.193	34.193	2.735	34.193	34.193	2.568	32.095	32.095
2	1.502	18.771	52.964	1.502	18.771	52.964	1.658	20.730	52.825
3	1.388	17.352	70.316	1.388	17.352	70.316	1.399	17.491	70.316
4	.688	8.599	78.915						
5	.578	7.228	86.143						
6	.510	6.370	92.514						
7	.367	4.591	97.105						
8	.232	2.895	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix(a)

	Component		
	1	2	3
Emphasise quality, price, unique features or other products/services attributes depending on the business activity concerned.	-.036	.080	.832
Within a single business activity, switch between emphasising factors such as quality, unique features, price or other products/services attributes.	.030	-.092	.822
Seek to provide the highest possible quality of businesses or products/services.	.768	.034	-.070
Tend to emphasise a unique feature of businesses or products/services.	.742	.207	-.017
Seek to achieve the lowest possible cost of businesses or products/services.	.119	.904	.004
Compete based on the highest quality of businesses or products/services	.844	.105	-.058
Differentiate businesses or products/services from those of competitors	.831	-.023	.151
Compete based on the lowest cost of businesses or products/services	.084	.878	-.016

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalisation.
a Rotation converged in 4 iterations.

2.2.3 Examining the Measures Based on Bowman's Strategy Clock Model

For testing Bowman's strategy clock model which can be used for assigning strategic competitive positions, a 6-item scale was constructed as the basic measures. Two dimensions were also defined as the perceived price and the perceived customer added value (PCAV). The six variables were reduced to two factors by the Principal Components Method (Figure 7). These two factors account for 58.9% of the variation (38.8% and 20.1% respectively). Factor 1 is the blend of issues of quality valued by customers (0.829), safety performance of products and services (0.785) and reliability of the technology of products and services (0.762). Factor 2 seems to

be items of level of price (-0.683) and speed of response to customers (0.722). The level of price item appears to have a contract loading against the item of speed of response to clients. It may suggest that organisations which respond to customers slowly tend to require a high level of price. Additionally, one item – price level customers willing to pay – appears to be loaded on both two factors (0.457 for factor 1 and 0.407 for factor 2).

Figure 7 Strategic Competitive Positions: Rotated Component Matrix(a)

	Component	
	1	2
Products/Services Quality Valued by Customers	.829	.054
Safety Performance of Products/Services	.785	.264
Reliability of Products/Services Technology	.762	-.246
Price that Customers are Willing to Pay	.457	.407
Speed of Response to Customers	.296	.722
Level Price Charged	.256	-.683

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalizsation.
a Rotation converged in 3 iterations.

The results presented in Figure 7 show that, when classifying competitively strategic groups, two dimensions produced may be slightly different from the definitions in the original design. Factor 1 may form one dimension with four variables counted and Factor 2 can form another dimension with two variables counted. However, if the item of speed of response to customers is ignored in Factor 2, the level of price item remains a separate dimension for the classification. Hence, Factor 1 can be titled as PCAV and Factor 2 can be titled as the perceived price. Thus, the validity of the two dimensions developed based on Bowman's Strategy Clock model can be proved.

Furthermore, the items of speed of response to customers and price that customers are willing to pay are not associated strongly with the emerged components and they might be eliminated from the set measures because they appear to be irrelevant. On the whole, the above results also indicate that factor analysis is a constructive approach for constructing the items which can be used to assign strategic competitive positions.

3. Assigning Business Strategic Groups: Cluster Analysis

The use of cluster analysis here is facilitating business strategic groups by identifying subjects or individuals who have similar options, styles or responses to business strategies. To check the validity of business strategic groups classified by using the approach developed by this researcher, K-means cluster analysis was carried out by specifying five clusters. Optimal final cluster centres are presented in Figure 8. Cases are allocated to the cluster with the closest centre using Euclidean distances.

Figure 8 Final Cluster Centres for Generic Business Strategies

	Cluster				
	1	2	3	4	5
Clear Articulated Business Strategies	2.73	1.33	3.60	2.09	1.33
Broad Range Products/Services	2.90	4.33	4.20	1.91	1.67
Serve Well Defined Customers	2.17	2.00	2.00	1.96	1.67
Offer a Full Set of Products/Services	2.56	1.33	4.20	2.35	2.22
Stable and changing Products/Services and Markets	2.85	1.67	3.00	2.26	3.22
Increasing Existing Products/Services in Current Markets	2.12	2.00	2.40	1.91	3.11
Develop Related Business	2.44	4.00	3.80	1.91	3.33
Market Development	2.23	1.00	5.00	1.65	2.44
Product Development	2.63	3.00	3.20	1.74	2.44
Diversification	4.77	1.67	5.40	4.30	5.56
Innovation	4.38	6.67	4.80	3.78	4.11
Operational Efficiency Focus	2.48	1.67	3.20	1.96	1.78
Ignore Development of Outside Existing Business	3.75	6.67	5.20	5.74	5.89
Rare Rapid Adjustment	3.44	6.33	2.60	5.48	5.22
Unavailable Management or Structure	3.73	2.33	1.60	5.30	5.44
Insist on Unsuitable Managements	4.60	6.67	3.20	6.13	5.89
Unable to Respond to Changes	3.56	5.33	2.00	5.13	5.33
Adapt to Changes	3.88	5.67	5.20	3.57	4.67
Create Changes	3.81	4.67	6.00	3.04	2.00
Forced to Change	3.96	5.33	2.40	5.26	2.33

Figure 8 shows that 92[*] valid cases are classified into 5 clusters. Of which, cluster 1 has certain characters of Analysers, and cluster 2, 3, 4 and 5 are assumed to have features of Defenders, Prospectors, Balancers and Reactors respectively. Hence, the alignment can be tackled with by using cross-tabulation statistics to compare the correlation between the groups produced by cluster analysis and previous assignment of strategic orientations (i.e. Reactors, Defenders, Prospectors, Analysers and Balancers studied in Chapter 8). The allocated cluster number is stored in "qcl_1" and this is tabulated against previous assignment of strategic types (Figure 9).

[*] 7 responses from other countries outwith China, Singapore and Malaysia are excluded.

Figure 9 Miles and Snow's Assignment - Cluster Number of Case Crosstabulation

		Cluster Number of Case					Total
		1	2	3	4	5	
Miles and Snow Assignment	Analyser	31	3	1	16	7	58
	Defender	3	0	0	0	0	3
	Prospector	2	0	0	1	2	5
	Balancer	7	0	0	6	0	13
	Reactor	9	0	4	0	0	13
Total		52	3	5	23	9	92

The observed results in Figure 9 show that none of the clusters is correctly classified in all cases. In Cluster 1, 31 of 52 Analysers are correctly classified. All Defenders (3), Prospectors (5) and Reactors (13) are wrongly classified and only 6 out of 13 Balancers are correctly classified. In order to seek the significance of agreement between the emerged clusters and initial assignment of business strategies, Kappa value was computed for the non-parametric significance test allowing to compare the classifications of two different approaches to assigning strategic types (Figure 10).

Figure 10 Symmetric Measures

		Value	Asymp. Std. Error(a)	Approx. T(b)	Approx. Sig.
Measure of Agreement	Kappa	.006	.030	.195	.846
N of Valid Cases		92			

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.
c Based on normal approximation.

Classification of categories into cluster shows poor agreement when using the Kappa test. The crosstab test between the obtained five clusters and emerged five strategic categories is insignificant, Kappa 0.006, $p = 0.846$. Consequently, the hypothesis that the five clusters do not have significant agreement with the five classified strategic groups can not be rejected. The researcher was then aware of the criticism of the clustering technique as it does not provide significant agreement when comparing with the initial assigned strategic groups.

4. Reliability of Responses: Item analysis

4.1 The Business Environment

In order to assess the reliability of environmental importance and impact constructs, the value of Cronbach's reliability coefficient α for each of six task environmental dimension was calculated. The α values ranged from 0.6929 (i.e. customers' significance) to 0.8795 (suppliers' significance) for the dimension of environmental

significance, indicating that the two items designed for each environmental sector are reliable.

Figure 11: Cronbach α values of Task Environmental Sectors

Dimension	Items Title	Cronbach α values (items)
Economic	Importance and Impact	0.8851 (2)
Technological	Importance and Impact	0.8256 (2)
Regulatory	Importance and Impact	0.8562 (2)
Customers	Importance and Impact	0.6929 (2)
Competitors	Importance and Impact	0.8232 (2)
Suppliers	Importance and Impact	0.8795 (2)

Next, the researcher intended to examine whether it was reliable if using three dimensions (i.e. complexity, dynamism and hostility) to measure the environmental uncertainty. The results (Figure 12) show that Cronbach's reliability coefficient α value is 0.41. These four items are not reliable to measure the intended factor of the environmental uncertainty and should not be considered alone when assessing the environmental uncertainty. It must be worthwhile to put the rest of the additional items with these four items together to form the scale of the environmental uncertainty. Adding up the rest of 45 items leads to a large increase of Alpha (0.8263). Hence, the initially designed 45 variables in the three environmental dimensions are reliable measures for the perceived environmental uncertainty.

Figure 12 Reliability Analysis: Environmental Dimensions Scale (Alpha)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
DYNAMISM	12.9898	7.3916	.3245	.2465
COMPLEXI	13.1531	9.1000	.0770	.4749
HOSTILIT	14.3878	6.5491	.3198	.2302
UNCERTAI	14.0510	7.3066	.1981	.3760

Reliability Coefficients
N of Items = 4
Alpha = .4101

4.2 Environmental Dimensions

4.2.1 Perceived Complexity

The researcher developed a measure that evaluates the degree of the perceived business environmental complexity. 11 items assess the environmental complexity. The selected SPSS output is presented in Figure 13 below. The item regarding number of customers had the lowest corrected item-total correlation (0.026) and the item regarding scope of firms within the industry had the next lowest correlation (0.03). They were therefore candidates for elimination.

To ensure that the item of scope of firms within the industry would still have a low correlation after deleting the item of number of customers, the Reliability Analyses procedure without the item of number of customers was rerun. The output shows that, as expected, the item of scope of firms within the industry had the lowest corrected item-total correlation.

Figure 13 Reliability Analysis: Perceived Complexity Scale (Alpha)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
COMPLEXI	41.2474	44.2298	.3319	.4941
EKNOWLED	41.5361	44.0846	.3458	.4913
TECHLEVE	41.2165	43.8797	.3083	.4967
PSIMILAR	42.8041	46.4716	.1036	.5479
REGULATI	41.9588	46.4358	.1246	.5409
NCUSTOME	42.0206	47.9996	.0260	.5691
CLIENTND	43.0825	43.1181	.2880	.4989
NSUPPLIE	42.3918	39.5533	.3775	.4678
CDSUPPLI	42.5052	43.9609	.2395	.5118
NFIRMS	43.0412	38.6441	.4396	.4484
SCOPEFIR	41.2887	49.4366	-.0303	.5811

Reliability Coefficients

N of Items = 11

Alpha = .5399

The Reliability procedure was rerun again without the above two elimination candidate items to determine whether additional revisions needed to be made. The output shows the alpha value is 0.6087 (0.6171). Based on the above results, the researcher chose not to eliminate any other items while the two items were excluded from the analysis.

4.2.2 Perceived Hostility

Based on the results provided in the following Reliability test (Figure 14), item pertaining to accessing to technology had the lowest corrected item-total correlation (0.0701) and item pertaining to clients switching to other competitors had the next lowest correlation (0.713). These two items lead to a slight increase of Alpha (0.703 and 0.7051) if they are deleted. It is then concluded that both items may be still included in the 15 items which form the scale of perceived hostility.

Figure 14 Reliability Analysis: Perceived Hostility Scale (Alpha)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
HOSTILIT	51.6170	68.5399	.3070	.6745
MDEMAND	52.0851	66.1647	.4135	.6595
MDEMANR	52.0532	72.9756	.1990	.6866
ACCESTEC	51.6383	74.8355	.0701	.7039
NREGULAT	51.3085	68.3232	.3768	.6657
LREGULAT	51.1915	68.0275	.3975	.6633
GRELATIO	51.2340	69.7941	.2799	.6779
CLIENSWI	50.7021	74.5555	.0713	.7051
ACCSUPPL	52.3936	69.2090	.3431	.6701
SRELATIO	52.7128	72.5080	.2903	.6777
ENTRYBAR	52.2340	70.9554	.2448	.6822
RIVALRY	50.8191	68.6874	.3122	.6737
COMACTIO	51.0638	67.7593	.3670	.6664
COMRELAT	51.1915	65.9844	.4444	.6557
CRELATIO	53.1170	70.3195	.3934	.6672

Reliability Coefficients
N of Items = 15
Alpha = .6907

Figure 15 Reliability Analysis: Perceived Dynamism Scale (Alpha)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
DYNAMISM	59.1383	158.6581	.1031	.8390
PRODUCDE	61.3404	143.5173	.5428	.8178
NEWPRODE	60.8511	148.0636	.4026	.8252
HQUADE	61.4681	145.5420	.4589	.8222
LOWERP	62.0213	157.5479	.1163	.8397
COMPRICE	60.3191	144.8433	.4342	.8236
IMQUALIT	60.8191	148.5368	.4713	.8222
NEWPRODI	60.6064	151.2735	.3087	.8299
RISPRICE	60.9255	148.8224	.3855	.8260
QUAREDUC	60.5106	149.0698	.4123	.8247
NEWMATER	60.6809	149.8325	.4427	.8236
EANDPCHA	60.5745	134.2471	.6409	.8102
WELLCHAN	60.8723	142.4997	.5457	.8173
RIGCHANG	60.7021	140.5770	.5839	.8149
TECHCHAN	61.1064	150.8273	.4218	.8246
DIFRATE	60.8511	149.4830	.3970	.8254
NREGCHAN	60.6064	144.0262	.4863	.8206
LOCALPCH	60.5745	145.3439	.4413	.8231

Reliability Coefficients
N of Items = 18
Alpha = .8323

4.2.3 Perceived Dynamism

The Reliability test (Figure 15) shows the 18 items designed as a scale for measuring dynamism. If any of these 18 items is deleted, it increases α value. Nonetheless, all items may be included in the scale as the Cronbach's reliability coefficient α value is high (0.8323) for these items.

4.3 Business Strategic Directions

20 items were used to form a scale to examine business strategies. The Alpha value obtained is 0.3792. This suggests that the strategy scale should be developed further. In which case, the new scales can be formed by examining the item content. The further divided scales may be formed by the items which sought to measure similar strategies such as Defenders, Prospectors, Reactors, Analysers and Balancers. The reliability procedure was rerun with the separated items. The results obtained show that the designed items for assessing each of the five strategies were much more reliable when they were grouped separately. For example, the following output shows the scale to measure Defenders. The Alpha is 0.5088 showing a certain degree of the reliability of this scale with those 7 items (Figure 16). Amongst those items, the "ignore change" item can be omitted as it has a poor correlation with the others and the Alpha value increases significantly if the item is deleted. The result is consistent with the earlier factor analysis.

Figure 16 The Scale for Defenders

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
NICHE	16.3441	16.7716	.2675	.4657
FULLSET	15.8817	15.3663	.3084	.4431
PENETRAT	16.2258	16.8506	.2408	.4742
RELATEBU	15.8817	14.1054	.4239	.3866
MARKETDE	16.1828	15.3249	.2796	.4551
EFFICIEN	16.1075	16.6187	.2233	.4797
IGNORANC	13.7634	16.3782	.0681	.5730

Reliability Coefficients
N of Items = 7
Alpha = .5088

Besides, the coefficients resulted in 0.6556 for a Rector business strategy (5 items) and the coefficients were 0.5992 for differentiation competitive strategy (six items), 0.7574 for low-cost competitive strategy (two items) and 0.6827 for perceived customer added value (five items). It is also observed that the α values of strategy classification dimensions can be improved after modifying the original 7-point scale in a plain form which only contains three options, with –1 indicating disagreement, 0 indicating neither disagreement nor agreement, and 1 indicating agreement.

4.4 Strategic Performance

The coefficient was 0.9247 for 20 items of strategic performance dimensions, showing a high level of reliability of the 20 items designed (Figure 17). As such, all the 20 items can be used for the scale of performance assessment.

Figure 17 Strategic Performance: Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
TAS	96.8710	203.4397	.5103	.9231
ROI	97.2796	203.3558	.5527	.9219
REN	96.9032	202.4144	.5438	.9223
NPM	97.4301	201.9652	.5013	.9237
TAT	97.0860	204.1664	.5179	.9227
COSTIMPR	97.1935	207.7665	.5129	.9226
PRICECOM	97.8387	206.5933	.4360	.9247
RELIABLE	97.2366	207.4652	.5267	.9223
QUALITY	97.0538	206.3123	.5233	.9224
RELATION	96.9892	200.9021	.6805	.9192
CAPABLE	97.5269	203.6433	.5964	.9210
OPTIMSM	97.2796	200.0079	.6329	.9202
STABILIT	97.3226	199.1774	.6780	.9191
CALIBRE	97.1290	202.5919	.7170	.9189
EFCENCY	97.1613	204.8541	.6502	.9202
INOSPED	97.4731	204.9694	.6187	.9206
EFETIVE	97.3011	203.6475	.6437	.9201
ADVALU	97.2258	205.1550	.6490	.9202
IMAGE	96.9247	196.9182	.7777	.9170
COFDENT	96.9032	199.4579	.7211	.9183

Reliability Coefficients
N of Items = 20 Alpha = .9247

In conclusion, the above values exceeded by a comfortable margin of 0.5 to 0.6 the criterion which is generally considered adequate for exploratory work (Nunnally, 1978; Badri, *et al.*, 2000). As such, the results provide evidence to support the reliability of the scales designed in the survey questions for investigation. Some items should be excluded when conducting formal analyses.

5. Comparison of the Control Groups

5.1 Data Files and Analytical Techniques

There are 16 samples matched in 8 pairs for the comparison analysis of the control groups. Among those, three pairs (i.e SG023 versus SG023_, SG032 versus SG032_, and CN016 versus CN016_) refer to the same respondents who responded to the same questionnaire twice - at the beginning and end of the survey (i.e. duration of approximately six months). Responses provided in SG023, SG032 and CN016 were analysed for the results presented in Chapter 7, 8 and 9. Meanwhile, responses SG023_ and SG023_ were given by respondents at the second time but CN016_

represents the first time responses provided by the same respondent. These three responses are only used here as a part of the control groups.

As said earlier, CN016 and CN016_ were subject to the same respondent. At the beginning, the respondent was not familiar with the questionnaire design and thought that some questions did not fit in their organisation as they were mainly engaged in engineering and construction businesses. The respondent had difficulties following some of the questions in the questionnaire. This is a special occasion which appeared only once over the period of survey investigation. After communicating with the informant on the phone and via emails, the purpose of the questionnaire was explained further. This respondent then was able to provide answers to the same questionnaire according to the induction. The respondent suggested that the second completed questionnaire (i.e. CN016) should be used in the data file.

Each of the rest five pairs is concerned with two respondents at different managerial levels within the same organisation. Four respondents (i.e. OT001 versus OT001*, OT008TS versus OT008TS*) provided answers during the pilot study. The managerial positions for each of the sample respondents in the control groups are also summarised below (Figure 18).

Figure 18 Managerial Positions for the Respondents in Control Groups

	Company Code	Management level
Respondents at different levels	SG022	General Manager
	SG022*	Manager of Business Development Far East
	CN004	General Manager
	CN004*	Sales Manager
	CN014	Chief Executive Officer
	CN014*	Operations Manager
	OT001	Business Development Manager
	OT001*	Marketing Manager
	OT008ts	Managing Director
	OT008ts*	Director of Sales and Marketing
Respondents provided answers twice	SG023 (SG023_)	Business Development Manager
	SG032 (SG032_)	Managing Director
	CN016 (CN016_)	International Business Manager

Two criterions were considered for selecting a Wilcoxon test technique. The normalities tests (using a Minitab software package) show that for each variable of the 16 cases, the data is not normally distributed. Nonparametric procedures are then considered firstly since the population distribution of the difference scores was not normal (Green, Salkind, and Akey, 2000). Furthermore, as each variable was measured at an ordinal level, it is preferable if a Wilcoxon test is conducted because medians are a more meaningful measure of central tendency. The survey questionnaire was designed based on multiple dimensions; both 5-point Likert and 7-point Likert scales were employed as measurement instruments. Because of these, the researcher decided to conduct separate Wilcoxon tests for the responses provided in each associated part of the questionnaire.

5.2 Environmental Sectors: Importance and Impact

A Wilcoxon test was conducted to evaluate whether the perceptions on the environmental factors by managers at a higher level differ from the perceptions given by managers at a lower level within the same organisation or the same manager would respond differently at different times during the survey. The results are shown in Figure 19.

Figure 19 Wilcoxon Test (Ranks): Environmental Impact and Importance

		N	Mean Rank	Sum of Ranks
SG022* - SG022	Negative Ranks	1(a)	3.00	3.00
	Positive Ranks	7(b)	4.71	33.00
	Ties	4(c)		
SG023_ - SG023	Negative Ranks	2(d)	3.00	6.00
	Positive Ranks	5(e)	4.40	22.00
	Ties	5(f)		
SG032_ - SG032	Negative Ranks	2(g)	2.50	5.00
	Positive Ranks	2(h)	2.50	5.00
	Ties	8(i)		
CN004* - CN004	Negative Ranks	1(j)	3.00	3.00
	Positive Ranks	2(k)	1.50	3.00
	Ties	9(l)		
CN014* - CN014	Negative Ranks	2(m)	3.75	7.50
	Positive Ranks	5(n)	4.10	20.50
	Ties	5(o)		
CN016_ - CN016	Negative Ranks	0(p)	.00	.00
	Positive Ranks	5(q)	3.00	15.00
	Ties	7(r)		
OT001* - OT001	Negative Ranks	6(s)	5.00	30.00
	Positive Ranks	3(t)	5.00	15.00
	Ties	3(u)		
OT008TS* - OT008TS	Negative Ranks	5(v)	4.10	20.50
	Positive Ranks	4(w)	6.13	24.50
	Ties	3(x)		

a SG022* < SG022; b SG022*> SG022; c SG022* = SG022; d SG023_ < SG023; e SG023_ > SG023; f SG023_ = SG023; g SG032_ < SG032; h SG032_ > SG032; i SG032_ = SG032; j CN004* < CN004; k CN004* > CN004; l CN004* = CN004; m CN014* < CN014; n CN014* > CN014; o CN014* = CN014 p CN016_ < CN016; q CN016_ > CN016; r CN016_ = CN016; s OT001* < OT001; t OT001* > OT001 u OT001* = OT001; v OT008TS* < OT008TS; w OT008TS* > OT008TS; x OT008TS* = OT008TS.

Test Statistics(d)

	SG022* - SG022	SG023_ - SG023	SG032_ - SG032	CN004* - CN004	CN014* - CN014	CN016_ - CN016	OT001* - OT001	OT008TS* - OT008TS
Z	-2.165(a)	-1.406(a)	.000(b)	.000(b)	-1.119(a)	-2.070(a)	-.921(c)	-.241(a)
Asymp. Sig. (2-tailed)	.030	.160	1.000	1.000	.263	.038	.357	.809

a Based on negative ranks. b The sum of negative ranks equals the sum of positive ranks. c Based on positive ranks. d Wilcoxon Signed Ranks Test

The results for the Wilcoxon test indicate significant different perceptions on the impact and importance of the environmental factors for SG022 versus SG022* and CN016 versus CN016_, z = -2.16, -2.07, p = 0.03, 0.04 respectively. The reason of producing a significant difference is thought as the same as what has been discussed or explained in the above section.

Managers operating at a lower management level may have different views when they assess environmental conditions but they might have biased views that may fail to provide a comprehensive assessment; and the respondent (CN016) failed to follow correctly the induction given in the questionnaire initially. However, if the results are examined at a 0.01 significance level, then it shows that there is no significant evidence to support that executives had different views on the impact and importance of the environmental factors or executives responded differently at various times.

Moreover, the differential perceptions for each of the rest pairs are insignificant. For both scenarios, SG032 versus SG032_ and CN004 versus CN004 *, z = 0, p = 1; for OT008TS versus OT008TS*, z = -0.241, p = 0.81. Hence, no evidence can be provided through these pairs of responses that managerial perceptions at different levels or responded at different times varied significantly from each other.

5.3 Nature of the Business Environment

The first table in Figure 20 shows that, of pair 1, for 18 of 45 subjects, theirs score given by SG022 was greater than the score given by case SG022* (negative ranks); 16 of 45 subjects, their score given by SG022* was greater than the score given by SG022, indicating that respondent manager SG022* perceived a greater level of uncertainty than that was perceived by respondent manager SG022.

There were eleven tied ranks and these eleven zero difference scores were excluded form the analysis for the further Wilcoxon test. The differential perceptions for five pairs are not significant, z = -0.63, 0.995, -0.61, -1.12, -1.25 for pair 1, 2, 5, 7 and 8, all p values are above 0.05. The results indicate a significant difference for pair 3, 4 and 6, z = - 0.98, -2.05, -2.50, p = 0.05, 0.04, 0.013.

The reason causing different answers has been discussed above: lower level managers may have a biased view regarding their originations; the respondent failed to follow correctly the induction given in the questionnaire. If the significance is at a 0.01 level, then a similar conclusion can be drawn: managers at different levels or responding at different times provide consistent perceptions on the nature of the business environment.

Figure 20 Wilcoxon Test (Ranks): the Business Environment:

		N	Mean Rank	Sum of Ranks
SG022* - SG022	Negative Ranks	18(a)	18.56	334.00
	Positive Ranks	16(b)	16.31	261.00
	Ties	11(c)		
SG023_ - SG023	Negative Ranks	12(d)	9.88	118.50
	Positive Ranks	7(e)	10.21	71.50
	Ties	26(f)		
SG032_ - SG032	Negative Ranks	7(g)	14.14	99.00
	Positive Ranks	19(h)	13.26	252.00
	Ties	19(i)		
CN004* - CN004	Negative Ranks	23(j)	16.07	369.50
	Positive Ranks	9(k)	17.61	158.50
	Ties	13(l)		
CN014* - CN014	Negative Ranks	14(m)	17.64	247.00
	Positive Ranks	19(n)	16.53	314.00
	Ties	9(o)		
CN016_ - CN016	Negative Ranks	19(p)	15.05	286.00
	Positive Ranks	8(q)	11.50	92.00
	Ties	18(r)		
OT001*- OT001	Negative Ranks	7(s)	13.29	93.00
	Positive Ranks	15(t)	10.67	160.00
	Ties	23(u)		
OT008TS* - OT008TS	Negative Ranks	15(v)	17.00	255.00
	Positive Ranks	21(w)	19.57	411.00
	Ties	8(x)		

a SG022* < SG022; b SG022*> SG022; c SG022* = SG022; d SG023_ < SG023; e SG023_ > SG023; f SG023_ = SG023; g SG032_ < SG032; h SG032_ > SG032; i SG032_ = SG032; j CN004* < CN004; k CN004* > CN004; l CN004* = CN004; m CN014* < CN014; n CN014* > CN014; o CN014* = CN014 p CN016_ < CN016; q CN016_ > CN016; r CN016_ = CN016; s OT001* < OT001; t OT001* > OT001 u OT001* = OT001; v OT008TS* < OT008TS; w OT008TS* > OT008TS; x OT008TS* = OT008TS.

Test Statistics(c)

	SG022* - SG022	SG023_ - SG023	SG032_ - G032	CN004* - CN004	CN014* - CN014	CN016_ - CN016	OT001* - OT001	OT008TS* - OT008TS
Z	-.629(a)	-.995(a)	-1.982(b)	-2.046(a)	-.608(b)	-2.497(a)	-1.124(b)	-1.248(b)
Asymp. Sig. (2-tailed)	.529	.320	.047	.041	.543	.013	.261	.212

a Based on positive ranks. b Based on negative ranks. c Wilcoxon Signed Ranks Test.

5.4 Business Strategies

In this part of assessment, the original measures on strategic orientations used a 7-point Likert scale with 1 indicating strong agreement, 4 indicating neutral and 7 indicating strong disagreement. In order to simplify, the 7-point scale was recoded into 3-point scale with -1 indicating agreement, 0 indicating neutral and 1 indicating disagreement.

The results (Figure 21) show that, apart from the pair of SG023_versus SG023 and the pair of CN014* versus CN014, there is not a significant difference of the answers given by the rest of the pairs of respondent samples. Pair 2 (SG023_ and SG023) and 4 (CN014* and CN014) appeared to have a significant difference, z = -2.54, -2.63, p = 0.011, 0.009 respectively.

Figure 21 Wilcoxon Test (Ranks): Business Strategic Orientations

		N	Mean Rank	Sum of Ranks
SG022* - SG022	Negative Ranks	7(a)	6.71	47.00
	Positive Ranks	5(b)	6.20	31.00
	Ties	22(c)		
SG023_ - SG023	Negative Ranks	6(d)	14.50	87.00
	Positive Ranks	21(e)	13.86	291.00
	Ties	7(f)		
SG032_ - SG032	Negative Ranks	4(g)	3.50	14.00
	Positive Ranks	2(h)	3.50	7.00
	Ties	28(i)		
CN004* - CN004	Negative Ranks	1(j)	2.50	2.50
	Positive Ranks	9(k)	5.83	52.50
	Ties	24(l)		
CN014* - CN014	Negative Ranks	4(m)	9.00	36.00
	Positive Ranks	12(n)	8.33	100.00
	Ties	18(o)		
CN016_ - CN016	Negative Ranks	9(p)	8.17	73.50
	Positive Ranks	7(q)	8.93	62.50
	Ties	18(r)		
OT001* - OT001	Negative Ranks	2(s)	1.50	3.00
	Positive Ranks	0(t)	.00	.00
	Ties	15(u)		
OT008TS* - OT008TS	Negative Ranks	0(v)	.00	.00
	Positive Ranks	2(w)	1.50	3.00
	Ties	15(x)		

a SG022* < SG022; b SG022*> SG022; c SG022* = SG022; d SG023_ < SG023; e SG023_ > SG023; f SG023_ = SG023; g SG032_ < SG032; h SG032_ > SG032; i SG032_ = SG032; j CN004* < CN004; k CN004* > CN004; l CN004* = CN004; m CN014* < CN014; n CN014* > CN014; o CN014* = CN014 p CN016_ < CN016; q CN016_ > CN016; r CN016_ = CN016; s OT001* < OT001; t OT001* > OT001 u OT001* = OT001; v OT008TS* < OT008TS; w OT008TS* > OT008TS; x OT008TS* = OT008TS.

Test Statistics(c)

	SG022* - SG022	SG023_ - SG023	SG032_ - SG032	CN004* - CN004	CN014* - CN014	CN016_ - CN016	OT001* - OT001	OT008TS* - OT008TS
Z	-.660(a)	-2.542(b)	-.750(a)	-2.626(b)	-1.767(b)	-.294(a)	-1.342(a)	-1.342(b)
Asymp. Sig. (2-tailed)	.509	.011	.453	.009	.077	.768	.180	.180

a Based on positive ranks. b Based on negative ranks. c Wilcoxon Signed Ranks Test

For the respondent in pair 2, the reason for making significant different opinions may be that the informant had obtained an overall view on business strategies after giving answers at the first time. The respondent might wish to show their organisation with a more appropriate strategic appearance when responded to the questionnaire at the second time. In this case, the response provided at the first time was used in the formal analysis. For different respondents at the same organisation, the reason for

making significant different opinions might because that the lower level manager failed to understand fully on their business strategies. In this case, the response provided by senior level manager should be used in the formal analysis.

The rest of five pairs of responses did not show a significant difference, for SG022* versus SG022, z = -0.66, p = 0.509; for SG032 versus SG032_, z = -0.75, p = 0.45; for CN 016 and CN016_, z = -0.29, p = 0.77; for OT001* versus OT001, z = -1.34, p = 0.18; and for OT008TS and OT008TS*, z = -1.34, p = 0.18. The results provide positive evidence that there is not a significant difference of answers given by managers at different levels or by managers responding at different times on their strategic orientations.

Figure 22 Wilcoxon Test (Ranks): Strategic Competitive Positions

		N	Mean Rank	Sum of Ranks
SG022* - SG022	Negative Ranks	1(a)	1.50	1.50
	Positive Ranks	2(b)	2.25	4.50
	Ties	3(c)		
SG023_ - SG023	Negative Ranks	1(d)	3.00	3.00
	Positive Ranks	4(e)	3.00	12.00
	Ties	1(f)		
SG032_ - SG032	Negative Ranks	2(g)	2.00	4.00
	Positive Ranks	1(h)	2.00	2.00
	Ties	3(i)		
CN004* - CN004	Negative Ranks	0(j)	.00	.00
	Positive Ranks	2(k)	1.50	3.00
	Ties	4(l)		
CN014* - CN014	Negative Ranks	3(m)	3.00	9.00
	Positive Ranks	2(n)	3.00	6.00
	Ties	1(o)		
CN016_ - CN016	Negative Ranks	1(p)	1.50	1.50
	Positive Ranks	1(q)	1.50	1.50
	Ties	4(r)		
OT001* - OT001	Negative Ranks	0(s)	.00	.00
	Positive Ranks	0(t)	.00	.00
	Ties	2(u)		
OT008TS*- OT008TS	Negative Ranks	0(v)	.00	.00
	Positive Ranks	0(w)	.00	.00
	Ties	2(x)		

a SG022* < SG022; b SG022*> SG022; c SG022* = SG022; d SG023_ < SG023; e SG023_ > SG023; f SG023_ = SG023; g SG032_ < SG032; h SG032_ > SG032; i SG032_ = SG032; j CN004* < CN004; k CN004* > CN004; l CN004* = CN004; m CN014* < CN014; n CN014* > CN014; o CN014* = CN014 p CN016_ < CN016; q CN016_ > CN016; r CN016_ = CN016; s OT001* < OT001; t OT001* > OT001 u OT001* = OT001; v OT008TS* < OT008TS; w OT008TS* > OT008TS; x OT008TS* = OT008TS.

Test Statistics(d)

	SG022* - SG022	SG023_ - SG023	SG032_ - SG032	CN004* - CN004	CN014* -CN014	CN016_ - N016	OT001* - T001	OT008TS* - OT008TS
Z	-.816(a)	-1.342(a)	-.577(b)	-1.342(a)	-.447(b)	.000(c)	.000(c)	.000(c)
Asymp. Sig. (2-tailed)	.414	.180	.564	.180	.655	1.000	1.000	1.000

a Based on negative ranks. b Based on positive ranks. c The sum of negative ranks equals the sum of positive ranks. d Wilcoxon Signed Ranks Test

5.5 Strategic Competitive Positions

The results in Figure 22 show that, for each pair of sample respondents, the Wilcoxon is not significant. Particularly, z-score is 0 and this value is insignificant for pairs between CN016 and CN016_, OT001 and OT001* as well as OT008 and OT008* (p = 1). It can therefore be concluded that for managers at different levels at the same company or managers providing responses at different times during the survey, there was a consistency of their opinions on the strategic competitive positions of their organisations.

5.6 Strategic Performance

The first table in Figure 23 shows that, of pair 1 for instance, for 6 of 20 subjects, their score given by case SG022 was greater than the score given by case SG022* (negative ranks); 8 of 20 subjects, their score given by case SG022* was greater than the score given by case SG022. The result indicates that SG022* perceived a higher level of strategic performance than SG022 did. There were 6 tied ranks (i.e. subjects which were scored the same by both cases). These six differences of 0 scores were excluded from the analysis for the further Wilcoxon test.

The table also shows the average number of negative and positive ranks and the sum of positive and negative ranks. In pair 1, the mean of the positive rank is 7.25 and the mean of the negative ranks is 7.83. The second table in SPSS output tells that the test statistic was based on the negative ranks, that the z-score is -0.353 for SG022* versus SG022, but this value is insignificant as p = 0.724. Because this value was based on negative ranks, it can be concluded that there was no significant increase in the strategic performance from the assessment given by SG022* to the assessment given by SG022.

For pair 2, the test statistic was carried out based on the positive ranks then this could tell that the results were in the opposite direction (namely the scores were greater for SG023_ compared to SG023). However, the z-score is -0.047 and this value is not significant because p = 0.963. Therefore, it can be concluded that for managers at the same organisation, there was not a significant difference in perceiving their strategic performance between senior managers at different levels.

Similar results can be seen for the other pairs of the cases that none of the difference tests is significant. For OT008TS* versus OT008TS, z = 0, p = 1; CN004 versus CN004*; z = -0.50, p = 0.617; SG032 versus SG032_, z = - 0.88, p = 0.377; and OT001 versus OT001*, z = -1.00, p = 0.32 respectively.

There is a marginal significant difference at the 0.10 level for CN014 versus CN014* and CN016 versus CN016_. When looking into the original data file, CN014* was an operations manager at the company. As a functional manager, the informant may not have an overall balanced view on their organisations. This might be the reason why this respondent had a marginally different view on their organisational performance from the respondent who was, as a chief executive officer, at the most senior management level. In this circumstance, responses provided by managers at the higher management level should be more reliable than those provided by managers at

the lower management level. A marginal different between CN016 and CN016_, as said above, may because of lack of understanding when this respondent answered the questions initially.

Figure 23 Wilcoxon Test (Ranks) for Strategic Performance

		N	Mean Rank	Sum of Ranks
SG022* - SG022	Negative Ranks	6(a)	7.83	47.00
	Positive Ranks	8(b)	7.25	58.00
	Ties	6(c)		
SG023_ - SG023	Negative Ranks	5(d)	6.70	33.50
	Positive Ranks	6(e)	5.42	32.50
	Ties	9(f)		
SG032_ - SG032	Negative Ranks	4(g)	5.88	23.50
	Positive Ranks	7(h)	6.07	42.50
	Ties	9(i)		
CN004* - CN004	Negative Ranks	6(j)	6.50	39.00
	Positive Ranks	7(k)	7.43	52.00
	Ties	7(l)		
CN014* - CN014	Negative Ranks	14(m)	8.86	124.00
	Positive Ranks	4(n)	11.75	47.00
	Ties	2(o)		
CN016_ - CN016	Negative Ranks	9(p)	6.72	60.50
	Positive Ranks	3(q)	5.83	17.50
	Ties	8(r)		
OT001* - OT001	Negative Ranks	1(s)	1.00	1.00
	Positive Ranks	0(t)	.00	.00
	Ties	3(u)		
OT008TS* - OT008TS	Negative Ranks	0(v)	.00	.00
	Positive Ranks	0(w)	.00	.00
	Ties	4(x)		

a SG022* < SG022; b SG022*> SG022; c SG022* = SG022; d SG023_ < SG023; e SG023_ > SG023; f SG023_ = SG023; g SG032_ < SG032; h SG032_ > SG032; i SG032_ = SG032; j CN004* < CN004; k CN004* > CN004; l CN004* = CN004; m CN014* < CN014; n CN014* > CN014; o CN014* = CN014 p CN016_ < CN016; q CN016_ > CN016; r CN016_ = CN016; s OT001* < OT001; t OT001* > OT001 u OT001* = OT001; v OT008TS* < OT008TS; w OT008TS* > OT008TS; x OT008TS* = OT008TS.

Test Statistics(d)

	SG022* - SG022	SG023_ - SG023	SG032_ - SG032	CN004* - CN004	CN014* - CN014	CN016_ - CN016	OT001* - T001	OT008TS* - OT008TS
Z	-.353(a)	-.047(b)	-.884(a)	-.500(a)	-1.715(b)	-1.731(b)	-1.000(b)	.000(c)
Asymp. Sig. (2-tailed)	.724	.963	.377	.617	.086	.083	.317	1.000

a Based on negative ranks. b Based on positive ranks. c The sum of negative ranks equals the sum of positive ranks. d Wilcoxon Signed Ranks Test

In short, the hypothetical assumption that managers at different levels or responding at different times would provide different assessment on their organisational strategic performance should be rejected. Hence, it can be concluded that views on strategic performance given by managers at different levels or at different times are consistent.

6. Conclusions of Supplementary Analysis

The completed supplementary analysis intended to establish the reliability and validity for the research instrument and responses. For doing this, four statistical techniques were applied. First, to check the validity of the constructs of the survey questionnaire, factor analysis was conducted. By combining various items to more abstract factors, factor analysis helped the researcher to discover the basic structure for the domains and to have a more comprehensive interpretation to the underlying dimensions. The results emerged in factor analysis support the dominant dimensions for strategic taxonomy and strategic performance. However, for environmental dimensions, the emerged results did not provide classifications showing a common trend or pattern. In fact, it varies from the researcher's intention that the perceived environment uncertainty in an East Asian context could be evaluated from three aspects: complexity, dynamism and hostility. As such, factor analysis is considered an inappropriate approach for generating the business environmental constructs whereas the researcher decided to stick on the initial contention of these three dimensions as they may have greater insight into the determinants of environmental uncertainty.

Second, in order to compare with the previous classification of business strategic groups assigned in the formal data analysis, cluster analysis was employed. The results based on cluster analysis are not consistent with factor analysis and provide insignificant evidence to validate the classifications of the strategic typologies developed by this researcher. Hence, cluster analysis is found to be an appropriate technique to allocate strategic groups. Third, item reliability analysis was carried out in an attempt to check the consistency of responses and results. The results obtained from the item analyses prove further the reliability of the constructed scales for the survey questionnaire despite a few items that could be excluded from analysis.

Finally, in order to check whether managers within the same organisation, or the same respondent responding at different times, have similar views on their organisations, Wilconxon tests were conducted. Through the comparative analysis of the control groups, the results have generally validated the data sets and have proved the reliability of the data used in the formal analysis. If significance is assessed at a 0.01 level, then almost all pairs of sample respondents in the control groups did not have significantly different views on the perceived business environment, strategic orientations and strategic performance. The hypothetical assumptions of significant differences between the two sides of each pair of the responses should be rejected. It is then considered further that managers at different levels in the same organisation may have equal or similar views on their organisations. In which case, responses from respondents at a higher management position could be regarded as representative and should be adopted for data analysis. In addition, respondents may also provide consistent answers when responding at different times. Consequently, by analysing the control groups, the response data used in the formal analysis have been validated and proved reliable.

Appendix B

Research Instrument

Covering Letter (in English and Chinese)

Survey Questionnaire (in English and Chinese)

THE
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The Energy Service Industry in East Asia

Dear Sir/Madam

In recent years, managers are encouraged to become more responsive to the dictates of the external environment and are required to scan and assess environment conditions when making strategic decisions.

However, little or nothing is known about the strategy needed for service companies to survive and prosper long-term in the East Asia business environment. In an attempt to fill this gap, I proposed in late 1999 my doctoral research project. This is based upon both previous research work and my personal interest.

Over the last two years, I have carried out a considerable amount of research on the oil and gas service sector, including pilot fieldwork during late 2000 and early 2001 in China. As a result of this work, I have developed a research survey questionnaire, which relates to **the business environment** and **strategies** for the **oil and gas service companies** in **East Asia.**

Because of the research objectives, the questionnaire is being sent only to executives of companies/organisations located mainly in ***China, Singapore*** and ***Malaysia.***

In order to complete my PhD thesis successfully, it is very important for me to obtain your assessment and it is for this reason that I would be very grateful if you would spare the time to complete the attached questionnaire.

Meanwhile, I very much believe that, by answering my questions, you will also obtain benefits, as you may be able to develop a fresh view of your organisation and its management.

I look forward to hearing from you soon.

Yours faithfully

Tan Yi

Tan Yi
Doctoral Student *MBA BSc*

THE
ROBERT GORDON
UNIVERSITY
ABERDEEN

Executive Survey

The Business Environment and Strategies For The Energy Service Sector in East Asia

Tan Yi
Doctoral Student

Aberdeen Business School, The Robert Gordon University

Induction

This PhD research project seeks to develop a comprehensive understanding of the business environment in which you operate and the strategies which your organisation pursues to adapt to that environment. Respondents to this questionnaire are oil and gas service company executives (CEOs, general managers, directors, or heads of operating/business units) mainly in China, Singapore and Malaysia.

Before you start, please read the following notes carefully.

- It will take you around 30 minutes to complete this questionnaire. IT IS IMPORTANT TO ANSWER EVERY QUESTION.
- Please provide the appropriate answers as accurately as you can.
- There are neither right nor wrong, neither good nor bad answers to the questions being asked. Please be frank in your answers.
- All responses will be treated as fully confidential and will be utilised anonymously in the research report and thesis. No information will be published about the person or the organisation.

Please return your COMPLETED questionnaire within ONE month of receipt in the envelope provided or to the address given. Thank you for assisting the researcher and contributing to this important undertaking.

Return address: Tan Yi, Doctoral Student, Aberdeen Business School, The Robert Gordon University, Kepplestone Mansion, Viewfield Road, Aberdeen AB15 7AW, United Kingdom.
Tel: 0044 1224 263148 Fax: 0044 1224 263100
E-mail:y.tan@rgu.ac.uk (or tanyiasia@hotmail.com and tanyi_2000@yahoo.com)

SECTION (I): BACKGROUND

YOUR ORGANISATION
Tick ✔ only one as appropriate

1. **Define the legal status of the organisation for which you are responsible.**

☐ Independent company
☐ Division/Subsidiary Company
☐ Operating/Business Unit
☐ Other (Please specify) .....

ORGANISATION LOCATION
Tick ✔ only one as appropriate

2. **In which country is the organisation as defined above situated?**

☐ China ☐ Singapore ☐ Malaysia ☐ Other (Please specify).....

SIZE
Tick ✔ only one as appropriate

3. **How many full time (or equivalent) people are employed in the above organisation?**

☐ 1–49 ☐ 50–199 ☐ 200–499 ☐ 500–2999 ☐ > 3000

AGE

4. **How long has the above organisation been in business under its present form?**

Please specify: ..... years

OWNERSHIP
Tick ✔ only one as appropriate

5. **Identify the type of ownership of your organisation.**

☐ Wholly Domestic State Owned
☐ Wholly Domestic Private/Individual
☐ Wholly Foreign Owned
☐ Joint Venture
☐ Domestic Share Holding/Public Limited (Company)
☐ Other (Please specify) .....

INDUSTRY SEGMENT
Tick ✔ the box(es) as appropriate

6. **Which energy industry does the above organisation service?**

(Oil and gas sector)
☐ Upstream (E&P)
☐ Midstream (Transportation)
☐ Downstream (Refining/processing and marketing)
☐ Other oil and gas service companies

(Other energy sector)
☐ Hydropower
☐ Electricity
☐ Nuclear
☐ Other Energy (Please specify).....

7. **For which oil and gas business activities do you provide a service?**

☐ Exploration ☐ Appraisal ☐ Development ☐ Production ☐ Other .....

BUSINESS IN EAST ASIA
Tick ✔ the box(es) as appropriate

8. **In which East Asian countries does this organisation operate oil and gas service businesses at present?**

☐ China ☐ Singapore ☐ Malaysia ☐ Philippines ☐ Indonesia
☐ Vietnam ☐ Thailand ☐ Japan ☐ South Korea ☐ Other.....

TITLE OF PERSON RESPONDING

9. **Please specify:**
.....

Important notes: all your following answers should be based on
- the "ORGANISATION" for which you are responsible
- the "REGION" where the organisation as identified above operates in East Asia
- the "**OIL AND GAS** SERVICE SECTOR" in which the above organisation operates

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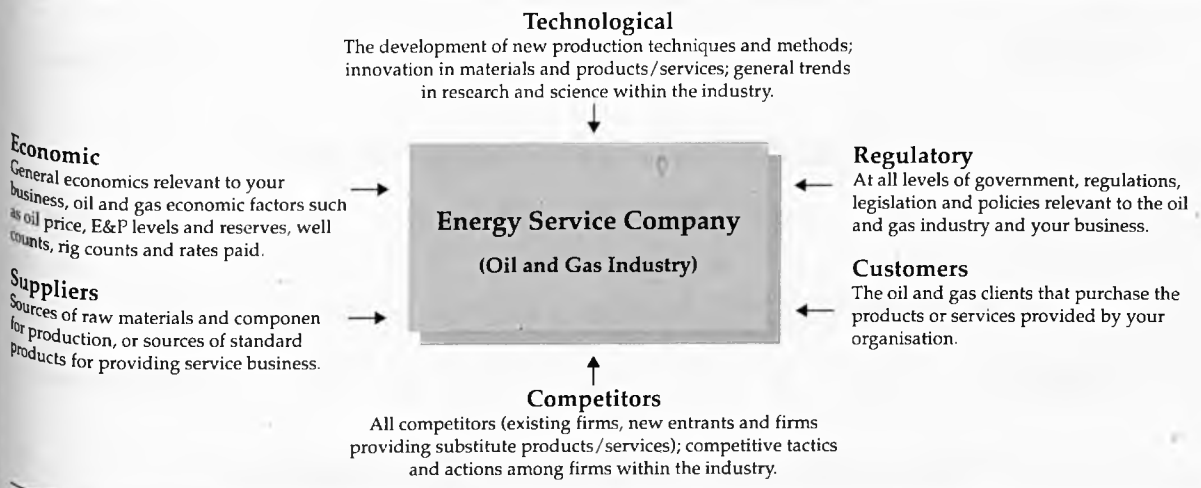
SECTION (II): THE BUSINESS ENVIRONMENT

Part One — Environmental Sectors

The business environment consists of the external factors considered to be crucial to the growth of your business within the oil and gas industry. These factors can be grouped into the following six sectors:



If a small change within an environmental sector brings about a great consequence to business, that sector is therefore considered ***important***. However, it may be that a big change within that sector makes little difference to business and, on that basis, the sector maybe considered to be of ***no or little importance***. It is inevitable that each environmental sector, whatever its level of importance, will have a varying effect (therefore ***impact***) on your business. Please circle the number that best indicates the above environmental sectors as they have affected your business over the **LAST 5 YEARS**:

1. In your opinion, how **IMPORTANT** are these sectors on the growth of your business?

	not important	slightly important	important	very important	most important
a) Economic	1	2	3	4	5
b) Technological	1	2	3	4	5
c) Regulatory	1	2	3	4	5
d) Customers	1	2	3	4	5
e) Competitors	1	2	3	4	5
f) Suppliers	1	2	3	4	5

2. For your experience, how does the **IMPACT** of these sectors affect the growth of your business?

	non-existent/ very weak	weak	moderate	strong	very strong
a) Economic	1	2	3	4	5
b) Technological	1	2	3	4	5
c) Regulatory	1	2	3	4	5
d) Customers	1	2	3	4	5
e) Competitors	1	2	3	4	5
f) Suppliers	1	2	3	4	5

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Part Two — Nature of the Business Environment

For different industries, the nature of the business environment can mean different things. In each of the following statements, you may select **only one** by circling the number you consider most accurately reflects your organisational environment over the **LAST 5 YEARS.**

(1 and 7 = very/dramatically/strongly, 2 and 6 =exactly, 3 and 5 = tend to be, and 4 is neutral)

1. The business environment in which you operate is

very static 1 2 3 4 5 6 7 *very dynamic*

2. The business environment in which you operate is

very simple 1 2 3 4 5 6 7 *very complex*

3. The business environment in which you operate is

very pleasant 1 2 3 4 5 6 7 *very unpleasant*

4. The knowledge required to understand the economic situation is

very simple 1 2 3 4 5 6 7 *very sophisticated*

5. The market demand within the oil and gas industry which you serve is

very big 1 2 3 4 5 6 7 *very small*

6. The market demand within the oil and gas industry which you serve is

increasing dramatically 1 2 3 4 5 6 7 *decreasing dramatically*

7. The level of technology involved in the oil and gas service sector in which you operate is

very low 1 2 3 4 5 6 7 *very high*

8. The products/services provided within the service sector in which you operate are

very similar to each other 1 2 3 4 5 6 7 *very different from each other*

9. In the region where you operate, access to available technologies is

very easy 1 2 3 4 5 6 7 *very difficult*

10. Government regulations, legislation and policies in the region where you operate are

very simple 1 2 3 4 5 6 7 *very complicated*

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11. The national government regulations and legislation in the region where you operate

strongly benefit your business	1	2	3	4	5	6	7	*strongly limit your business*

12. The local level government policies (e.g. Customs or administrative bureaux) in the region where you operate

very positively influence your business	1	2	3	4	5	6	7	*very negatively influence your business*

13. The relationships of your organisation with government are

very close	1	2	3	4	5	6	7	*very distant*

14. Within the oil and gas industry, the number of customers whom you serve is

very small	1	2	3	4	5	6	7	*very large*

15. The needs and preferences of the oil and gas clients whom you serve are

very similar	1	2	3	4	5	6	7	*very different*

16. Your key customers switch to another competitor's products/services

with great difficulty	1	2	3	4	5	6	7	*very easily*

17. The relationships of your organisation with your key oil and gas clients are

very good	1	2	3	4	5	6	7	*very poor*

18. The number of suppliers to your organisation are

very small	1	2	3	4	5	6	7	*very large*

19. The supply conditions (e.g. price, quality, speed or service) provided by your suppliers are

very similar	1	2	3	4	5	6	7	*very different*

20. Access to suppliers for obtaining available raw materials or standard goods and services is

very easy	1	2	3	4	5	6	7	*very difficult*

21. The relationships of your organisation with your key suppliers are

very supportive	1	2	3	4	5	6	7	*very unhelpful*

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22. The number of firms within the service sector in which you operate is

very small (market is dominated by a few firms)	1	2	3	4	5	6	7	*very large (market is shared by numerous firms)*

23. The scope of firms within the service sector in which you operate is

very narrow (completely domestic companies only)	1	2	3	4	5	6	7	*very extensive (companies from all over the world)*

24. The entry barriers to the oil and gas service sector in which you operate are

very high	1	2	3	4	5	6	7	*very low*

25. The rivalry among the competitors within the service sector in which you operate is

very orderly	1	2	3	4	5	6	7	*very turbulent*

26. Competitive actions adopted by firms within the service sector in which you operate are

very reasonable	1	2	3	4	5	6	7	*very unreasonable*

27. The relationship of your organisation with your key competitors is

very collaborative	1	2	3	4	5	6	7	*very un-collaborative*

28. The business environment in which you operate is

very certain	1	2	3	4	5	6	7	*very uncertain*

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The following questions pertain to the degree of predictability taking place in each of the same six environmental sectors as defined above. PREDICTABLE means the situation stays about the same from year to year. UNPREDICTABLE means things that cannot be forecast from year to year. How would you rate the following environmental factors on the degree of their predictability in the **LAST 5 YEARS?**

1	2	3	4	5	6	7
highly predictable	predictable	tend to be predictable	neutral	tend to be unpredictable	unpredictable	highly unpredictable

(Circle one)

29.	**Customers**							
	a) demand for existing products/services	1	2	3	4	5	6	7
	b) demand for new products/services	1	2	3	4	5	6	7
	c) demand for higher quality or more services	1	2	3	4	5	6	7
	d) preference for lower price	1	2	3	4	5	6	7
30.	**Competitors**							
	a) changes in their competitive price of products/services	1	2	3	4	5	6	7
	b) improvement in quality of products/services	1	2	3	4	5	6	7
	c) introduction of new products/services	1	2	3	4	5	6	7
31.	**Suppliers**							
	a) rising prices	1	2	3	4	5	6	7
	b) reduction in quality of goods and services	1	2	3	4	5	6	7
	c) introduction of new materials and components or standard products	1	2	3	4	5	6	7
32.	**Economic**							
	a) changes in oil and gas exploration and production in the region where you operate	1	2	3	4	5	6	7
	b) changes in well counts in the region where you operate	1	2	3	4	5	6	7
	c) changes in rig activities (rig counts) in the region where you operate	1	2	3	4	5	6	7
33.	**Technological**							
	a) technological changes in the service sector in which you operate	1	2	3	4	5	6	7
	b) rate of technological diffusion throughout the service sector in which you operate	1	2	3	4	5	6	7
34.	**Regulatory**							
	a) changes in national regulations and legislation in the region where you operate	1	2	3	4	5	6	7
	b) changes in local level government policies in the region where you operate	1	2	3	4	5	6	7

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SECTION (III): STRATEGY

Part Three — Strategic Orientation

Strategy is defined as a pattern of organisational decisions for positioning a firm in the environment and guiding internal operations. From your knowledge, please assess each of the following statements by selecting the most applicable to your organisation over the **LAST 5 YEARS.**

1	2	3	4	5	6	7
strongly agree	agree	tend to agree	neutral	tend to disagree	disagree	strongly disagree

(Circle one)

1.	We have clearly articulated our business strategy(ies).	1	2	3	4	5	6	7
2.	We offer a broad range of products/services to the markets we serve.	1	2	3	4	5	6	7
3.	We direct our product/services to well-defined customer groups.	1	2	3	4	5	6	7
4.	We offer customers a full set of products/services.	1	2	3	4	5	6	7
5.	Some of our products/services and markets are stable, others changing.	1	2	3	4	5	6	7
6.	We seek to increase use of existing products/ services in existing markets.	1	2	3	4	5	6	7
7.	We seek to develop some products/services that are closely related to our existing products/services in existing markets.	1	2	3	4	5	6	7
8.	We seek to develop new markets for our existing products/services.	1	2	3	4	5	6	7
9.	We seek to introduce new products/services in our existing markets.	1	2	3	4	5	6	7
10.	We seek to generate unrelated new products/ services and markets.	1	2	3	4	5	6	7
11.	We seek to create new products/services to make similar existing products/services obsolete.	1	2	3	4	5	6	7
12.	We devote attention to the operational efficiency for our existing business.	1	2	3	4	5	6	7
13.	We tend to ignore developments outside our established business.	1	2	3	4	5	6	7
14.	We seldom make rapid adjustments in our organisational structure or methods of operation.	1	2	3	4	5	6	7
15.	We have a viable strategy but our management or structure is not linked to it in an appropriate manner.	1	2	3	4	5	6	7
16.	We adhere to our structure or methods of operation even though they are no longer relevant to environmental conditions.	1	2	3	4	5	6	7

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17. Within a single business activity, we switch between emphasising factors such as quality, unique features, price or other products/services attributes.	1	2	3	4	5	6	7
18. We emphasise quality, price, unique features or other products/services attributes depending on the business activity concerned.	1	2	3	4	5	6	7
19. We frequently perceive crucial change occurring but are not always ready to respond.	1	2	3	4	5	6	7
20. We rapidly adapt to the change developed by others.	1	2	3	4	5	6	7
21. We usually create change in the industry.	1	2	3	4	5	6	7
22. We make changes only when forced to do so by pressures.	1	2	3	4	5	6	7
23. We seek to provide the highest possible quality of business or products/services.	1	2	3	4	5	6	7
24. We tend to emphasise a unique feature of business or products/services.	1	2	3	4	5	6	7
25. We seek to achieve the lowest possible cost of business or products/services.	1	2	3	4	5	6	7
26. We compete based on the highest quality of business or products/services.	1	2	3	4	5	6	7
27. We differentiate our business or products/services from those of our competitors.	1	2	3	4	5	6	7
28. We compete based on the lowest cost of business or products/services.	1	2	3	4	5	6	7

29. Within the oil and gas service industry, each time we compete with other companies in a marketplace in East Asia,

*(tick ✔ the **boxes** as appropriate)*

a) price charged by our products/services is

☐ Very low ☐ Below moderate ☐ Moderate ☐ Above moderate ☐ Very high

b) products/services quality valued by customers is

☐ Very low ☐ Below moderate ☐ Moderate ☐ Above moderate ☐ Very high

c) reliability of (products/services) technology is

☐ Very low ☐ Below moderate ☐ Moderate ☐ Above moderate ☐ Very high

d) safety performance of products/services is

☐ Very low ☐ Below moderate ☐ Moderate ☐ Above moderate ☐ Very high

e) speed of responding to clients' requires is

☐ Very low ☐ Below moderate ☐ Moderate ☐ Above moderate ☐ Very high

f) price that customers are willing to pay is

☐ Much lower than what we offer ☐ Below what we offer ☐ The same as what we offer ☐ Above what we offer ☐ Much higher than what we offer

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Part Four — Strategic Performance

This part is concerned with how your organisation performance **changed** in the **PAST 5 YEARS**. In each of the following questions, to your knowledge, you may select **only one** by circling the number that best estimates your organisation's situation.

1	2	3	4	5	6	7
much less	less	slightly less	no change	slightly more	more	much more

1.	Total assets (current and fixed assets)	1	2	3	4	5	6	7
2.	Return on total assets (net profits after taxes to total assets)	1	2	3	4	5	6	7
3.	Annual sales/production revenue	1	2	3	4	5	6	7
4.	Annual net profit margin (net profits after taxes to sales/production revenue)	1	2	3	4	5	6	7
5.	Total asset turnover (sales/production revenue to total assets)	1	2	3	4	5	6	7

1	2	3	4	5	6	7
much worse	worse	slightly worse	no change	slightly better	better	much better

6.	Products/services cost improvements	1	2	3	4	5	6	7
7.	Price competitiveness	1	2	3	4	5	6	7
8.	Products/services reliability (cost involved, ease of use, speed of delivery, technical support, service availability, etc.)	1	2	3	4	5	6	7
9.	Products/services quality	1	2	3	4	5	6	7
10.	Relationship with key customers	1	2	3	4	5	6	7
11.	Capability of influencing customers' purchase decisions	1	2	3	4	5	6	7
12.	Optimism of obtaining/resuming contracts	1	2	3	4	5	6	7
13.	Key employment stability	1	2	3	4	5	6	7
14.	Personnel calibre at all levels	1	2	3	4	5	6	7
15.	Operational efficiency (do things right first time)	1	2	3	4	5	6	7
16.	Speed of innovation and implementation of change	1	2	3	4	5	6	7
17.	Overall organisation effectiveness (do right things and eliminate non-positive impact activities)	1	2	3	4	5	6	7
18.	Value added	1	2	3	4	5	6	7
19.	General organisation image	1	2	3	4	5	6	7
20.	Confidence to achieve growth	1	2	3	4	5	6	7

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Thank you for responding to the executive survey. **All information provided will be treated in strict confidence.** However, purely for the purpose of clarification, it would be appreciated if you could provide a business card or fill in the following. Completion of this is optional.

Name of person responding	
Company name (in full)	
Address (full postal)	
Post code	
Telephone No.	Country code:..... Area code:..... No:.....
Fax No.	Country code:..... Area code:..... No:.....
E-mail	
Website	

Please return this COMPLETED QUESTIONNAIRE at your earliest convenience. Thank you.

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THE
ROBERT GORDON
UNIVERSITY
ABERDEEN

经营管理调研

东亚能源服务行业的经营环境和战略

谭鹭
博士研究生

阿伯丁商学院，罗伯特·歌顿大学

前言

这项博士研究课题旨在理解您的业务经营环境以及贵机构为了适应该环境而采取的战略。接受调研的对象是那些主要在中国，新加坡和马来西亚的石油天然气服务行业中领域从事供应服务业务的公司。受访者为这些公司的高层管理经理(如董事长，总经理以及经营或业务经理)。

在您开始回答问题以前，敬请仔细阅读下列内容：

- 完成这份调研问卷约需 30 分钟，请回答每道问题。
- 请尽您所能提供准确清楚的答案。
- 所提问题不涉及正确或者不正确，好或者坏。敬请保证您的回答公正与客观。
- 所有回答将被严格保密并以匿名的形式用在本人的学术文章，报告和博士论文里。本人不会发表与具体个人或机构相关的信息。

请将完成了答案的问卷在收到后的一个月内按所提供的地址或信封寄回。多谢关照与您的贵力协助！

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第一节: 背景信息

机构状况

1. 您所负责经营的机构的合法地位:
(仅选择一项打 √)

- ☐ 独立核算公司
- ☐ 附属公司，分公司或分支机构
- ☐ 经营/业务单元
- ☐ 其它 (请注明) .....

机构位置

2. 贵机构设置在哪一个国家?
(仅选择一项打 √)

☐ 中国 ☐ 新加坡 ☐ 马来西亚 ☐ 其它(请注明).....

规模

3. 贵机构全日制或相类似性质的员工有多少位?
(仅选择一项打 √)

☐ 1-49 ☐ 50-199 ☐ 200-499 ☐ 500-2999 ☐ >3000

经营年限

4. 贵机构以目前的业务形式经营了多长时间?

请注明: ..... 年

所有权

5. 贵机构的所有权形式:
(仅选择一项打 √)

- ☐ 完全国营企业
- ☐ 完全私营或个体所有企业
- ☐ 完全外资所有企业
- ☐ 合资企业
- ☐ 国内的股份制或上市公司
- ☐ 其它 (请注明) .....

行业细分

6. 您负责的机构服务于哪些能源工业?
(可选择多项打 √)

(油气类)
- ☐ 上游 (勘探与生产)
- ☐ 中游 (运输)
- ☐ 下游 (精炼，加工与营销)
- ☐ 其它油气服务公司

(其它能源类)
- ☐ 水力
- ☐ 电力
- ☐ 核能
- ☐ 其它能源工业(请注明).....

7. 您为哪一类油气工业的业务活动提供服务?

☐ 勘探 ☐ 评估 ☐ 开发(包括完井) ☐ 生产 ☐ 其它.....

东亚业务

8. 目前，您在哪一个东亚国家或地区的油气服务供应行业从事着业务经营活动? *(可选择多项打 √)*

- ☐ 中国
- ☐ 越南
- ☐ 新加坡
- ☐ 泰国
- ☐ 马来西亚
- ☐ 日本
- ☐ 菲律宾
- ☐ 南韩
- ☐ 印度尼西亚
- ☐ 其它.....

答复者的职位

9. 请注明:
.....

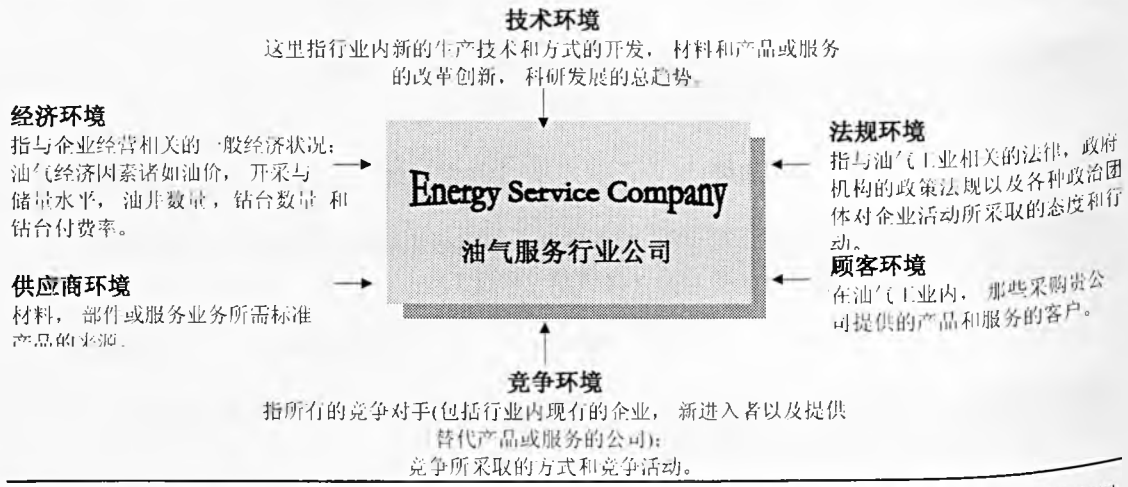
请注意: 以下所有答案须局限于
- 您所负责管理经营的"本机构"
- 该机构业务经营涉及的"东亚地区"
- 该机构业务经营涉及的"油气服务行业"

第二节：经营环境

第一部份

环境因素分类

一系列外部环境因素会对贵机构在油气工业领域的业务增长有着决定性的影响。这些与油气服务供应行业经营相关的环境因素可概括为以下六类：



如果某一类环境因素的微弱变化对您的经营与业务带来很大冲击，这类因素可被考虑为是**重要的。**然而，某类环境因素即使有了巨大的变化，也仅仅给您的经营和业务带来轻微的差别，这类因素可能被认为**不或一点点重要**。而每一类环境因素，无论其重要程度如何，都会不同程度地左右着(即会**影响**)您的业务经营。在**过去的5年里**，上述环境因素对贵机构的经营影响如何，请选择您认为最合适的答案评估下面的每类环境因素的影响（在相应的数字上划圈）。

1. 以您所见，每类环境因素对您的业务增长有多**重要**？

		不重要	有点重要	重要	很重要	最重要
a)	经济环境	1	2	3	4	5
b)	技术环境	1	2	3	4	5
c)	法规环境	1	2	3	4	5
d)	客户环境	1	2	3	4	5
e)	竞争环境	1	2	3	4	5
f)	供应商环境	1	2	3	4	5

2. 根据您的经验，每类环境因素**影响**您业务增长的程度如何？

		不存在/很微弱	微弱	一般	强烈	很强烈
a)	经济环境	1	2	3	4	5
b)	技术环境	1	2	3	4	5
c)	法规环境	1	2	3	4	5
d)	客户环境	1	2	3	4	5
e)	竞争环境	1	2	3	4	5
f)	供应商环境	1	2	3	4	5

第二部份　　经营环境的本质

对于不同的工业或行业，环境的本质是不同的。为了评估**过去 5 年里**您的业务经营环境，在下列每一项陈述的观点中，请选择您认为最合适的答案 (在相应的数字上划圈)。

(1，7 = 很/极其/非常；2，6 = 恰好/正是；3，5 = 倾向于；4 = 中立态度或状况)

1. 您所经营的环境是

非常稳定的 1 2 3 4 5 6 7 *非常活跃的*

2. 您所经营的环境是

非常简单的 1 2 3 4 5 6 7 *非常复杂的*

3. 您所经营的环境令人感觉

很愉快 1 2 3 4 5 6 7 *很不愉快*

4. 了解经济状况所需的知识

非常简单 1 2 3 4 5 6 7 *非常复杂*

5. 您所服务的油气工业的市场需求

极大 1 2 3 4 5 6 7 *极小*

6. 您所服务的油气工业的市场需求

正急剧地增长 1 2 3 4 5 6 7 *正急剧地减少*

7. 您业务所在的油气服务行业的技术水准

很低 1 2 3 4 5 6 7 *很高*

8. 您所经营的油气服务行业内的产品或服务

彼此非常相似 1 2 3 4 5 6 7 *彼此差别很大*

9. 您所经营的地域内，获取所需技术

很容易 1 2 3 4 5 6 7 *很难*

10. 您所经营的地域内，政府的法律法规，制度及政策

非常简单 1 2 3 4 5 6 7 *非常复杂*

11. 您所经营的地域内，国家的法规和制度

极其利于您的业务经营活动 1 2 3 4 5 6 7 *极大地限制了您的业务经营活动*

12. 您所经营的地域内，地方政府部门(如海关，主管局)的政策

对您的业务经营有着非常积极的影响 1 2 3 4 5 6 7 *对您的业务经营有着非常消极的影响*

13. 贵机构与政府部门的关系

非常密切 1 2 3 4 5 6 7 *非常疏远*

14. 在油气工业内，您服务的顾客数量

很少 1 2 3 4 5 6 7 很多

15. 您的油气工业客户的需求与选择

非常相似 1 2 3 4 5 6 7 极其不同

16. 您主要的客户转变使用竞争对手的产品或服务

相当困难 1 2 3 4 5 6 7 非常容易

17. 贵机构与主要客户的关系

相当好 1 2 3 4 5 6 7 相当差

18. 贵机构供应商的数量

很少 1 2 3 4 5 6 7 很多

19. 您的供应商提供的供应条件(如价格，质量)

很相似 1 2 3 4 5 6 7 很不一样

20. 获取供应商提供所需的基本原材料，标准产品及其服务

很容易 1 2 3 4 5 6 7 很难

21. 您与主要供应商之间的关系

对业务经营很有帮助 1 2 3 4 5 6 7 对业务经营非常无帮助

22. 您经营的油气服务行业的公司数量

很少(市场仅被几家公司主宰) 1 2 3 4 5 6 7 很大(市场被大量公司瓜分)

23. 您经营的油气服务行业的公司范围

很窄(完全由国内企业组成) 1 2 3 4 5 6 7 很广(公司来自于世界各地)

24. 进入您经营的油气服务行业的门槛

非常高 1 2 3 4 5 6 7 非常低

25. 在您经营的油气服务行业内，竞争对手之间的抗衡

非常有序 1 2 3 4 5 6 7 非常无序

26. 行业内企业的竞争活动

很合理 1 2 3 4 5 6 7 很不合理

27. 贵机构与主要竞争伙伴的关系

很合作 1 2 3 4 5 6 7 很不合作

28. 您对所经营环境的理解是

非常确定的 1 2 3 4 5 6 7 非常不确定的

以下问题与您对环境因素的预测判断有关。"可预测性"指年复一年形式大致相似的情况。"非预测性"指年复一年不能够被预见的情形。您如何评估在**过去的 5 年里**，以下环境因素可被预测的程度？

1	2	3	4	5	6	7
很高的可预测性	可以预测	倾向于可以预测	中立态度	倾向于非可预测	非可预测	很高的非可预测性

(每道仪选择一项答案划圈)

29.	顾客环境							
	a) 客户对现有的产品或服务的需求	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	b) 其对新产品的需求	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	c) 对高质量或更多服务的要求	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	d) 对更低价格的选择	**1**	**2**	**3**	**4**	**5**	**6**	**7**
30.	竞争环境							
	a) 竞争伙伴新产品或服务的竞争价格改变	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	b) 其产品或服务质量的提高	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	c) 其新产品或服务的介绍	**1**	**2**	**3**	**4**	**5**	**6**	**7**
31.	供应商环境							
	a) 其价格的提升	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	b) 产品和服务质量的降低	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	c) 新材料，配件或标准产品的介绍	**1**	**2**	**3**	**4**	**5**	**6**	**7**
32.	经济环境							
	a) 您经营地域内油气开采与生产的变化	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	b) 生产油井数量的变化	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	c) 钻台数量的变化	**1**	**2**	**3**	**4**	**5**	**6**	**7**
33.	技术环境							
	a) 您经营的油气服务行业内技术的转变	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	b) 该行业内的技术普及率	**1**	**2**	**3**	**4**	**5**	**6**	**7**
34.	法规环境							
	a) 您经营地域内，与油气行业相关的国家法规和制度的变化	**1**	**2**	**3**	**4**	**5**	**6**	**7**
	b) 您经营地域内，与经营活动相关的地方政府部门政策的变化	**1**	**2**	**3**	**4**	**5**	**6**	**7**

第三部份

战略方向

战略这里指为了界定企业在经营环境中所处的位置和指导其经营运作而采取的行动决策方案。下列所陈述的观点试图理解在**过去 5 年里**贵机构的战略经营行为。根据您的经验，请评估以下的观点。

1	2	3	4	5	6	7
很赞成	赞成	倾向于赞成	中立态度	倾向于不赞成	不赞成	很不赞成

(每道仅选择一项答案划圈)

1.	我们已经清楚地明确了我们的企业经营战略。	1	2	3	4	5	6	7
2.	我们为市场提供的产品或服务的范围很广泛。	1	2	3	4	5	6	7
3.	我们为明确界定的客户提供专门的产品或服务。	1	2	3	4	5	6	7
4.	我们可为客户提供其所需的全套品种的产品或服务。	1	2	3	4	5	6	7
5.	我们的某些产品或服务和市场是稳定的，其它的则在转变。	1	2	3	4	5	6	7
6.	我们试图增加现有产品或服务在我们现有市场上的使用。	1	2	3	4	5	6	7
7.	在现有的市场上，我们试图开发那些仅与我们现有产品或服务密切相关的产品或服务。	1	2	3	4	5	6	7
8.	我们试图为我们现有的产品或服务开发新的市场。	1	2	3	4	5	6	7
9.	我们试图在现有的市场上介绍新的产品或服务。	1	2	3	4	5	6	7
10.	我们试图开发与现有业务不相关联的新产品或服务和新市场。	1	2	3	4	5	6	7
11.	我们试图创造新的产品或服务以使市场上现存的类似产品或服务被淘汰。	1	2	3	4	5	6	7
12.	对于现有的经营业务，我们专注于经营效率。	1	2	3	4	5	6	7
13.	我们倾向于不去理会我们现有经营业务以外的发展变化。	1	2	3	4	5	6	7
14.	我们很少快速地对我们的组织机构或经营方式做出调整。	1	2	3	4	5	6	7
15.	我们有一套明确的战略方针，然而我们的管理或结构尚不能与该战略有机地结合起来。	1	2	3	4	5	6	7
16.	即使我们的组织机构或经营方式不再适合于现有的环境因素，我们仍然继续维持着。	1	2	3	4	5	6	7
17.	同一业务的经营，我们的着重点(诸如品质，价格，特性或其它的产品或服务特质)是转变的。	1	2	3	4	5	6	7
18.	根据经营业务的不同，我们的着重点会分别强调品质，价格，特性或其它的产品或服务特质。	1	2	3	4	5	6	7
19.	只有出于压力我们才做出改变。	1	2	3	4	5	6	7
20.	我们能察觉到重要变化的出现，但我们往往不能采取及时的措施做出应对。	1	2	3	4	5	6	7

21.	我们非常迅速地适应别人的发展变化。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	在行业内我们通常创造变化。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	我们试图提供尽可能最高品质的业务，产品或服务。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	我们倾向于强调我们的业务，产品或服务在行业内独具特色。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25.	我们试图提供尽可能最低成本的业务，产品或服务。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	在行业内，我们的竞争优势是最高品质的业务，产品或服务。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27.	我们使自己的业务，产品或服务与竞争对手的有区别。	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28.	在行业内，我们的竞争优势是最低成本的业务，产品或服务。	**1**	**2**	**3**	**4**	**5**	**6**	**7**

29. 在油气服务行业内的东亚市场上，每一次我们与其它公司竞争，

(每道可选择多项答案打√)

a) 我们的产品或服务的价位

☐ 很低 ☐ 低于一般水平 ☐ 一般水平 ☐ 高于一般水平 ☐ 很高

b) 顾客对我们产品或服务所理解的价值

☐ 很低 ☐ 低于一般水平 ☐ 一般水平 ☐ 高于一般水平 ☐ 很高

c) 产品或服务技术的可靠性

☐ 很低 ☐ 低于一般水平 ☐ 一般水平 ☐ 高于一般水平 ☐ 很高

d) 产品或服务的安全性能

☐ 很低 ☐ 低于一般水平 ☐ 一般水平 ☐ 高于一般水平 ☐ 很高

e) 对客户需求做出反应的速度

☐ 很低 ☐ 低于一般水平 ☐ 一般水平 ☐ 高于一般水平 ☐ 很高

f) 顾客乐意付出的价格

☐ 大大低于我们所提供的价位 ☐ 低于我们所提供的价位 ☐ 与我们所提供的价位相当 ☐ 高于我们所提供的价位 ☐ 大大高于我们所提供的价位

第四部份

战略绩效

这一部份的内容与贵机构在**过去5年里**的经营表现有关。在下面阐明的每一种情形中，选择一个您觉得最符合贵机构实际情况的答案(在合适的答案上划圈)。

1	2	3	4	5	6	7
减少很多	减少	减少一点点	没变化	增加一点点	增加	增加很多

1.	总资产额 (流动和固定资产)	1	2	3	4	5	6	7
2.	总资产额回报 (税后净利润比总资产额)	1	2	3	4	5	6	7
3.	年销售额或产值	1	2	3	4	5	6	7
4.	年净利润额 (税后净利润比销售额或产值)	1	2	3	4	5	6	7
5.	总资产营业额 (销售额或产值比总资产额)	1	2	3	4	5	6	7

1	2	3	4	5	6	7
变差了很多	变差了	变差了一点点	没有变化	变好了一点点	变好	变好了很多

6.	产品或服务的成本改善	1	2	3	4	5	6	7
7.	价格的竞争力	1	2	3	4	5	6	7
8.	产品或服务的可靠性 (诸如涉及的花费，使用的难易，交货速度，技术帮助，客户可得到的服务等)	1	2	3	4	5	6	7
9.	产品或服务的品质	1	2	3	4	5	6	7
10	与主要客户的关系	1	2	3	4	5	6	7
11.	影响客户采购决策的能力	1	2	3	4	5	6	7
12.	赢得或延续合同的乐观性	1	2	3	4	5	6	7
13.	主要员工的稳定性	1	2	3	4	5	6	7
14.	人员的总体素质							
15.	经营效率 (把事情第一次就做对)	1	2	3	4	5	6	7
16.	企业创新和启动转变的速度	1	2	3	4	5	6	7
17.	总体机构有效性(做对的事及排除非积极影响的活动)	1	2	3	4	5	6	7
18.	增加的价值	1	2	3	4	5	6	7
19.	机构整体形象	1	2	3	4	5	6	7
20.	实现增长目标的信心	1	2	3	4	5	6	7

感谢您对这份问卷的答复。**以上所有信息将严格保密**。但仅仅出于核对答案的可能性，请赐名片或填写下面的内容。此项敬请随意。

回答者姓名	
机构/公司全称	
通信地址	
邮政编码	
电话	国家区号：..... 城市区号：..... 号码：.....
传真	国家区号：..... 城市区号：..... 号码：.....
电子信箱	
网页	

请将完成了答案的问卷尽早寄回. 再次感谢！

Appendix C

Coding Sheet

Variable Coding and Definitions
(for SPSS Data Input)

I	II	Short Name	Full Label	Values	Value Label
I: variables; II: questions' numbers of the survey questionnaire					
1	**0**	ID	Company Code	None	**SG**: Singapore **CN**: China **ML**: Malaysia (e.g. SG001, CN001, ML001)
Section I: Background					
2	**1**	Status	Legal Status Category	1 2 3 4	IDC: Independent Company DV/SB: Division/Subsidiary Company OU/BU: Operating/Business Unit OT: Other Type
3	**2**	Location	Situated East Asian Country	1 2 3 4	CN SG ML OC: Another Country
4	**3**	Size	Full Time Employees	1 2 3 4 5	1-49 50-199 200-499 500-2999 3000+
5	**4**	Age	Years Since Present Business Form	None	
6	**5**	Owner	Ownership Category	1 2 3 4 5 6	WDSO: Wholly Domestic State Owned WDP/WDI: Wholly Domestic Private/Individual WFO: Wholly Foreign Owned JV: Joint Venture DSH/PLC: Domestic Share Holding/Public Limited (Company) OOT: Other Ownership Type
		Energy Service Sector		0 1	No Yes
7	**6**	Energy1	Upstream (E&P)		
8		Energy2	Midstream		
9		Energy3	Downstream		
10		Energy4	Other service companies		
11		Energy5	Hydropower		
12		Energy6	Electricity		
13		Energy7	Nuclear		
14		Energy8	Other Energy		

		Oil and Gas Service Sector		0 1	No Yes
15	7	Service1	Serve Exploration		
16		Service2	Serve Appraisal		
17		Service3	Serve Development		
18		Service4	Serve Production		
19		Otherser	Serve other oil & gas business activities		
		Business Coverage East Asian Countries		0 1	No Yes
20	8	Asia1	China		
21		Asia2	Singapore		
22		Asia3	Malaysia		
23		Asia4	Philippines		
24		Asia5	Indonesia		
25		Asia6	Vietnam		
26		Asia7	Thailand		
27		Asia8	Japan		
28		Asia9	South Korea		
29		Asia10	Other East Asian Countries		
30	9	Title	Respondent Management Level	None	CEO: Chief Executive Officer; GM: General Manager; VP: Vice President; ED: Executive Director; PR: President; MD: Managing Director; BDM: Business Development Manager; RM: Regional Manager (Sales or Operations); BUM: Business Unit Manager; DM: Division Manager; IBM: International Business Manager; FM: Functional Manager (Sales or Operations); OT: Other.

Section II - Part One					
31	1 a	Imptant1	Economic Importance	1 2 3 4 5	NI: Not important SI: Slightly important IM: Important VI: Very important MI: Most important
32	b	Imptant2	Technological Importance		
33	c	Imptant3	Regulatory Importance		
34	d	Imptant4	Customers Importance		
35	e	Imptant5	Competitors Importance		
36	f	Imptant6	Suppliers Importance		
37	2 a	Impact1	Economic Impact	1 2 3 4 5	NE/VW: Non-existent/very weak WK: Weak MD: Moderate ST: Strong VS: Very Strong
38	b	Impact2	Technological Impact		
39	c	Impact3	Regulatory Impact		
40	d	Impact4	Customers Impact		
41	e	Impact5	Competitors Impact		
42	f	Impact6	Suppliers Impact		

Section II - Part Two					
43	1	Dynamic	Environmental Dynamism	1 2 3 4 5 6 7	VST: Very static ST: Static TS: Tend to be static NT: Neutral TD: Tend to be dynamic DY: Dynamic VD: Very dynamic
44	2	Complex	Environmental Complexity	1 2 3 4 5 6 7	VSP: Very simple SP: Simple TSP: Tend to be simple NT: Neutral TCX: Tend to be complex CX: Complex VCX: Very complex
45	3	Hostile	Environmental Hostility	1 2 3 4 5 6 7	VP: Very pleasant PL: Pleasant TP: Tend to be pleasant NT: Neutral TUP: Tend to be unpleasant UPL: Unpleasant VUP: Very unpleasant
46	4	Econom1	Economics Knowledge Required	1 2 3 4 5 6 7	VSP: Very simple SP: Simple TSP: Tend to be simple NT: Neutral TSH: Tend to be sophisticated SH: Sophisticated VSH: Very sophisticated

47	5	Econom2	Size of Market Demand	1 2 3 4 5 6 7	VB: Very big BG: Big TB: Tend to be big NT: Neutral TS: Tend to be small SM: Small VS: Very small
48	6	Econom3	Changing of Market Demand	1 2 3 4 5 6 7	ICD: Increasing dramatically IC: Increasing TIC: Tend to be increasing NT: Neutral TDC: Tend to be decreasing DC: Decreasing DCD: Decreasing dramatically
49	7	Tech1	Technology Level	1 2 3 4 5 6 7	VL: Very low LW: Low TL: Tend to be low NT: Neutral TH: Tend to be high HG: High VH: Very high
50	8	Tech2	Similarity of Industrial Products/ Services	1 2 3 4 5 6 7	VSMR: Very similar SMR: Similar TSMR: Tend to be similar NT: Neutral TDFR: Tend to be different DFR: Different VDFR: Very different
51	9	Tech3	Access to Available Technologies	1 2 3 4 5 6 7	VE: Very easy ES: Easy TE: Tend to be easy NT: Neutral TDFC: Tend to be difficult DFC: Difficult VDFC: Very difficult
52	10	Regult1	Government regulations, Legislation and Polices	1 2 3 4 5 6 7	VSP: Very simple SP: Simple TSP: Tend to be simple NT: Neutral TCP: Tend to be complicated CP: Complicated VCP: Very complicated
53	11	Regult2	National Government Regulations and Legislation	1 2 3 4 5 6 7	SBF: Strongly benefit BFT: Benefit TBF: Tend to benefit NT: Neutral TLT: Tend to limit LIT: Limit STLT: Strongly limit
54	12	Regult3	Local Government Policies	1 2 3 4 5 6 7	VPS: Very positive PST: Positive TPS: Tend to be positive NT: Neutral TNG: Tend to be negative NEG: Negative VNG: Very negative

55	13	Relat1	Relationship With Government	1 2 3 4 5 6 7	VCL: Very close CL: Close TCL: Tend to be close NT: Neutral TDT: Tend to be distant DT: Distant VDT: Very distant
56	14	Cstmer1	Number of Oil and Gas Clients	1 2 3 4 5 6 7	VSML: Very small SML: Small TSML: Tend to be small NT: Neutral TLG: Tend to be large LGE: Large VLG: Very large
57	15	Cstmer2	Needs and Preferences of Oil and Gas Clients	1 2 3 4 5 6 7	VSMR: Very similar SMR: Similar TSMR: Tend to be similar NT: Neutral TDFE: Tend to be different DFE: Different VDFE: Very different
58	16	Cstmer3	Levels of Key Customers Switching to Competitors	1 2 3 4 5 6 7	GDFY: With great difficulty DFY: With difficulty TDFY: Tend to be with difficulty NT: Neutral TES: Tend to be easily ES: Easily VES: Very easily
59	17	Relat2	Relationship With Customers	1 2 3 4 5 6 7	VGD: Very good GD: Good TGD: Tend to be good NT: Neutral TPR: Tend to be poor PR: Poor VPR: Very poor
60	18	Suplier1	Number of Suppliers	1 2 3 4 5 6 7	VSML: Very small SML: Small TSML: Tend to be small NT: Neutral TLG: Tend to be large LGE: Large VLG: Very large
61	19	Suplier2	Similarity of Supply Conditions by Suppliers	1 2 3 4 5 6 7	VSMR: Very similar SMR: Similar TSMR: Tend to be similar NT: Neutral TDFE: Tend to be different DFE: Different VDFE: Very different
62	20	Suplier3	Access to Suppliers for Materials or Goods	1 2 3 4 5 6 7	VE: Very easy ES: Easy TE: Tend to be easy NT: Neutral TDFC: Tend to be difficult DFC: Difficult VDFC: Very difficult

63	21	Relat3	Relationship with Suppliers	1 2 3 4 5 6 7	VSP: Very supportive SPT: Supportive TSP: Tend to be supportive NT: Neutral TUHP: Tend to be unhelpful UHP: Unhelpful VUHP: Very unhelpful
64	22	Compet1	Number of Firms within the Industry Sector	1 2 3 4 5 6 7	VSML: Very small SML: Small TSML: Tend to be small NT: Neutral TLG: Tend to be large LGE: Large VLG: Very large
65	23	Compet2	Scope of Firms Within the Industry Sector	1 2 3 4 5 6 7	VNW: Very narrow NW: Narrow TNW: Tend to be narrow NT: Neutral TET: Tend to be extensive ET: Extensive VET: Very extensive
66	24	Compet3	Entry barriers	1 2 3 4 5 6 7	VH: Very high HG: High TH: Tend to be high NT: Neutral TLW: Tend to be low LW: Low VLW: Very low
67	25	Compet4	Rivalry Among Competitors	1 2 3 4 5 6 7	VOD: Very orderly OD: Orderly TOD: Tend to be orderly NT: Neutral TTB: Tend to be turbulent TB: Turbulent VTB: Very turbulent
68	26	Compet5	Competitive actions	1 2 3 4 5 6 7	VRS: Very reasonable RES: Reasonable TRE: Tend to be reasonable NT: Neutral TUR: Tend to be unreasonable UR: Unreasonable VUR: Very unreasonable
69	27	Relat4	Relationship With Competitors	1 2 3 4 5 6 7	VCL: Very collaborative CL: Collaborative TCL: Tend to be collaborative NT: Neutral TUCL: Tend to be un-collaborative UCL: Un-collaborative VUCL: Very collaborative
70	28	Certaint	Environmental Nature	1 2 3 4 5 6 7	VCT: Very certain CT: Certain TCT: Tend to be certain NT: Neutral TUCT: Tend to be uncertain UCT: Uncertain VUCT: Very uncertain

			Predictability		
71	**29**	Precstm1	Customer Demand for Existing Products/ Services	1 2 3 4 5 6 7	HP: Highly predictable PR: Predictable TP: Tend to be predictable NT: Neutral TUP: Tend to be unpredictable UP: Unpredictable HUP: Highly unpredictable
72		Precstm2	Demand for New Products/ Services		
72		Precstm3	Demand for Higher Quality or More Service		
74		Precstm4	Preference for Lower Price		
75	**30**	Precomt1	Changes in Competitive Price		
76		Precomt2	Competitors' Quality Improvement		
77		Precomt3	Competitors' Introduction of New Products/ Services		
78	**31**	Presupl1	Suppliers Rising Prices		
79		Presupl2	Suppliers Quality Reduction		
80		Presupl3	Suppliers Introduction of New Materials or Standard Products		
81	**32**	Preecm1	Changes in Oil and Gas E&P Level		
82		Preecm2	Changes in Well Counts		
83		Preecm3	Changes in Rig Counts		
84	**33**	Pretech1	Technological Changes		
85		Pretech2	Rate of Technological Diffusion		
86	**34**	Preregu1	Changes in National Regulations and Legislation		
87		Preregu2	Changes in Local Government Policies		

Section III - Part Three					
		Business Strategic Orientations			
88	1	Charact1	Clear Articulated Business Strategies	1	SA: Strongly agree
89	2	Prosptr1	Broad Range Products/ Services	2	AG: Agree
90	3	Defend1	Well Defined Customers	3	TA: Tend to agree
91	4	Defend2	Offer A Full Set of Products/ Services	4	NT: Neutral
92	5	Anlysor1	Stable and Changing Products/Services and Markets	5	TD: Tend to disagree
93	6	DF/AN	Increasing Existing Products/Services in Current Markets	6	DA: Disagree
94	7	Defend3	Develop Related Business	7	SD: Strongly disagree
95	8	Prosptr2	Market Development		
96	9	Prosptr3	Product Development		
97	10	Prosptr4	Diversification		
98	11	Prosptr5	Innovation		
99	12	Defend4	Operational Efficiency Focus		
100	13	Defend5	Ignore Development Outside Business		
101	14	Defend6	Rare Rapid Adjustment		
102	15	Reactor1	Unavailable Management or Structure		
103	16	Reactor2	Insist on unsuitable managements		
104	17	Reactor3	No Competitive Strategies		
105	18	Charact2	Emphasise Competitive Strategies		

106	**19**	Reactor4	Unable to Respond to Changes	1 2 3 4 5 6 7	SA: Strongly agree AG: Agree TA: Tend to agree NT: Neutral TD: Tend to disagree DA: Disagree SD: Strongly disagree
107	**20**	Anlysor2	Adapt to Changes		
108	**21**	Prosptr6	Create Changes		
109	**22**	Reactor5	Forced to Change		
110	**23**	Charact5	Seek to High Quality		
111	**24**	Charact6	Seek to Differentiate		
112	**25**	Charact7	Seek to Achieve Cost Leadership		
113	**26**	Charact8	High Quality		
114	**27**	Charact9	Differentiation		
115	**28**	Charat10	Cost Leadership		

		Competitive Positions			
116	**29**	Clock1	Level of Price	1 2 3 4 5	VL: Very low BM: Below moderate MD: Moderate AM: Above moderate VH: Very high
117		Clock2	Quality valued by Customers		
118		Clock3	Reliability of Products/ Services Technology		
119		Clock4	Safety Performance of Products/ Services		
120		Clock5	Speed of Responding to Customers		
121		Clock6	Price Level Customers Willing to Pay	1 2 3 4 5	MUCH LOWER BELOW OFFER SAME ABOVE OFFER MUCH HIGHER

Section III - Part Four					
		Financial Assessment			
122	1	TAS	Total Assets	1 2 3 4 5 6 7	ML: Much less LS: Less SL: Slightly less NC: No change SM: Slightly more MO: More MM: Much more
123	2	ROI	Return On Total Assets		
124	3	REN	Annual Sale or Production Revenue		
125	4	NPM	Annual Net Profit Margin		
126	5	TAT	Total Asset Turnover		
		Other Strategic Aspects			
127	6	Cost	Cost Improvement	1 2 3 4 5 6 7	MW: Much worse WR: Worse SW: Slightly worse NC: No change SB: Slightly better BT: Better MB: Much better
128	7	Price	Price competitive-ness		
129	8	Reliable	Reliability		
130	9	Quality	Products/ Service Quality		
131	10	Relation	Key Customers' Relationships		
132	11	Capablty	Influence Customers Decisions		
133	12	Optimsm	Optimism of Obtaining /Resuming Contracts		
134	13	Stabilty	Key Employment Stability		
135	14	Calibre	Personnel Calibre At all Levels		
136	15	Efcency	Do Things Right First Time		
137	16	Inosped	Innovation Speed and Implementing Change		
138	17	Efetive	Overall Organisation Effectiveness		
139	18	Advalu	Value added		
140	19	Image	General Organisation Image		
141	20	Cofdent	Growth Confidence		

Appendix D

Pilot Fieldwork

Interview Guide

Pilot Questionnaire

THE
ROBERT GORDON
UNIVERSITY
ABERDEEN

FACULTY OF MANAGEMENT
Aberdeen Business School

The business environment in East Asia:
An evaluation of opportunities, challenges and strategies
for the energy service industry

Interview Guide

Prepared by Tammy Tan
August 00

In order to to clarify the scope, variables and effectiveness of the questionnaire to be used for the pilot studies and further empirical investigations, the researcher intends to undertake discussion with academics and other interest groups/individuals and also conduct discussion-based interviews with CEOs from the selected service firms.

The questions are follows:

Nature of the environment

- What is your view of the business environment in terms of uncertainty?
  a) Is it relatively static or does it show signs of change, and in what ways?
  b) Is it simple or complex to understand?

- What approaches do you use in terms of making sense of the environment?

Environmental influences

- What environmental factors currently affect your organisation? Which are the most important now and will be important in the next few years?

- How do you consider the way in which the most important environmental influences impinge on your organisations and the industry? How do economic and technological factors affect your firm?

Competitive forces

- Which of the five forces (the power of buyer or supplier, the threats of entry or substitute, rivals within the industry) do you identify as the most significant bases of advantage upon which your firm (or its SBUs) can build in order to capture business opportunities? Why are they significant?

Industry and competition

- a) What do you think the boundaries of the industry are? Where do the boundaries of the industry begin and end?
  b) What are the characteristics of the industry in terms of concentration, economics of scale, product/service differentiation, and barriers to entry?
  c) Which firms are your competitors? How do your identify them?

Operating environment

- What factors affect your firm's success in terms of acquiring needed resources or in profitably marketing its goods and services? How do you access the major determinants of competition among the following most important factors:

- the firm's competitive position,
- the composition of its customers,
- its reputation among suppliers and creditors,
- and its ability to attract capable employees?

Competitive position

- a) What do you think the key success factors (KSFs) are for your firm or strategic business unit (SBU) to compete with other firms for the same resources, or customers?
  b) How does your firm stand in relation to others competing in the same sector as yourself with regard to these KSFs?

Opportunities and threats

- How do you identify the key opportunities and threats to your firm?

Strategic position

- In your opinion, what is the current strategic position of your firm or its SBUs?

Strategy

- Does your firm use a formal strategic planning process? Which level in your firm makes strategic decision? What is your firm's mission?

Generic strategy

- a) There are bases of strategic choice in terms of how the firm seeks to compete at SBU level. What is your identification of bases of competitive advantage arising from an understanding of both markets and customers, and the special competencies that your firm has to offer which contribute to your generic strategy?
  b) What are the generic strategies that your company pursues to achieve a competitive advantage?

Strategy generation

- There may be several possible courses of action that your firm could have followed. Would you historically review strategies used in the past (five years), and describe what you would (or you think you should) follow in the future (next five years)?

Strategy evaluation and selection

- **Suitability**: Which of your strategic options built upon strengths, overcame weakness and took advantage of opportunities, while minimising or circumventing the threats that the business faced?

- **Feasibility**: In your opinion, to what extent could a strategic option be put into effect? Can required finance be raised, and sufficient stock be made available at the right time and in the right place? Also, can staff be recruited and trained to reflect your firm's image?

- **Acceptability**: In your opinion, are your current strategies acceptable to the stakeholders? Why?

THE
ROBERT GORDON
UNIVERSITY
ABERDEEN

SURVEY QUESTIONNAIRE
问卷调查

(English-Chinese Version 中英文对照)

By completing this questionnaire you will be able to develop a comprehensive understanding of the business environment in which you operate and the strategic activities which your organisation pursues to adapt to that environment

本问卷的问题，可以帮助您对经营所处的业务环境有一个全面的反思，完成这份问卷后，您对贵机构为了适应该环境而采取的战略行为将会有进一步了解。

Your assessment, together with other senior management (CEOs, directors, functional heads) in China, Singapore and Malaysia will constitute a critical value of the report on the business environment and strategies for the oil and gas service industry in East Asia.

您与其他来自中国，新家坡，马来西亚的高层经营管理者所陈述的观点， 将给关于东亚石油天然气工业的供应服务行业的经营业务环境，及其战略方面的研究提供至关重要的价值。

It will take you around 30 minutes to complete this questionnaire. PLEASE ANSWER ALL THE QUESTIONS AS COMPLETELY AS POSSIBLE.

完成这份问卷约需要 30 分钟，请尽可能全面地回答问题。

All responses will be treated as fully confidential. No information will be published about the person or the organisation.。 All of these responses and your written comments will be combined anonymously in a research report and thesis. The researcher will be pleased to send a Summary Report to all respondents who return a completed survey.

所有的答复将被严格保密。本人将不会发表与个人或与贵机构相关的信息。所有回复的答案和您所作的评论将会以匿名的方式用在本人的学术研究报告和博士论文里。本人将乐意向每位回复了问卷的受访者寄去一份概略报告。

There are no right or wrong answers to the questions being asked. Please provide the appropriate answers as accurately and as clearly as you can, and please be frank and honest in your answers. Please return your COMPLETED questionnaire within one month of receipt in the envelope provided or to the address given.

所提的问题均不涉及正确或错误的答案。请尽您所能提供准确清楚的答案，请保持答案的诚实，公正与客观性。请将您的答案在收到后的一个月内按所给地址或提供的信封寄回。

Thank you for assisting the researcher and contributing to this important undertaking.

感谢您对本人研究工作的大力支持与帮助。

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SECTION I: COMPANY BACKGROUND AND INDUSTRY CLASSIFICATION
第一节：公司背景和行业分类

Organisation Status
机构状况
Tick √ only one as appropriate
选择一项打勾 √

Define the legal status of your organisation for which you are responsible. 确认您所负责经营机构的合法地位。

- ☐ Independent company (owner managed) 独立核算公司（所有者经营）
- ☐ Independent company (not owner managed) 独立核算公司（非所有者经营）
- ☐ Subsidiary company 附属公司
- ☐ Division 分公司或分支机构
- ☐ Operating Unit 经营单元
- ☐ Office 办事处
- ☐ Business Unit 业务单元
- ☐ Other (Please specify) ..... 其他（请注明）.....

Industry Segment
行业细分
Tick √ the box(es) as appropriate
在合适的选项上打勾 √

Which energy industry does the organisation as defined above service?
您负责的公司或业务服务于哪些能源工业？

(Oil and gas sector) （石油与天然气类）

- ☐ Upstream Oil (E&P)) 上游石油（开采）
- ☐ Midstream Oil and Gas (Transportation) 中游（石油与天然气管道运输）
- ☐ Downstream Oil (Refinery) 下游石油（精炼）
- ☐ Other oil and gas service companies 其他石油与天然气服务公司

- ☐ Hydropower 水力
- ☐ Electricity 电力
- ☐ Nuclear 核能
- ☐ Coal 煤田
- ☐ Solar 太阳能
- ☐ Other (please specify):..... 其他（请注明）.....

For which ***upstream*** oil and gas business activities do you provide a service?
您为哪一类上游的石油天然气业务活动提供服务？

- ☐ Exploration 油田开发
- ☐ Appraisal 油田评估
- ☐ Development 油田发展
- ☐ Production 油田生产
- ☐ Not applicable 无从谈起

Business in East Asia
东亚业务
Tick √ the box(es) as appropriate
在合适的选项上打勾 √

In which East Asian countries (regions) do you offer your oil and gas supply and service business at present?
目前，您在哪一个东亚的国家或地区，开展对石油天然气工业提供服务与供应的业务？

- ☐ China 中国
- ☐ Singapore 新家坡
- ☐ Malaysia 马来西亚
- ☐ Indonesia 印度尼西亚
- ☐ Philippines 菲律宾
- ☐ Thailand 泰国
- ☐ Vietnam 越南
- ☐ Hong Kong 香港
- ☐ Taiwan 台湾
- ☐ Japan 日本
- ☐ South Korea 南韩
- ☐ Other 其它 .....

SECTION I: COMPANY BACKGROUND AND INDUSTRY CLASSIFICATION
第一节：公司背景和行业分类

Important Note: ***All your following answers should be appropriate to your organisation within the domestic industry. "Your organisation" refers the organisation as defined above; the "domestic" is in relation to the country or region in which your organisation is located and operates; and the "industry" means the oil and gas service sector of your business.***
请注意：以下所有提供的答案须局限于在国内行业中运作的贵机构。"贵机构"指您前面确认的您所负责管理经营的机构；"国内的"指在贵机构经营所在的国家或地区内；"行业"指您业务所在的石油天然气供应服务行业的这一部分。

Number of Employees
员工人数
Tick √ only one as appropriate
选择一项打勾 √

How many full time (or equivalent) people are employed in your organisation as defined above?
贵机构全日制（或相类似性质的）员工有多少位？

- ☐ 0-9
- ☐ 10-49
- ☐ 50-99
- ☐ 100-149
- ☐ 150-199
- ☐ 200-499
- ☐ 500-999
- ☐ 1000-1499
- ☐ 1500-1999
- ☐ 2000-10.000
- ☐ >10.000 大于 1 万
- ☐ Not applicable 无从回答

Service Category
服务类别
Tick √ the boxes as appropriate
在合适的选项上打勾 √

Identify the category of your service business in the oil and gas industry.
在石油天然气工业内，请确认您的服务行业类别。

- ☐ Suppliers & Manufacturers service 制造商供应服务
- ☐ Service without products 非产品性服务
- ☐ Purchased products service 用采购来的产品提供的服务
- ☐ Other (Please specify)..... 其它（请注明）.....

Assess Business(es)
业务审核
Tick √only one as appropriate
选择一项打勾 √

Has your annual business (sales or production) turnover increased every year over the last five years?
过去五年，您的年业务量（销售额或产值）每年是增长的吗？

☐ Yes 是 ☐ No 否 ☐ Not applicable 无从回答

On average, have you made a profit over the last five years? 平均而言，过去的五年，贵机构赢利了吗？

☐ Yes 是 ☐ No 否 ☐ Not applicable 无从回答

Currently, your service business is: 目前，您的服务业务

- ☐ Primarily within the oil and gas industry 主要在石油天然气工业内部
- ☐ Primarily outside the oil and gas industry 主要在石油天然气工业以外
- ☐ Half within half outside the oil and gas industry 一半在石油天然气工业内部，一半在其外部

The number of the principal products/services you currently provide to the domestic oil and gas industry is:
目前，您提供给国内石油天然气工业的主要产品或服务的数量是：

☐ Few 极少 ☐ Several 几个 ☐ Some 一些 ☐ Many 许多 ☐ Numerous 大量 ☐ Not applicable 无从谈起

SECTION I: COMPANY BACKGROUND AND INDUSTRY CLASSIFICATION
第一节：公司背景和行业分类

Age of Business
业务年限
Tick √only one as appropriate
选择一项打勾 √

How long has your organisation as defined above been in business under its present form?
贵机构以目前的业务方式经营了多长时间？

- ☐ Less than one year 不到一年
- ☐ 1 - <5 years 1 到 5 年以下
- ☐ 5 – < 10 years 5 到 10 年以下
- ☐ 10 – <20 years 10 到 20 年以下
- ☐ More than 20 years 超过 20 年
- ☐ Not applicable 无从回答

Ownership Type
所有权形式
Tick √ the box(es) as appropriate
在合适的选项上打勾 √

Identify the type of your organisation's ownership.
确认贵机构的所有权形式。

- ☐ Domestic State Owned (Enterprise) 国营企业
- ☐ Domestic Private/Individual (Enterprise) 国内的私营企业
- ☐ Foreign Owned (Enterprise) 外资企业
- ☐ Joint Venture 合资企业
- ☐ Public Limited (Company) 上市公司
- ☐ Share Holding (Company) 股份制(公司)
- ☐ Other (Please specify) ..... 其它（请注明）.....

Who owns your organisation? 谁拥有贵机构？

- ☐ Oil and gas service company 石油天然气工业的服务公司
- ☐ Oil and gas company 石油天然气公司
- ☐ Other (Please specify) ..... 其它（请注明）

Identify from where the business, or its parent organisation originates. 贵机构或其母公司来自于何处？

- ☐ China 中国
- ☐ Singapore 新家坡
- ☐ Malaysia 马来西亚
- ☐ Japan 日本
- ☐ USA 美国
- ☐ British 英国
- ☐ Europe 欧洲
- ☐ Hong Kong 香港
- ☐ Other 其它 .....

Which city is the headquarters of the business or company?
您公司或业务的总部在哪个城市？

City: 城市.....

SECTION II: ASSESSMENT ON THE BUSINESS ENVIRONMENT
第二节：业务环境评估

Part One
第一部分

Nature of the Business Environment
环境本质

For different industries, the nature of the business environment can mean different things. In the following questions, we would like to know what you think. Respondents are asked to rate the following statements according to:
对于不同的工业，其环境的本质是不同的。在下列问题中，我们希望了解您的看法。请根据下面的范畴评估所阐述的观点：

Most strongly agree with the assessment as stated on the left	Strongly agree with the assessment as stated on the left	Agree with the assessment as stated on the left	Agree that the situation is midway between both	Agree with the assessment as stated on the right	Strongly agree with the assessment as stated on the right	Most strongly agree with the assessment as stated on the right
1	**2**	**3**	**4**	**5**	**6**	**7**
最同意左边的观点	较同意左边的观点	同意左边的观点	同意两种观点中间状况	同意右边的观点	较同意右边的观点	最同意右边的观点

You may select only one by circling the number (a scale ranging from 1 to 7, with 4 representing the neutral) you consider most accurately reflects your organisation in the domestic business environment. For example,
在国内的业务环境里，您认为以下观点中，哪种情形最适合贵机构？请在所给定的 1 到 7 数字范围内（4 表示中间），仅选择一个您觉得最合适的号码划圈。例如，

Overall, your company
总体来讲，贵公司

lags behind in technology 在技术方面落后 — **1 2 3 4 (5) 6 7** — is an industry leader in technology 是行业内技术领袖

(The selection indicates that you "agree with the assessment as stated on the right")
（此选择表明您"同意右边的观点"）

PLEASE ANSWER EACH OF THE FOLLOWING QUESTIONS.
请回答下面的每一个问题。

1

The business environment in which you operate
您所经营的业务环境

is relatively static 是相对稳定的 — **1 2 3 4 5 6 7** — shows signs of change 有着变化的征兆

2

The business environment in which you operate is
您所经营的业务环境是

simple to understand 简单而容易被理解的 — **1 2 3 4 5 6 7** — complex to understand 复杂而难以被理解的

3

The business environment in which you operate is
您所经营的业务环境是

munificent 是慷慨大方的 — **1 2 3 4 5 6 7** — hostility 存在着敌意的对立

4

The business environment in which you operate has a
您所经营的业务环境有一个

integrated market 一体化的市场 — **1 2 3 4 5 6 7** — diversified market 多元化的市场

SECTION II: ASSESSMENT ON THE BUSINESS ENVIRONMENT
第二节：业务环境评估

5 The business activity of your key competitors is
您主要竞争对手的业务活动是

knowable 可知的 — **1 2 3 4 5 6 7** — not knowable 不可知的

6 The demands of your clients are
您客户的需求是

predictable 可预见的 — **1 2 3 4 5 6 7** — not predictable 不可预见的

7 The supplies to the domestic oil and gas industry by you and your competitors are
您和您的竞争对手给国内石油天然气工业提供的供应是

predictable 可预见的 — **1 2 3 4 5 6 7** — not predictable 不可预见的

8 A growth in the number of organisations within the industry in which you operate is
您所经营的石油服务行业内，机构数量的增长是

slow 慢的 — **1 2 3 4 5 6 7** — quick 快的

9 The skills of your operating processes, products and services have
您的经营程序，以及产品和服务的技能已经

decreased 减少 — **1 2 3 4 5 6 7** — increased 增加

10 Your operation or production methods and marketing tactics have
您运作或生产的方式和营销的战术已经

decreased 减少 — **1 2 3 4 5 6 7** — increased 增加

11 The domestic government policy
国内的政策

ensures your consistent confidence with doing business 使您一贯有信心经营 — **1 2 3 4 5 6 7** — creates problems for your business every day 令您没有一天不担心做生意

12 The products/ services provided within the domestic oil and gas service industry of your business
在贵业务所在的国内石油服务行业里，大家所提供的产品或服务

are very similar to each other 彼此非常相似 — **1 2 3 4 5 6 7** — are very different from each other 相互间差别很大

13 The needs and wants of your clients are
您的客户的所需所想

normally the same 通常保持一致 — **1 2 3 4 5 6 7** — always different 总是不一样

14 The level of technology involved in the domestic service industry of your business is
您业务所在的国内服务行业所涉及的技术水准是

low 低的 — **1 2 3 4 5 6 7** — high 高的

SECTION II: ASSESSMENT ON THE BUSINESS ENVIRONMENT
第二节：业务环境评估

15 The business environment requires your organisation to have
环境要求贵机构掌握

simple knowledge about products, services, customers and whatever
简单的产品，服务，客户等方面的知识

1 2 3 4 5 6 7

sophisticated knowledge about products, services, customers and whatever
复杂的产品，服务，客户等方面的知识

16 The relevant domestic government regulations and policies
国内的相关政府政策规定

benefit your business
使您的业务受益

1 2 3 4 5 6 7

limit your business
局限了您的业务

17 The domestic legal system which might influences your oil and gas service businesses
对您的石油服务业务，可能有影响的国内法律法规体系

is well developed
相当发达

1 2 3 4 5 6 7

is not complete
还不够完善

18 The domestic Customs procedures
国内的海关程序

positively influence your business
对您的业务有积极的影响

1 2 3 4 5 6 7

nnegatively influence your business
对您的业务有消极的影响

19 The barriers to enter the oil and gas service industry in which you operate are
进入您所经营的石油服务行业的门槛是

low
低的

1 2 3 4 5 6 7

high
高的

20 Your organisation as defined above obtains available resources
您所经营的业务获得可利用的资源

easily
容易

1 2 3 4 5 6 7

with difficulty
困难

21 Your organisation
贵机构

picks and chooses customers
挑选客户

1 2 3 4 5 6 7

must make a bit for all its contracts
必须为争取每份合同而努力

22 Your organisation
贵机构

has good links and networks with clients or domestic government
与客户或国内政府机构有良好关系网和联系

1 2 3 4 5 6 7

lacks links and networks with clients or the domestic government
与客户或国内政府机构缺乏良好关系网和联系

23 The size of the domestic market in which your oil and gas service business is located is
在您业务所在的石油服务行业中，国内的市场规模是

small
小的

1 2 3 4 5 6 7

big
大的

SECTION II: ASSESSMENT ON THE BUSINESS ENVIRONMENT
第二节：业务环境评估

24 The size of the market domestic in which your oil and gas service business is located is
在您业务所在的石油服务行业中，国内的市场规模在

increasing 增长 — **1 2 3 4 5 6 7** — decreasing 萎缩

25 The market share of your oil and gas service business in the domestic market place
您的石油服务业务在国内的市场份额

always remains the similar 总是保持相似 — **1 2 3 4 5 6 7** — is rapidly changing 正迅速改变

26 The domestic market in which your oil and gas service business is located is
您所经营的服务业务所在的国内市场

dominated by only a few firms 由几家公司主宰 — **1 2 3 4 5 6 7** — shared by numerous competitors 被大量竞争对手瓜分

27 Your main competitors
您主要的竞争对手

have fair competitive practices 公平竞争 — **1 2 3 4 5 6 7** — adopt unfair competitive practices 采取不公平的手段竞争

28 Your key customers are
您主要的客户

difficult to persuade to switch to another competitor's products or services 难以被劝服去使用其他竞争对手的产品或服务 — **1 2 3 4 5 6 7** — easily persuaded to switch to another competitor's products or services 容易被劝服去使用其他竞争对手的产品或服务

29 The rivalry between the competitors within the domestic industry of your service business is
在您的服务业务所在的行业内，竞争对手的抗衡

polite and friendly 是礼貌文明的 — **1 2 3 4 5 6 7** — warlike 像战争一样

30 The scope of competitive rivalry in the domestic industry consists of
在您的服务业务所在的行业内，竞争抗衡的范围

domestic companies only 仅限于国内公司 — **1 2 3 4 5 6 7** — companies from all over the world 包括来自于世界各地的公司

31 Overall, the oil and gas service industry in which you operate is
总的来讲，您所运作的石油服务行业

suffering a loss 正在亏损 — **1 2 3 4 5 6 7** — enjoying profit benefits 正享受利润所带来的利益

32 Since last five years, your expenditure on promoting products/services has been
过去五年以来，您用在产品或服务推广方面的费用已经

reduced 减少 — **1 2 3 4 5 6 7** — increased 增加

33 Technology and its diffusion throughout the domestic oil and gas service industry
技术及其在国内石油服务行业的推广

has been stable for a long period 在相当一段时间保持稳定 — **1 2 3 4 5 6 7** — is rapidly changing 正迅速改变

SECTION II: ASSESSMENT ON THE BUSINESS ENVIRONMENT
第二节：业务环境评估

34 In the market place in which you operate, your organisation
在您所经营的市场上，贵机构

waits for others to try new technologies first 等待他人尝试新技术	**1**	**2**	**3**	**4**	**5**	**6**	**7**	is the first to introduce new technologies 率先介绍新技术

35 Once you decide to adopt a new technology, you adopt this
一旦您决定采用新技术，您会

gradually 逐步推广	**1**	**2**	**3**	**4**	**5**	**6**	**7**	straight-away 直接使用

36 Your organisation
贵机构

depends on others for technology 依赖他人的技术	**1**	**2**	**3**	**4**	**5**	**6**	**7**	uses your own technology developed in-house 使用自己开发研究的技术

Part Two
第二部分

Opportunities and Challenges
机遇和挑战

37 **What do you think are the key opportunities in the business environment in which you operate?**
在您经营的业务环境里，您认为主要的机遇是什么？

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38 **In your opinion, what are the current challenges that face your business?**
您认为目前您的业务所面临的挑战是什么？

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SECTION II: ASSESSMENT ON THE BUSINESS ENVIRONMENT
第二节：业务环境评估

Part Three **The Domestic Oil and Gas Service Industry**
第三部分 **国内石油天然气服务行业**

You may assess the degree of each of the following statements by circling the most accurate number from the answer scale of 1 to 5 as it appliers to each.
请评估下列所阐述的观点。从所给的 1 到 5 的范围，在您认为最准确的号码上划圈。

Not exist/very weak	Weak	Neutral	Strong	Very strong
1	**2**	**3**	**4**	**5**
不存在或很弱	弱	中间	强	很强

	39 How do you think the following forces affect your business at present and will affect it in the future? 您怎么看待下列作用因素，在现在和将来对您的业务所造成的冲击影响？	***Current*** *目前*					***Future*** *将来*				
		Circle as appropriate *选择合适的号码划圈*									
a)	**Threats of entrants** (Potential new entrants bring new capacity, the desire to gain market share and substantial resources. As a result, the profit of the industry in which you operate might be reduced.) **潜在进入者的威胁** 行业新的进入者会带来新的投入以及去赢得市场份额和稳固资源的愿望。这会导致您的行业利润率的降低，从而对您的业务造成威胁。	1	2	3	4	5	1	2	3	4	5
b)	**Bargaining power of buyers** (Buyers can force down prices, demand higher quality or more service and play competitors against each other to compete with the industry.) **顾客议价的能力** 顾客可以强迫降价，要求更高质量的产品或更多的服务，以使行业内的供应商处于一种竞争的状态，从而会对您的业务造成压力。	1	2	3	4	5	1	2	3	4	5
c)	**Bargaining power of suppliers** (Suppliers can exert bargaining power on participants in the industry by raising prices or reducing the quality of purchased goods and services.) **供应商议价的能力** 供应商对您的业务所带来的冲击，可由于其对行业内参与者的提价，降低其供应产品和服务的质量而产生。	1	2	3	4	5	1	2	3	4	5
d)	**Threats of substitutes** (Substitute products or services limit the potential returns of an industry by placing a ceiling on the prices firms in the industry can profitably charge.) **替代的威胁** 企业通常希望通过提价来实现利润增长，但替代的产品或服务会抑制价格上涨和利润增长。	1	2	3	4	5	1	2	3	4	5
e)	**Competitive rivalry** (Existing firms take the familiar form of manoeuvring for an advantageous position – using tactics like price competition, advertising battles, product introduction, and increased customer service or warranties.) **竞争的抗衡** 行业内现有企业展开相似的竞争方式，诸如价格竞争，广告战，产品介绍，增加客户服务和质量保证的营销战术，去争取主动的优势。	1	2	3	4	5	1	2	3	4	5
f)	**Threats of the strategic partnership** (Business activities might be constrained because of your alliances, networks and collaboration with suppliers, customers or whatever.) **战略伙伴关系的威胁** 您的业务可能会因您与您的供应商，或客户等所建立的同盟和合作关系而受到约束。	1	2	3	4	5	1	2	3	4	5

40 **What do you see are the driving forces in the oil and gas service industry in which you operate?**
您认为，什么样的作用力，促使着您所运作的石油天然气服务行业形成，成长和发展？

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41 **What are the key success factors (KSFs) which you must take into consideration to compete successfully with each other for the same resources or customers?**
为了与竞争对手争取同样的客户和资源，您必须考虑的关键成功因素是什么？

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SECTION III: ASSESSMENT OF STRATEGY
第三节：战略评估

Part Four
第四部分

Information on Strategy
战略信息

42 **The following questions ask about your organisation in relation to strategy.**
以下问题与贵机构的战略有关。

Circle as appropriate
选择合适的答案划圈

a) Does your company currently have a standard mission (or equivalent) statement? Yes/ no
贵公司有正规的企业使命或（类似内容的）口号吗？ 有/没有

b) Has your company set up formal/explicit long-terms goals? Yes/ no
贵公司建立了规范化或明确的长期目标吗？ 有/没有

c) Has your company/business set up formal/explicit short-term objectives? Yes/ no
贵公司或业务建立了规范化或明确的短期指标吗？ 有/没有

d) Does your company/business currently use formal/explicit strategies? Yes/ no
贵公司或业务目前使用规范化或明确的战略吗？ 有/没有

e) Does your company currently have strategic plans for undertaking business activities? Yes/ no
贵公司目前有没有战略计划去指导业务活动的开展？ 有/没有

43 **In your opinion, how important are the strategies to the success of your business?**
Tick √ only one *as appropriate.*
您认为战略对您业务的成功有多重要？ *选择一项打勾* √。

☐ Not important 不重要 ☐ Slightly important 有一点重要 ☐ Important 重要 ☐ Very important 非常重要 ☐ The most important 最重要

Tick as appropriate
选择合适的打勾
√

44 **Which level(s) in your firm makes strategic decisions?**
公司哪一级管理层作战略决定？

- ☐ Board of directors 董事会
- ☐ Corporate 公司
- ☐ Divisional 附属分公司
- ☐ Business /operating unit 运作/业务单元
- ☐ Functional 部门级别
- ☐ Other 其它(please specify 请注明) ……

45 **How frequently does your organisation make strategies?**
贵机构多久制定一次战略？

- ☐ Never 从来没有
- ☐ Randomly 随机地
- ☐ Less than 1 year 不到 1 年
- ☐ Every 1 year 每 1 年
- ☐ Every 3 years 每 3 年
- ☐ Every 5 years 每 5 年
- ☐ Every 10 years 每 10 年
- ☐ More than 10 years 10 年以上
- ☐ Other 其它(Please specify 请注明)……

SECTION III: ASSESSMENT OF STRATEGY
第三节：战略评估

Tick as appropriate
选择合适的打勾

46 **What is the length of the strategies made?**
所定战略的时限有多长？

	√
Less than 1 year 不到 1 年	☐
1 year 1 年	☐
3 years 3 年	☐
5 years 5 年	☐
10 years 10 年	☐
More than 10 years 10 年以上	☐
Not applicable 无从谈起	☐

47 **How frequently does your organisation revise the strategies made?**
多长时间你们修改所制定的战略？

Never 从来没有	☐
Randomly 随机地	☐
Less than 1 year 不到 1 年	☐
Every 1 year 每 1 年	☐
Every 3 years 每 3 年	☐
Every 5 years 每 5 年	☐
Every 10 years 每 10 年	☐
More than 10 years 10 年以上	☐
Other 其它 (Please specify 请注明).....	☐

Part Five
第五部分

Corporate Growth
公司成长

48 **Which of the following statements do you think apply to your organisation?**
下面所陈述的观点哪个是适合于贵机构的？

Tick the box(es) as appropriate
在合适的选项上打勾

		√
a)	Your business growth rate is similar to the domestic industry average. 您的业务增长率与国内行业的平均发展速度相当。	☐
b)	Your business growth rate is significantly greater than the domestic industry average. 您的业务增长率显著超过国内行业的平均发展速度。	☐
c)	Your business growth rate is similar to its own historical performance. 您的业务增长率与其以往的业绩表现相当。	☐
d)	Your business growth rate is significantly in excess of historical performance. 您的业务增长率显著超过其以往的业绩表现。	☐
e)	Your business growth continues to serve the same or related markets with similar or related products/services. 您的业务增长与对相关或相同市场提供持续的相同产品或服务有关。	☐
f)	Previously accepted levels of historical measures of performance need to be adjusted. 以往可接受的历史评估水平仍须加以调整。	☐
g)	None of the above situations is applicable to your business. 上述情形没有一种适合您的业务	☐

SECTION III: ASSESSMENT OF STRATEGY
第三节：战略评估

Part Six
第六部分

Generic Strategy
一般战略

49 **Which of the following statements do your think is the most applicable for your company or business(es) to compete in the marketplace?**
您认为，以下哪些情形最贴切地描述了贵公司或您的业务在市场上的竞争？

Tick the box(es) as appropriate
在合适的选项上打勾.
√

a) **Cost Leadership** refers that you pursue a cost position lower than your competitors through the total control of expenditure and pursuit of cost reductions for an efficient performance within your organisation. ☐
成本领先战略是您努力发现和挖掘所有的资源优势，在行业内保持整体成本领先地位，从而以行业最低价格为您的产品和服务所定的竞争战略。

b) **Differetiation** intends to create a unique feature that is perceived industry wide. ☐
差异化战略是您的企业向顾客提供的产品和服务在行业内独具特色。

c) **Focus** refers that you focus on particular customer groups or market segments or geographic markets to achieve either differentiation or low cost or both. ☐
集中战略是将目标集中在特定的顾客或某一特定的地理区域上，即在行业内很小竞争范围内建立差异化，低成本或二者兼备的独特的竞争优势。

d) **Stuck in the middle** is that you develop none of the three strategic directions stated above. ☐
夹在中间指您没有向上述任何一种战略方向发展。

Part Seven
第七部分

Strategy Clock
战略钟

50 **The price level(s) of the principal products/services you currently offer within the domestic service industry is:** *(Tick √ the box(es) as appropriate)*
目前，您主要产品或服务在国内的石油服务行业中的价位是： *在合适的选项上打勾√)*

☐ Lowest 最低 ☐ Lower than average 低于平均 ☐ Average 平均 ☐ Higher than average 高于平均 ☐ Highest 最高 ☐ Not applicable 无从回答

51 **The quality level(s) of the principal products/services you currently offer within the domestic service industry is:** *(Tick √ the box(es) as appropriate)*
在国内的石油服务行业内，您所提供的主要产品或服务的质量水准是：
（在合适的选项上打勾√）

☐ Lowest 最低 ☐ Lower than average 低于平均 ☐ Average 平均 ☐ Higher than average 高于平均 ☐ Highest 最高 ☐ Not applicable 无从回答

52 **The perceived added value of your principal products/services you currently create within the domestic service industry is:** *(Tick √ the box(es) as appropriate)*
目前，对于您在国内石油服务行业中所提供的主要产品或服务，顾客理解的所增加的价值水平是： *（在合适的选项上打勾 √）*

☐ Very low 很低 ☐ Low 低 ☐ Neutral 中间 ☐ High 高 ☐ Very high 很高 ☐ Not applicable 无从回答

SECTION III: ASSESSMENT OF STRATEGY
第三节：战略评估

Part Eight
第八部分

Grand Strategy
主要战略

53 Please define the grand strategy(ies) that your organisation's top management (CEOs, directors, functional heads) adopted in the past and has decided to pursue in the future. **Which of the following statements is the most applicable to your company or business?**
请表明贵机构的高级管理层在过去采用，以及已决定在将来要采取的主要战略。**下列内容哪些适合于贵公司或您的业务？**

	1996 ~2000	2001 ~ 2005
	√	√

Tick as appropriate
在合适的选项上打勾

53.1 Internal Development 内部发展

a) ***Market penetration*** (increases use of present products/services in present markets).
市场渗透（指增加现有产品或服务在现有市场上的使用。） ☐ ☐

b) ***Market development*** (sells present products/services in new markets).
市场开发（指用现有的产品或服务去开发新市场。） ☐ ☐

c) ***Product development*** (develops new products/services for present markets).
产品开发（指发展新产品或服务来增加现有市场上的营销。） ☐ ☐

d) ***Innovation*** (creates a new product/service life cycle and makes similar existing products/services obsolete).
革新（指创造新的产品或服务生命周期，以使类似的产品或服务被淘汰。） ☐ ☐

53.2 Corporate Integration and Diversification 公司一体化和多元化

a) ***Horizontal integration*** (involves acquisition of one or more similar firms operating at the same stage of the production-marketing chain).
水平一体化（即开展那些与企业业务相竞争或相互补充的活动以增加相关业务， 涉及并购一个或多个在生产—营销链同阶段运作的类似公司。） ☐ ☐

b) ***Vertical integration*** (involves in acquiring firms that supply it with inputs, such as raw materials or which are customers for its outputs, such as warehouses for finished products).
垂直一体化 [指与企业目前业务的输入端（如原材料供应商）或输出端（如有着存放公司产品仓库的公司）相关的并购活动。] ☐ ☐

c) ***Concentric diversification*** (involves in acquiring businesses that are related to your firm in terms of technology, markets, or products).
同心多元化（涉及公司以市场， 技术或产品为中心的并购业务活动。） ☐ ☐

d) ***Conglomerate diversification*** involves acquisition of a business based principally on its profit benefit).
聚合多元化（指公司基于赢利上的好处而涉及的并购业务活动。） ☐ ☐

SECTION III: ASSESSMENT OF STRATEGY
第三节：战略评估

Tick as appropriate
在合适的选项上打勾

53.3 Co-Operation 合作关系

		√	√
a)	***Joint ventures*** [are third commercial companies (children) created and operated for the benefit of the co-owners (parents)]. **合资企业**（是为合伙投资者的利益而建立和运作的第三独立核算的商业公司。）	☐	☐
b)	***Strategic alliances*** (are ongoing contractual agreements between two or more independent companies, without any equity position involved in one another). **战略同盟**（指两个或多个独立公司之间连续的合作协定，不牵涉彼此的财产事务。）	☐	☐
c)	***Consortia*** (are defined as large interlocking relationships between the businesses of an industry, typically focusing on a particular venture or project). **联 营**（指的是一个行业内业务间的大规模连锁，典型地，集中于某一特殊风险投资或项目。）	☐	☐

53.4 Recovery and Reduction 复苏和缩减

a)	***Turnaround*** (means that, when your firm finds itself with declining profits, your firm makes a concerted effort to fortify its distinctive competences and minimize the losses that are occurring for pursuing survival and eventually recovery). **转 向**（指贵公司发现自己的赢利正在减少。为了生存和复苏经营，你们采取一致努力的措施去巩固自己独特的能力并将正在出现的亏损面减至最低。）	☐	☐
b)	***Divestiture*** (involves the sale of your firm/business or a major component of your firm/business). **放 弃**（涉及放弃贵公司或业务的销售，或其主要营业部分的销售。）	☐	☐
c)	***Liquidation*** (typically involves your firm being sold in parts or as a whole but only for its tangible asset value). **清 理**（典型地，涉及贵公司的有形资产被部分或全部出售或转让。）	☐	☐
53.5	**Other** (please specify) **其它**（请注明）.....	☐	☐

FURTHER INFORMATION
更多信息

- The purpose of this section is purely for classification purposes.这一节的目的是出于分类的需要。
- This information will enable the researcher to provide you with an analytical feedback report.以下信息可以使本人有可能提供一份反馈的分析报告给您。
- No information will be published about the person or the organisation. 本人将不会发表与个人或与贵机构相关的信息。
- Response to this section is optional.您可以选择是否回答下列问题。

Main Oil and Gas Service Business
主要石油天然气工业的业务服务

What are the main business(es) of your organisation as defined above? 贵机构的主要业务是什么?

Tick √ the box(es) as appropriate 在合适的选项上打勾 √

- ☐ Bits & Tools
  钻头和工作机械
- ☐ Blow-out and Firefighting Specialists
  爆破作业和消防专家
- ☐ Caterers Food & Services
  配餐服务
- ☐ Computer Services- Oil & Gas
  电脑服务—石油天然气工业类
- ☐ Corrosion Control & Cathodic Protection Services
  腐蚀控制和高压电子输出设备保护
- ☐ Design Services – Oil and Gas
  设计服务—石油天然气工业类
- ☐ Directional Drilling, Well Surveying & MWD Services
  方位钻井，油井实地考察和 MWD 服务
- ☐ Diving & ROV Contractors
  潜水和遥控操作船（ROV）承包商
- ☐ Drilling Contractors
  钻井承包商
- ☐ Drilling Mud & Mud Loggers
  污泥钻凿和泥速测量
- ☐ Engineering & Construction
  工程和建筑施工
- ☐ Environmental Services
  环境保护服务
- ☐ Fabricators – Machine Shops – Welders
  焊接装配—机械—金属焊接
- ☐ Geologists
  地质学
- ☐ Geophysical & Seismographic Services
  地球物理和地震预报服务
- ☐ Information Services – Reports, Maps, Log
  信息服务—报告，地图，航海日志
- ☐ Insurance Services, Claims Adjusters
  保险服务，索赔调停
- ☐ Laboratories –Core Analysis, Measuring Services
  研究实验室—岩石分析，测量服务
- ☐ Lease, Royalty & Property Brokers, incl. Landmen
  土地，房屋租赁经营，专利和财产经纪人
- ☐ Lease Services, Location & Roadwork
  租赁，契约服务，场地选定和近海停泊
- ☐ Logistics Specialists – Oil and Gas
  物流配送专家—石油天然气工业类
- ☐ Marine Contractors
  海上承包商
- ☐ Marine Supply Bases, Expediters & Chandlers
  海上供应基地，工作处理和杂货
- ☐ Marine Surveying & Positioning
  海上实地勘测和定位
- ☐ Oilfield Chemicals Personnel Services
  油田化工专职人员服务
- ☐ Petroleum & Consulting Engineers
  石油化工和咨询工程师
- ☐ Pipe Services
  管道服务
- ☐ Pipeline Contractors
  石油天然气管道承包商
- ☐ Rental, Tools & Equipment
  工具和设备的计费租赁
- ☐ Ship, Boat & Offshore Rig Builders
  三桅船，通用船和海上钻井船的制造商
- ☐ Stimulation & Cementing Services
  活化和水泥服务
- ☐ Surveyors, Lease & Pipeline
  实地勘测，天然气管道和租赁
- ☐ Transportation Contractors – Land, Air, Marine
  运输业—陆地，海上，航空
- ☐ Valve & Instrument Reconditioning
  阀门和精密仪器的再调较
- ☐ Well Testing, Completion & Wireline Services
  油井测试，完成和线路服务
- ☐ Workover & Well Services
  工作结束和油井服务
- ☐ Other (please specify) .....
  其它（请注明）.....

Competitive position
竞争地位
Tick √only one as appropriate.
选择一项打勾√

How would you describe your organisation's relative competitive position in the domestic market place?
您怎么形容贵机构在国内市场上的相对竞争地位？

☐ Strong 强　☐ Neutral 中等　☐ Weak 弱　☐ Drop out 退出　☐ Not applicable 无从回答

Identify your relative competitive position in terms of both market share and your annual sales or production turnover within the domestic industry in which you operate.
从市场份额和年业务量（销售额或产值）的角度出发，您在所经营的国内石油服务行业的相对竞争地位是：

☐ Leader 领导者　☐ Follower 跟随者　☐ Defender 防御者　☐ New entrant 新进入者　☐ Not applicable 无从回答

The number of your current competitors is:
您现有的竞争对手的数量是：

☐ 1—5　☐ 6—10　☐ 11 — 50　☐ 51—100　☐ > 100　☐ Not applicable 无从回答

What is your market share in the domestic market that you serve?
在您所服务的国内市场上，您的市场占有率是：

☐ 0-<1%　☐ 1%- <10%　☐ 10% - <50%　☐ >50%　☐ Not applicable 无从回答

What recent annual business (sales or production) turnover (US$) has this organisation made?
贵机构最近一年所创造的年业务量（销售额或产值）是多少（以百万美元为单位）？

☐ $0–<1m　☐ $1 – <5m　☐ $ 5 – <50 m　☐ $ 50 – <500 m　☐ > 500 m　☐ Not applicable 无从回答

Principal Customers
主要客户

Please give the names of up to three of your principal oil and gas clients.
请提供至多三个您主要的石油客户名称。

	Which key OILFIELDS are these firms located in? 这些石油公司的主要油田是：
1.	.....
2.	.....
3.	.....

	If you wish to receive a summary report of this survey questionnaire as soon as it is available, please provide your business card or fill in the following contents. 如果您想收到这份问卷调查的概括报告，请赐名片或填写下面的内容。
Company name (in full) **公司全称**	
Name of person responding **受访者姓名**	
Occupation of person responding **受访者职务**	
Address (full postal) **通讯地址**	
Post code **邮编**	
Telephone No. **电话**	Country code: ..... Area code: ..... No: ..... 国家代码: ..... 地区代码: ..... 号码: .....
Fax No. **传真**	Country code: ..... Area code: ..... No: ..... 国家代码: ..... 地区代码 : ..... 号码: .....
E-mail **电子邮件**	
Website **网页**	

If you wish, please feel free to comment on the questionnaire and this research.
对于本问卷和研究, 欢迎提供宝贵意见。

Please return this COMPLETED QUESTIONNAIRE to the following addresses:
请将完成了答案的问卷按下列地址寄回：

Yi(Tammy) Tan, Research Student,
Aberdeen Business School, The Robert Gordon University,
Kepplestone Mansion, Viewfield Road, Aberdeen,
AB15 7AW, United Kingdom

Thank you for responding to the questionnaire survey.
谢谢您对问卷的回复。

Appendix E

Preliminary Investigation

Preliminary Investigation Questionnaire

The Result Report

The Business Environment in East Asia, a PhD research project is sponsored by Simmons & Company International. Respondents to the questionnaire are oil and gas service company executives mainly in the UK, the USA and East Asian countries. The research is being conducted by Tan Yi studying at the Robert Gordon University, Aberdeen, UK.

Business Environment in East Asia: Opportunities, Challenges and Strategies for The Energy Service Industry

It would be appreciated if you would spare the time to answer this questionnaire and return it to me, Tan Yi, by 30 November 1999 in the attached, pre-addressed envelope, or fax it to me. (Fax number: 0044, 1224, 202303).

1. Do you have business or trade in East Asian countries? (tick as appropriate)

Yes ☐

No ☐

If yes, please go to question 2;

If no, please go to question 3.

2. If you answer Yes to question 1, which of the following countries (or districts) does your company do business with (tick box as appropriate) and, on a scale of 1 - 5, what is the level of each country's importance to your company's business development in the next five years. (1 = not important & 5 = very important) (circle as appropriate)

	not important		important		very important
Great China					
P.R. of China ☐	1	2	3	4	5
Hong Kong ☐	1	2	3	4	5
Taiwan ☐	1	2	3	4	5
Southeast Asia					
Vietnam ☐	1	2	3	4	5
Indonesia ☐	1	2	3	4	5
Malaysia ☐	1	2	3	4	5
Philippines ☐	1	2	3	4	5
Singapore ☐	1	2	3	4	5
Thailand ☐	1	2	3	4	5
Northeast Asia					
Japan ☐	1	2	3	4	5
South Korea ☐	1	2	3	4	5

go to question 4

3. If you answer No to question 1, which of the following countries (or districts) is your priority market option (tick box as appropriate) and, on a scale of 1 - 5, what is the level of each country's importance to your company's business development in the next five years. (1 = not important & 5 = very important) (circle as appropriate)

	not important		important		very important
Great China					
P.R. of China ☐	1	2	3	4	5
Hong Kong ☐	1	2	3	4	5
Taiwan ☐	1	2	3	4	5
Southeast Asia					
Vietnam ☐	1	2	3	4	5
Indonesia ☐	1	2	3	4	5
Malaysia ☐	1	2	3	4	5
Philippines ☐	1	2	3	4	5
Singapore ☐	1	2	3	4	5
Thailand ☐	1	2	3	4	5
Northeast Asia					
Japan ☐	1	2	3	4	5
South Korea ☐	1	2	3	4	5

go to question 4

4. Which energy industry does your company service? (tick as appropriate)

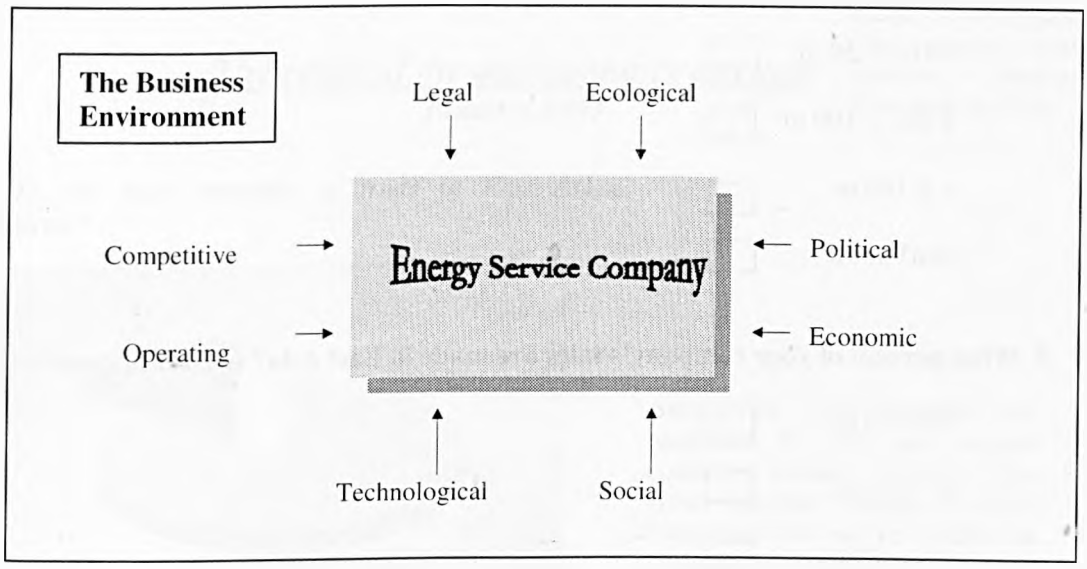
Oil and gas

- Upstream ☐
- Midstream Gas ☐
- Downstream Oil ☐
- Other oil and gas service company ☐

- Hydropower ☐
- Electricity ☐
- Nuclear ☐
- Coal ☐
- Solar ☐
- Wave power ☐

The others _____

5. As an energy service company, among the following business environmental factors, how important do you think these influences affect your company's business in the East Asian areas? (1 = not importance & 5 = very important) (circle as appropriate)



	not important		important		very important
Legal	1	2	3	4	5
Ecological	1	2	3	4	5
Competitive	1	2	3	4	5
Operating	1	2	3	4	5
Political	1	2	3	4	5
Economic	1	2	3	4	5
Technological	1	2	3	4	5
Social	1	2	3	4	5

6. In terms of employees, what is your company's size? (tick as appropriate)

0 - < 10 ☐

10 - < 50 ☐

50 - <250 ☐

> 250 ☐

7. What is your company's annual turnover (US$)? (tick as appropriate)

$ 0 - < 5 m ☐

$ 5 - <10 m ☐

$ 10 - < 50 m ☐

$ 50 - < 100 m ☐

> $ 100 m ☐

don't know ☐

8. What percent of your company's sales are made in East Asia? (tick as appropriate)

0% - <1% ☐

1 - < 10 % ☐

10 - < 25 % ☐

25 - <50 % ☐

> 50 % ☐

don't know ☐

9. Are you willing to join the further research of this project if I contact you again?

Yes ☐ No ☐

The findings of this survey will be made available at the end of January 2000. Please tick box below if you would like to receive a copy of the report. Yes ☐ No ☐

Thank you for completing the questionnaire. **All information provided will be treated in strict confidence.** But it would be appreciated if you provide a business card with the completed questionnaire in the return envelope, or complete the form below.

Your name: _____ Occupation: _____

Company: _____

Telephone: _____ Fax: _____ Email: _____

Address: _____ Post Code: _____

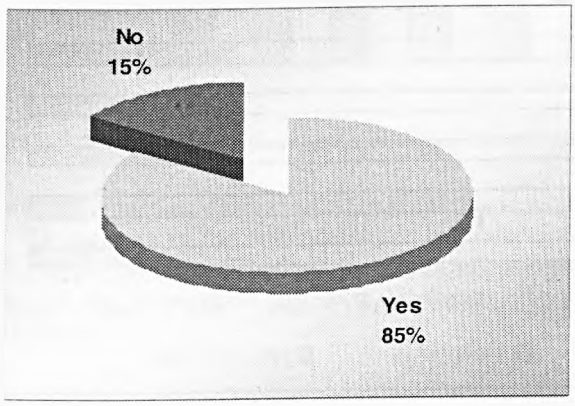
Business Environment in East Asia: Opportunities, Challenges and Strategies for The Energy Service Industry

This questionnaire investigated the attitudes and interests on the business environment in East Asia as well as related business issues, from the perspective of mainly Western oil and gas service companies. Respondents to the questionnaire include company executives from 111 oil and gas service and support firms. The answers were received between September and November in 1999.

The result of the questionnaire answers

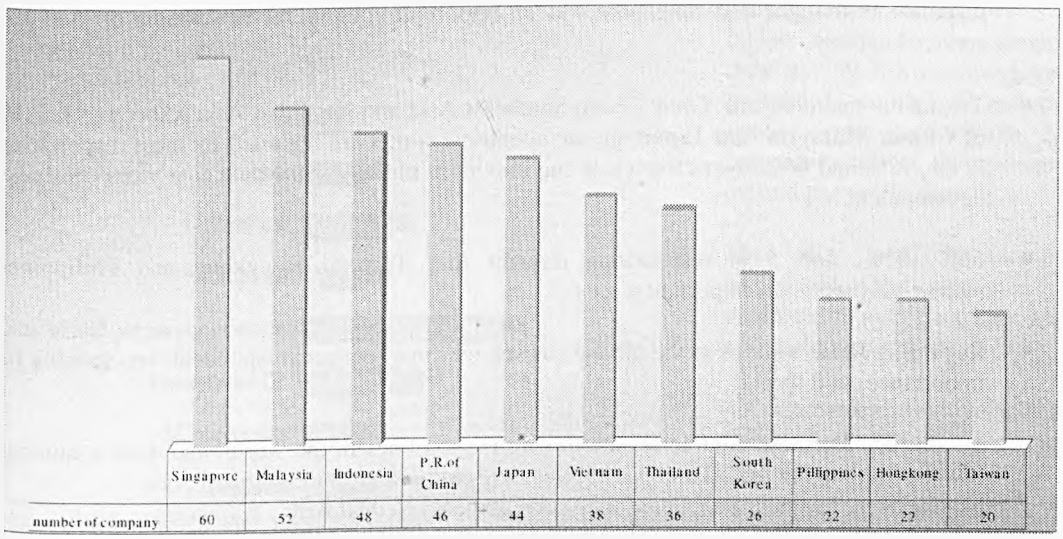
January 2000

1. Do you have business or trade in East Asian countries?



Among the 111 companies that responded, 94 (85%) have already conducted business or trade in East Asian countries, whereas 17 (15%) companies have not yet tackled the East Asian market.

2. (To the companies which have business in East Asia) ***Which of the following countries (or districts) does your company do business with?***

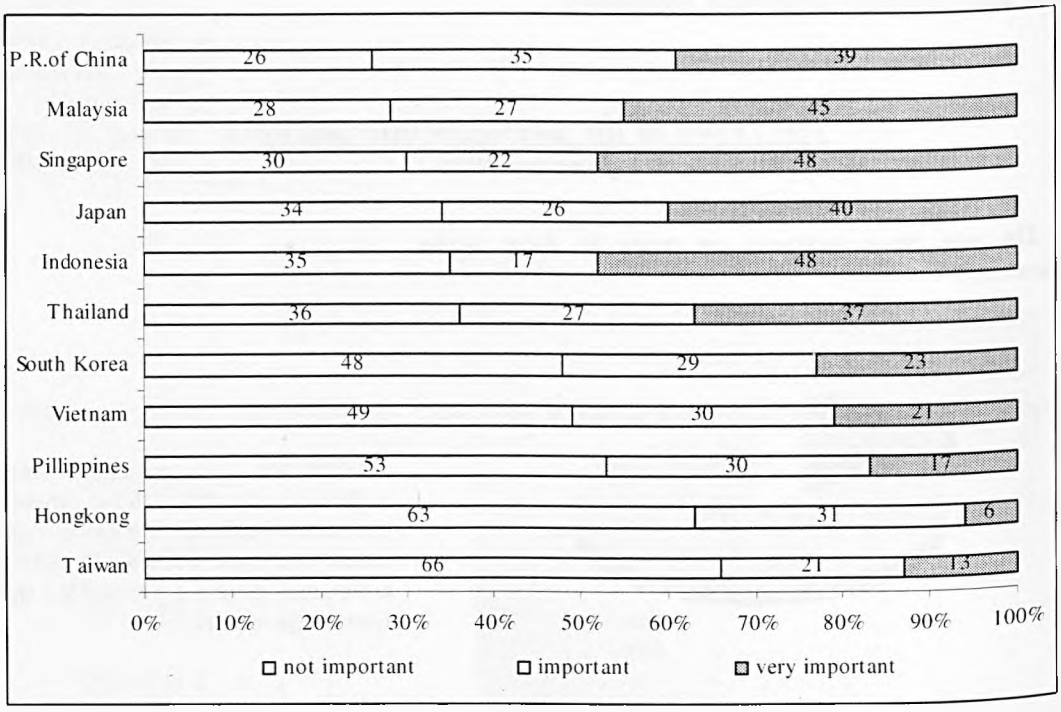


	Singapore	Malaysia	Indonesia	P.R.of China	Japan	Vietnam	Thailand	South Korea	Pilippines	Hongkong	Taiwan
number of company	60	52	48	46	44	38	36	26	22	22	20

- Covering the regions of Great China, Southeast Asia and Northeast Asia respectively, **P.R. of China, Singapore and Japan** are the three leading countries to have already attracted international energy (mainly oil and gas) service investment.

- International energy service investment is relatively more active and popular in Southeast Asia. For example, 52 respondents are active in **Malaysia** and 48 in **Indonesia,** compared with 60 companies in **Singapore,** which is ranked top for energy service activities in East Asia.

On a scale of 1 - 5, what is the level of importance (of the following countries) to your company's business development in the next five years? (1 = not important & 5 = very important)



(Note: This result includes 111 respondents' answers and the interview data.)

- Overall, **P.R. of China, Malaysia and Singapore** are regarded as the top three countries in terms of important business development over the next five years. For example, 70% of respondents thought that Singapore was an important country for developing oil and gas service business.

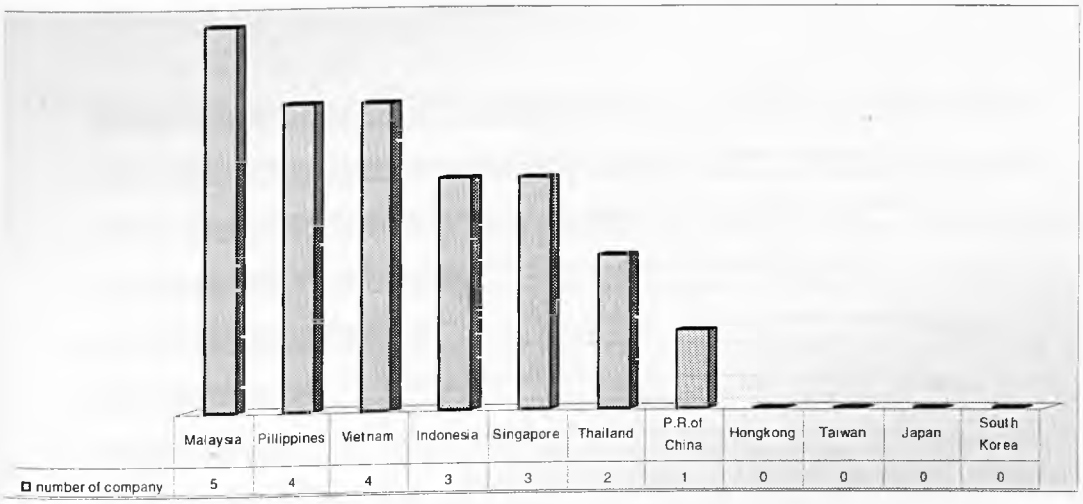
- Taking the main regions, Great China, Southeast Asia and Northeast Asia respectively, **P.R. of China, Malaysia and Japan** are the countries, which are regarded by most respondents (74%, 72% and 66% respectively), as the important places for the next five years' business development.

- 66%, 63%, and 53% respondents thought that Taiwan, Hongkong and Philippines respectively were not important places.

- Regarding Japan's status in the oil and gas services marketplace, respondents recognising its importance, said that:

  a) In fact, Japanese contractors are among the top ones in the world, and quite a number are involved in the oil and gas business in South Korea and Southeast Asia.
  b) Japanese business people are very good and easy to deal with.
  c) A lot of oil and gas related construction has been done in Japan.

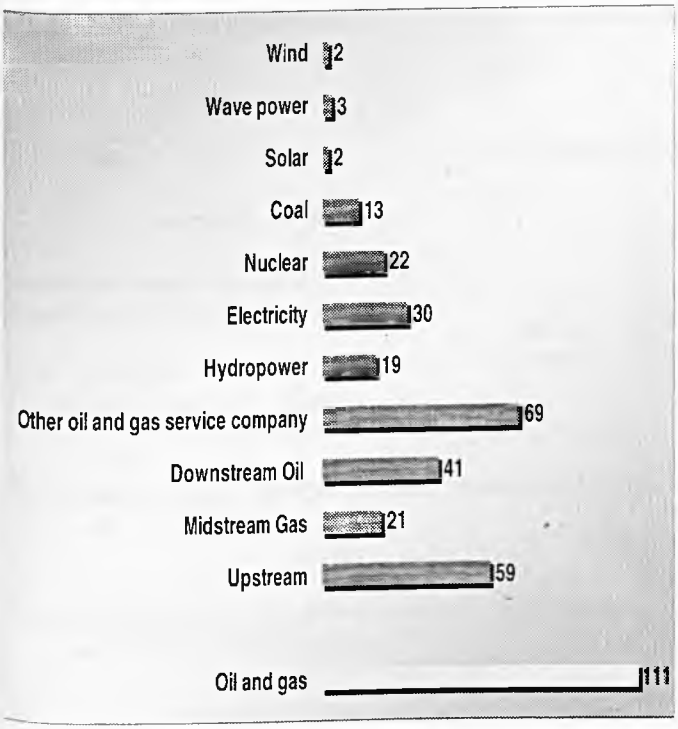
3. (To the companies which don't have business in East Asia) ***Which of the following countries (or districts) is your market option?***



	Malaysia	Pilippines	Vietnam	Indonesia	Singapore	Thailand	P.R.of China	Hongkong	Taiwan	Japan	South Korea
number of company	5	4	4	3	3	2	1	0	0	0	0

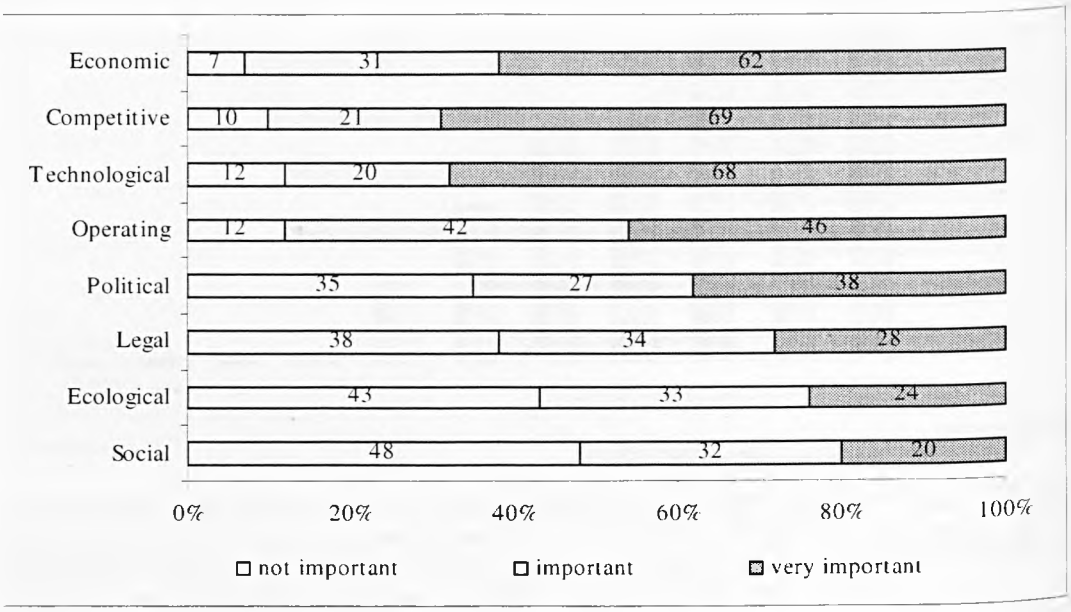
Of the 17 companies which currently have no business in East Asia, 3 are not interested in this area at all. The majority of the respondents are interested in South East Asia (e.g. 5 companies selected Malaysia as their priority option). One company is keen to enter China's oil and gas service market. None of the respondents regarded Hongkong, Taiwan, Japan or South Korea as a priority marketplace.

4. Which energy industry does your company mainly service?



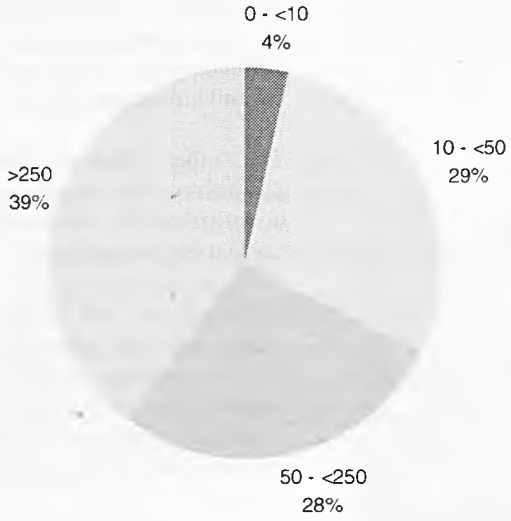
- All 111 respondents provide services to oil and gas industry.
- The upstream oil industry is a major sector to the service industry. 69 firms are engaged in services to other oil and gas service companies, while 59 companies service the upstream oil and gas sector directly.
- The other relatively focused businesses of the companies are downstream oil, electricity and nuclear power services.
- 43 companies are involved in energy services other than for the oil and gas industry. 13 respondents are engaged in providing service throughout the whole oil and gas industry.

5. As an energy service company, among the following business environmental factors, how important do you think these influences affect your company's business in the East Asian areas? (1 = not importance & 5 = very important)



The **competitive, technological, economic and operating** environmental factors are relatively important issues to the companies' businesses in East Asia, whereas a smaller proportion of respondents regard legal, ecological and social as important factors. For example, 90% and 93% of respondents thought that the competitive and economic factors respectively were important, and nearly half of the respondents (43% and 48%) thought that the ecological and social environmental drivers were not important.

6. In terms of employees, what is your company's size?



Among 111 companies,

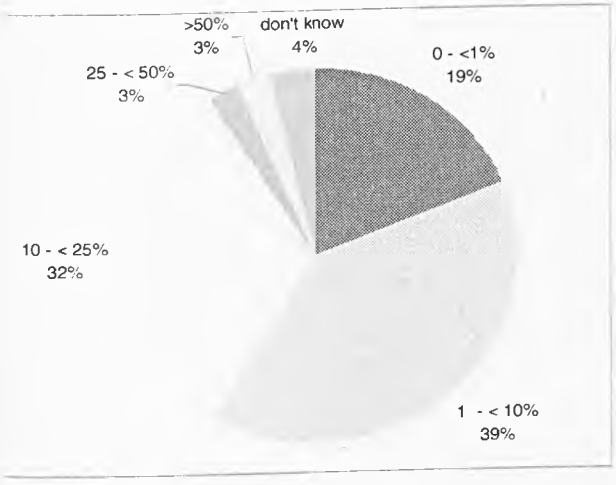
- 44 (39%) companies are large with more than 250 employees.
- 31 (28%) companies are medium size with from 50 to 250 employees.
- 36 (29%) companies are small size with not more than 50 people.
- 4 (4%) are mini-small size with not more than 10 employees.

7. What is your company's turnover?

Turnover	Number of company
$ 0 - < 5 m	16
$ 5 - < 10 m	23
$ 10 - < 50 m	20
$ 50 - < 100 m	14
> $ 100 m	35
Don't know	3

- 35 (31%) respondents are engaged in more than 100 million US dollars businesses.
- 23 (21%) respondents have a turnover ranging from $5 million to not more than $10 million.
- 20 (18%) respondents have a turnover from $10 million to not more $50 million.
- 14 (13%) companies have a turnover from $50 million to not more $100 million.

8. What percent of your company's sales are made in East Asia?



- 39% of respondents' sales in East Asia are from 1% to not more than 10% of their total sales.
- 32% of companies have business ranging from 10% to 25% of total sales in East Asia.
- 6% of companies' sales in East Asia have more than 25% of total sales.

9. Are you willing to join the further research of this project if I contact you again?

	Yes	No	Not sure
Number of company	73	36	2

73 respondent companies, including some energy service industry leaders, were willing to join the further research.

PART TWO

PUBLICATIONS

Rising in the east

Major recent discoveries have resulted in an upturn in the fortunes of China's oil and gas industries. Jeremy Cresswell and Tan Yi report how this vast country, despite its problems, is forging ahead

China can boast one of the fastest growing economies anywhere in the world. While fellow east Asian nations like Korea and Japan suffered badly during the 1997-98 financial crisis, the Chinese appeared least affected. Their economy slowed, but nothing like as drastically as their neighbours' did. The giant Asian tiger started off 1999 predicting 8 per cent economic growth – though this has since been downgraded to just above 7 per cent, it is still purring along and impressive by any standards.

That is not to say that the Chinese do not have problems. There is, for example, deep concern about Hong Kong, whose economy stumbled after the UK handed the protectorate back to Beijing. This in turn has had a knock-on effect on Shenzhen, the huge economic free-zone/city created right next Hong Kong some 20 years ago, though the huge amount of American-style office/hotel/retail complex and freeway system development currently in hand paints a highly dynamic picture.

With Portugal returning the much less significant Macao back to Beijing, a long European tradition of camping on China's doorstep is ending. It remains to be seen how Macao's much less dynamic economy fares, and whether the November 1999 handover has a negative impact on the neighbouring free zone powerhouse Zhuhai. Such cities are just cogs in the vast Chinese economic machine that grinds on relentlessly, sucking in an apparently never ending stream of inward investment as Western companies literally queue to establish manufacturing operations.

The process is set to accelerate over the next few years as Washington and Beijing, mid-November, buried the hatchet over a number of key issues blocking access to eventual membership of the WTO (World Trade Organisation).

All this activity is placing enormous strains indigenous China's energy resources, where coal remains king, but whose price is pollution on such horrendous levels that Beijing is now taking steps to curtail some usage, notably the ending of steam locomotive traction on the state rail network. Oil and gas are becoming increasingly important and it will take a very modest increase in per capita consumption of the billion or so Chinese to result in a massive rise in pressure on limited known indigenous resources and a significant impact on the quantities of oil and gas bought on the international market.

Good news

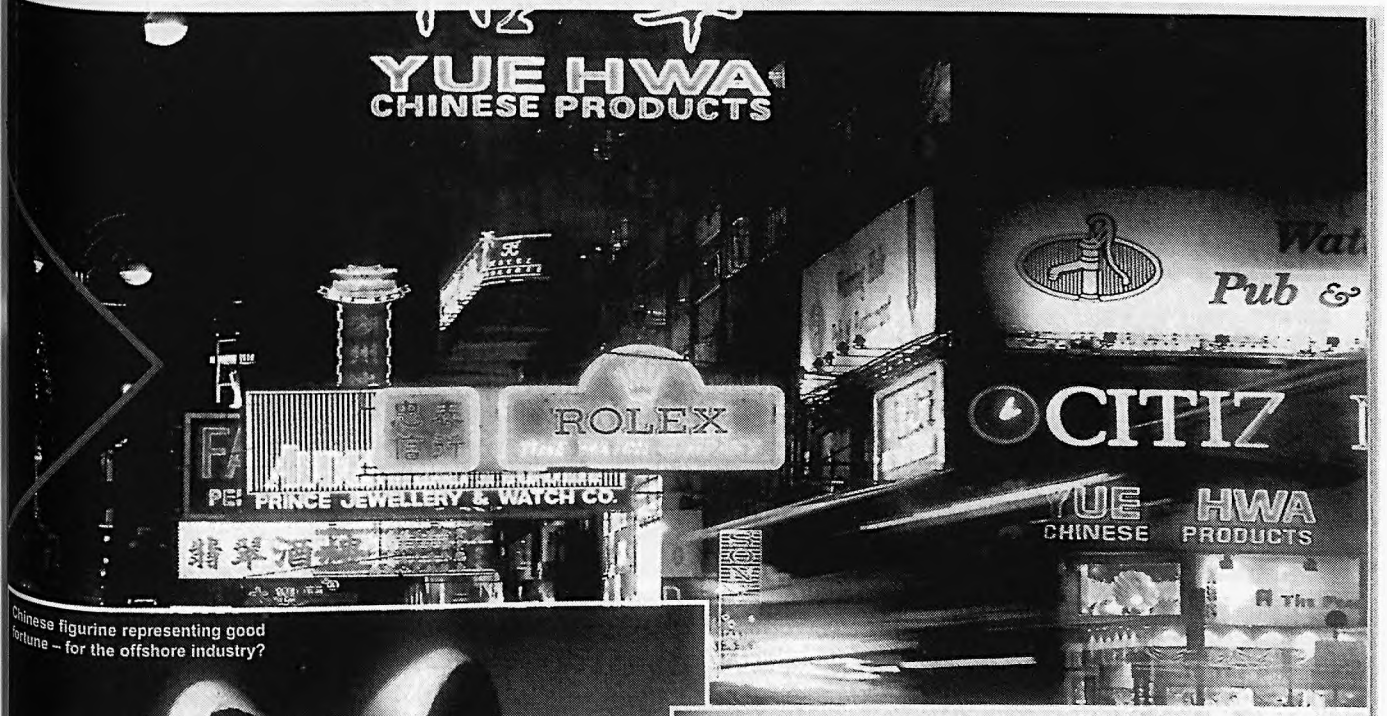
There was excitement indeed when Phillips Petroleum announced in July 1999 that it had come up trumps with an apparently major heavy oil and gas discovery offshore in the Bohai Bay area. The find was made on a large anticline some six miles in length and located at the centre of block 11/05, approximately 80 miles from the port of Dalian in just over 20m of water.

The PL 19-3-1 discovery well reached a total depth of 5,531ft on 15 May, encountering a gross pay interval of more than 1,400ft, with 712ft of net pay in the Minghuazhen and Guantao formations.

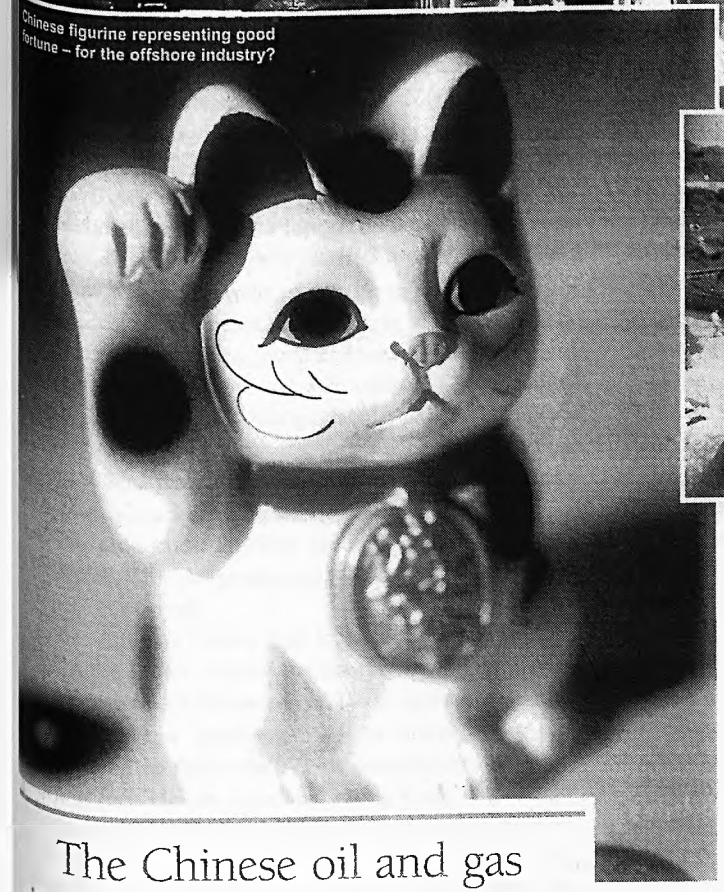
Phillips reported the presence of a "thick hydrocarbon column". The company immediately set about drilling an appraisal well of much the same depth 1.6 miles south-southwest of the discovery well, encountering 1,700ft of gross pay and 748ft net.

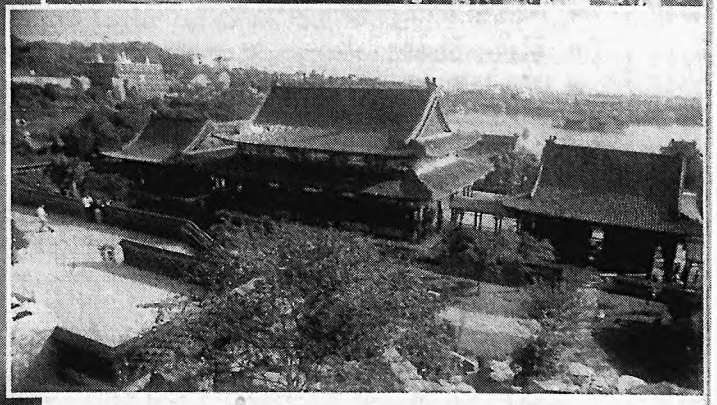
"These two wells were drilled in a fault block with an area of closure of approximately 1,400 acres. Both wells encountered high quality reservoirs with good porosities and permeabilities," said Phillips in a statement.

Three satisfactory drill-stem tests of crudes ranging from 22deg API to 16.8deg API were conducted using natural flow conditions. Phillips summed the results up in an upbeat



Chinese figurine representing good fortune – for the offshore industry?





The Chinese oil and gas industry is evolving rapidly, in line with much of the rest of the Asian tiger economy

Statement issued in July 1999: "Analysis of produced oil indicates a low pour-point crude that's easy to produce, process, transport and market.

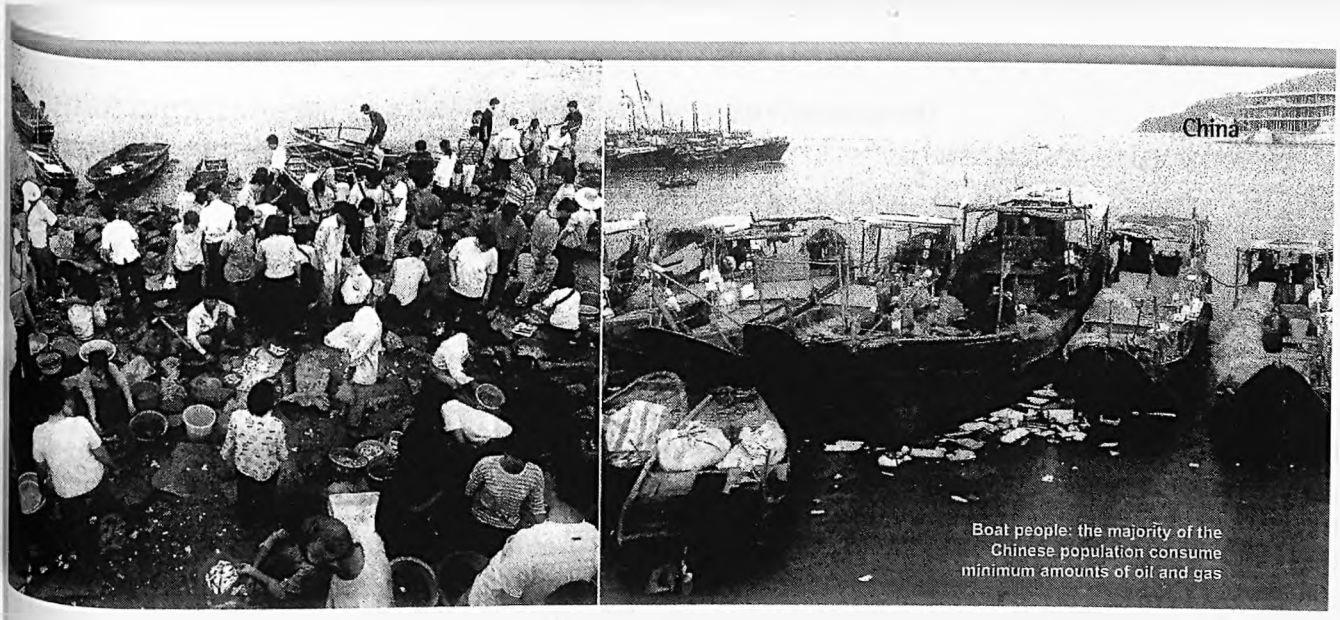
"Immediate plans are to drill as many as five more appraisal wells prior to year-end to delineate the productive area of this large feature and jointly initiate commercialisation studies with China National Offshore Oil Corporation (CNOOC).

"Facility and drilling costs are expected to be low due to shallow water and reservoir depths. The discovery is also close to existing CNOOC production facilities." Phillips has since gone on to drill further wells. Two more had been completed by early November 1999, each one successful. In the case of the fourth well, PL 19-3-5, this encountered a gross pay interval of 850ft with 260ft of net pay in a previously untested fault block on the western flank of the clearly very large field. Limited drill-stem tests were conducted, producing variously 13deg API and 17deg API crudes. Phillips was sufficiently encouraged to upgrade its reserves estimate from the original 400m barrels figure made public in October. This is a very large discovery, it seems.

The appraisal programme continues and conceptual studies are well under way with CNOOC. In addition, Phillips is planning four new field exploration wells on other unexplored features of block 11/05.

Bad news

But not everyone is enjoying success offshore China. For example, energy information specialist EOS has reported on the trials and tribulations regarding XCL and Apache. The former launched an action to remove the latter from the Zhaodong licence, also in Bohai Bay. XCL maintains that Apache has carried out unauthorised, unnecessary and wasteful activities with regard to the intended development of discoveries made at Zhaodong. Apache has countered by saying that XCL owes it



Boat people: the majority of the Chinese population consume minimum amounts of oil and gas

oney but, by its own admission, lacks the funds to cover capital penditure obligations. Amidst this confusion, Zhaodong was pposed to come onstream late 1999/early 2000.

Apparently running more smoothly is a production sharing greement hatched between Statoil of Norway and China tional Petroleum Company (CNPC). The target is the ainan field, again in Bohai, a low technology, shallow water oject, part of which is located in the littoral zone between gh and low water. However, it has been reported that the greement could be hampered by differences in Norwegian and hinese attitudes regarding both corporate philosophy and uman rights. Until now, Statoil's only offshore China involvement has been Lufeng, a less than spectacular project that utilised ovion's FPSO Berge Hugin.

In total, China has 12-plus major oil and gas fields in production, plus a number of lesser developments. Offshore oil bout 20mt production in 1999) accounts for around 10 per nt of overall Chinese production. The gas contribution is bout 6 per cent overall.

For now, Amoco's Liuhua field located in the South China ea remains the largest offshore development, with an original serves estimate of 1.5 billion barrels of oil equivalent.

Second largest is Suizhong 36-1 in Bohai Bay. Arco's 3TCF Yacheng gas field, which came onstream in 1995 is also nificant. It fuels Hainan Island and Hong Kong.

Among various discoveries currently undergoing development or waiting in the wings for the starting gun are ehuangdao 32-6 and Nanbao 35-2 in the Central Bohai Sea. heir combined reserves are put at 1.5 billion barrels of oil and e CNOOC project is expected to deliver some 80,000bpd and completed in 2004.

It is important to realise that the Chinese oil and gas industry is evolving rapidly, in line with much of the rest of the Asian gion economy, and that huge structural changes are taking place ina increasingly opens its doors to western influence.

eaping the past

storically, there have been problems within the Chinese l and gas sector. It is regarded as a basic supporting industry of the national economy. Here, state-owned enterprises OEs) remain dominant and there have also been problems the sector's organisation, marketing direction, pricing d administration.

Interestingly, Beijing central planners are aware that the industry's supply chain badly requires reorganising, and steps have been taken to sort out the mess. Many of the US and European oil service big names have established offices and support facilities, variously in Beijing, around Bohai Bay and in the Pearl Delta area (notably Shenzen/Shokou).

In March 1998, Beijing announced that the oil and gas industry would be divided into northern and southern groups, according to geography. Basically the Great Wall of China is the border. The previously separate upstream and downstream sectors have become integrated.

One sector, broadly the northern half, was placed under the control of the China National Petroleum Corporation (CNPC), the other area, covering the southeast and along the coast down to Guangzhou came under the China Petroleum Corporation (SINOPEC). CNPC was formerly the Chinese Ministry of Petroleum Industry. CNPC is an extremely big SOE and is directly administrated by the central government. SINOPEC is an organisation in which the central government invests directly.

The China National Offshore Oil Corporation (CNOOC) split off from CNPC in 1982, to become a sister company and be responsible for China's offshore oil production. CNOOC has been responsible for all the country's offshore activities.

According to the American embassy in Beijing's 1997 report, a total of $35-45 billion (US) will be invested in the E&P side of the oil and gas industry over the next few years.

Offshore expenditure is forecast to increase by around 5 per cent to $1.5 billion in 2000. The total offshore commitment during 1996 and 2000 in China is estimated by Mackay Consultants to be $7.8 billion, which is very modest when measured against the North Sea.

To date, CNOOC has signed around 1,000 contracts with foreign oil companies for exploration and development in its four major regions: the South China Sea, East China Sea, Bohai Gulf and Beigu Basin. China's offshore reserves currently stand at least 6.2 billion barrels of oil (not counting the Phillips find) and 4.9TCF of gas, mostly in the South China Sea.

In its (1997) report on the Chinese energy sector, Houston oil bank Simmons & Company International noted that the South China Sea accounted for 43 per cent of the foreign licensed acreage, the East China Sea with 36 per cent, Bohai Basin with 19 per cent and Beigu Basin with 2 per cent. ■

Employing strategies to adapt to the business environment: An empirical pilot study in China

By Yi Tan

Introduction

China and Malaysia are the most attractive emerging oil exploration and production (E&P) markets in East Asia (BP's Statistical Review of World Energy 1998) and offer profitable business opportunities. It is also well known that Singapore offers environmental advantages to the oil and gas service industry in terms of good financial and economic stability as well as advanced information-technology. For different industries in different countries, the nature of the business environment can mean different things. How can the business opportunities and challenges be evaluated? What is the common trend of strategies adopted by existing firms? What is the alignment between strategy and environment? (Simerly and Li, 2000, Luo and Park, 2001) These can be three typical issues for senior managers to take into account as they seek to apply better business practice in an emerging market. However, little or nothing is known about the strategic solutions needed for service companies to survive and prosper long-term in the East Asia business environment. In an attempt to fill this gap, and based on the researcher's personal interest, previous studies and work experiences, a research project was proposed in late 1999 with its main focus on the oil and gas service sector in China and to a lesser extent, Singapore and Malaysia. It seeks:

- to examine the dominant business environment conditions which affect the service organisations
- to identify common trends concerning the strategic directions across existing organisations within the industry
- to establish an understanding of the alignments, if any, between the business environment and strategies

The original proposal of the research programme was that it should include four major stages. The initial stage would be devoted to literature review, methodology design and the development of research instruments including an interview guide and a questionnaire. In order to test the effectiveness of the research method designed and the survey questionnaire, it was proposed to conduct pretests and pilot fieldwork. In the second stage, a multi-method approach (Saunders, Lewis, and Thornhill, 1997) was designed in order to conduct the empirical research, which was planned to progress in two phases. Phase one would involve a questionnaire survey addressed to senior management. The data obtained would represent the problems to be investigated and highlight the critical issues that will form an important element of the project. In phase two, the problems revealed by the questionnaire would be investigated further in order to clarify the content of some of the questionnaire results. This would be crucial to understanding the implications behind some of the data gathered in questionnaires. The third stage would then involve in-depth studies of selected service companies based on the results from the above research progress. The focus of the last stage would be to justify the relevance and validity of the data obtained and to discuss the extent to which the theories the researcher started with have been developed as a result of the research. Thereby, the significance of the research for oil service companies seeking long-term success in the business environment of East Asia would be addressed.

The rest of this article is organised as follows: First, it discusses the key issues on research measurement and questionnaire design. Next, it deals with the empirical pilot fieldwork that was undertaken to test survey techniques and the questionnaire. Then, it discusses the major indicative outcomes of and lessons learned from the fieldwork. Finally, it summarises, as the result of the above work, what will be carried out during the next phase of the research.

Measures

Environmental sectors

This study uses a multidimensional construct (Elenkov, 1997, Luo and Park, 2001) to conceptualise environment. Four dimensions of the environment, viz. complexity, dynamism, hostility and market diversity (Mintzberg, Ahlstrand and Lampel, 1998) were assessed for the environmental sectors at three levels: remote, industry and operating environment (Pearce and Robinson, 1997, p.63). The senior executives' views of and attitudes towards the environmental factors were measured by using a 36-item scale developed by the researcher. Based on the work of Elenkov (1997), Simerly and Li (2000), and Sutcliffe and Zaheer (1998), the measurement of perceived *dynamism and complexity* focused on environmental factors such as politics, economics, social-culture, technology, industry, buyers, suppliers, competitors, and resources. For example, the researcher measured technological change by rating the views on technology transfer speed and the attitude towards adopting new technology. Since industry concentration describes the number and size distribution of firms in an industry (Kotha and Nair, 1995), the researcher also measured this based on evaluating whether market share was dominated by several firms. Perceived *hostility* was measured mainly by means of competition and likelihood of obtaining contracts based on the work of Sutcliffe and Huber (1998), Luo and Park (2001), and Tan and Litschert (1994). Market diversity reflects the extent of the markets of an organisation ranging from integration to diversity. This was directly accessed with a question.

The respondents were asked to rate the degree to which they agreed on various characteristics of the environmental sectors. The answers were measured by a series of 7-point bipolar rating scales (Zikmund, 2000, p.293). Bipolar adjectives anchor the right and left of the scale, with 1 indicating that the respondent most strongly agreed with the left assessment; 7 indicating that the respondent most strongly agreed with the right assessment; and 4 showing that the respondent felt that, for his company, the situation was midway between both. For instance, if the question asks:

The business environment in which you operate

is relatively static 1 2 3 4 5 6 7 shows signs of change

Should "5" be selected by a respondent, it indicates that the respondent "agrees with the assessment as stated on the right". In each measuring situation a score has been assigned for the nature of the business environment.

Industry forces

The perceived *dynamism* and *hostility* were further measured by accessing the industry environmental forces. The researcher developed a 6-item scale based on Porter (1980) and Sondhi (1999) to assess potential entrants, buyers, suppliers, substitutes, rivals, and strategic partnerships. This researcher defined a 5-point scale to clarify the six forces which have a current and future "threaten" impact on an organisation, with a score of 1 indicating non-existent or very weak, 2 indicating weak, 3 indicating average, 4 indicating strong and 5 indicating very strong. Assessing characteristics of the key six sectors simultaneously enabled the researcher to compare the impact of the industry forces and distinguish significant influences.

Strategy taxonomy

Three dimensions of strategy on generic strategy (Porter, 1980), strategy clock (Bowman and Faulkner, 1996) and grand strategy (Pearce and Robinson, 1997) were developed as measurements. A multidimensional construct approach was also adopted to measure each organisation's strategic orientation. To assess generic strategies, four items - "cost leadership", "differentiation", "focus" and "stuck in the middle" - were developed to examine competitive advantages of a firm or business. Based on Pearce and Robinson, 14 items were utilised to assess grand strategies, which provide basic direction for strategic actions. Respondents were simply asked to select the grand strategies, which they had

adopted in past years and planned to adopt for near-term. A scale of three was used to assess the strategy clock, which was another way to analyse the competitive position of a company or business versus the offerings of competitors within the domestic industry. The respondents were asked to assess their principal products/services by selecting options scaled on price, quality and perceived added value (Johnson and Scholes, 2000). The questions used a 6-category scale response format.

Background information

Company background and industry classification were assessed in order to find out, within a particular industry context, what the characteristics of the industry were in line with the foregoing category measures. This researcher developed eight sectors in order to measure organisation status, industry segment, businesses in East Asia, number of employees, service category, business assessment, age of business, and ownership type. In particular, the firm's size (measured by the number of employees), age (based on years), turnover (by sales or production), and ownership structure have proved to be common and important control variables in similar studies (Luo and Park, 2001, Simerly and Li, 2000).

Regarding the assessment of strategies, a 5-item scale was set up to evaluate whether the selected organisations formally adopted any type of corporate or business strategies: whether or not a firm had set up missions, goals and objectives; and whether it used strategies and business plans. The perceived importance of strategy was measured by five categories: not important, slightly important, important, very important and the most important. In order to cross check the validity of pertinent information, the strategic decision making process was measured in terms of the level at which management decisions were made, how often they made and revised strategies and timescale of strategies.

Questionnaire Design

Developed by the researcher, the pilot questionnaire was arranged to begin easy/general questions before moving into more difficult/sensitive and specific areas. The questionnaire had both closed and open-ended questions, and was divided into three distinct sections, each dealing with one of the following issues: Section I, *Company Background and Industry Classification*, together with section III, *The assessment of strategy*, were used to survey facts on organisations. Section II, *The assessment of the business environment* was used on individuals to survey attitude of managers or senior executives.

Participants were told there was no such thing as right or wrong, nor were there good or bad answers. What mattered were their thoughts. Therefore, the subjects were encouraged simply to respond by justifying, from their own experience, how they felt about each topic. Section I, as described above, was divided into eight sub-sections. The first 41 questions formed Section II with three distinct parts, each preceded with a lead-in subject title indicating the focus of that part: nature of the business environment, opportunities and challenges, the domestic oil and gas service industry. The next twelve questions formed Section III to evaluate the respondents' variations in strategies. These questions were based on contemporary writings and similar research on strategy. Respondents were first investigated, based on a western strategic standard, whether their organisations utilised formal/explicit strategies, and were then asked about their strategic orientations at business and corporate levels by using the measurements as stated above.

Apart from the three main sections, an additional part covering "further information" was also designed at the end of the questionnaire. Together with Section I, the questions were used as control variables or for identification purposes. Three areas were investigated: main businesses, competitive position, and major oilfields in which their principal customers operate. Participants were instructed that it was optional to answer questions in this part.

An empirical pilot study

As said earlier, the purpose of the pilot fieldwork was to find out how the data collection protocols and the survey instruments worked in a real situation (Fowler, p.100). The pilot study (Zikmund, 2000, p.58, Fowler, 1992, p.100) was undertaken for the following distinctive perspectives: content of questionnaire, survey techniques, sampling, as well as for generating primary data. In addition, the researcher could gauge the validity and sensitivity of questions, as well as the reliability of the data collected.

Fieldwork pretests

In order to build a picture of the important issues the researcher was likely to encounter in the research and to suggest possible topics for formal investigation, in-depth interviews (Zikmund, 2000, p.108) were conducted with experts and interest parties in the UK. This was essential contextual data, which helped identify the scope of the survey questionnaire. Based upon this and before the researcher left for China in November 2000, the first questionnaire draft was completed. However this draft had not been perfected for administration. Pretests of survey questionnaire were conducted using a structured-interview technique to test sections of the survey questionnaire (Bourgue and Fielder, 1995, p. 79) in December 2000. Ten senior and operating/business managers from eight companies within the Chinese offshore service sector, including three foreign-owned organisations participated in pretests. The interviews were undertaken in Chinese and English as appropriate. Each respondent was asked to complete the questionnaire as presented at that time and provide comments on the questionnaire and the research. The longest meeting took around three hours and the shortest meeting was one hour.

Fieldwork pilot tests

In order to further refine the questionnaire and test the administrative procedures that would be used in the study, the researcher conducted a pilot survey in South China during January/February 2001 after completing the pretests. The pilot survey questionnaires were distributed via nine more interviews, one telephone interview, nine by mail and three by email, plus five hand deliveries. For those respondents who took part in interviews, the survey questionnaire was used. During the interviews, the researcher had discussions with respondents to ensure the accuracy of information recorded. Follow-up phone calls and later personal visits were also made to clarify points that were not clearly made during the interviews. Each of the 14 packets mailed or delivered by hand to potential respondents contained the questionnaire (including an induction page), and a self-addressed envelope for returning completed to the researcher.

Indicative outcomes

Altogether, 34 pilot questionnaires were distributed to a cross-section of up, mid and downstream service companies during the pretests and pilot tests. The researcher received back 21 questionnaires or 70% of those distributed. 15 were returned after face-to-face interviews, with four cases based on one-to-one self-administered questionnaires (Bourgue and Fielder, 1997); four after the researcher's next visit; one after a telephone interview; one after the email, and none after the mailing (see Table 1).

Table 1: Questionnaire distribution and its response rate in the pilot tests, China

Questionnaire	Interview		Mailing	Email	Delivery
	Face to face	Telephone			
Distributed	16	1	9	3	5
Received	15	1	0	1	4
Early notice	16	1	0	1	5
Response rate	94%		8%		80%

Response rates varied greatly, with a 94 % response rate for interviews, 80% for the hand delivery group and only 8% for the mailing and email group. This was partially due to procedural differences in the way questionnaires were administered and distributed. The interview and hand delivery groups were selected with help from managers of oil companies in China. Permission to complete the questionnaire was secured in advance. In the mailing and email groups, only one of the twelve potential respondents was given early notice by phoning in advance and returned the questionnaire in time. In the case of self-administered questionnaires, the researcher was able to answer any questions that respondents had about them during completion.

Based in the South China Sea area, 24 managers from 23 services companies participated in pilot questionnaire. Most were highly specialised and technology-based. Access was achieved through the process of "guanxi" (Nair and Stafford, 1998, *et al*) or personal contacts with the industry people. Respondents included general managers (four cases), vice presidents or deputy general managers (six cases), operations or business managers (six cases), managing directors (four cases), representatives (two cases) and one commercial manager.

Questionnaire Revision

Revisions made during the pretests and pilot tests have resulted in the following key improvements to the questionnaire. First, questions and information, which respondents and, ultimately the researcher too, considered irrelevant, or which acted as a barrier to the subject of the investigation, were dropped. For instance, when Revision 7 of the questionnaire was developed, questions regarding a firm's internal factors became irrelevant and were therefore taken away. Secondly, ambiguous questions have been revised and the questionnaire layout has been improved. Wording of questions in both English and Chinese was modified in each revision. The outcome of the pilot tests helped to change the wording of questions found to be confusing. For example, Question 50 and 51 originally were designed to identify the price and quality levels pursued by organisations within the service industry. A respondent queried: "How do you clarify this standard? International or domestic? Local or the whole country?" As a result, the measure of "domestic" service industry was redefined to access the varying levels of price and quality throughout China. The questions covering "company background and industry classifications" were originally designed for that one section but were later developed to appear in the first (Company Background and Industry Classifications) and last (Further Information) parts of the questionnaire respectively. The main reason was that the author tried to focus on the key variables at the beginning, while those relevant but sensitive questions were moved to the end of the questionnaire.

Thirdly, the researcher re-phrased the questions that respondents felt uneasy about answering. In order to assess the environmental factors that have an effect on a firm's business activities, the original questionnaire design included attempting to measure the importance and impact of the environment factors by using a 5-point and 11-point Likert scale respectively. But it was found that respondents misunderstood what they were asked and lost motivation when they were asked similar questions again. Respondents had a lot to say about some items but could make no sense of the others. This meant that each item had to be clearly identified by providing more details. Based on discussions with and advice provided by the interviewees, the original scales were replaced by a 7-point numerical scale to assess environment. This change enabled all later respondents to express their views on the business environment directly.

Value of pretests and pilot tests

Lessons learned

The fieldwork pilot studies made the researcher aware of some fundamental problems. First, pretests and pilot tests help to find out how long it takes to complete or respond to the questionnaire and made the

researcher realise that the revisions of the questionnaire, survey cost and the amount of personnel time required for the exercise had been underestimated. Secondly, counter to the researcher's original belief, some middle managers, especially, those working in global operational oil and gas service organisations, were not familiar with their corporate strategic directions. However, they contributed views on the business environment and they had an idea of how to compete in the marketplace in which they operate. Thus, a better strategy assessment approach should be carefully developed further. Thirdly, while the researcher used the questionnaire as a guide for interviews, it was found that in parts one and three, where 7-point and 5-point scales were used respectively, the respondents had difficulty in providing options compared with those who completed questionnaire by themselves. Thus, another Interview Guide should be developed based on the questionnaire for interview survey work.

The pretests and pilot tests helped to test the validity of the questionnaire. The results of pretesting indicate that, although Chinese managers were not familiar with western theories, they were capable of understanding strategic options characterised by Pearce and Robinson (1997), Porter (1980) and Bowman (1996), if the concepts were clearly explained. However, several respondents indicated that their organisations provided many principal products or services to their clients. Therefore, each different product or service might enquire a different strategic direction to be competitive. In this case, using Porter's generic strategy and Bowman's strategy clock models to assess competitive strategies for an organisation might result in a validity problem. In order to deal with this, a multi-category scale measurement combining the two models should be developed. Besides, both pretests and pilot tests indicated that the 7-point numerical scale did not completely reflect subtle attitude variations as several items did not apply to a certain organisation or several respondents had no feel for some topics. In order to eliminate the problems, the researcher should further consider whether to use a forced-choice or a nonforced-choice scale for the final revision of the questionnaire.

Developing research methods

The results of the pilot studies are being evaluated and used in making changes to not only the questionnaire but also the administrative procedures. Based on the above results of pretests and pilot tests, a multi-method approach has emerged. It will compose at least three and quite likely four steps. First, firms selected for participation in this study will be contacted by emails or phone calls. Permission for managers to participate will be obtained in advanced and the researcher will ask them which method, either mailing (email) or telephone, is best suited for their participation. After initial contact and confirmation, the researcher will act as appropriate. Four weeks after the first mailing, follow up emails or phone calls will be made to all mailing respondents to remind those who have not yet completed questionnaires to complete them and to thank those who have returned them. Then, a follow-up telephone interview will be conducted with all those who have not completed and returned their questionnaires. Finally, face-to-face interviews will be carried out where insufficient responses have been received.

The pretests and pilot tests helped the researcher to identify the most appropriate sampling technique and clarify the sample that should be selected. It was impossible to find a complete list of oil and gas companies in China and therefore the total population was difficult to identify. Combining snowball and convenience sampling (Saunders, Lewis and Thornhill, 1997, p.147), the following multi-stage sampling technique is being considered in the next phase of the study: select the most accessible cases, including those that participated in the earlier surveys and interviews; make initial contact with these cases; ask these cases to identify further cases; ask the new cases to identify further new cases (and so on); and continue the sampling process until the required sample size has been reached.

Dealing with zero/low response to mailing questionnaire

It was proved by the pilot tests that the response rate for mail-based questionnaire surveys was very low in China. Six key reasons for this were identified. First of all, senior managers were very busy and therefore not willing to contribute any time to complete a questionnaire, which they perceived to be

unimportant and non-beneficial to them. Secondly, a 12-page English version (19-page Chinese-English version) of questionnaire was too long and thirdly, the questions might not appeal to potential respondents because they were not familiar with relevant theoretical concepts. Fourthly, they did not trust using the postal system. In this circumstance, the potential respondents might have wondered whether this researcher was a commercial or political spy from the West and, for reasons of confidentiality, they were not willing to tell the truth in their answers and therefore declined to response. The fifth is a cultural reason - Chinese people are conditioned to give right or good answers. If they are not confident of being able to provide the right or good answers to questions, they might try to avoid answering. The last point is that most Chinese managers are willing to talk rather than write. Some respondents expressed a willingness to talk with someone they could get to know, rather than completing a questionnaire from a complete stranger.

How to increase the response rate in the actual study has to be further thought about. For the reasons explained above, several key issues must be taken into account. First, since the survey questionnaire is too detailed on some points, it should be shortened by reducing the number of questions, sections and sub-elements. The omitted content can be inserted into the next phase of the researcher's in-depth studies if necessary. Secondly, improving communication techniques is essential. The significance and importance of the work to the researcher and emphasis of the possible benefit of the survey to potential respondents should be clearly addressed in a covering letter or via an advance telephone call. In order to make a postal questionnaire more "user friendly" (Bourque and Fielder, 1995, p.82), a photograph of the researcher will be considered. Thirdly, there is the issue of obtaining help from the industry through the use of "guanxi" to increase trust. "Guanxi" proved to be very important in securing appointments with respondents in order to encourage them to become more amenable to replying to the questions. Finally, the mixed approach to distributing the questionnaire and the multi-stage sampling technique as stated above should be utilised.

Other difficulties

In one meeting, a senior manager was puzzling the purpose of the researcher's visit before interviewing. This respondent asked whether the researcher was doing the work for a foreign organisation or country and would any information obtained from the meeting be published. It was carefully explained that the interview was for the researcher's studies and that his response would be kept confidential. It was promised that no information would be published about the person or the organisation. Apart from the common business attitude of secrecy towards research like this, the political sensitivity of Chinese senior mangers, especially at state-owned enterprises, may also contribute to the difficulties of conducting research in China. One Chinese respondent said that he and the other managers were once told not to fill in any type of questionnaire when they were on a business trip abroad because foreign organisations tried to obtain confidential information from them. The respondent asked the researcher's opinion on this and the researcher expressed the view that such a hostile attitude smacked of cold-war thinking. If a survey questionnaire is anonymous, and responses to questions are regarded as confidential, and questions are not related to their commercial or corporate secrets, in most circumstances, they should not be so sensitive or worry too much. Other crucial challenges continually surfaced during the pilot work. There was a lack of authorised information on the Chinese oil and gas service sector, mainly due to the continuous restructuring of the state's oil and gas industry. Also, the total population was changing and therefore unknown. Existing literature on business research methods applied by Chinese scholars remains extremely scarce. In many cases, Chinese senior managers were not familiar with using English, so it is essential to prepare a Chinese version of survey questions when conducting research in China.

Latest Development

Based on the results of preliminary analysis, revision of the questionnaire is continuing in order to further improve its reliability, validity and sensitivity. Final revision of the questionnaire will be completed shortly and the project will proceed into the next phase of study: questionnaire survey. In June 2001,

subsequent questionnaires will be distributed to senior management within the oil and gas service industry in China, Singapore and Malaysia via the multi-method approach outlined above.

Acknowledgement

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Managerial Perceptions of the Business Environment:

An empirical pilot test in China

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Abstract

This paper seeks to (1) develop a well-defined typology for interpreting and analysing organizational environment (2) provide empirical evidence of the pilot test on the validity of the typology and (3) present the results on the managerial perceptions of the business environment in China. Results support our contention that the business environment for the oil and gas service industry in the South China Sea is uncertain due to the perception of managers that it is complex, dynamic and hostile. The environmental sectors of economics, technology, government regulations, customers and competitors present high levels of uncertainty for executives. Meanwhile, the findings provide initial empirical evidence that each of the external environmental sectors could indicate both opportunities and challenges to firms in the industry.

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1. Introduction

Early in the 1950s, organisational theorists started to investigate organisation-environment interaction (Tung, 1979) and they have found that the views of managers play a central role in learning about environment (Hegarty and Tihanyi, 1999). Strategic management theories and practices stress that understanding the business environment is crucial in every organisation's life. Managers are encouraged to become more responsive to the dictates of the external environment and are required to scan and assess environment conditions when making strategic decisions (Fahey and Narayanan, 1986). Fahey and Narayanan suggest that assessment implies identifying and evaluating how and why current and projected environment changes affect or will affect the strategic management of the organisation. Assessment attempts to investigate what the key issues are presented by the environment and what the implications of the issues are for the organization. Accurate assessment of the environment by managers may help bring about more effective organizational strategies and thereby higher performance for long-term success (Downey and Slocum, 1975; Hambrick, 1982; Daft, Sormunen and Parks, 1988; Hegarty and Tihanyi, 1999).

In spite of the fact that most literatures on organisational or strategic management theories have introduced the concept of the environment, comprehensive analyses or empirical studies of environmental characteristics are limited. Tung (1979) argues that a major obstruction has been how best to describe and conceptualise organisational environments. The reliability of an instrument for measuring manager perception on the business environment is still to be developed and tested. Given the distinction of the perceived business environment construct to theory and research in strategic management, research on managerial perception of the business environment remains an important theoretical and empirical task.

The concept of uncertainty has long been a central component of a number of theories of organisation and strategy. In recent years, researchers have devoted their attention to managerial perception under uncertain environmental conditions. The concept of the uncertainty of the perceived environment advanced by many researchers (Tung, 1979; Hrebiniak and Snow, 1980; Koberg, 1987, Daft, Sormunen and Parks, 1988) has been a key aspect of a number of strategy theories (Miles and Snow, 1978; Lawrance and Lorsch, 1967; Mintzberg, Ahlstrand and Lampel, 1998; Miller, 1993). Research (Ireland, Hitt, Bettis and Porras, 1987; Kotha and Nair, 1995; Sutcliffe and Huber, 1998; Sutcliffe and Zaheer, 1998; Elenkov, 1997; Simerly and Li, 2000) integrating the perspectives on organisational uncertainties has been developed. As Miller (1993) find out, "a major obstacle to empirical research on perceived environmental uncertainties is the lack of well-established measurement instruments. Existing measures from organisation theory suffer from conceptual problems and inadequate reliability and validity". That difficulty still exists.

In this pilot study, we address some of these concerns by examining the relative effects of the environment on the offshore oil and gas service sector (OOGSS) in the South China Sea. We studied executives' perceptions of the environmental characteristics in order to develop and test, on an empirical basis, an environmental typology grounded in organisational and strategy management theory.

China is a leading country in terms of oil and gas exploration and production (E&P) in East Asia. Now that China is moving towards membership of the World Trade Organisation and has secured the 2008 Olympic games, conditions in this emerging market are becoming much more optimistic for future's business developments. Until now, around 80 per cent of national offshore oil and gas has been produced from the South China Sea. ShenZhen, a city located in South China near Hongkong, is an offshore service and supply hub and therefore acts as a magnet to oil service companies within China and from overseas. That was the reason why this city was selected for the China pilot study.

There are three major reasons for choosing the OOGSS. First, this industrial sector is considered representative because it is characterised both by few players with large market shares and many players with fragmented market share engaged in different activities (Tan, 2001). Second, the sector is important because it services the needs of the wider oil and gas industry, other sectors of economically important energy industry, such as nuclear, coal, power generation and petrochemicals. Third, empirical studies examining the relative impacts of the business environment in the oil and gas service industry are rare.

The rest of this paper is organized as follows: Section two discusses the problems with existing environmental typology and develops an alternative approach; section three discusses the experimental method utilized in the study and examines the validity of the typology developed in this research; in the penultimate section, we present the results of the pilot research; and the final section presents discussions, including the implications and limitations of the empirical findings for theory and research.

2. Environmental typology

Duncan (1972) defines a concept to distinguish external environment from internal. The internal environment refers to all factors existing inside an organisation, including organisational culture, structure and functions. The external environment refers to all the forces outside the organisation. In this study, the term environment refers to the external environments. The features of a firm's external environment are described in numerous ways. Most strategy theories characterise environments in terms of their levels, e.g., general, industry and task environment, and firm specific variables (Duncan, 1972; Koberg, 1987; Daft, Sormunen and Parks, 1988; Ireland, Hitt, Bettis and Porras, 1987; Miller, 1993; Hegary and Tiahnyi, 1999; Luo and Park, 2001; Tan and Lischert, 1994). Thompson (1967) suggests that the priority for an organisation is to deal with the uncertain eventualities of the environment, particularly those of the task environment (Dill, 1958).

In the past, researchers have made a distinction between the composition of organisational environments and environmental characteristics or dimensions (Tung, 1979). The composition of environments refers to the factors or sectors encompassing the crucial environment, e.g., economic, regulatory, technological, social, customers, competitors, suppliers (Koberg, 1987; Daft, Sormunen and Parks, 1988; Ireland, Hitt, Bettis and Porras, 1987; Hrebiniak and Snow, 1980; Miles and Snow, 1978; Miller, 1993; Hegary and Tiahnyi, 1999; Luo and Park, 2001; Tan and Lischert, 1994). For environmental characteristics or dimensions, it refers to the aspects of the

environment confronting the organisation, e.g., complexity, dynamism, hostility (Daft, Sormunen and Parks, 1988; Tung, 1979; Hrebiniak and Snow 1980; Miles and Snow, 1978; Miller, 1993; Hegary and Tiahnyi, 1999; Simerly and Li, 2000; Luo and Park, 2001; Kotha and Nair, 1995; Tan and Lischert, 1994; Sutcliffe and Huber, 1997). The organizational environment could be static or dynamic, complex or simple, hostile or favourable (Mintzberg, Ahlstrand and Lampel, 1998).

Managers operating in the external environment context confront a variety of uncertain factors. International business management researchers have focused primarily on the assessment of political government policy and macroeconomic uncertainties and appropriate organisational responses. Some researchers in the strategy field emphasise that uncertainties are related to market demand for products or services, product and process technologies, the availability of critical inputs, and strategic actions by competitors and potential entrants (Miller, 1993).

Most commonly, general environmental uncertainty includes the uncertainty of politics, economics, social/culture and technology (PEST). Industrial or task environmental uncertainty encompasses suppliers, buyers, potential entrants, substitute products/services and rivalry among competitors. Some analysts (Sutcliffe and Huber, 1997) have identified industry environment characteristics in terms of industry concentration, entry barriers and changes in demand or changes in product characteristics. The category of firm-specific uncertainties pertains to uncertainties of operations, management, research and development and employee actions (Miller, 1993).

Previous research (Tan and Litschert, 1994; Miles and Snow, 1978; Hegary and Tihanyi, 1999; Hrebiniak, and Snow, 1980; Luo and Park, 2001) has developed a number of sectors or categories to measure the three dimensions of environmental uncertainty in general and task environment. However, the limitation of the validity of their environmental components is that the scope of the concept on each of the environmental factors is still too broad for Chinese managers to understand perfectly the meaning. For instance, when assessing regulatory environmental sector (Tan and Litschert, 1994), Chinese managers might wonder which levels of governmental regulations they should consider. Is it the international level, national level, or local level? As such, it is indeed necessary to develop a well-defined typology for interpreting and analysing three environmental dimensions.

In this research, the three environmental dimensions investigated were complexity, dynamism, and hostility. Using the above environmental components as a basis, it is possible to build a scale that categorises the environment and provides a rating for its degree of environmental uncertainty. The three dimensions were developed as the following typology presented in Table 1. Although some other researchers have proposed different environmental dimensions which may also produce a resulting degree of perceived uncertainty (Thompson, 1967; Lawrence and Lorsch, 1967; Tung, 1979), such as dimensions of the routiness of organisational environment (Tung, 1979), visibility of future (Luo and Park, 2001), they are not within the scope of this study.

TABLE 1

Environmental typology: Three dimensions versus defined environmental variables

Dimensions	Variables	7-point Bipolar Scale							
(I)		Homogeneity							Heterogeneity
Complexity	Environment	*simple*	1	2	3	4	5	6	7	*complex*
	Knowledge required	*simple*	1	2	3	4	5	6	7	*sophisticated*
	Market	*integrated*	1	2	3	4	5	6	7	*diversified*
	Technological level	*low*	1	2	3	4	5	6	7	*high*
	Products or services	*similar*	1	2	3	4	5	6	7	*dissimilar*
	Customer needs/wants	*same*	1	2	3	4	5	6	7	*different*
	Competitors	*domestic*	1	2	3	4	5	6	7	*worldwide*
	Industry firms	*a few*	1	2	3	4	5	6	7	*numerous*
	Operating skills	*decreased*	1	2	3	4	5	6	7	*increased*
	Operations/ marketing methods	*decreased*	1	2	3	4	5	6	7	*increased*
	Adopt new technology	*depends on others*	1	2	3	4	5	6	7	*use own developed technology*
(II)		Stability								Instability
Dynamism	Environment	*static*	1	2	3	4	5	6	7	*change*
	Government policies	*consistent confidence*	1	2	3	4	5	6	7	*create problems*
	Technology	*stable*	1	2	3	4	5	6	7	*change*
	Growth in number of firms	*slow*	1	2	3	4	5	6	7	*quick*
	Competitors' activities	*more predictable*	1	2	3	4	5	6	7	*less predictable*
	Clients' demands	*more predictable*	1	2	3	4	5	6	7	*less predictable*
	Service supplies	*more predictable*	1	2	3	4	5	6	7	*less predictable*
	Market share	*remains similar*	1	2	3	4	5	6	7	*rapidly changing*
	Adopt new tech	*gradually*	1	2	3	4	5	6	7	*straight-away*
(III)		Munificence								Hostility
Hostility	Environment	*favourable*	1	2	3	4	5	6	7	*hostile*
	Government regulations	*benefit*	1	2	3	4	5	6	7	*limit*
	Legal system	*well developed*	1	2	3	4	5	6	7	*not complete*
	Customs' impact	*positive*	1	2	3	4	5	6	7	*negative*
	Market size	*big*	1	2	3	4	5	6	7	*small*
	Market size	*increasing*	1	2	3	4	5	6	7	*decreasing*
	Industry	*profit*	1	2	3	4	5	6	7	*loss*
	Entry barriers	*high*	1	2	3	4	5	6	7	*low*
	Obtain resources	*easily*	1	2	3	4	5	6	7	*with difficulty*
	Relationships	*good*	1	2	3	4	5	6	7	*lack*
	Competitive situation	*choose customers*	1	2	3	4	5	6	7	*bid for contracts*
	Competitors	*fair competition*	1	2	3	4	5	6	7	*unfair competition*
	Customers switch to other competitors	*with difficulty*	1	2	3	4	5	6	7	*easily*
	Rivalry	*friendly*	1	2	3	4	5	6	7	*warlike*
	Use new technology	*others try first*	1	2	3	4	5	6	7	*first introduce*
	Promotion expenditure	*reduced*	1	2	3	4	5	6	7	*increased*

Uncertainty level: Low High

3. Perceived environment uncertainty

Complexity

Fahey and Narayanan (1986) define that complexity refers to the degree of similarity or differentiation between elements or entities within and across environmental factors or components. It pertains to the number and heterogeneity/diversity of factors and components in the external environment. Tung (1979) explains that the heterogeneity/diversity included two arrays of variables: the number of factors and components in external environments, and the relative differentiation or variety of these factors and components. Early work (Lawrence and Lorsch, 1967; Duncan, 1972; Tung, 1979; Downey and Slocum, 1975; Dess and Beard, 1984; Luo and Park, 2001) found that if the number and diversity of environmental factors or components increase, the executives' cognitive abilities to figure out the significances are increasingly limited. As a result, the level of perceived environmental uncertainty increases.

Dynamism

Previous research has directed attention to the managerial perception under changing environmental conditions and suggested that dynamism is an important dimension (Lawrence and Lorsch, 1967; Duncan, 1972; Tung, 1979; Dess and Beard, 1984). Industry dynamics have been viewed as giving rise to managerial uncertainties. They suggest that environmental dynamism is the product of several forces operating at one time, including the growth of the size and number of organizations within an industry, and the growth of the rate of technological change and its dispersion throughout the industry. Dess and Beard (1984) define environmental dynamism as the rate and the degree of instability of environmental change. Change rate refers to the frequency and enormity of turbulence of environmental factors and components. Instability may increase the complexity of environmental factors and require punctual organizational actions (Hegarty and Tihanyi, 1999). Miles and Snow (1978) emphasise that uncertainty refers to the unpredictability of environmental or organisational variables that have an impact on corporate performance. An effect of increasing levels of environmental dynamism is to reduce access to knowledge needed to make strategic decisions. This, in turn, reduces the stability and predictability perceived by executives regarding environmental factors or components (Tung 1979).

Tung (1979) defines that the concept of dynamism pertains to change rate, which includes frequency and magnitude of change; and the stability of change or predictability of the change pattern. If the change is more or less random rather than following a trend, the change may be too sudden and completely unpredictable for organisations to possess the capabilities to deal with the change. It was hypothesized that this sort of change would greatly increase the degree of environment uncertainty perceived by executives (Tung, 1979). When it is difficult or impossible for an organisation to predict the latest changes and grasp their implications of operations and activities, the dynamism dimension thus has an impact on the degree of uncertainty perceived by executives (Thompson, 1967; Duncan, 1972; Downey and Slocum, 1975, Tung 1979; Simerly and Li, 2000). Simerly and Li (2000) propose that greater environmental uncertainty is associated with greater environmental dynamism.

Hostility

Research has shown that there are two aspects to hostility (Luo and Park 2001). Firstly, it points out how critical are the resources controlled by each environmental sector and secondly, refers to the deterrence factor, in other words, the extent to which each environmental sector becomes a threat to the growth of an organisation. In the first case, hostility shows the extent to which resources required by the organisation are available in its environment and describes the capacity of the environment to support organisations in the marketplace (Fahey and Narayanan, 1986). In the second case, Pfeffer and Salancik's (1978) resource dependency theory proposes that organisations arrange their external relationships in response to the uncertainty rising from dependence on components of the environment. Using Tan and Litschert (1994) approach, suggesting from the resource dependence perspective, hostility focuses on the degree of the organisation's dependence on others for resources. The degree of dependency on the factors and components affect or restrict the executives' management capabilities for carrying out business activities. What is more, the level of perceived environmental hostility depends not only on resource availability, but also on relationships with direct environmental agencies and competition within the same industry (Mintzberg, Ahlstrand and Lampel, 1998). As the environment becomes less favourable or more hostile, firms are subjected to greater uncertainty (Tan and Litschert, 1994; Luo and Park, 2001; Kotha and Nair, 1995).

In summary, the levels of perceived environmental complexity, dynamism and hostility are associated with the influence of major environmental sectors upon organisations within the same industry. The greater the degree of the numbers and heterogeneity/diversity of the environmental sectors, the greater degree of environmental complexity; the greater the rate of change and unpredictability of the environmental sectors, the greater the degree of environmental dynamism; and the greater the degree of difficulties associated with resource availability and resource deterrence, the greater the degree of perceived hostility.

4. Empirical pilot study

One major task attempted by this pilot study was an examination of the relationship between perceived environmental uncertainty and environmental factors. There were two major foci. Some researchers (Tan and Litschert, 1994) have provided empirical evidence that the environment in China is dynamic, complex and hostile. Thus, we first sought to demonstrate that **the business environment of the oil and gas service sector in China would be seen as uncertain**. Some factors in general, industry and task environmental sectors would be perceived as having a greater influence than others in terms of the environmental uncertainties. Researchers (Hegarty and Tihanyi 1999) have found that sectors in the industry and task environment create greater perceived strategic uncertainty than sectors in the general environment. It was evident that senior managers perceived the customer and competitor sectors to be more uncertain than supplier factors in the task environment (Hegarty and Tihanyi 1999). The second focus may therefore be stated as follows: **Senior managers will perceive some external environmental sectors as having a higher level of uncertainty than other environmental sectors.**

Hegarty and Tihanyi (1999) propose that for success, it is also essential for a firm to be able to identify potential opportunities and challenges in the environment. Although some environmental events help businesses to sustain their competitive advantage, others may create hostile conditions for survival. In strategic management theories, it is very common to use strengths, weaknesses, opportunities and threats (SWOT) framework for assessing internal and external environmental factors. McNamee (1992) developed an approach to identify opportunities and threats of environmental sectors. He weighted the importance and impact of each of environmental sectors by using a 5-point scale from 1 to 5 and an 11-point Likert scale from –5 to +5. When importance and impact are multiplied, negative or positive results are possible. It was suggested that a positive result indicated an environmental opportunity while a negative one indicated a threat to the organisation examined. Due to the exploratory nature of this phase of the research project, we examined the above approach by posing the following open-ended question: **What will executives perceive the opportunities and challenges to be within the oil and gas service sector in China?**

Due to the lack of information, managers from major offshore oil and gas production companies and participating service companies were asked to estimate the total population of the service sector in Shenzhen. It emerged that there were around 50 to 60 organisations providing services and supplies to oil companies. 24 South China Sea-based executives (CEOs, general managers, directors and operation/business unit heads) from 23 offshore oil and gas services companies participated in a pilot questionnaire survey. The questionnaire was administered to each of these executives via email, face-to-face and telephone interviews and hand delivery. This was to establish the key issues considered important by executives and to enable improvements to be made to the content, layout and wording of the questionnaire. For reasons of confidentiality, the 23 participant service companies are identified by a code, namely PLf01, PLf02... and PLf23. Participant organisations were considered representative because they were the major players and they represented most service activities within the service sector. A more detailed description of the participating organisations and executives as well as data collection techniques is presented in Table 2. Due to the limited time made available, three participating managers could not finish their questionnaires. Consequently, only 20 completed questionnaires can be used for results analysis at this stage.

As said earlier, following numerous studies in organisational and strategic management theory, three dimensions of complexity, dynamism and hostility are assessed in this study. Based on a 7-point Bipolar rating scale, 36 items were measured to present the managerial perceptions of the business environment in China. Each of the bipolar adjectives anchors the right and left extremis of the scale. The respondents were asked to rate each of environmental variables by selecting a number from a scale ranging from 1 to7, with 4 presenting neutral ground.

Table 2: Companies of the participation in the pilot study in South China

Company code	Ownership style	Oil and gas industry services *	Respondents	Administering the questionnaire
PLf01	Share holding company	Upstream and service companies	Managing Director	Delivery and collection
PLf02	Foreign company	Services companies	Dist Rep.	Delivery and collection
PLf03	Joint venture	Upstream and service companies	Deputy Business Manager	Delivery and mailing return
PLf04	Domestic Private company	Upstream	Managing Director	Structured personal interview
PLf05	State-owned company	Other service companies	Marketing Manager	Delivery and self-completion
PLf06	Foreign owned office	Upstream, midstream and service companies	Operations Support	Delivery and self-completion
PLf07	Private company	Upstream and downstream	Deputy General Manager General Manager	Structured personal interview Structured personal interview
PLf08	Joint venture	Upstream and downstream	Manager	Structured personal interview (half completed)
PLf09	Foreign subsidiary company	Upstream	General Manager	Structured personal interview (half completed)
PLf10	Private company	Upstream, midstream and service companies	Managing Director	Delivery and collection
PLf11	Subsidiary company	Upstream	Vice President	Telephone interview
PLf12	Public company	Upstream	Vice President	Structured personal interview
PLf13	Foreign owned operating unit	Upstream	Operations Manager, China	Delivery and self-completion
PLf14	Foreign owned operating unit	Upstream and service companies	Operations Manager-China	Delivery and self-completion
PLf15	Joint venture	Upstream, midstream and service companies	Operation Manager	Structured personal interview
PLf16	Foreign owned office	Upstream, downstream, and service companies	Chief Representative	Structured personal interview
PLf17	State owned company	Upstream	General Manager	Structured personal interview (half completed)
PLf18	Joint venture	Upstream	Deputy General Manager	Delivery and collection
PLf19	Public company	Upstream	General Manager	Delivery and mailing return
PLf20	Joint venture	Upstream and downstream	Managing Director	Structured personal interview
PLf21	State owned company	Upstream	Vice General Manager	Structured personal interview
PLf22	Foreign company	Upstream	Commercial Manager	Structured personal interview
PLf23	Private company	Upstream and service companies	Vice General Manager	Structured personal interview

*Note: Oil and gas services are split in four. Upstream covers exploration and production; midstream covers transportation (pipelines and tankers), downstream covers refining marketing and sales, and service companies refer to any suppliers within the supply chain of the oil and gas industry.

The majority of this empirical study in China was to pilot test the primary data collection method and the reliability, validity and sensitivity of the survey questionnaire; and to generate early relevant primary data. The contents, layout and wording of the questionnaire changed over the period of this empirical fieldwork. Answers to 36 items are not complete in the 20 completed questionnaires and are therefore not available presented entirely. Collected data are thus not subjected to strict statistical techniques here. However, data analysis using descriptive statistics from SPSS software package has been used to present the results, that is, respondents' answers. Therefore, regardless of whether or not managerial perceptions on the business environment align the above stated foci can be examined.

5. Results

Preliminary analysis provides insights into the relative factors for explaining managers' perceptions of environmental uncertainties. The empirical findings reported in this paper prove that manager rankings of complexity, dynamism and hostility of environmental components vary from person to person. Results based on 20 respondents from the major oil and gas players indicate that the environment for the oil and gas service sector in the South China Sea is uncertain as managers perceive it to be complex, dynamic and hostile (see Table 3).

TABLE 3
Descriptive Statistics: Perceived Environmental Uncertainty

Environment	N (cases)	Minimum	Maximum	Mean
SIMPLE/COMPLEX	20	2.00	7.00	4.8000
STABLE/DYNAMIC	20	2.00	7.00	4.8500
FAVOURABLE/HOSTILE	20	1.00	7.00	4.6000

Evidence also shows that executives perceived economic and technological factors as key indicators of uncertainty in the general environment; and customers, competitors and rivalry within the existing industry had stronger influences than other sectors in the industry or task environment. The environment was complex for the reasons of required sophisticated knowledge; diversified markets involved; desired high technologies in marketplace; a combination of worldwide competitors; increased operating skills; increased operations and marketing methods; and the ability of firms to use their own technologies developed in house.

There were three environmental factors that resulted in dynamism: a quick increase in the number of organisations within the industry; and rapid change of market share. The environmental factors which indicate hostility were: negative influences of domestic Customs procedures; high barriers to new entrants; the level of effort needed to win contracts; perceived unreasonable competitive practices; customers switching easily to other competitors; a perceived hostile rivalry within the industry; the tendency for some organisations to introduce new technologies first; and enhanced marketing activities such as increased promotional expenditure (Table 4).

TABLE 4

Descriptive Statistics: Perceived complexity, dynamism and hostility

(I) Complexity Assessment

Variables	Bipolar	N (cases)	Minimum	Maximum	Mean
Knowledge required	SIMPLE/SOPHISTICATED	20	2.00	7.00	5.4000
Market	INTEGRATED/DIVERSIFIED	20	1.00	7.00	4.1500
Technological level	LOW/HIGH	19	2.00	7.00	4.6842
Products/services	SIMILAR/DIFFERENT	20	2.00	6.00	3.9000
Customer needs/wants	SAME/DIFFERENT	20	1.00	7.00	3.9000
Competitors	DOMESTIC/ WORLDWIDE	14	1.00	7.00	4.8571
Industry firms	A FEW/NUMEROUS	20	1.00	7.00	3.3500
Operating skills	DECREASED/INCREASED	13	2.00	7.00	4.9231
Operations/marketing methods	DECREASED/INCREASED	13	3.00	7.00	4.7692
Adopting new technology	DEPEND ON/USE OWN TECH	14	1.00	7.00	4.4286

(II) Dynamism Assessment

Variables	Bipolar	N (cases)	Minimum	Maximum	Mean
Government policies	CONFIDENCE/PROBLEMS	20	1.00	5.00	3.4000
Technology	STABLE/CHANGING	20	1.00	7.00	4.0000
Growth in number of firms	SLOW/QUICK	13	2.00	7.00	4.3077
Competitors' activities	MORE PRED./LESS PRED.	13	2.00	5.00	3.9231
Clients' demands	MORE PRED./LESS PRED.	14	1.00	5.00	3.2857
Service supplies	MORE PRED./LESS PRED.	13	2.00	5.00	3.0000
Market share	SIMILAR/CHANGING	13	1.00	6.00	4.4615
Adopting new technology	GRADUALLY/STRAIGHT-AWAY	13	1.00	7.00	3.7692

(III) Hostility Assessment

Variables	Bipolar	N (cases)	Minimum	Maximum	Mean
Government regulations	BENEFIT/IIMIT	20	1.00	7.00	3.9500
Legal system	DEVELOPED/UNCOMPLETED	13	1.00	7.00	4.0000
Customs' impact	POSITIVE/NEGATIVE	13	1.00	7.00	4.9231
Market size	SMALL/BIG	13	2.00	7.00	4.3077
Market size	INCREASING/DECREASING	14	1.00	7.00	3.8571
Industry	LOSS/PROFIT	13	3.00	7.00	5.2308
Entry barriers	LOW/HIGH	13	2.00	7.00	4.2308
Obtaining resources	EASILY/DIFFICULTY	20	2.00	6.00	3.7500
Relationships	GOOD/LACK	20	1.00	6.00	3.4000
Competitive situation	CHOOSE CUSTOMER/BIT FOR CONTARACTS	20	2.00	7.00	5.2000
Competitors	FAIL/UNFAIL	20	2.00	5.00	4.1000
Customers switch to other competitors	WITH DIFFICULTY/EASY	13	3.00	6.00	4.3077
Rivalry	FRIENDLY/WARLIKE	20	1.00	7.00	4.3000
Using new technology	WAIT/FIRST	20	2.00	7.00	4.7000
Promotion expenditure	REDUCED/INCREASED	13	3.00	7.00	4.8462

The oil and gas firms found business opportunities and faced challenges at the different external environmental levels. It was found that an environmental sector was

perceived to include both challenges and opportunities for the offshore oil and gas service sector in the South China Sea (Box 1).

BOX 1
Opportunities and challenges for the oil and gas service sector in China
(Number of cases: 20)

Environmental sectors	Opportunities	Challenges
Political (policy and regulatory)	• Join World Trade Organisation (WTO). • Stricter environmental requirements (increase the demand for high quality products). • Restructuring within the oil industry in China.	• Nationalisation trends bring more market protection to national suppliers. • State-owned companies are protected. • It is not a regulated and standardised market.
Economic	• New entrants gain entry to the sector because oil companies reduced their costs when oil prices fell. • More capital injection into exploration in the South China Sea east sector. • Major oilfield discoveries. • Increasing offshore activities. • New oilfields are under development. • The increasing need for integrated services and program management. • Continually market expand	• Current oilfields are becoming mature. • Oilfield market demand reduces when it has been developed for a long time. • The total size of our niche industry market is reducing. We are seeking changes, such as changing our investment directions and jumping out the oil industry for new opportunities. • Demand is limited in a certain market. This requires involvement in a diversified marketplace.
Social	• A good Guanxi -personal relationship brings opportunities.	• Even though we have good technologies and quality, it's no use without a good Guanxi.
Technological	• Mainland oilfields are mature, with a high "water-cut" (water content) and new technologies are needed to help operators to reduce their costs. • Industry's highly specialised (technological) characteristics.	• Improve and renew hi-tech equipment and technology. • Technology research and development are required to meet clients' rapid changing needs. • Lack of our own core technologies.
Industry/Task environment	• Long-term co-operation relationships with oil clients • Our clients trust us because we have created an honest image among our customers. • Oil companies development. If they find oil, it means we will have opportunities. • The planning characteristics of oil companies suggest what the business opportunities could be.	• The competencies of (Chinese) domestic oil and gas service suppliers become stronger and stronger. • The competition within the industry is fierce, turbulent and unreasonable. • The others are able to do what we can do. • Our suppliers raise price or reduce quality.

6. Conclusion

The principal findings of this empirical pilot study in China show that it is possible both to conceptualise and to analyse organizational environments in terms of three dimensions. The three environmental characteristics - complexity, dynamism, and

hostility were shown to be significant interpreters of the degree of the perceived environmental uncertainty. It is also believed that the results of this pilot study provide a significant improvement in terms of measuring the three environmental dimensions. A better-defined environmental typology can assist organizational and strategy theorists and researchers to identify more clearly the problems confronting organisations in each of the different environmental sectors. In addition, with better-defined variables, the survey questions are found to be more effective as they helped to avoid misunderstanding of the issues investigated.

Secondly, the findings of this pilot study provide evidence that an environmental sector cannot be considered as an indicator of only either opportunity or challenge. Each environment sector might indicate both opportunities and threats for the oil and gas service sector. McNamee's (1992) technique of assessing environmental opportunities and threats is deemed inappropriate. Finally, the findings of this empirical pilot study have widespread implications for the next stage of our research on strategic management theory. One limitation of the questionnaire is that the reliability and validity should be further tested and adjusted. Moreover, the variables designed for measuring the three dimensions of environment could be improved further.

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EFFECTIVE BUSINESS STRATEGIES IN EAST ASIA: EMPIRICAL EVIDENCE

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Abstract

This paper addresses various types of business strategies adopted by oil and gas supply and service companies operating in East Asian countries like China, Singapore and Malaysia. Based on Miles and Snow's typology, it provides empirical evidence gathered from a survey completed mainly by senior managers and business or regional heads from 70 firms. By presenting the results on strategic orientations and performance, we are able to identify the types of business strategy that deliver the best organisational performance for firms operating in East Asia. Results support our contention that the strategic directions of the firms operating in the region can be categorised into five groups: Prospector, Defender, Analyser, Balancer and Reactor. Among the five strategic orientations, we found that Balancer organisations displayed the highest strategic performance while the strategic performance of Reactor organisations was relatively poor. The result also indicates that the service companies in China were more aggressive or reactive than Singapore-based organisations.

Introduction

China is the leading oil and gas exploration and production (E&P) country in East Asia. Malaysia ranks as an attractive emerging E&P market, where there has been substantial oil and gas activity for over 30 years. Having been supported by its government, Singapore has been the preferred regional hub for numerous international oil and gas supply and service companies since the 1960s (DTI, 1996; EIA, 2000). These three countries are considered politically stable and offer profitable business opportunities. The magnitude of their contribution to the oil and gas industry in East Asia is considerable.

For different industries in different countries, the strategic directions pursued by firms can be different. What are the general trends of business strategies adopted by existing firms in East Asia? This is an essential question for senior managers to take into account as they seek to apply better business practice in the region. Yet little or nothing is known about the solutions needed for the oil and gas service companies to survive and prosper long-term. Particularly, business strategies adopted by such companies operating in East Asia have not been researched to any great depth. In order to fill this gap, conducting research into what effective business strategies they need is essential. A general objective proposed in late 1999 guiding this study was to examine the common trends concerning strategic orientations across the existing oil and gas service organisations in the East Asian business environment.

In this study, the service sector comprises organisations which supply products and services to the oil and gas industry. The service companies serve the needs of the wider oil and gas industry and other sectors of economically important energy industries, such as nuclear energy, coal, power generation and petrochemicals. They range from small to very large indigenous and international firms, including technology intensive and labour intensive enterprises. This service sector is characterised both by few players with large market shares and many players with fragmented market shares engaged in a wide range of different activities. The scope of service activities covers businesses such as oil and gas drilling, logistics, oilfield chemicals, engineering and construction, equipment leasing, as well as environmental, geological, well testing and catering services, etc.

The rest of this article is organised as follows: It deals first with the conceptual framework of the existing typology of business strategies and strategy-performance relationship. Next, it briefly presents hypotheses and then outlines the methods concerning research measures and approaches used for data collection and preliminary analysis. In the penultimate section, it reports findings of descriptive statistics. Finally, it draws conclusions on the implications and limitations of the empirical findings for theory and research.

Conceptual framework

Typology of business strategies

Miles and Snow (1978) propose that organisations develop relatively enduring prototypes of strategic orientations in line with characteristics like the range of products and markets, technology solutions, desired growth pattern, and attitude toward change. In this study, a conceptual framework of five types of business strategies, namely, Defender, Prospector, Analyser, Balancer and Reactor, was developed.

Defenders seek stability and control in their operations to maximise efficiency. They provide a narrow range of products/services to serve well-defined niche markets. Normally, they focus on a single core technology and typically grow by market penetration. In contrast, Prospectors provide a broad range of products/services and create changes in the industry. They pursue growth through product and market development. Analysers emphasise both stability and flexibility and follow keenly the most promising changes developed by Prospectors and Defenders. Reactors are naturally unstable in terms of their adjustment and lack consistency in strategic options. As a result, the Reactors' performance is relatively poor.

Researchers such as Hambrick (1982) criticise the Miles and Snow typology on the grounds that it is not the most elaborate framework that could be chosen. A later study by Wright *et al.* (1990) suggests a good-performing amalgamation strategy: the Balancer. They assume that the Balancer combines the features of Defender, Prospector and Analyser. Parnell, *et al* (2000) summarise the Balancer as having three separate product-market spheres. The feature in the first sphere is very similar to that of Defenders whose managers stress the domain of existing products/services and customers. The second sphere resembles the Analyser type. Conducting technological changes is encouraged in order to imitate the best of products and markets developed by Prospectors. In the third sphere, managers attempt to initiate changes within the industry. The strategically operational style tends to bear a resemblance to the characteristic of Prospector organisations.

Strategy-performance relationship

Researchers (e.g. Wright, *et al.* 1995; Croteau and Bergeron, 2001; Parnell, *et al*, 2000) have not only attempted to classify business strategies into typologies but also studied more effectively relations between strategy and other variables like performance. A common observation is that the more specific the type of business strategy adopted by an organisation, the better the organisational performance. However, there should be a negative link for the Reactor type, which means that Balancers are high performers while Reactors are low performers (Parnell, et al, 2000). In their work, Croteau and Bergeron (2001) also discover that there is a positive link between strategic activities and performance for Prospectors whereas there is a negative link for Reactor. Slater and Olson (2000) focus on the evidence that Prospectors, Analysers and Defenders can achieve superior performance when implementing strategies appropriately.

In this field of studies, empirical evidence has also been gathered in China. Tan and Litschert (1994) find that defensive-oriented strategies are related to higher overall performance. Luo and Tan (1998) further prove that both Defender and Analyser strategies are positively and significantly related to the Chinese firms' financial performance. Luo and Park (2001) provide evidence showing that the Analyser orientation organisations yield a high performance, while the Prospector and Defender orientations lead to poor financial performance when mismatching with a highly dynamic and complex China's market. Since similar empirical research in the oil and gas service sector are rare, this study sought to examine the typology of business strategy and also correlate this with the assessment of managerial perceptions of strategic performance.

Hypotheses

The present study is exploratory as there is no readily available conceptual framework that has been utilised and tested in the identified industrial sector. In order to construct a picture of business practice of service firms operating in East Asia, the hypotheses examined in this study can be summarised as follows:

> Hypothesis 1: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, senior managers' perceptions of their business strategies will be different, and, based on managerial identifications, organisations will be able to be categorised into five major strategic categories: Prospector, Defender, Analyser, Balancer and Reactor.
>
> Hypothesis 2: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, strategic performance will be associated with strategic orientations: Balancers and Analysers will outperform organisations in other categories of strategic orientations; having a Reactor character will yield the organisation a relatively poor strategic performance; strategic performance of Defenders and Prospectors will stand in the middle among the five groups of organisations.
>
> Hypothesis 3: For oil and gas service organisations operating in East Asian countries like China, Singapore and Malaysia, in order to achieve a long-term success, most organisations will seek to adopt a Balancer or Analyser strategy whereas a Reactor strategy will not be a preferred option by senior management.

Research methods

Measures

Business strategies

We measured the construct of business strategy by examining the above generated five types of strategic orientation. Based on the original Miles and Snow (1978) typology, contemporary writings and the discussions with the industry experts and managers, the appropriate measures were constructed which assessed 1) the range of product/service domains; 2) the growth pattern; 3) the attitude toward change; and 4) the approach of managing change.

22 questions were designed to deal with the variations of managerial perceptions of strategic orientation (see Appendix). Of those, three questions were related to whether they had clearly articulated business strategies in supporting the assignment of strategic categories. Questions were randomly arranged to eliminate a questions ordering bias. The participants were asked to respond, by justifying from their own experience, how they felt about each topic. All responses were measured on a 7-point numerical scale (Zikmund, 2000), with 1 indicating strong agreement; 7 indicating strong disagreement.

The present study allocated strategic orientations for businesses based on an approach developed by Parnell, *et al.* (2000). A business was categorised as pursuing the strategy reflected by the highest number of its responses. When there was a tie between Defender and Prospector strategies, the business was classified as an Analyser. When there was a tie among

all non-Reactor strategies, the business was classified as a Balancer. When there was a tie between the Reactor and one or two other strategies, the business was classified as a Reactor.

Strategic performance

In this study, we also measured managerial perceptions of strategic performance. Performance has been of interest to both academics researchers and practising managers. There is literature widely available for the assessment of organisational or business performance and there are numerous ways to measure the performance (Nash, 1983). Slater and Olson (2000) suggest that performance is a complex multidimensional construct that is influenced by both the level of analysis (i.e. individual, business unit, or organisation as a whole) and strategy type. However, Croteau and Bergeron (2001) argue that measuring organisational performance can be a problem because no universally recognised measure of this concept is available. Today, the academic debates about issues of terminology, level of analysis, and conceptual bases for assessing performance are still on going.

The most dominant model in empirical research on business or organisational performance is based on the simple outcome of financial indicators and is referred to as the financial performance (Yamin *et al.*, 1999). Typical financial indicators usually include sales or production turnover, profitability and total asset growth. Some strategy studies have employed market or value-based measurements in conjunction with financial based measures because of their relevance regardless of types of strategy (Parnell *et al.*, 2000). In addition to indicators of financial performance, another broader conceptualisation of business performance would include non-financial emphasis indicators such as operational performance (Helm *et al.*, 1997). The available measures can be product or service quality, effectiveness, efficiency, added value and technological reliability.

In order to measure the fulfilment of the overall goals of business, using only the single functional performance approach is not an appropriate solution applied in this study. The concept has therefore been expanded to a wider range including the indicators which are assumed to reflect the general achievement of an organisational business. This concept is referred to as strategic performance that covers the organisational activities such as marketing, operations, finance, human resource management and organisational image.

Another set of 20 questions was formed to evaluate strategic performance (see Appendix). These questions were developed based on strategic management text books, previous research and an empirical pilot study carried out in early 2001 in China (Tan, 2001). It is difficult to access directly organisational archive data such as financial or marketing figures as they are usually viewed as being sensitive and confidential. Consequently, this study employed a subjective measurement (Dess and Robinson, 1984) that calls upon the managerial perceptions. The reliability of this self-reporting approach has been proved by various studies (Tan and Litschert, 1994; Luo and Tan, 1998; Luo and Park, 2001). However, a five-point Likert scale (from bottom 20% to top 20% in the industry) was inappropriate because the relevant information of the oil and gas service sector in China, Singapore and Malaysia was unavailable or hard for respondents to obtain. To solve this, a 7-point interval scale was drawn from Ramanujam and Venkatraman's (1987) work, with 1 indicating much less or worse and 7 indicating much more or better (see Appendix). For simplification, the average score of each case has been adopted as a result of strategic performance.

Data collection and preliminary analysis

The collected data was based on a questionnaire survey sent to the senior managers of the oil and gas service companies operating in East Asian countries like China, Singapore and Malaysia. Apart from the above mentioned two sets of questions, the questionnaire also includes a background section, which seeks to gather the basic information on the legal status, location, size, age, and ownership of the participating organisations as well as the job title of person responding. Both closed and open-ended questions were used in this section.

Samples included either foreign or domestic oil and gas service companies generating their business mainly in the domestic market. We focused on independent entities, which had their own strategic decision-making and control centres particularly foreign companies operating internationally.

The formal questionnaire survey addressed to senior management was progressed as follows. 400 questionnaires were distributed to the senior management respondents via post (mainly), email and fax in October 2001, followed by a second round mail-shot by December. Each of the packets mailed contained a covering letter with the correspondent's photograph on it, the questionnaire and a self-addressed envelope for return. By February 2002, 78 completed questionnaires had been returned by managers involved in operating businesses in China, Singapore and Malaysia. The postal survey response rate at this stage is near 20 per cent. 70 completed questionnaires were usable for preliminary data analysis.

The preliminary analysis was conducted by employing techniques such as frequency, explore, and cross-tabulation descriptive statistics. Frequency and cross-tabulation statistics describe a picture of the participating organisations; and explore statistics assess the relationship between strategic orientations and performance. In order to distinguish the companies in China from the firms in Singapore and Malaysia, a comparative analysis method was utilised. Excel and SPSS software package for data analysis were used and the research findings are presented below.

Findings

Participating organisations

Among the 70 participating organisations (Table 1), 28 were independent companies, 29 were division or subsidiary companies and 13 were operating or business units with 26 situated in China, 34 in Singapore, 4 in Malaysia and 6 in the other countries such as Thailand and the UK. For companies situated outside China, Singapore and Malaysia, they operated business in the above three countries, but their business strategic decisions were made by headquarters elsewhere. More than 95% of the organisations had been in business under their existing forms for more than five years.

The participating organisations are representative in terms of types of ownership. Of those enterprises, 12.9% were wholly domestic state owned; 17.1% were wholly domestic private or individual; 38.6% were wholly foreign owned; 20% were joint ventures; and 11.4% belonged to other types of ownership. Most respondents were senior managers (managing directors, general managers, CEOs or presidents) and operating or business unit heads.

Table 1 Frequency: Participating Organisations Operating in East Asia (n=70)

	Frequency	Percent
Legal Status Category		
Independent company	28	40.0
Division/subsidiary company	29	41.4
Operating/business unit	13	18.6
Country Where Based		
China	26	37.1
Singapore	34	48.6
Malaysia	4	5.7
Other countries	6	8.6
Years Since Present Business Form		
<5 years	3	4.3
5 to <10 years	27	38.6
10 to more than 10 years	40	57.1
Ownership Category		
wholly domestic state owned	9	12.9
wholly domestic private/individual	12	17.1
wholly foreign owned	27	38.6
joint venture	14	20.0
Domestic share holding/ public limited company	5	7.1
other types	3	4.3
Respondent's Position		
Senior Manager	45	64.3
Business or Regional Head	22	31.4
Functional Head	3	4.3

Strategic orientations

From the strategic orientation and country-based Cross-tabulation table (Table 2), we discover that, the oil and gas service firms operating in East Asia are assigned as 10 Balancers, 43 Analysers, 6 Prospectors, 2 Defenders and 9 Reactors. In each of the selected East Asian countries, the majority of strategic options was Analyser while the minority was Defender. For example, for 26 China-based organisations, 61.5% were Analysers; for 34 Singapore organisations, 58.8% were Analysers; for organisations situated in either China or Singapore, the fewest companies were Defenders.

Notably, the result shows that 80% of the Balancers were from Singapore, but only 10% of the Balancers were from China; while, compared with Singapore organisations, more China-based organisations deployed a Prospector or a Reactor strategy. This indicates that organisations situated in China were relatively more aggressive or reactive than Singapore organisations.

Table 2 Strategic Orientation and Country-Based Cross-tabulation

			Country Where Based				Total
			China	Singapore	Malaysia	Other Countries	
Strategic Orientation	Defenders	Count	1	1			2
		% within Strategic Orientation	50.0%	50.0%			100.0%
		% within Country Where based	3.8%	2.9%			2.9%
	Prospectors	Count	3	2		1	6
		% within Strategic Orientation	50.0%	33.3%		16.7%	100.0%
		% within Country Where based	11.5%	5.9%		16.7%	8.6%
	Analysers	Count	16	20	3	4	43
		% within Strategic Orientation	37.2%	46.5%	7.0%	9.3%	100.0%
		% within Country Where based	61.5%	58.8%	75.0%	66.7%	61.4%
	Balancers	Count	1	8		1	10
		% within Strategic Orientation	10.0%	80.0%		10.0%	100.0%
		% within Country Where based	3.8%	23.5%		16.7%	14.3%
	Reactors	Count	5	3	1		9
		% within Strategic Orientation	55.6%	33.3%	11.1%		100.0%
		% within Country Where based	19.2%	8.8%	25.0%		12.9%
Total		Count	26	34	4	6	70
		% within Strategic Orientation	37.1%	48.6%	5.7%	8.6%	100.0%
		% within Country Where based	100.0%	100.0%	100.0%	100.0%	100.0%

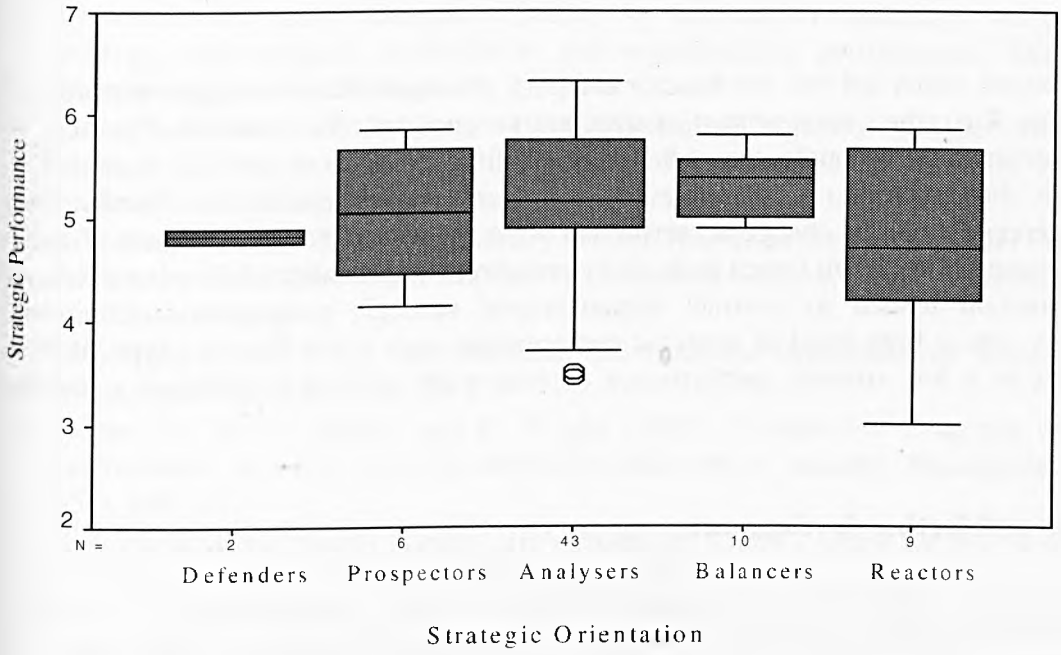
Strategic orientations and associated performance

Box plot chart and descriptive statistics were used to explore the relationship between the identified strategic orientations and performance (Figure 1). The mean of the strategic performance is 5.3550, 5.1842, 5.0333, 4.8250 and 4.7989 assessed by managers from the Balancer, Analyser, Prospector, Defender and Reactor organisations respectively. We can also see that the largest median (5.3750) appears among the Balancer organisations and the smallest lower median (4.7000) is within the Reactor category. In addition, the characteristics of organisations under different strategic tracks and the associated strategic performances are summarised as follows:

Defenders

Defender organisations attempted to devote attention to the operational efficiency for their existing business while avoiding rapid adjustments in organisational structure or methods of operation. They tended to ignore developments outside established business and focus on well-defined customer groups with a full set of products or services. Defender organisations were not associated with a higher level of strategic performance.

Figure 1 Explore Statistics: Strategic Orientations and Performance



Descriptive

	Strategic Orientation		Statistic
Strategic Performance	Defenders	Mean	4.8250
		Median	4.8250
	Prospectors	Mean	5.0333
		Median	5.0500
	Analysers	Mean	5.1842
		Median	5.1500
	Balancers	Mean	5.3550
		Median	5.3750
	Reactors	Mean	4.7989
		Median	4.7000

Prospectors

Managers in Prospector organisations agreed that they sought to initiate changes in their industrial sector and lead innovation in the development of new products or services. Such organisations offered a broad range of products/services to the markets they served and grew mainly through product and market development as well as diversification. Their strategic performance appeared to be better than Defenders'.

Analysers

Organisations carrying out Analyser strategic orientations tended to adapt rapidly to the change developed by others. Some of their products or services and markets were stable, while others were changing. They were associated with a sound strategic performance.

Balancers

The essential feature of the Balancers is that they combined the characteristics of Defender, Prospector and Analyser. There are three types of scenario with regard to their attitudes towards change: they seldom made a rapid adjustment for their existing business; meanwhile,

they were able to adapt to changes created by others, and they were also capable of initiating changes within the industry. The Balancer organisations had an ideal strategic performance.

Reactors
For organisations which fell into the Reactor category, managers tended to agree with four of the statements. First, their management or structure was not linked to established strategy in an appropriate manner. Secondly, they adhered to existing structures or methods of operation, even though they were no longer relevant to environmental conditions. Thirdly, they frequently perceived crucial change occurring but were not always ready to respond. Finally, they made changes only when forced to do so by pressures. Organisations following a Reactor strategic direction tended to obstruct organisational strategic performance. Obviously, organisations with a high level of strategic performance were not a Reactive type. Rather, organisations in a low strategic performance context were inclined to embrace a Reactor strategy.

Conclusions and further development

Research findings derived from descriptive statistics prove our prediction in the first hypothesis that managerial perceptions vary amongst the oil and gas service organisations in China, Singapore and Malaysia. Participating organisations could be classified into five strategic groups: Prospector, Defender, Analyser, Balancer and Reactor. In particular, organisations operating in China were relatively more aggressive or reactive than Singapore organisations, which appeared to be better strategic players in the region of East Asia.

The descriptive statistic results also prove our contention in the second hypothesis that different strategic performances are associated with different strategic directions. Among the participating oil and gas service organisations that operate businesses in China, Singapore and Malaysia, those adopting Balancer or Analyser strategic orientations had a relatively high performance. Reactors performed relatively poorly, while the performance of Prospectors and Defenders stood in the middle.

The findings support partially our third hypothesis that the majority of the oil and gas service companies in East Asia is Analyser. The results disprove that a Reactor strategy would not be a preferred option by senior management. Fewest organisations were Defenders in this industrial sector in the East Asian business environment. Although the strategic performance of the cluster of Reactor organisations was poorer, quite a few service companies still followed a Reactor strategy.

At this stage of preliminary analysis, there are inevitable limitations to the findings. For instance, they lack sufficient responses from Malaysia. After some follow-up, more completed questionnaires have been returned from that country. What is more, since several respondents are functional heads, it is possible that they gave biased assessments of their organisations; the number of firms assigned into different categories of business strategic orientations is not balanced. These might influence the validity of the result analysis. It is intended to conduct additional statistic analysis such as correlation and regression to examine the research findings further.

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Appendix

Strategic Orientation

Strategy is defined as a pattern of organisational decisions for positioning a firm in the environment and guiding internal operations. From your knowledge, please assess each of the following statements by selecting the most applicable to your organisation over the **LAST 5 YEARS**.

1	2	3	4	5	6	7
strongly agree	agree	tend to agree	neutral	Tend to disagree	disagree	strongly disagree

(Circle one)

1.	We have clearly articulated our business strategy(ies).	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	We offer a broad range of products/services to the markets we serve.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	We direct our product/services to well-defined customer groups.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	We offer customers a full set of products/services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	Some of our products/services and markets are stable, others changing.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	We seek to increase use of existing products/services in existing markets.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	We seek to develop some products/services that are closely related to our existing products/services in existing markets.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	We seek to develop new markets for our existing products/services.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	We seek to introduce new products/services in our existing markets.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	We seek to generate unrelated new products/services and markets.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	We seek to create new products/services to make similar existing products/services obsolete.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	We devote attention to the operational efficiency for our existing business.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	We tend to ignore developments outside our established business.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14.	We seldom make rapid adjustments in our organisational structure or methods of operation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	We have a viable strategy but our management or structure is not linked to it in an appropriate manner.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	We adhere to our structure or methods of operation even though they are no longer relevant to environmental conditions.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	Within a single business activity, we switch between emphasising factors such as quality, unique features, price or other products/services attributes.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	We emphasise quality, price, unique features or other products/services attributes depending on the business activity concerned.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	We frequently perceive crucial change occurring but are not always ready to respond.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	We rapidly adapt to the change developed by others.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	We usually create change in the industry.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	We make changes only when forced to do so by pressures.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Strategic Performance

This part is concerned with how your organisation performance **changed** in the **PAST 5 YEARS**. In each of the following questions, to your knowledge, you may select only one by circling the number that best estimates your organisation's situation.

1	2	3	4	5	6	7
Much less	less	slightly less	no change	Slightly more	more	much more

1.	Total assets (current and fixed assets)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	Return on total assets (net profits after taxes to total assets)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	Annual sales/production revenue	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	Annual net profit margin (net profits after taxes to sales/production revenue)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	Total asset turnover (sales/production revenue to total assets)	**1**	**2**	**3**	**4**	**5**	**6**	**7**

1	2	3	4	5	6	7
much worse	worse	slightly worse	no change	slightly better	better	much better

6.	Products/services cost improvements	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	Price competitiveness	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	Products/services reliability (cost involved, ease of use, speed of delivery, technical support, service availability, etc.)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	Products/services quality	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10	Relationship with key customers	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	Capability of influencing customers' purchase decisions	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	Optimism of obtaining/resuming contracts	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	Key employment stability	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14.	Personnel calibre at all levels	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	Operational efficiency (do things right first time)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	Speed of innovation and implementation of change	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	Overall organisation effectiveness (do right things and eliminate non-positive impact activities)	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	Value added	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	General organisation image	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	Confidence to achieve growth	**1**	**2**	**3**	**4**	**5**	**6**	**7**

GENERIC BUSINESS STRATEGY, COMPETITIVE POSITION AND STRATEGIC PERFORMANCE: AN EMPIRICAL ANALYSIS OF FIRMS OPERATING IN EAST ASIA

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Abstract

Following Porter's typology, this paper seeks to test four strategic directions, namely differentiation, low-cost, hybrid and no-purpose. It also addresses various types of competitive positions based upon Bowman's strategy clock model. Empirical evidence was gathered from a survey completed mainly by senior managers and business or regional heads from 70 oil and gas supply and service companies operating in East Asian countries like China, Singapore and Malaysia. The results indicate that the majority of the participating organisations deployed a differentiation strategy while the minority of them employed a low-cost strategy. Among the four generic strategies, thirty per cent of the participating organisations pursue a hybrid strategy and these hybrid organisations yield a higher strategic performance. The strategic performance of the organisations in the no-purpose category is not the worst; rather, relatively poor strategic performance appears in the low-cost generic strategy context. Most organisations pursue a strategic competitive position of high customer added value at high or moderate prices and none is seen in a low value low price position. Within the high value category, it is discovered that strategic performance is associated with the level of price: organisations charging a higher-level price outperform those who provide prices at a lower level.

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Introduction

In most large organisations, there are a number of separate Strategic Business Units – SBUs (Hall, 1978) and their corporate strategies and business strategies are usually different; but in some organisations, especially small businesses, their corporate-level strategy and business-level strategy may be the same. In each incidence, it is important to be clear about the basis of strategic option at a business level (Johnson and Scholes, 1999). Miles and Snow's (1978) typology and Porter's (1980) taxonomy are two of the most widely accepted conceptual frameworks on business strategy (Carter, et al 1994; Slater and Olson, 2000). In this paper, the focus is on generic strategies advanced by Porter (1980, 1985) and competitive position based on Bowman's strategy clock model (Johnson and Scholes, 1999).

Porter (1980, 1985) emphasises that the basis of business generic strategy is how customer or client needs can best be met, usually through achieving a certain competitive advantage. A competitive position is the basis on which a business might achieve competitive advantage in its market (Johnson and Scholes 1999). Great attention has been attracted to analysing generic strategies and competitive positions associated with the organisational performance (Yamin *et al.*, 1999). However, the majority of research on business generic strategy has been conducted in relation to Western businesses. A limited number of studies have been conducted in East Asia. Little or nothing is known about the solutions needed for service companies within the oil and gas industry in China, Singapore and Malaysia. Empirical academic studies examining the competitive position for these service companies are also rare.

China is the leading oil and gas exploration and production (E&P) country in East Asia. Malaysia ranks as an attractive emerging E&P market, where there has been substantial oil and gas activity for over 30 years. Having been supported by its government, Singapore, the small island country, has been the preferred regional hub for numerous international oil and gas supply and service companies since the 1960s (DTI, 1996; IEA, 2000). These three countries are considered politically stable and in favour of profitable business opportunities. The magnitude of their contribution to the oil and gas industry in East Asia is considerable.

In this study, the service sector comprises organisations that supply products and services to the oil and gas industry. The service companies also serve the needs of the wider oil and gas industry and other sectors of the economically important energy industry, such as nuclear energy, coal, power generation and petrochemicals. They range from small to very large indigenous and international firms, including technology intensive and labour intensive enterprises. This service sector is characterised both by few players with large market shares and many players with fragmented market shares engaged in a wide range of different activities (Tan, 2001).

This paper emphasises the link between generic strategy, competitive position and strategic performance in an effort to construct, in strategic terms, a picture of the supply and service sector in the oil and gas industry in East Asia. It includes several perspectives. First, the theoretical context regarding the taxonomy of generic strategies and the types of competitive position are synthesised. Second, it specifies the research methods used for primary data collection and preliminary analysis. Third, the research results are presented and finally, an attempt is made to discuss the implications that have emerged from the empirical findings.

Theoretical context

Generic strategies

According to Porter (1980), businesses can attain significant and enduring competitive advantage over their rivals by adroitly pursuing generic strategies (i.e. cost leadership, differentiation, low cost focus or differentiation focus and multiple strategies). A firm failing to adopt its strategy in any one of the generic directions or engaging in each generic strategy without achieving any of them will stay in the position of being "stuck in the middle" (Porter, 1980, 1985).

The "focus" generic strategy is that a firm is concentrating on a number of particular market segments such as buyer group, division of the product line, or geographic market (Porter, 1985). Because the nature of this study accentuates business rather than marketing attributes, and in so far that no existing standards have been found to define the "focus" level for firms within the oil and gas service sector, the focus strategy is not included in this study. Consequently, attention has been devoted on the other types of generic strategies.

A number of empirical studies have been conducted to test the validity of Porter's (1980, 1985) generic strategies. The debates lie in two principal areas. In the first area, empirical investigations contradict the prospect on the pursuit of more than one generic strategy. The key point is that low cost and differentiation strategies are incompatible. Many researchers support the argument that, for higher business performance, an organisation has to choose either the low cost or the differentiation as a prior strategy, rather than both (Porter, 1985; Faulkner and Bowman, 1995). In the second area, some other researchers argue against Porter (1985) in the assertion of using a single generic strategy. They emphasise that a firm can pursue low cost and differentiation simultaneously and the combination of both strategies can also result in higher business performance (Chang and Wang, 1999; Proff, 2000).

Regardless of the above debates, a number of researchers (Helms *et al.*, 1997; Yamin *et al.*, 1999; Wright *et al.*, 1990) support both schools of thought and suggest that organisations should deploy generic strategies that best suit their circumstances. In this study, a taxonomic framework for generic business strategies has been generated based on conceptual theories and contemporary empirical studies. Four basic generic strategies are defined as low-cost, differentiation, hybrid and no-purpose (Figure 1).

Figure 1 The matrix of generic strategies

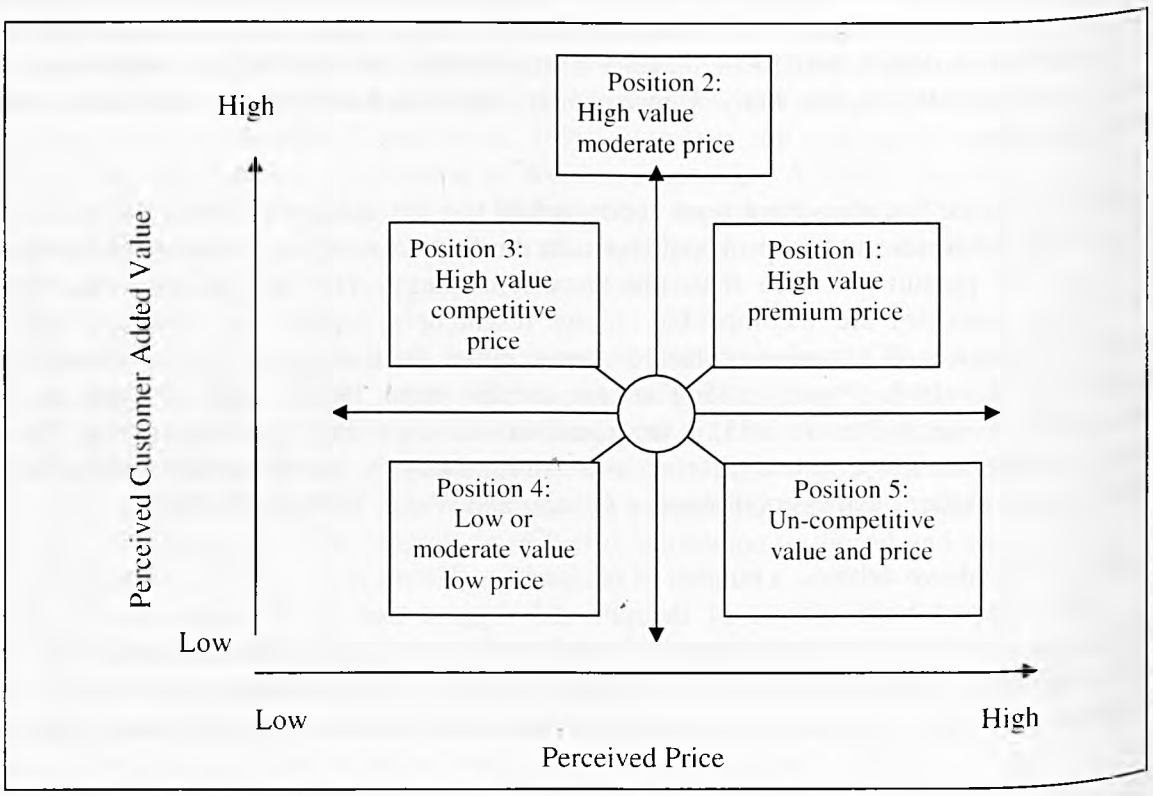
	Differentiating business	
Lowering cost	Yes	No
Yes	Hybrid	Low-cost
No	Differentiation	No-purpose

As Yamin *et al.* (1999) demonstrate, differentiation strategy aims at achieving, even at considerable cost, superior quality throughout the value chain and creating the image of an unique feature; while the emphasis of a low-cost strategy is on lowering cost more than competitors wherever possible. A hybrid strategy means that a firm seeks to deploy more than one of the generic strategies and achieves cost leadership and differentiation simultaneously (Johnson and Scholes, 1999; Proff, 2000; Porter, 1980). If a firm fails to develop its strategy in at least one of the three directions or, is inconsistent in pursuing the generic strategies, and achieves no competitive advantage, the firm has no distinctive strategy (Hunt, 1990). Such firms are described as no-purpose strategy organisations.

Competitive positions

According to Porter (1985), competitive advantage is the underlying concept of generic strategies. All organisations are in a competitive position in relation to each other as they compete either for customers or for resources (Johnson and Scholes, 1999). Because of the characteristics of the service sector within the oil and gas industry, firms compete mainly for customers (i.e. operators). In order to understand an organisation's strategic position within which it attains competitive advantage, the Bowman's strategy clock (Johnson and Scholes, 1999), which is advanced by Faulkner and Bowman (1995) as Customer Matrix, has been developed further in this study (Figure 2).

Figure 2 Strategic competitive positions



Two basic dimensions of the strategy clock are defined as Perceived Customer Added Value (PCAV) and perceived price. The PCAV is conceptualised by Faulkner and Bowman (1995) as Perceived Use Value. In this study, the PCAV refers to the senior managerial perceptions on the degree of the value that their businesses create to meet the satisfaction of customers. Perceived price refers to the level of price charged by firms for their products or services. In order to simplify, five basic competitive positions are defined as: high value premium (i.e. above the moderate level) price; high value moderate price; high value competitive (i.e. below the moderate level) price; low or moderate value low price, and un-competitive value and price.

Generic strategies, competitive position and strategic performance

Four assumptions were developed for investigation so as to explore the identified industrial sector. Porter (1985) suggests that in some industries with intense competition, focus or differentiation is the only way to achieve an above-average return. Hambrick (1983) has pointed out that, in a dynamic industry environment, the low cost strategy would be unlikely to be found. It has been discovered that the business environment in an East Asian country like China is dynamic (Tan and Lischert, 1994) and

competition within the oil and service industry in the region is fierce. What is more, for a firm pursuing the lowest cost, information on cost levels of competitors is usually very difficult to obtain (Faulkner and Bowman, 1995). Hence ***assumption 1*** is proposed as:

For oil and gas service companies in East Asia, low-cost generic strategy is not a preferred option by senior management.

Porter (1985) suggests that a firm achieving cost leadership or differentiation may potentially obtain above-average profitability performance of its industry. The rewards of achieving simultaneously cost leadership (which implies lower costs) and differentiation (which leads to premium prices) are also great because the firm gains extra benefits (Porter, 1980). Several researchers provide evidence to support Porter that a company adopting its strategy in a hybrid direction outperforms businesses pursuing a single generic strategy (Chan and Wong, 1999; Proff, 2000; Wright *et al.*, 1990).

The strategic situation of a firm is extremely poor when it develops its strategy in a way that has no distinctive emphasis (Porter 1980, 1985). Porter suggests further that such a firm is almost guaranteed low profitability because firms deploying low-cost, differentiation or hybrid strategies are able to sustain a stronger position and compete better in any segment. Researchers (Porter, 1980; Faulkner and Bowman, 1995) point out that, although a firm may have no distinctive emphasis on any generic strategies for achieving competitive advantage, it can still attain a satisfactory performance, notably through earning attractive profits.

There may be two reasons for this. First, the structure of its industry is highly favourable or secondly, the other firms in the industry do not adopt successfully any generic strategies. Nevertheless, in the long-term, those firms that have not made a choice between the generic strategy alternatives will be exposed when an industry becomes mature and competition is fierce (Faulkner and Bowman, 1995). Based on these debates, ***assumption 2*** and ***assumption 3*** are set up as:

Having a generic strategy such as low-cost or differentiation or hybrid yields the firm a higher level of strategic performance; and pursuing none of these three generic strategies (no-purpose) produces a relatively poor strategic performance.

Hybrid organisations outperform those competing mainly with either low-cost or differentiation strategy.

Helms *et al.* (1997) have pointed out that a firm's success is associated with the possession of strategic advantages, rather than strict adherence to Porter's generic strategies. They insist that the more the competitive advantages a firm holds the better the business performance it receives. Hence, ***assumption 4*** can be developed as:

Organisations that aim for the position of high value with competitive price outperform companies in other categories of competitive position.

Research methods

The research methods adopted in the construction of this paper refer to the techniques used in collecting and analysing data. The data was based on a questionnaire survey sent to the senior managers of the oil and gas service companies operating in China, Singapore and Malaysia.

Measures

Strategy type

As said earlier, based on Porter (1980, 1985), four generic strategies have been examined in this study. A 6-item scale was used to assess generic competitive strategies. If firms compete based on the highest quality or differentiate themselves from competitors in the industry, they were assigned to the category of differentiation organisations; if firms compete based on the lowest cost in the industry, they were categorised as low-cost organisations. If firms pursue both the lowest possible cost and the highest possible quality or a unique feature, and are able to compete, simultaneously, based on both the lowest cost and differentiated business, they were classed as hybrid organisations. In contrast, if firms seek to attain both cost leadership and differentiation yet fail to achieve a strategy in either direction, they were assigned to the category of no-purpose organisations. A 7-point numerical scale (Zikmund, 2000) was defined to measure each item, with 1 indicating strong agreement; 7 indicating strong disagreement.

Competitive advantage

Two dimensions were defined as perceived price and perceived customer added value. A 6-item scale was used in an attempt to construct a strategy clock for participating organisations. The perceived price was measured by managerial perceptions on the level of price charged. The perceived customer added value was assessed by the mean of managerial perceptions on five variables: quality valued by customers, technological reliability, safety performance, speed of responding to customers, price that customers are willing to pay. For the first five items, a 5-point scale was used with 1 indicating very low, 5 indicating very high and 3 indicating a moderate position. For the price that the customer is willing to pay, 1 indicates much lower than the service provider offers, 5 indicates much higher than the service provider offers, and 3 indicates the same as the service provider offers. By doing so, it was able to categorise five clusters of strategic competitive position for the participating organisations.

Strategic performance

Performance has been of interest to both academics researchers and practising managers (Nash, 1983). Slater and Olson (2000) suggest that performance is a complex multidimensional construct that is influenced by both the level of analysis (i.e. individual, business unit, or organisation as a whole) and strategy type. There is widely available literature for the assessment of organisational or business performance and there are numerous ways to measure the performance. Today, the academic debates about issues of terminology, level of analysis, and conceptual bases for assessing performance are still on going.

The most dominant model in empirical research on business or organisational performance is based on the simple outcome of financial indicators and is referred to as the financial performance (Yamin *et al.*, 1999). Typical financial indicators usually include sales or production turnover, profitability and total asset growth. Some strategy studies have employed market or value-based measurements in conjunction with financial based measures because of their relevance regardless of types of strategy (Parnell *et al.*, 2000). For example, Porter (1985) uses a U-shaped relationship between return on investment and market share to reveal performance. In addition to indicators of financial performance, another broader conceptualisation of business performance would include non-financial emphasis indicators such as operational performance (Helm *et al.*, 1997). The available measures can be product or service quality, effectiveness, efficiency, value-added and technological reliability.

In order to measure the fulfilment of the overall goals of an organisation or business, it is considered that only the single functional performance approach is not an appropriate solution applied for this study. The concept has therefore been expanded to a wider range including the indicators that are assumed to reflect

the general achievement for an organisation or business. This concept is referred to as strategic performance.

It is difficult to access directly organisational archive data such as financial or marketing figures as they are viewed mostly to be sensitive and confidential. Bearing this in mind, this study has focused on the empirical evidence of the managerial perceptions on strategic performance. A 20-item scale was developed covering overall organisational activity areas such as finance, operations, marketing, human resource management and image. A 7-point numerical scale was drawn from various studies (Tan and Litschert, 1994; Luo and Park, 2001) with 1 indicating much less or worse and 7 indicating much more or better. The average score of each case has been adopted for the strategic performance assessment.

Questionnaire survey

400 questionnaires were distributed to the senior management respondents via post (mainly), email and fax in October 2001, followed by a second round mail-shot by December. Each of the packets mailed contained a covering letter with the correspondent's photograph on it, the questionnaire and a self-addressed envelope for return. A Chinese version of the questionnaire was checked by Chinese experts and Chinese oil and gas industry managers. The participants were asked to respond, by justifying from their own experience, how they felt about each topic. The samples selected included either foreign or domestic oil and gas service companies generating their business mainly in the domestic market.

By February 2002, there were 78 completed returns out of a total of 400 questionnaires sent resulting in a response rate of 19.5% at this stage. 70 completed questionnaires were usable for preliminary data analysis. For the reasons of confidentiality, the names of respondents and companies were classified in a code term. The associated details of these companies can therefore not be identified by anyone except the correspondent researcher.

Preliminary analysis

The preliminary analysis was conducted by employing techniques such as Frequency, Explore and Cross-tabulation descriptive statistics. Frequency statistics describe a picture of the participating organisations; cross-tabulation can be used to observe the interrelation between generic strategy and competitive position; explore statistics assess the relationships between generic strategies or competitive position and strategic performance. In order to distinguish the companies in China from the firms in Singapore and Malaysia, a comparative analysis method was utilised. Excel and SPSS software package for data analysis were used.

Results and discussion

Participating organisations

Among 70 participating organisations (Table 1), 28 were independent companies, 29 were divisional or subsidiary companies and 13 were operating or business units with 26 situated in China, 34 in Singapore, 5 in Malaysia and 6 in other countries such as Thailand and the UK. For companies situated outside China, Singapore and Malaysia, they operated business in the three countries, but their business strategic decisions were made by the headquarters elsewhere. More than 95 % of the respondents were senior managers (managing directors, general managers, CEOs or presidents) and operating or business units heads. The results regarding the organisational size - in terms of full time (or equivalent) employees, organisational age under its present business form, and types of organisational ownership are also shown in Table 1.

Table 1 Frequency: Participating Organisations Operating in East Asia (n=70)

	Frequency	Percent
Legal Status Category		
Independent company	28	40.0
Division/subsidiary company	29	41.4
Operating/business unit	13	18.6
Country Where Based		
China	26	37.1
Singapore	34	48.6
Malaysia	4	5.7
Other country	6	8.6
Full Time Employees		
1-49	28	40.0
50-199	14	20.0
200-499	9	12.9
500-2999	14	20.0
>3000	5	7.1
Years Since Present Business Form		
<5 years	3	4.3
5 to <10 years	27	38.6
over 10 years	40	57.1
Ownership Category		
wholly domestic state owned	9	12.9
wholly domestic private/individual	12	17.1
wholly foreign owned	27	38.6
joint venture	14	20.0
domestic share holding/ public limited company	5	7.1
other types	3	4.3
Respondent's Position		
Senior Manager	45	64.3
Business or Regional Head	22	31.4
Functional Head	3	4.3

Generic strategies

According to the conception as defined above, the 70 participant oil and gas service are assigned as 39 differentiation, 21 hybrid, 3 low-cost, and 7 no-purpose organisations. The result shows that, overall, the majority (55.7%) of firms deployed a differentiation strategy and the minority (4.3 %) of firms pursued a low-cost strategy (Figure 3).

Figure 3: Assigning generic competitive strategies.

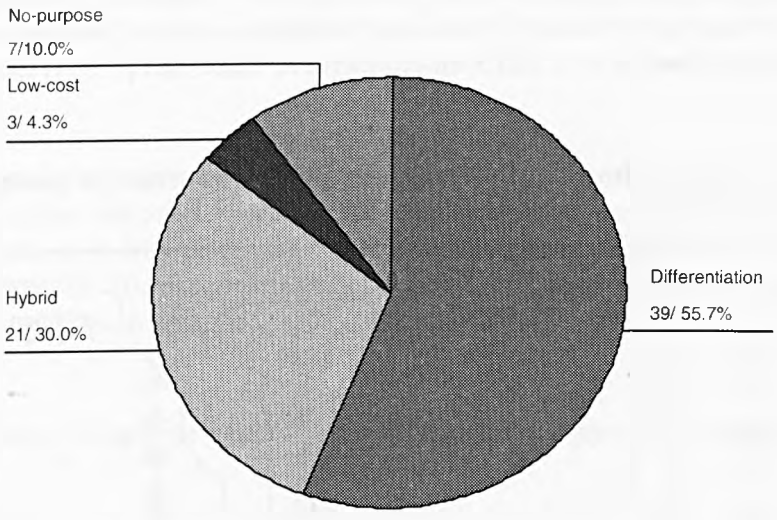


Table 2: Generic Strategies and Country-Based Cross-tabulation

			Generic Strategies				Total
			Differentiation	Hybrid	Low -cost	No-purpose	
Country where based	China	Count	13	7	2	4	26
		% within Situated East Asian Country	50.0%	26.9%	7.7%	15.4%	100.0%
		% within Generic Strategies	33.3%	33.3%	66.7%	57.1%	37.1%
		% of Total	18.6%	10.0%	2.9%	5.7%	37.1%
	Singapore	Count	21	11		2	34
		% within Situated East Asian Country	61.8%	32.4%		5.9%	100.0%
		% within Generic Strategies	53.8%	52.4%		28.6%	48.6%
		% of Total	30.0%	15.7%		2.9%	48.6%
	Malaysia	Count	2	1	1		4
		% within Situated East Asian Country	50.0%	25.0%	25.0%		100.0%
		% within Generic Strategies	5.1%	4.8%	33.3%		5.7%
		% of Total	2.9%	1.4%	1.4%		5.7%
	Other	Count	3	2		1	6
		% within Situated East Asian Country	50.0%	33.3%		16.7%	100.0%
		% within Generic Strategies	7.7%	9.5%		14.3%	8.6%
		% of Total	4.3%	2.9%		1.4%	8.6%
Total		Count	39	21	3	7	70
		% within Situated East Asian Country	55.7%	30.0%	4.3%	10.0%	100.0%
		% within Generic Strategies	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	55.7%	30.0%	4.3%	10.0%	100.0%

om the generic strategies and country-based cross-tabulation table (Table 2), a similar result was tained. In each of the selected East Asian countries, the major generic strategy deployed by firms is fferentiation while the fewest organisations followed a low-cost generic direction. For example, for 26 hina-based organisations, 50% were differentiation and 7.7% were low-cost; for 34 Singapore ganisations, 61.8% were differentiation and none was a low-cost organisation. The result indicates that fferentiation within a niche industrial sector presents a main strategic trend for oil service firms. This oves our earlier contention (*assumption 1*) that, for oil and gas service companies in East Asia, low-cost neric strategy is not a preferred option by senior management.

Organisation competitive portfolio

The participant organisations can be categorised into five clusters of competition position by using a Scatterplot graph (Figure 3): 26 high value premium price (Position I); 32 high value moderate price (Position II); 7 high value competitive (lower than moderate) price (Position III); 0 low (or moderate) value competitive price (Position IV); and 5 un-competitive value and price (Position V).

Figure 3 Scatterplot (show sunflowers): The perceived strategic competitive positions

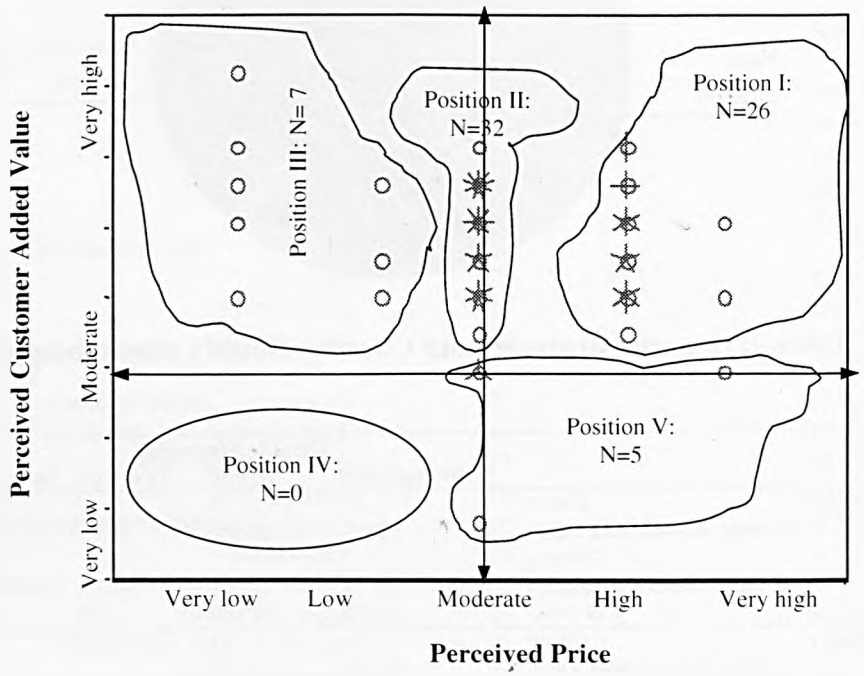


Table 3 Generic strategy and competitive position cross-tabulation

			Generic Strategies				Total
			Differentiation	Hybrid	Low -cost	No-Purpose	
Strategic Competitive Position	High Value Premium/ Moderate Price	Count	32	15	3	7	57
		% within Strategic Competitive Position	56.1%	26.3%	5.3%	12.3%	100.0%
		% within Generic Strategies	82.1%	71.4%	100.0%	100.0%	81.4%
	High Value Competitive Price	Count	4	4			8
		% within Strategic Competitive Position	50.0%	50.0%			100.0%
		% within Generic Strategies	10.3%	19.0%			11.4%
	Un-competitive Value and Price	Count	3	2			5
		% within Strategic Competitive Position	60.0%	40.0%			100.0%
		% within Generic Strategies	7.7%	9.5%			7.1%
Total		Count	39	21	3	7	70
		% within Strategic Competitive Position	55.7%	30.0%	4.3%	10.0%	100.0%
		% within Generic Strategies	100.0%	100.0%	100.0%	100.0%	100.0%

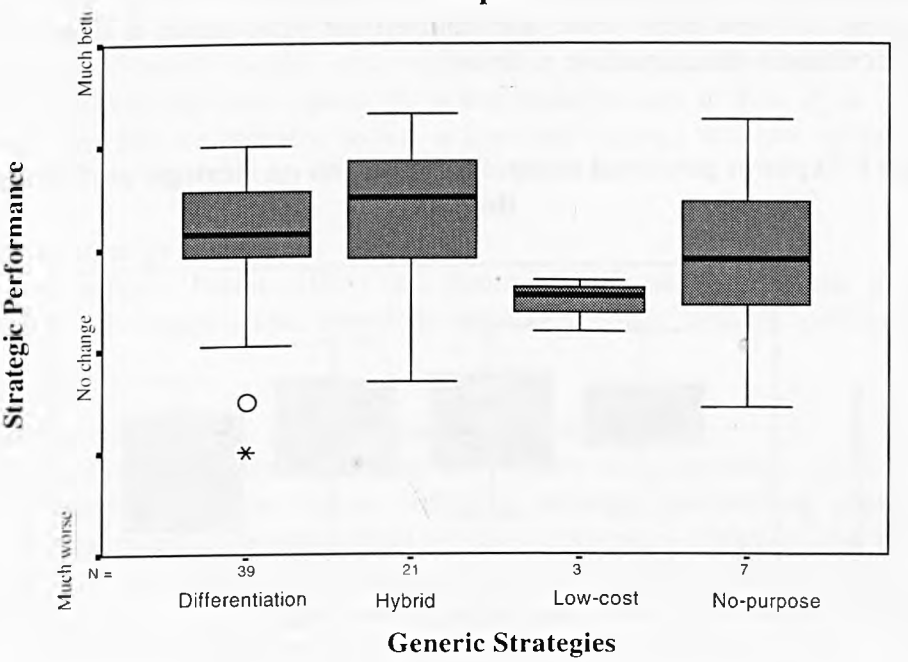
From generic strategy and competitive position tabulation table (Table 3), we discover that, most senior management (i.e. 82.1 % of differentiation organisations, 71.4% of hybrid organisations and all low-cost and no purpose organisations) perceived that they were in a high value premium or moderate price position. In each of the generic strategy categories, the fewest managers judged that their businesses had been launched in an un-competitive value and price position.

Strategic performance

Generic strategies on strategic performance

We used Explore descriptive statistics to assess the relationship between generic strategy and strategic performance. From Figure 4, it was discovered that hybrid and differentiation organisations are above-average performers within the 70 respondent organisations. The low-cost and no-purpose organisations had a relatively poor strategic performance.

Figure 4 Explore: generic strategies on strategic performance



Descriptives

	Generic Strategies		Statistic	Std. Error
Strategic Performance	Differentiation	Mean	5.1067	.1029
	Hybrid	Mean	5.3567	.1527
	Low-cost	Mean	4.4833	.1481
	No-purpose	Mean	4.9157	.3573
Valid N (listwise)	70	Mean	5.1359	.6984

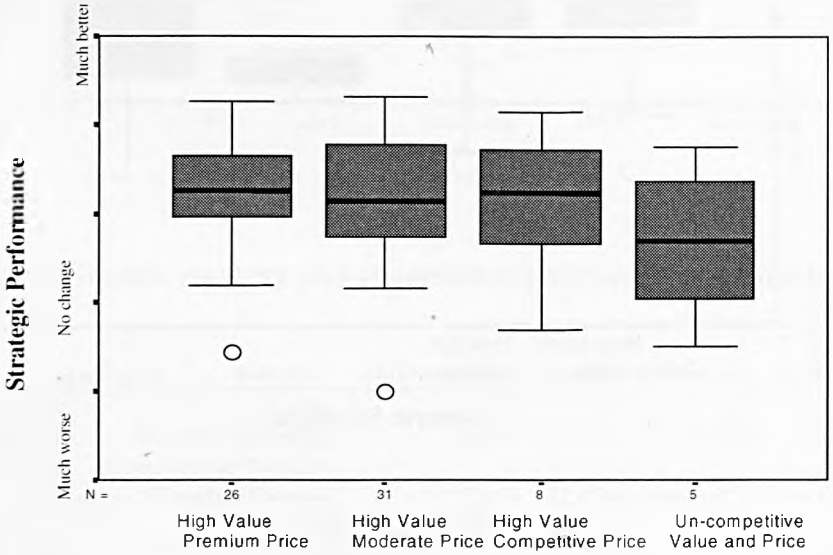
The result does not support *assumption 2* that having a generic strategy yields a higher strategic performance while following a no-purpose strategic direction produces a relatively poor strategic performance. It was found that, the worst strategic performance (mean 4.9157) does not appear in the category of the no-purpose organisations, which had no emphasis on any generic strategies; while a relatively poor strategic performance is associated with those using a low-cost strategy (4.4833).

According to Faulkner and Bowman (1999), the no-purpose firms attaining a sound performance may be because of two main reasons. First, their competitors had a similar behaviour with no distinctive emphasis on any particular generic strategies. Second, the profitable opportunity within the oil and gas service industry sector in East Asia is highly favourable over the contemporary period. However, the results show that the strategic performance of the hybrid cluster is above the average level. This supports *assumption 3* that 30% of the organisations with a hybrid strategy (mean 5.3567) did outperform businesses that competed with either differentiation strategy (mean 5.1067) or low-cost strategy (mean 4.4833).

Perceived competitive position on strategic performance

The result in Figure 5 indicates that the best strategic performance (mean 5.2042) appears when organisations pursued a high value premium price position, while the poorest strategic performance (mean 4.6720) is associated with the un-competitive value and price position. The organisations (mean 5.1545) with high value high price or high value moderate price outperform those (mean 5.1313) with a combined competitive advantage of high value and lower price. The result shows that high value high price and high value moderate price organisations achieve an above-average performance among the 70 organisations (mean 5.1359). This does not support *assumption 4* that organisations holding a combination advantage of both high value and competitive price attain a better performance than organisations in other clusters of competitive position.

Figure 5 Explore: perceived competitive position on strategic performance
Boxplot



Descriptives

	Strategic competitive position		Statistic	Std. Error
Strategic Performance	High value premium price	Mean	5.2042	.1158
	High value moderate price	Mean	5.1545	.1312
	High value competitive price	Mean	5.1313	.2768
	Un-competitive value and price	Mean	4.6720	.4137
Valid N (listwise)	70	Mean	5.1359	.6984

Conclusions

Using the empirical evidence gathered from the oil and gas service companies that operate business in China, Singapore and Malaysia, generic strategies, competitive positions and associated strategic performance were examined. Based upon the preliminary analysis, the conclusions are drawn below.

Desirable generic strategy: hybrid

The results of empirical findings do support that those hybrid organisations are more successful than those organisations dedicated to single strategic thrust as having a hybrid strategy has yielded a relatively higher strategic performance.

Popular generic strategy: differentiation

Most firms were involved in a differentiation strategy and having a differentiation strategy supports a sound strategic performance.

Unfavourable generic strategy: low cost

Results indicate that the firms with a low-cost generic strategy perform relatively poorly and their strategic performance is at a below-average level among the participating firms. In spite of several firms seeking to achieve the lowest possible cost within their niche industrial sector, the low-cost generic strategy is the least likely preferred option by senior management in East Asia. It is considered that, within the oil and gas service industry sector, a low-cost strategy will not achieve a sound strategic performance.

No-purpose generic strategy

The results do not support Porter (1985) that firms without any one of the generic strategies are guaranteed to fail. Such organisations appear to achieve a better strategic performance than low-cost organisations.

Competitive positions and strategic performance relationships

The results suggest that there are significant differences in competitive positions. There are also significant performance differences across different strategic competitive positions. Organisations pursuing high value premium price outperform all other clusters of organisations; while those in an un-competitive value and price position performed poorly. However, the results do not support the view that those organisations with a combination advantage of high value and competitive price perform more successfully than organisations in other categories of competitive position.

Further development

There are inevitable limitations to the preliminary analysis at this stage. For example, the amount of firms assigned into different categories of generic strategies and competitive positions are not balanced and this might influence the validity of the result analysis; since several respondents are functional heads, it is possible that they gave a biased assessment of their organisations. It is intended to carry on further analysis based on more completed questionnaires.

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A study of business strategies in the East Asian business environment

The Doctoral Colloquium Paper for the 30th Annual Conference of

Academy of International Business

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PhD Thesis:

Effective business strategies for energy service companies in the East Asian business environment.

Working Status

Started on 30 October 1999, full time. The thesis is due to be completed in 2003.

General Aims and Research Objectives

For different industries in different countries, the nature of the business environment can mean different things and strategic directions pursued by firms may be different. How can the business environment be evaluated? What is the common trend of business strategies adopted by existing firms in East Asia? What is the alignment, if any, between strategy and environment? These can be three typical issues for senior managers to take into account as they seek to apply better business practice in the region. Yet little or nothing is known about the strategic solutions needed for the oil and gas service companies to survive and prosper long-term. Particularly, business strategies adopted by such companies operating in East Asia have not been researched to any great depth. In order to fill this gap, conducting research into what effective business strategies they need is essential. A general objective proposed in late 1999 guiding this study was to examine the common trends concerning strategic orientations across the existing oil and gas service organisations in the East Asian business environment.

The research seeks to study executives' perceptions of the business environmental characteristics and their strategic orientations in order to develop, on an empirical basis, environmental and business strategy typologies grounded in organisational and strategic management theory. Three research objectives were proposed as follows:

- **i.** to examine the dominant business environmental conditions that impact upon the oil and gas service sector in China and, to a lesser extent, in Singapore and Malaysia
- **ii.** to investigate business strategies adopted by oil and gas service companies in response to the business environment(s) in which they operate
- **iii.** in the light of evidence gathered, to evaluate the reliability of the strategic theoretical frameworks based on Western business practice but applied in a non-Western business environment like East Asia

In this study, the service sector comprises organisations which supply products and services to the oil and gas industry. The service companies serve the needs of the wider oil and gas industry and other sectors of economically important energy industries, such as nuclear energy, coal, power generation and petrochemicals. They range from small to very large indigenous and international firms, including technology intensive and labour intensive enterprises. This service sector is characterised both by few players with large market shares and many players with fragmented market shares engaged in a wide range of different activities. The scope of service activities covers businesses such as oil and gas drilling, logistics, oilfield chemicals, engineering and construction, equipment leasing, as well as environmental, geological, well testing and catering services, etc.

Main Strands in the Literature

The Business Environment

The importance of understanding the business environment and adapting strategy to enable an organisation to achieve a high standard of performance is widely acknowledged in strategic management literature. Early in the 1950s, organisational theorists started to investigate organisation-environment interaction (Tung, 1979) and they have found that

the views of managers play a central role in learning about environment (Hegarty and Tihanyi, 1999). Strategic management theories and practices stress that understanding the business environment is essential in every organisation's life. Managers are encouraged to become more responsive to the dictates of the external environment and are required to scan and assess environment conditions when making strategic decisions (Fahey and Narayanan, 1986).

Fahey and Narayanan suggest that assessment implies identifying and evaluating how and why current and projected environment changes affect or will affect the strategic management of an organisation. Assessment attempts to investigate what key issues are presented by the environment and what the implications of the issues are for the organisation. Accurate assessment of the environment by managers may help bring about more effective strategies and thereby higher performance for long-term success (Downey and Slocum, 1975; Hambrick, 1982; Daft, Sormunen and Parks, 1988; Hegarty and Tihanyi, 1999).

Duncan (1972) defines a concept to distinguish external environment from internal. The internal environment refers to all factors existing inside an organisation, including organisational culture, structure and functions. The external environment refers to all the forces outside the organisation. In this study, the term business environment refers to the external environment. The features of a firm's external environment are described in numerous ways. In strategic management field studies, some researchers (Mintzberg, Ahlstrand and Lampel, 1998) suggest that the business environment should be evaluated from three aspects: the objective, perceived and enacted environment. The objective business environment refers to the measurable reality. The perceived business environment implies managerial perceptions on the business environment. The enacted business environment can be interpreted as strategy options, as organisations use strategies to create and drive development of the business environment in which all entities exist.

Most strategy theories characterise environments in terms of their levels, i.e., general, industrial or competitive and task or operating environment (Duncan, 1972; Koberg, 1987; Miller, 1993; Luo and Park, 2001). The general environment factor normally refers to politics, economics, social/culture and technology (PEST). Both industrial and task environmental factors encompass suppliers, buyers, potential entrants, substitute products/services and rivalry among competitors. A previous investigation by this researcher discovers that Western oil and gas service companies' executives regard operating, competitive, technological and economic environmental influences as being the most important issues to be taken into account for their organisations.

Researchers have also made a distinction between the composition of organisational environments and environmental characteristics or dimensions (Tung, 1979). The composition of environments refers to the factors or sectors encompassing the crucial environment, namely, economic, regulatory, technological, social, customers, competitors, and suppliers (Koberg, 1987, *et al*). For environmental characteristics or dimensions, it refers to the aspects of the environment confronting the organisation, such as complexity, dynamism and hostility (Daft, Sormunen and Parks, 1988). The organisational environment could be static or dynamic, complex or simple, hostile or favourable (Mintzberg, Ahlstrand and Lampel, 1998). Previous research (Tan and

Lischert, 1994) indicates that the environmental dynamism, complexity and hostility are associated with the environmental uncertainty.

Managers operating in the external environment context confront a variety of uncertain factors. In recent years, researchers have devoted their attention to managerial perception under uncertain environmental conditions. The concept of the uncertainty of the perceived environment advanced by many researchers (Tung, 1979; Hrebiniak and Snow, 1980; Koberg, 1987, Daft, Sormunen and Parks, 1988) has been a key aspect of a number of organisational and strategic theories. Despite most literature on organisational or strategic management theories introducing the concept of the environment, comprehensive analyses or empirical studies of environmental characteristics are limited. Integrating the perspectives on organisational uncertainties has been developed. As Miller (1993) found: "*a major obstacle to empirical research on perceived environmental uncertainties is the lack of well-established measurement instruments. Existing measures from organisation theory suffer from conceptual problems and inadequate reliability and validity*". That difficulty still exists.

Tung (1979) argues that a major obstruction has been how best to describe and conceptualise organisational environments. Most commonly, general environmental uncertainty includes the uncertainty of the general environment. Some strategy researchers emphasise uncertainties are related to market demand for products or services, product and process technologies, the availability of critical inputs, and strategic actions by competitors and potential entrants (Miller, 1993). Thompson (1967) emphasises that the priority for an organisation is to deal with the uncertain eventualities of the environment, particularly those of the task environment (Dill, 1958). The reliability of an instrument for measuring manager perception on the business environment is still to be developed and tested. Research on managerial perception of the business environment remains an important theoretical and empirical task.

Business Strategy

In most large organisations, there are a number of separate Strategic Business Units – SBUs (Hall, 1978), and their corporate strategies and business strategies are usually different; but in some organisations, especially small businesses, their corporate-level strategy and business-level strategy may be the same. In each incidence, it is important to be clear about the basis of strategic option at a business level (Johnson and Scholes, 1999). Miles and Snow's (1978) typology and Porter's (1980) taxonomy are two of the most widely accepted conceptual frameworks on business strategy (Carter, *et al.*, 1994; Slater and Olson, 2000).

Miles and Snow typology

Miles and Snow (1978) propose that organisations develop relatively enduring prototypes of strategic orientations in line with characteristics like the range of products and markets, technology solutions, desired growth pattern, and attitude toward change. Defenders seek stability and control in their operations to maximise efficiency. They provide a narrow range of products/services to serve well-defined niche markets. Normally, they focus on a single core technology and typically grow by market penetration. In contrast, Prospectors provide a broad range of products/services and create changes in the industry. They pursue growth through product and market development. Analysers emphasise both

stability and flexibility and follow keenly the most promising changes developed by Prospectors and Defenders. Reactors are naturally unstable in terms of their adjustment and lack consistency in strategic options. As a result, the Reactors' performance is relatively poor.

Researchers such as Hambrick (1982) criticise the Miles and Snow typology on the grounds that it is not the most elaborate framework that could be chosen. A later study by Wright *et al.* (1990) suggests a good-performing amalgamation strategy: the Balancer. They assume that the Balancer combines the features of Defender, Prospector and Analyser. Parnell, *et al.* (2000) summarise the Balancer as having three separate product-market spheres. The feature in the first sphere is very similar to that of Defenders whose managers stress the domain of existing products/services and customers. The second sphere resembles the Analyser type. Conducting technological changes is encouraged in order to imitate the best of products and markets developed by Prospectors. In the third sphere, managers attempt to initiate changes within the industry. The strategically operational style tends to bear a resemblance to the characteristic of Prospector organisations.

Researchers (e.g. Wright, *et al.,* 1995; Croteau and Bergeron, 2001; Parnell, *et al.*, 2000) have not only attempted to classify business strategies into typologies but also studied more effectively relations between strategy and other variables like performance. A common observation is that the more specific the type of business strategy adopted by an organisation, the better the organisational performance. In their work, Croteau and Bergeron (2001) also discover that there is a positive link between strategic activities and performance for Prospectors whereas there is a negative link for Reactor. Slater and Olson (2000) focus on the evidence that Prospectors, Analysers and Defenders can achieve superior performance when implementing strategies appropriately.

In this field of studies, empirical evidence has also been gathered in China. Tan and Litschert (1994) find that defensive-oriented strategies are related to higher overall performance. Luo and Tan (1998) further prove that both Defender and Analyser strategies are positively and significantly related to the Chinese firms' financial performance. Luo and Park (2001) provide evidence showing that the Analyser orientation organisations yield a high performance, while the Prospector and Defender orientations lead to poor financial performance when mismatching with a highly dynamic and complex China's market.

In this study, a conceptual framework of five types of business strategies, namely, Defender, Prospector, Analyser, Balancer and Reactor, was developed. Since similar empirical research in the oil and gas service sector are rare, the study sought to examine the typology of business strategy and also correlate this with the assessment of managerial perceptions of strategic performance.

Porter's taxonomy

According to Porter (1980), businesses can attain significant and enduring competitive advantage over their rivals by adroitly pursuing generic strategies (i.e. cost leadership, differentiation, low cost focus or differentiation focus and multiple strategies). A firm failing to adopt its strategy in any one of the generic directions or engaging in each generic strategy without achieving any of them will stay in the position of being "stuck in

the middle" (Porter, 1980, 1985). Porter emphasises that the basis of business generic strategy is how customer or client needs can be met best, usually through achieving a certain competitive advantage. A competitive position is the basis on which a business might achieve competitive advantage in its market (Johnson and Scholes 1999).

A number of empirical studies have been conducted to test the validity of Porter's (1980, 1985) generic strategies. Great attention has been attracted to analysing generic strategies and competitive positions associated with the organisational performance (Yamin *et al.*, 1999). The debates lie in two principal areas. In the first area, empirical investigations contradict the prospect on the pursuit of more than one generic strategy. The key point is that low cost and differentiation strategies are incompatible. Many researchers support the argument that, for higher business performance, an organisation has to choose either the low cost or the differentiation as a prior strategy, rather than both (Porter, 1985; Faulkner and Bowman, 1995). In the second area, some other researchers argue against Porter (1985) in the assertion of using a single generic strategy. They emphasise that a firm can pursue low cost and differentiation simultaneously and the combination of both strategies can also result in higher business performance (Chang and Wang, 1999; Proff, 2000). Regardless of the above debates, a number of researchers (Helms *et al.*, 1997; Yamin *et al.*, 1999; Wright *et al.*, 1990) support both schools of thought and suggest that organisations should deploy generic strategies that best suit their circumstances.

However, the majority of research on business generic strategy has been conducted in relation to Western businesses. A limited number of studies have been conducted in East Asia. Little or nothing is known about the solutions needed for service companies within the oil and gas industry in China, Singapore and Malaysia. Empirical academic studies examining competitive positions for these service companies are also rare.

In this study, a taxonomic framework for generic business strategies has been generated based on conceptual theories and contemporary empirical studies. Four basic generic strategies are defined as low-cost, differentiation, hybrid and no-purpose. As Yamin *et al.* (1999) demonstrate, differentiation strategy aims at achieving, even at considerable cost, a superior quality throughout the value chain and creating the image of an unique feature; while the emphasis of a low-cost strategy is on lowering cost more than competitors wherever possible. A hybrid strategy means that a firm seeks to deploy more than one of the generic strategies and achieves cost leadership and differentiation simultaneously (Johnson and Scholes, 1999; Proff, 2000; Porter, 1980). If a firm fails to develop its strategy in at least one of the three directions or, is inconsistent in pursuing the generic strategies, and achieves no competitive advantage, the firm has no distinctive strategy (Hunt, 2000). Such firms are described as no-purpose strategy organisations.

Research Methods

Questionnaire Design

Developed by the researcher, the survey questionnaire was arranged to begin with easy/general questions before moving into more difficult/sensitive and specific areas. The questionnaire had mainly closed questions, and was divided into four distinct sections, each dealing with one of the following issues: organisational background, the business environment, strategic orientations and strategic performance. Participants were told there

was no such thing as right or wrong, nor were there good or bad answers, what mattered was their thoughts. The subjects were therefore encouraged simply to respond by justifying from their own experience, how they felt about each topic. In order to eliminate a question's ordering bias, questions pertaining to the nature of the business environment and strategic orientations were randomly arranged.

Measures

The Business Environment

This study uses a multidimensional construct (Elenkov, 1997, Luo and Park, 2001) to conceptualise environment. Three dimensions of the environment, viz. complexity, dynamism, and hostility were assessed for six task environmental sectors: economic, technological, regulatory, customers, suppliers and competitors. Based on a 7-point Bipolar rating scale, for example, 28 items were measured to present managerial perceptions of environmental complexity and hostility. Each of the bipolar adjectives anchors the right and left extremes of the scale. The respondents were asked to rate each of environmental variables by selecting a number from a scale ranging from 1 to7, with 4 presenting neutral ground. For instance, if the question asks:

The business environment in which you operate is
very static 1 2 3 4 5 6 7 very dynamic

Should "5" be selected by a respondent, it indicates that the respondent "agrees with the assessment as stated on the right". In each measuring situation a score has been assigned for the nature of the business environment.

Miles and Snow Business Strategies

Based on the original Miles and Snow (1978) typology, contemporary writings and the discussions with the industry experts and managers, the appropriate measures were constructed which assessed 1) the range of product/service domains; 2) the growth pattern; 3) the attitude toward change; and 4) the approach of managing change. A 22-items scale was designed to deal with the variations of managerial perceptions of business strategic orientations. All responses were measured on a 7-point numerical scale (Zikmund, 2000), with 1 indicating strong agreement; 7 indicating strong disagreement. The present study allocated strategic orientations for businesses based on an approach developed by Parnell, *et al.* (2000). A business was categorised as pursuing the strategy reflected by the highest number of its responses. When there was a tie between Defender and Prospector strategies, the business was classified as an Analyser. When there was a tie among all non-Reactor strategies, the business was classified as a Balancer. When there was a tie between the Reactor and one or two other strategies, the business was classified as a Reactor.

Porter's Generic Strategies

A 6-item scale was used to assess four generic competitive strategies. If firms compete based on the highest quality or differentiate themselves from competitors in the industry, they were assigned to the category of differentiation organisations; if firms compete based on the lowest cost in the industry, they were categorised as low-cost organisations. If firms pursue both the lowest possible cost and the highest possible quality or a unique feature, and are able to compete, simultaneously, based on both the lowest cost and differentiated business, they were classed as hybrid organisations. In contrast, if firms

seek to attain both cost leadership and differentiation yet fail to achieve a strategy in either direction, they were assigned to the category of no-purpose organisations. A 7-point numerical scale (Zikmund, 2000) was defined to measure each item, with 1 indicating strong agreement; 7 indicating strong disagreement.

Competitive Positions

Two dimensions were defined as perceived price and perceived customer added value. A 6-item scale was used in an attempt to construct a strategy clock (Faulkner and Bowman, 1995; Johnson and Scholes, 1999) for participating organisations. The perceived price was measured by managerial perceptions on the level of price charged. The perceived customer added value was assessed by the mean of managerial perceptions on five variables: quality valued by customers, technological reliability, safety performance, speed of responding to customers, price that customers are willing to pay. For the first five items, a 5-point scale was used with 1 indicating very low, 5 indicating very high and 3 indicating a moderate position. For the price that the customer is willing to pay, 1 indicates much lower than the service provider offers, 5 indicates much higher than the service provider offers, and 3 indicates the same as the service provider offers. By doing so, it was able to categorise five clusters of strategic competitive position for the participating organisations.

Strategic Performance

In order to measure the fulfilment of the overall goals of business, the concept of strategic performance was developed by this researcher. A 20-items scale covering the organisational activities such as marketing, operations, finance, human resource management and organisational efficiency and effectiveness was formed to evaluate strategic performance. It is difficult to access directly organisational archive data such as financial or marketing figures as they are usually viewed as being sensitive and confidential. Consequently, this study employed a subjective measurement (Dess and Robinson, 1984) that calls upon the managerial perceptions. The reliability of this self-reporting approach has been proved by various studies (Tan and Litschert, 1994; Luo and Tan, 1998; Luo and Park, 2001). A 7-point interval scale was drawn from Ramanujam and Venkatraman's (1987) work, with 1 indicating much less or worse and 7 indicating much more or better. For simplification, the average score of each case has been adopted as a result of strategic performance.

Sampling

Samples included either foreign or indigenous companies generating their business mainly in the domestic market. As it was impossible to find a comprehensive list of oil and gas service companies in the selected East Asian countries, notably China, the total population was difficult to identify. Combining snowball and convenience sampling (Saunders, Lewis and Thornhill, 1997), a multi-stage sampling technique was employed for the formal survey. That is, to select the most accessible potential respondents, including those that participated in the earlier pilot studies; make initial contact with these respondents; ask them to identify further contacts; ask the new contacts to identify further new contacts (and so on); and continue the sampling process until the required sample size has been reached.

Data Collection

The collected data was based on a questionnaire survey sent to the senior managers of oil and gas service companies operating in East Asian countries such as China, Singapore and Malaysia. 500 questionnaires were distributed to the senior management respondents via post (mainly), email and fax between late 2001 and early 2002; then following-up phone calls and emails were made in an attempt to achieve the proposed response target. Each of the packets mailed contained a covering letter with the correspondent's photograph on it, the questionnaire and a self-addressed envelope for return. As a result, by August 2002, 108 completed questionnaires had been returned by managers involved in operating businesses in China, Singapore and Malaysia, with a response rate of 21.6 percent. Among those, 97 completed questionnaires are usable for the final primary data analysis. For the reasons of confidentiality, the names of respondents and companies were classified in a code term. The associated details of these companies can therefore not be identified by anyone except this researcher.

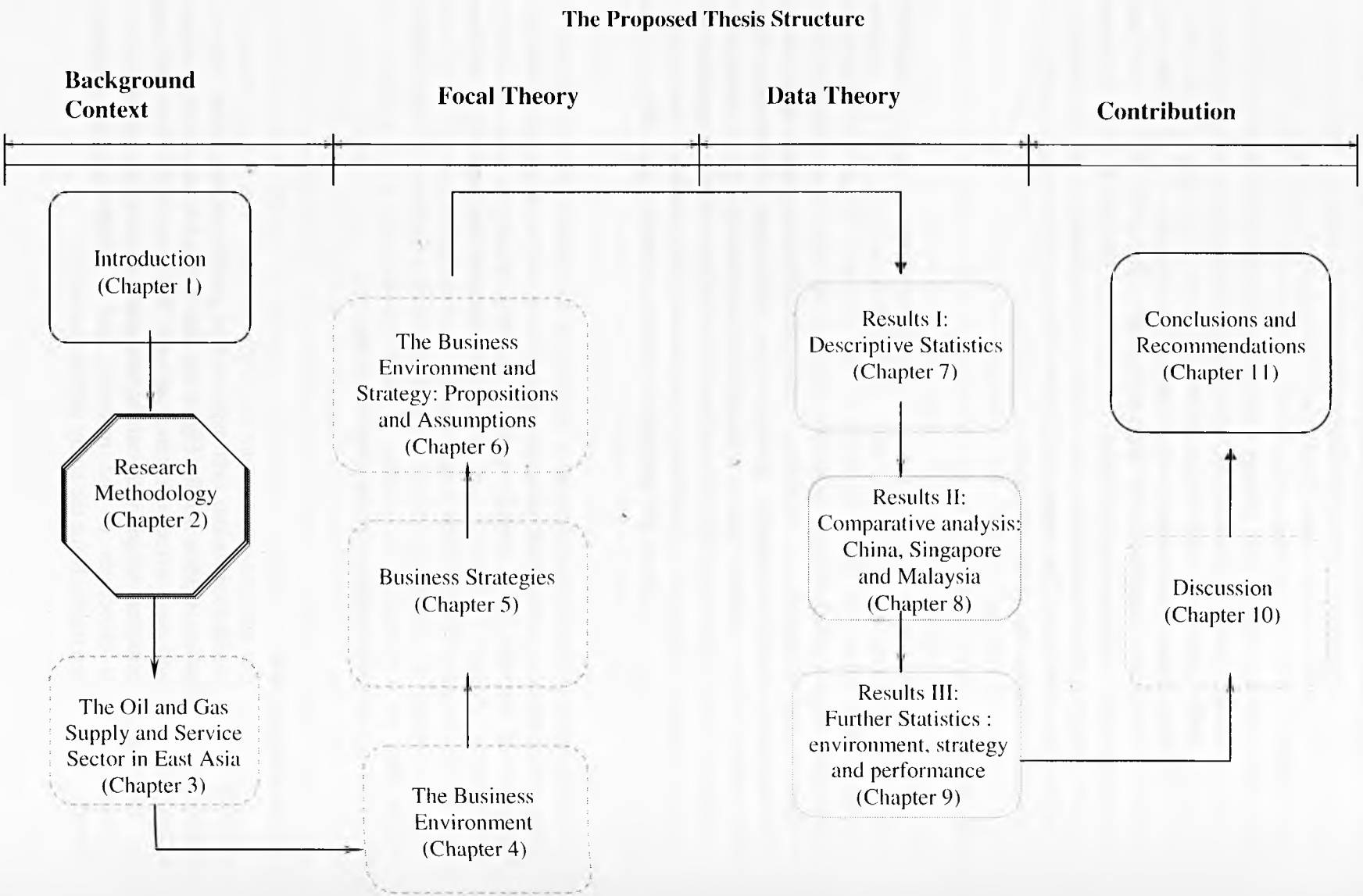
Data Analysis

The collected primary data were analysed, using computer programmes such as SPSS and Excel. Different statistical techniques were used in this analysis, and the selection of techniques was based on their relevance to the research objectives. The following techniques were applied where applicable. Firslty, the data was summarised using frequencies and histograms. In addition, various descriptive statistics were calculated including means, medians, standard deviations and coefficients of skewness. This was done for each of the variables. The explore and frequency statisitcs gave a good picture of how the various variables were distributed. In order to distinguish the companies in China from the firms in Singapore and Malaysia, cross-tabulation statistics was utilised for comparative analysis. To check the consistency across responses reliability, Cronbach's alpha was calculated.

Secondly, further statistical analysis was carried out to evaluate the relationship of the perceived business environment, strategic orientations and strategic performance. For instance, to classify firms based on their business strategies and then on their performance, clustering analysis was performed. To test the significant differences between the environment groups and the business strategies groups, Analysis of Variance test were applied. To check the normality, the Kolgomorov-Smirnov goodness-of-fit test on the data was performed. The finding of the above tests had a big influence on the choice of statistical techniques employed in this study.

Thesis Construction

The PhD thesis is to be broken into four aspects: background context, focal theory, data theory, and contribution (Ogden, 1993) (Figure 1). Background context delivers a general picture on the oil and gas service sector in East Asia. This part of the thesis will include an "Introduction" chapter, which sets out the content and structure of the thesis and identifies principal objectives of the research; and a "Methodology" chapter that introduces the chosen methods for the study will be included.


The Proposed Thesis Structure
Background Context
Focal Theory
Data Theory
Contribution
Introduction (Chapter 1)
Research Methodology (Chapter 2)
The Oil and Gas Supply and Service Sector in East Asia (Chapter 3)
The Business Environment (Chapter 4)
Business Strategies (Chapter 5)
The Business Environment and Strategy: Propositions and Assumptions (Chapter 6)
Results I: Descriptive Statistics (Chapter 7)
Results II: Comparative analysis: China, Singapore and Malaysia (Chapter 8)
Results III: Further Statistics : environment, strategy and performance (Chapter 9)
Discussion (Chapter 10)
Conclusions and Recommendations (Chapter 11)

The focal theory reviews relevant theoretical literature and discovers its link to the study. It studies schools of thoughts, similar research on the assumptions, hypotheses or propositions on the business environment and business strategy, and instruments used by previous researchers on how to measure the variables of the business environment and strategy. Data theory includes the analysis and presentation of the collected data. The author will accumulate sufficient evidence to allow a conclusion. The "Contribution" part will include conclusions drawn from the results of the data analysis and will illustrate how an original contribution to knowledge has been made through completion of this research. The author will discuss the limitations of the study. Recommendations will be made for future research.

A Brief of Key Findings to Date

Organisation Background

Table 1 Frequency: Participating Organisations Operating in East Asia (n=97)

	Frequency	Percent	Cumulative Percent
Legal Status Category			
Independent company	39	40.2	40.2
Division/subsidiary company	40	41.2	81.4
Operating/business unit	17	17.5	99.0
Other types	1	1	100.0
Country Where Based			
China	30	30.9	30.9
Singapore	39	40.2	71.1
Malaysia	21	21.6	92.8
Other countries	7	7.2	100.0
Full Time Employees			
1-49	39	40.2	40.2
50-199	19	19.6	59.8
200-499	19	19.6	79.4
500-2999	16	16.5	95.9
>3000	4	4.1	100.0
Years Since Present Business Form			
<5 years	6	6.2	6.2
5 to <10 years	29	29.9	36.1
over 10 years	62	63.9	100.0
Ownership Category			
wholly domestic state owned	9	9.3	9.3
wholly domestic private/individual	14	14.4	23.7
wholly foreign owned	38	39.2	62.9
joint venture	21	21.6	84.5
domestic share holding/ public limited company	12	12.4	96.9
other types	3	3.1	100.0
Respondent's Position			
Senior Manager	62	63.9	63.9
Business or Regional Head	29	29.9	93.8
Functional Head	6	6.2	100.0

Among 97 participating organisations (Table 1), 39 were independent companies, 40 were divisional or subsidiary companies, 17 were operating or business units and one was a regional office, with 30 situated in China, 39 in Singapore, 21 in Malaysia and 7 in other countries such as Thailand, Indonesia, UK, etc. For companies situated outside China, Singapore and Malaysia, they operated business in the three countries, but their business strategic decisions were made by the headquarters elsewhere. 39 organisations had less than 50 full time (or equivalent) employees. Four were very large size organisations with more than 3000 employees. 93.8% of the organisations had operated for more than five years since their existing business forms. 39.2% of the respondent organisations were wholly foreign owned and 24.7% were domestic state owned companies or private/individual companies. 93.8% of the respondents were senior managers (managing directors, general managers, CEOs or presidents) and operating or business units heads.

The Perceived Business Environment

Results (Table 2) indicate that the perceived business environment for the oil and gas service industry in East Asia was complex, dynamic and pleasant. The business environment was perceived as neutral, which indicates that the nature of the business environment could fluctuate between certain and uncertain conditions.

Table 2 Frequency: The Environmental Uncertainty

	N	Minimum	Maximum	Mean	Std. Deviation
Dynamism	97	1.00	7.00	5.2165	1.2766
Complexity	97	1.00	7.00	5.0206	1.2498
Hostility	97	1.00	7.00	3.8247	1.5001
Uncertainty	97	1.00	7.00	4.1753	1.5001
Valid N (listwise)	97				

Business Strategies and Strategic Performance

Miles and Snow business strategies

Results support the earlier contention that the strategic directions of the firms operating in the region can be categorised into five groups: Prospector, Defender, Analyser, Balancer and Reactor. Among the five strategic orientations, the researcher found that Balancer organisations displayed the highest strategic performance while the strategic performance of Reactor organisations was relatively poor. The result also indicates that the service companies in China were more aggressive or reactive than Singapore-based organisations.

Porter's generic strategies

The majority of the participating organisations deployed a differentiation strategy while the minority of them employed a low-cost strategy. Among the four generic strategies, 32 (Table 3) of the participating organisations pursued a hybrid strategy and these hybrid organisations yielded a higher strategic performance.

Table 3: Competitive Strategies Pursued by the Participating Organisations

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Generic Strategies	N	Percent	N	Percent	N	Percent
Strategic Performance	Cost Leadership	5	100.0%	0	.0%	5	100.0%
	Differentiation	54	100.0%	0	.0%	54	100.0%
	Dual	32	100.0%	0	.0%	32	100.0%
	No-purpose	6	100.0%	0	.0%	6	100.0%

Most firms were involved in a differentiation strategy and having a differentiation strategy supported a sound strategic performance. The strategic performance of the organisations in the no-purpose category was not the worst; rather, relatively poor strategic performance appeared in the low-cost generic strategy context. This result does not support Porter (1985) that firms without any one of the generic strategies are guaranteed to fail.

Competitive positions

Most organisations pursued a strategic competitive position of high customer added value at high or moderate prices and none was seen in a low value low price position. Within the high value category, it is discovered that strategic performance was associated with the level of price: organisations charging a higher-level price outperformed those who provided prices at a lower level. The results suggest that there are significant differences in competitive positions. There are also significant performance differences across different strategic competitive positions. Organisations pursuing high value premium price outperformed all other clusters of organisations; while those in an un-competitive value and price position performed poorly. However, the results do not support the view that those organisations with a combination advantage of high value and competitive price perform more successfully than organisations in other categories of competitive position.

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PART THREE
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