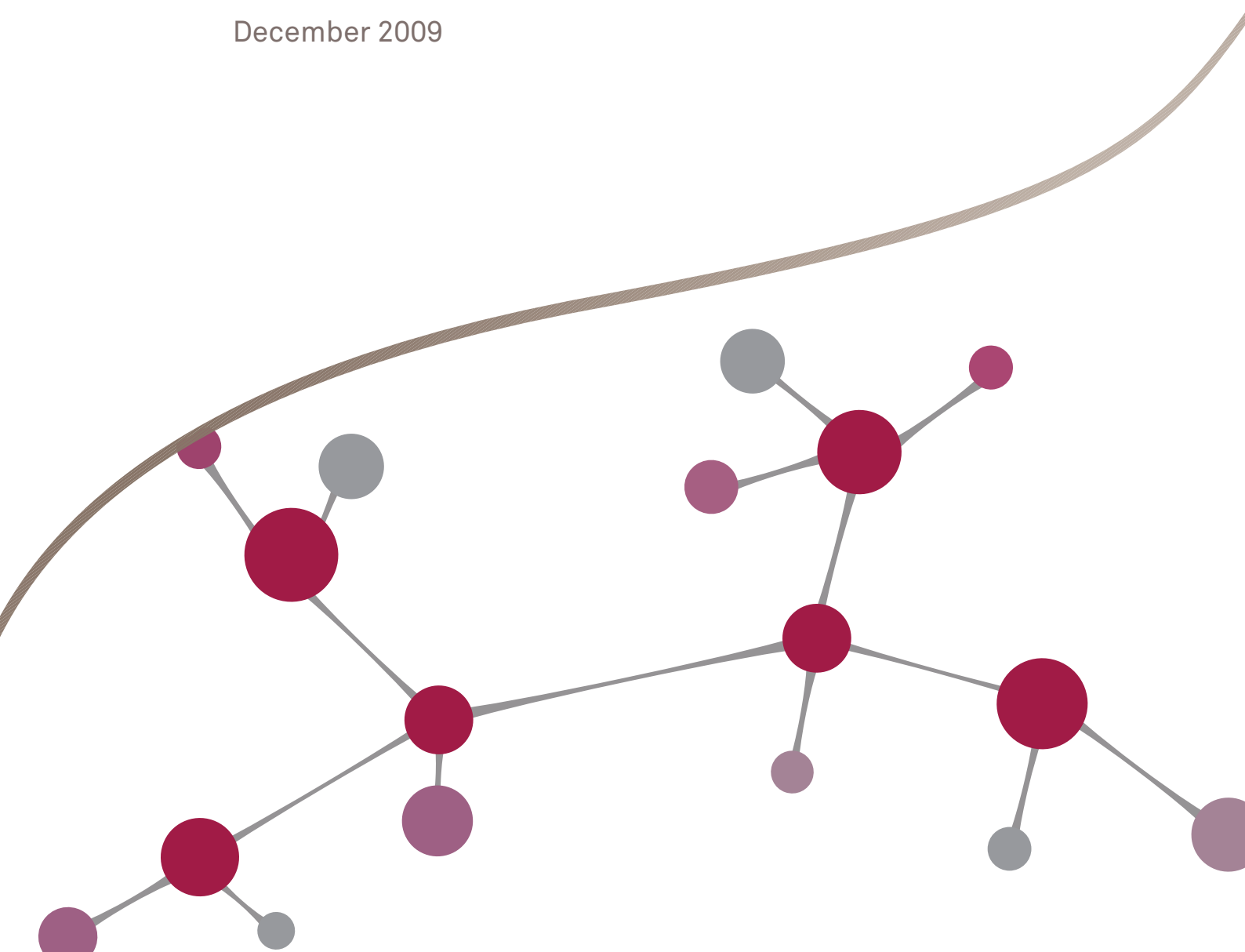




## Global CIO Report

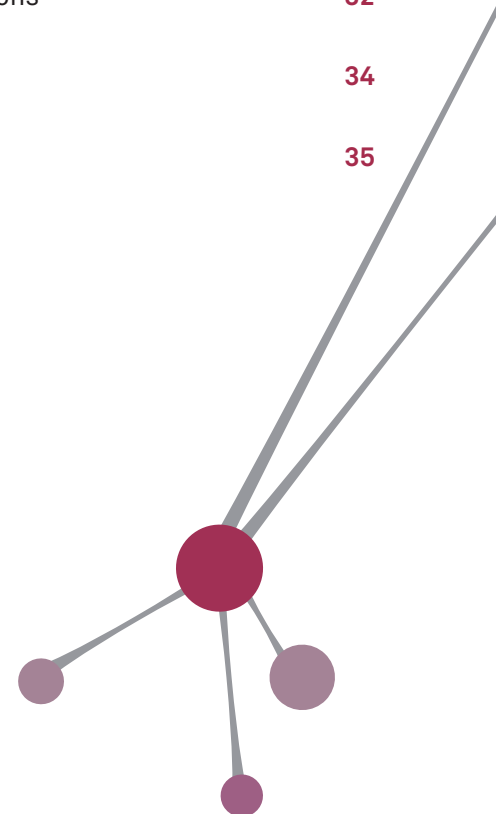
Harnessing Information Value :  
Could you be a digital winner?

December 2009



# Contents

Executive Summary	4
IT Value – What does it mean?	6
Three clusters according to the maturity level of the IT function	8
A step-by-step progression towards Business Technology	12
Industrialisation, innovation, and technology and information usage: high differences in terms of maturity levels	16
Does IT help in the current economic context?	22
A new perspective for companies	24
Conclusion: three challenges to face	26
About the survey method	28
Participating companies and organisations	32
Contributors	34
About Capgemini Consulting	35



# Foreword

This year, Capgemini Consulting's fourth consecutive Global CIO Report addresses the question of how a business can create value through its deployment of IT and the effective usage of information.

For many years corporate IT policy has tended to focus on the installation of IT equipment, the creation of IT assets and the development of IT skills within the organisation. IT has become a powerful technology introduced to change existing ways of working: automating processes, breaking down organisational barriers, connecting users with customers and partners. However the issue of its ability to create real value and make a tangible contribution to the core business has barely been addressed.

Today, as companies face the global economic crisis, capital budgets are under pressure and the economic value of an organisation's IT investments is under greater scrutiny. The need to evaluate and maximise the business value of IT is a matter of increasing importance to business managers, but it is a challenge that many CXOs have yet to address. As our partner in this year's study, Donald Marchand, Professor of Strategy Execution and Information Management at IMD in Lausanne, Switzerland, observes: *"If you ask senior executives whether their companies are extracting the expected business value from their investments in IT, the overwhelming answer by a large margin is 'no'."*

So the question remains: how to create value by deploying IT and using information in business processes and activities effectively? That the answer remains so elusive is a tantalising paradox. Nobody doubts the immense power of today's IT and information, but directing that power in a way that actually propels the business forward to gain a competitive advantage in the marketplace is a major challenge.

The aim of this year's Global CIO Report is to shed light on the value creation that the usage of information and technology can bring to a company. We highlight the maturity of IT function practices throughout the world and evaluate the potential value that a company can gain through the effective deployment of IT systems and the use of information.

Our study is based on face-to-face interviews with 490 CIOs in 14 countries and an online survey completed by a representative subset of the 490 respondents.

We would like to take this opportunity to thank all CIOs for their time and their confidence in sharing their situations with us.

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**Patrick Ferraris**  
Capgemini Consulting  
Technology Transformation Global Leader

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**Mark Porter**  
Capgemini Consulting  
Chief Operating Officer

# Executive Summary

The report is the result of 490 face-to-face interviews with global CIOs representing all industries. The report highlights that despite a 15% average cut in IT budgets, CIOs see the economic context as an opportunity to show the true value of IT and to further improve IT industrialisation. Their industrial model will nevertheless be challenged by growing technologies and business models around Cloud Computing and Software/Infrastructure as a Service. Information Lifecycle Management is the next innovation challenge for CIOs and their corporation. CIOs will have to invent a new model and governance to lead the charge on getting value out of the information assets of their corporation. The report also identifies 3 types of IT organisations among which “Digital Winners” have been at the forefront of the new industrialisation challenges, have a significant impact on the innovation of their corporations and have addressed the information challenge across their organisation.

## **2009: IT budgets shrink, expectations grow**

The 2009 economic downturn had a significant impact on IT budgets, with almost three quarters of CIOs (70%) reporting a decrease. On average, IT budgets dropped by 15%. Perhaps more surprisingly, CIOs say they are using the crisis to show the value of IT for their companies, by giving priority to projects that contribute more to the business or taking advantage of new market conditions.

## **Digital Winners suffered less from the economic downturn**

Three quarters of CIOs surveyed believe their company is positioning their IT function as more than a technology utility, whose primary objective would be to roll-out technology components at a low cost. The Global CIO Report distinguishes three different profiles of IT function, according to their level of maturity:

- Technology Utility (24%): IT is managed as a pure utility;
- Service Centre (39%): IT assets are packaged to provide a service to the business;
- Business Technology (37%): IT is a key asset for information leadership.

Industries where the Business Technology profile is most widespread are banking, insurance, media/entertainment and telecommunications. According to the survey, to become Digital Winners companies must adopt the Business Technology profile. CIOs who adopt the Business Technology profile have proven the value of bringing IT closer to the business. Unsurprisingly, they also suffered less from the economic downturn than the two other profiles: Service Centre and Technology Utility.

## **Industrialisation at the core of IT practices but challenged by new business models and technologies**

According to the participants, industrialisation is being managed effectively. A majority of CIOs (91%) said IT projects are prioritised according to business strategy and economic impact, while 93% said IT functions use indicators to follow up the availability of IT infrastructure and business applications and 87% said IT functions set up a strategic IT plan for 3 years.

This increased focus on IT industrialisation is expected to be challenged by the developments around cloud computing, infrastructure and Software as a Service (SaaS) which provide new alternatives to traditional architectures and disrupt the ‘make or buy’ policies CIOs have developed for years.

### IT usage as a business value enhancer

We found IT functions tend to focus on the deployment of IT systems up until the moment that a project goes live. But the value of IT does not stop on the go-live date but starts on it. Indeed, the value of IT is not in “deploying it” at all but in “using it” and taking full advantage of it. IT brings value only when employees, clients and partners are able to use technology efficiently and improve their own performance. IT functions have the opportunity to create enhanced business value through improving the usage of these technologies, and most of all to get a strong return on their information assets.

### Information as the main weapon of Digital Winners

This report offers insights into the future of IT functions and an information centric-model to support competitiveness. CIOs see information lifecycle management as the next challenge for corporations. CIOs surveyed confirm what academic research indicates: 80% of the value of IT is driven by usage, whereas technology deployment itself only accounts for 20%.

However, the value of information is still uncharted territory and investigating user behaviour has become a priority. Although most IT users within organisations are aware of the advantages of quick access to accurate and relevant information, a significant change in behaviour is still required. The study found that only 40% of IT performance is measured via business indicators. Most CIOs are looking beyond their function to monitor IT usage across the organisation.

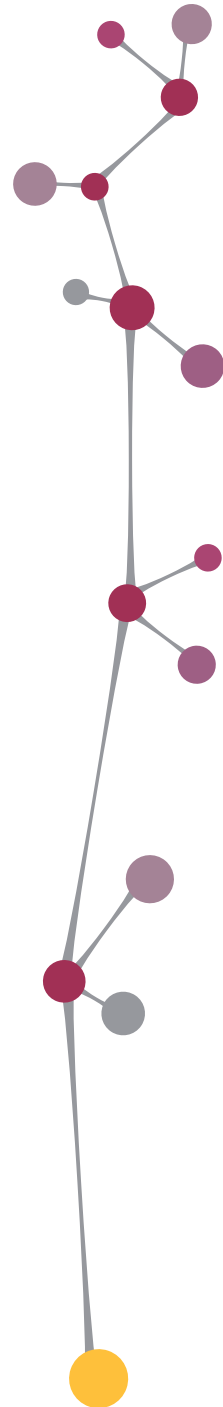
### Time for a new model of governance

Most successful companies now focus on the management of the information lifecycle to maximize the value of their IT. This requires progress in three key areas:

- Improving existing information system usage to benefit from its full potential;
- Developing information based synergies across the organisation through IT;
- Developing better information usage to ensure people learn how to collect, organize and maintain data.

One banking respondent said: *“If I can make sure my clients and employees provide relevant information, this will change our risk profile. And we all know the importance of risk management nowadays.”*

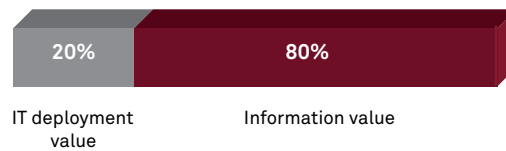
Capgemini Consulting strongly believes CIOs must proactively take the lead on information lifecycle management and provide the impetus for the definition of a new framework of joint governance between business and IT function managers. The new governance model should focus on creating value through cultural and behavioural changes regarding the use of information, based on employee training and incentives.



# IT Value – What does it mean?

Senior managers are aware of the need to extract the maximum business value from IT but very few manage to capture this value. The IT value within any business process or activity lies in the interaction of information, technology and people. IT value can be divided into two distinct parts: IT deployment value, essentially the suitability of the system to the business needs of the user, and information value, derived from the way in which the IT tools and information are used by people.

**Figure 1 - IT value is divided into two distinct parts**



*IT value is the value of the interaction of information, technology and people within any business process or activity."*

**Pr. Marchand, IMD Lausanne**

Academic research has concluded that only about 20% of the business value of IT can be derived from IT deployment in a company; the remaining 80% depends on the way in which the information handled by the IT system is used by managers, the workforce, customers, business partners and suppliers. Companies that in recent years have implemented ERP, CRM and Web-enabled supply chain management systems have seen that value is derived from using these systems effectively in a business context rather than from their deployment alone.

A useful analogy is the familiar one of an iceberg, only a small proportion of which is visible and draws the attention of the observer. In the same way, most business and IT management attention today is still focused on the relatively insignificant IT deployment value, while the main source of true business value creation remains submerged and to a large extent neglected.



**IT deployment value** is optimised when the company has become efficient at defining, building and rolling-out the IT systems appropriate to its business requirements, and when the IT function has been industrialised (for example, through the implementation of best-practice standards such as CMMI or ITIL).

By contrast, **information value** is a product of the effective use of the information systems by stakeholders both within the organisation and without (including clients and suppliers). Usage of an information system refers to the interaction between information, IT and people in performing business processes in a company and externally with customers, partners and suppliers. It is measured through business performance indicators such as productivity improvement, sales growth, time-to-market reduction and financial performance.



*We have deployed the right IT systems and measured the indicators associated. However, we almost never communicate within the whole organisation to enable effective usage of these systems.”*

**CIO from Finland**



# Three clusters according to the maturity level of the IT function

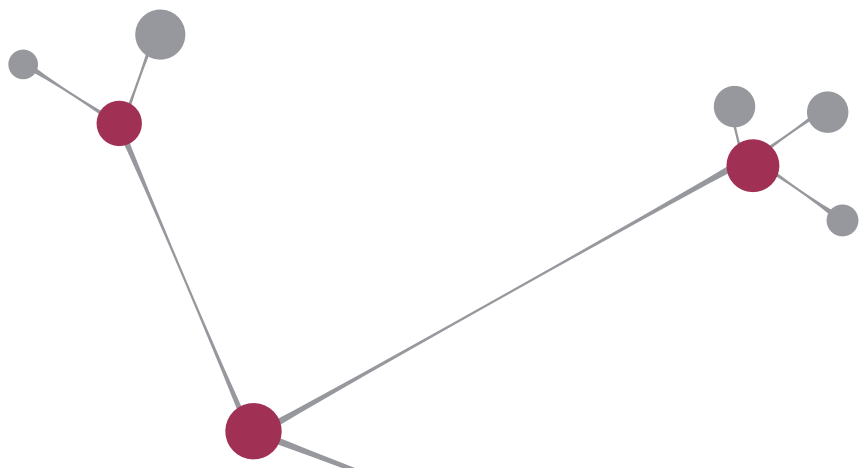
## CIOs see their IT functions as belonging to one of three clusters

We asked CIOs to position their IT functions on 3 axes: the profile of their IT functions in the company, the level of their IT deployment practices and the value of information through the usage of IT.

Statistical analysis of the CIOs' answers allowed us to produce three combinations of profile, which we call "clusters".

These clusters are:

- 1 The IT function as a Technology Utility**  
*"The IT function provides technology to the business to enable it to do what it needs to do."*  
**CIO from the UK**
- 2 The IT function as a Service Centre**  
*"The IT function has established itself as a service provider to the business."*  
**CIO from Finland**
- 3 The IT function as Business Technology**  
*"For our organisation, IT is the sinews of war."*  
**CIO from France**

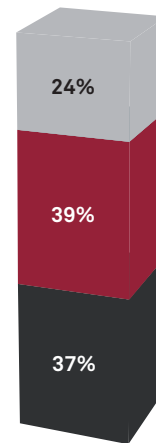




**Figure 2 - Definition of the three IT function clusters**

Percentage of IT functions identified in each cluster, based on statistical analysis of 490 respondents.

Definition	In a few words
<p><b>Technology Utility</b> IT is managed as a pure utility and its usage is influenced primarily by cost, availability and the range of technological innovations offered by the IT function.</p>	<p>Cost-oriented. Technology-oriented. Close to CFO.</p>
<p><b>Service Centre</b> The IT function mostly delivers IT services according to business demands driven by SLA. IT assets are seen as the means of providing a service to the business, although some of them already view IT as an important business asset. Extracting value out of the usage of IT is the responsibility of business owners.</p>	<p>IT service delivery-oriented. Level of services defined (SLAs). Business owner – IT supplier model.</p>
<p><b>Business Technology</b> The IT function is a key partner to the business with which it co-develops business services and tends to become a distinctive company asset and a part of its core expertise. IT is considered as one of the competitive levers of the business. Technology and information value is seen more and more in terms of business and company performance.</p>	<p>Partnership-oriented. Business process expertise. Close to CEO.</p>



We note that the IT function within a company is becoming more and more mature, as 75% of respondents positioned their IT functions in the two clusters that are closer to the business (Service Centre and Business Technology).

We then analysed differences between each cluster based on three capability areas:

- Information Technology Practices (ITP) - the ability of a company to manage IT applications and infrastructure effectively to support operations, business processes, innovation and managerial decision-making.
- Information Management Practices (IMP) - the ability of a company to manage information usage effectively including identifying, collecting, organising, processing, and maintaining information.
- Information Behaviours and Values (IBV) - the ability of a company to instil and promote the values and appropriate behaviour patterns in its people for effective use of information. These include integrity, formality, control, transparency, sharing and proactiveness.

By examining each of these three capabilities, we were able to cross-reference our previous findings and draw meaningful comparisons between the clusters in terms of IT, information and people.

## Three clusters defined in terms of IT, information and people

### Technology Utility

Ability to manage IT applications and infrastructure effectively	Very weak
Ability to manage information usage effectively	Weak
Ability to instil and promote the values and appropriate behaviour	Average -
Total	Weak

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CIOs from the Technology Utility cluster recognise that the ability of their organisations to leverage information and knowledge is low.

Companies with this profile are not collecting, organising and maintaining information as a business asset. These companies are mostly product-driven and have a managerial mindset.

The CIOs in this cluster perceive that employees are not using IT in an efficient way. Business managers do not encourage the use of IT to improve business processes.

### Service Centre

Ability to manage IT applications and infrastructure effectively	Weak
Ability to manage information usage effectively	Average +
Ability to instil and promote the values and appropriate behaviour	Good
Total	Average +

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CIOs from the Service Centre cluster perceive that people in their companies are becoming aware of the potential value that IT carries; people trust formal sources of information. However they still don't know how to maximise that value.

The CIOs also recognise that employees are good at collecting and organising information. However they do not know whether the information gathered is used for solving problems.

Companies in this cluster are doing well regarding operational support in areas such as ERP deployment, etc. They are good at linking business processes with those of their suppliers and customers. They are also good at fostering and communicating new ideas.

### Business Technology

Ability to manage IT applications and infrastructure effectively	Good
Ability to manage information usage effectively	Very good
Ability to instil and promote the values and appropriate behaviour	Very good
Total	Very good

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CIOs from the Business Technology cluster perceive that people are aware of the advantages of using information more efficiently. However, there is still room for improvement.

These CIOs also perceive that people are solid on the basics such as collecting, organising, and maintaining information. They pay attention to the accuracy of the information and are encouraged to control and update it. Although they are ahead of the members of the two other clusters, there is still room for improvement in areas such as the control of information to improve working behaviours.

Companies in this cluster are really solid in areas such as operational, process and management support. Innovation that relies on people's behaviours and not only on IT tools is one area when further improvement could be achieved.

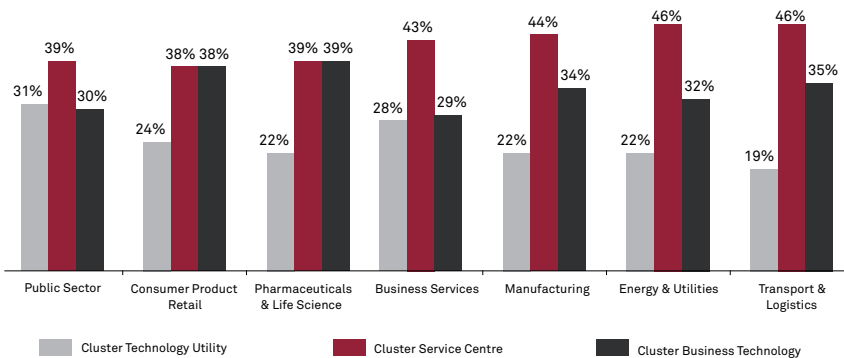
These results show the ranking of CIOs' responses to the questions contained in the information usage analysis performed by enterprise IQ® on the basis of its international benchmark. (see the section "About the survey method" for further information).

## The distribution of the clusters per economic sector is not homogeneous

The study shows that no industry sector is predominantly in the Technology Utility cluster. Interestingly, the public sector, which has information at the heart of what it does, shows the highest proportion of this cluster, though it has a higher proportion of its IT function in the Service Centre cluster.

Industry sectors such as business services, energy and utilities, transport and logistics, manufacturing and the public sector are predominantly in the Service Centre cluster.

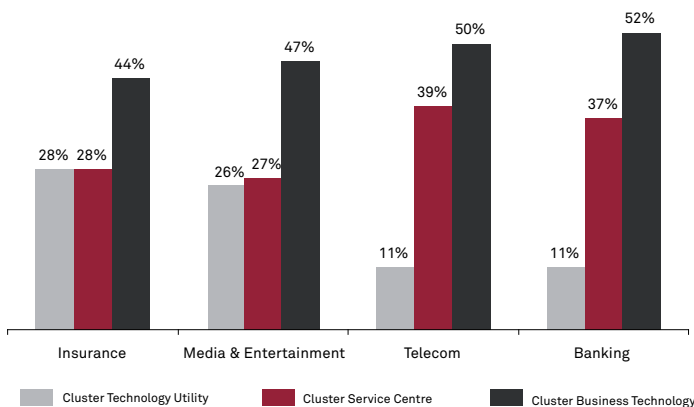
**Figure 3 - Economic sectors with IT function predominantly in the Service Centre cluster**



Highly IT-intensive industries such as banking, insurance, media/entertainment and telecommunications are predominantly in the Business Technology cluster. This makes sense as their core business relies heavily on IT systems (consequently generating high IT spending) with the result that the IT function is more likely to be a key partner in delivering business value.

**“**  
*Our Bank is an IT organisation with a banking license.”*  
**CIO from the Netherlands**

**Figure 4 - Economic sectors with IT function predominantly in the Business Technology cluster**



# A step-by-step progression towards Business Technology

## The level of maturity in IT deployment is a key driver to generating value, but there is no shortcut to being a digital winner

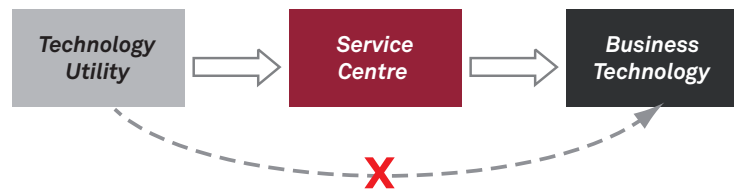
CIOs were asked how they see their IT function maturity developing in the future. The results clearly indicate that the maturity of IT functions follows an evolutionary path from one cluster to the next (i.e. from Technology Utility to Service Centre, and from Service Centre to Business Technology). CIOs do not envisage a sudden leap forward in maturity.

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*IT wants to get closer to the business not because of the economy but because it's the right thing to do."*

*CIO from the UK*

**Figure 5 - The evolution path from the cluster "Technology Utility" to "Business Technology" through "Service Centre"**



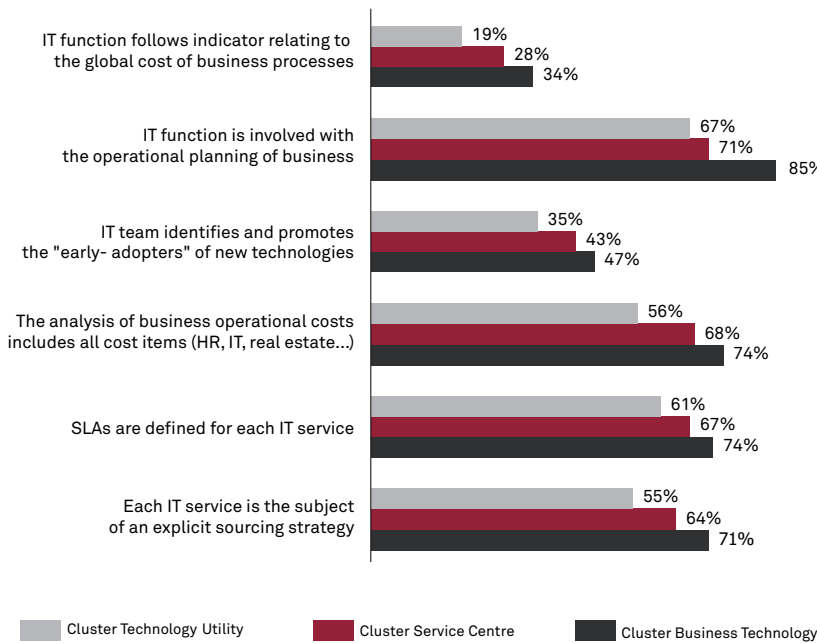
It should be noted, however, that within some companies, business perceptions, strategy and culture mean that managers neither want nor need their IT functions to evolve along these lines and therefore stay within the same cluster. Only a crisis situation such as a major IT service system failure, a huge write-off on a project or the appointment of a new CEO with a different vision for IT is likely to create a situation in which the IT function maturity goes down and the IT function shifts from cluster Business Technology to Service Centre, or Service Centre to Technology Utility.



## Evidence of this evolutionary path

The examination of changes in maturity level of IT practices confirms the existence of this path. The level of maturity of IT practices increase from the Technology Utility cluster to Business Technology cluster as shown below:

**Figure 6 - Evidence of this evolutionary path through the three clusters % of IT functions that replied “systematically” or “regularly” to a selection of questions**



Another clear trend emerging from the study is that CIOs within the Business Technology cluster are in a better position to create alliances with other key stakeholders within the company (in particular the CEO, CFO and the HR department) than those in the other two clusters. CIOs in the Business Technology cluster have more opportunity to extend their roles beyond the IT function.



The existence of this evolution path is also confirmed by analysis of maturity in information usage.

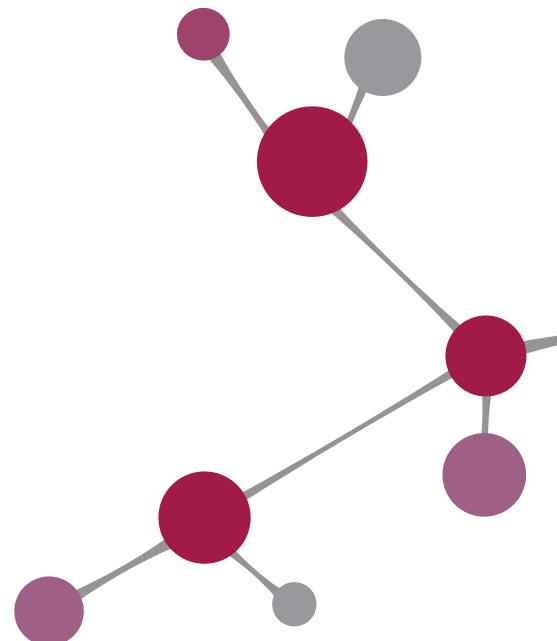
As shown in the table below, the levels of maturity in the three capabilities varied from cluster to cluster. In the Technology Utility cluster, the level of maturity in all three capabilities was the lowest, while the highest levels of maturity were recorded in the Business Technology cluster.

**Figure 7 - Levels of maturity in the three capabilities per cluster**

	Cluster Technology Utility		Cluster Service Centre		Cluster Business Technology
Ability to manage IT applications and infrastructure effectively	Very weak		Weak		Good
Ability to manage information usage effectively	Weak	→	Average +	→	Very good
Ability to instil and promote the values and appropriate behaviour	Average -		Good		Very good
<b>Total</b>	<b>Weak</b>		<b>Average +</b>		<b>Very good</b>

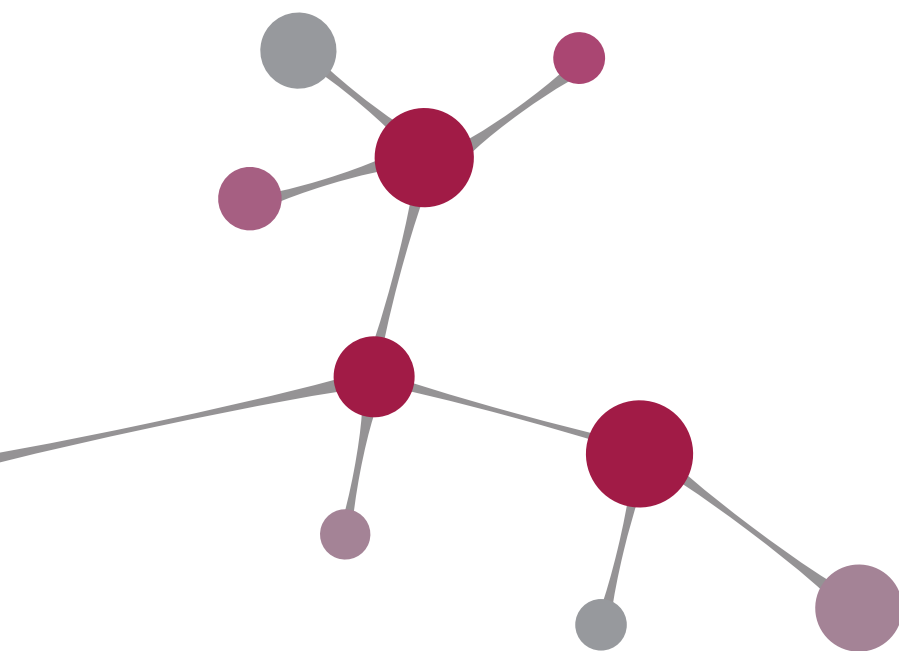
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The pattern emerging from the information usage analysis confirms the differences between each cluster and the existence of an evolutionary path followed by the clusters from Technology Utility via Service Centre to Business Technology.



//

*Since we successfully deployed an ERP platform and we put in place a standard architecture, the CEO considers that the company is now achieving a better degree of agility, compared to our competitors. I am now a member of the executive group.”*  
**CIO from Business Technology Cluster**



# Industrialisation, innovation, and technology and information usage ...

## ... high differences in terms of maturity levels

- Practices relating to IT industrialisation are well implemented.
- The majority of practices relating to innovation through IT are in the process of being deployed.
- Practices (even basic practices) relating to usage are still emerging.

## IT functions are well-industrialised but challenges lie ahead

Industrialisation is at the core of mature IT practices and CIOs clearly consider industrialisation to be the cornerstone of the IT function.

A vast majority of companies have, for example, set up shared service centres, have contracted Service Level Agreements (SLAs) between business and IT, and follow up the engagements of those SLAs in dashboards which monitor the availability of IT infrastructure and business applications.

Management of project portfolios and project delivery is also well documented, formalised and executed. CIOs have implemented a set of processes enabling joint optimisation of the project portfolio between IT and business. Almost all of them have a strategic IT plan for the next three years, that allows the prioritisation of IT projects according to the business strategy and their economic impact.

The level of programme management skills within the IT function is so high that often CIOs co-drive business transformation programmes that have a large IT component.

CIOs consider that they have reached the level where IT is good at supporting operational and management needs and business processes.



*A part of the IT organisation is even called 'the factory.'*  
CIO from the Netherlands

*"Operational excellence will pay off."*  
CIO from the Netherlands

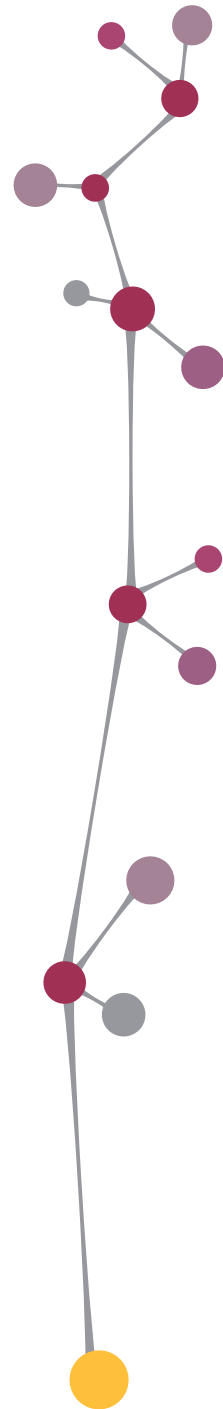
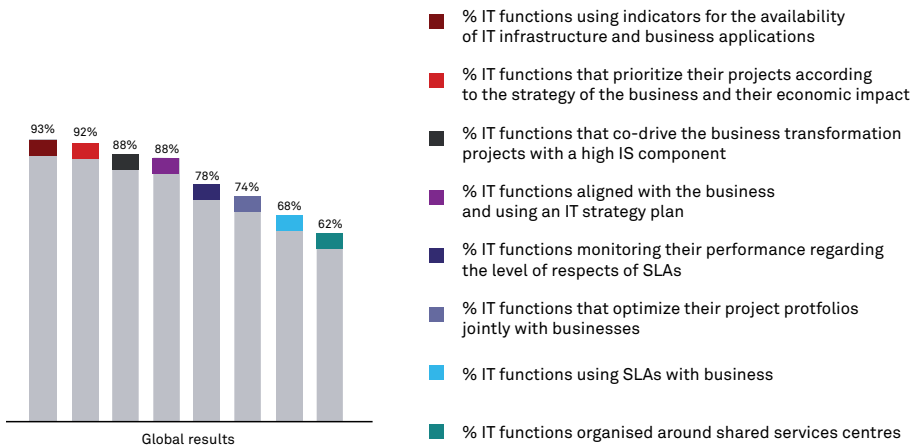
**Figure 8 - Level of maturity of capabilities relating to industrialisation**  
Ranking of CIOs' responses to questions contained in the information usage analysis

IT Practices™ (ITP)	
IT for management support	Good
IT for innovation support	Good
IT for business process support	Good
IT for operational support	Good

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**Figure 9 - Level of maturity for some questions relating to industrialisation**



## Our point of view

*CIOs have defined and implemented sourcing policies, more flexible architectures, industrialised processes and operations with standards like ITIL, CobiT or others. They have also defined and measured KPIs and standard costs like other functions in the corporation.*

*But just as they had to redefine their operations with web-based technology in the early 2000s, we think that the infrastructure revolution, which lies just ahead of us, including massive virtualisation, cloud computing and SaaS delivery, will break or at least challenge the current industrial model: sourcing policies now have a third answer to the well-mastered make or buy dilemma – rent – and the architecture will have to be revisited.*

*This revolution will also change the financial business model of IT reducing CAPEX\* in favour of OPEX\*\*.*

\* CAPEX: CAPital Expenditures - it refers to the cost of developing a product or system.

\*\* OPEX: OPERating Expenditures - it refers to the ongoing costs for running a product or system.

**//**  
*If IT wants to function as core to the business model it has to be seen as a real "Innovation Provider."*  
**CIO from Germany**

## IT functions are making real headway on innovation

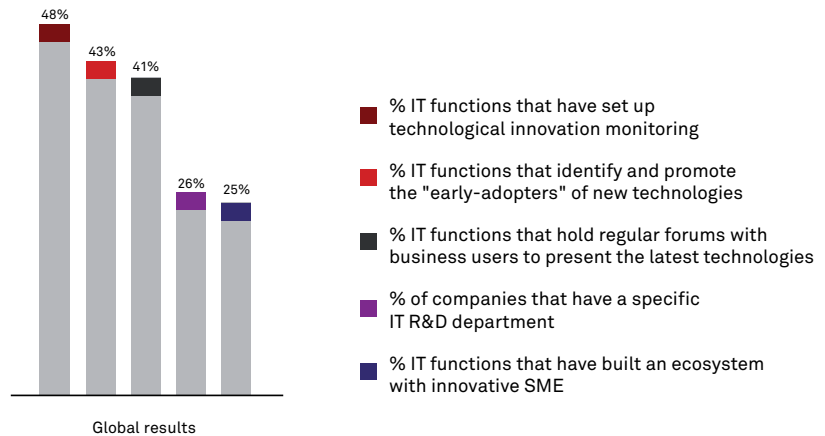
One practice area in which the IT function seems to be making real headway is contributing to innovation and promoting new technologies to business.

More than half of the companies report that the potential of IT is integrated within the business innovation process. IT functions have to adapt their organisation to better link with business innovation. That's why more and more IT functions employ IT product managers and why IT teams often hold forums with business users to present the latest technologies and their potential use.

Furthermore, many IT functions are effectively making use of innovations originating outside the company with, for example, almost half of IT teams organising visits to other companies in order to demonstrate the value of new technologies to business users.

Overall, CIOs rate the maturity of the practices related to innovation in their organisations at slightly above average.

**Figure 10 - Level of maturity for some questions relating to innovation through IT**





They rate their companies above average on their ability to seek information on new business opportunities and threats and to help business to change in the competitive environment.

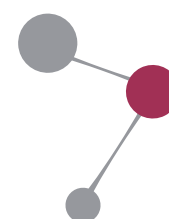
Similarly, companies score above average both on their ability to formalise informal sources of information and on their ability to foster and communicate new ideas. Nevertheless, regarding their ability to appreciate the potential of using new information to solve problems, most companies score below average.

But while people are becoming aware of the advantages that quick access to accurate and relevant information could bring them, and are starting to think in innovative ways to formalise information and make it more reachable, there has yet to be a significant change in behaviours.

**Figure 11 - Level of maturity of capabilities relating to innovation**  
**Ranking of CIOs' responses to questions contained**  
**in the information usage analysis**

Valuing the potential of using new information to solve problems	Average -
Seeking information on competitive opportunities and threats	Average +
Explore new ways to acquire and use information to do their jobs better	Average +
To foster and communicate new ideas	Average +
Looking for opportunities to use information to respond quickly to changes in the competitive environment	Average +
Formalising informal sources of information	Average +
Avoiding the use of informal sources of information when formal information sources exist and are credible	Average +

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## Our point of view

*Developments such as Web 2.0, social networks, RFID, internet mobile and search engines are strong sources of innovation for most companies. Thus CIOs are at the heart of the company innovations as innovation will often be technology- driven.*

*Business managers need to be aware of the potential that new technologies carry in terms of innovation and value creation. On the other hand, CIOs can and must contribute to the identification of added-value use of this potential.*

*Innovation represents therefore a great opportunity for the IT function to get closer to the business and increase its impact on value creation.*

## Technology and information usage value remains uncharted territory

Although most IT functions already conduct yearly customer satisfaction surveys, investigating usage through quantitative indicators is still something that remains incomplete. Indeed, only one out of three types of IT functions employ a basic set of performance indicators relating to the efficiency of business processes.

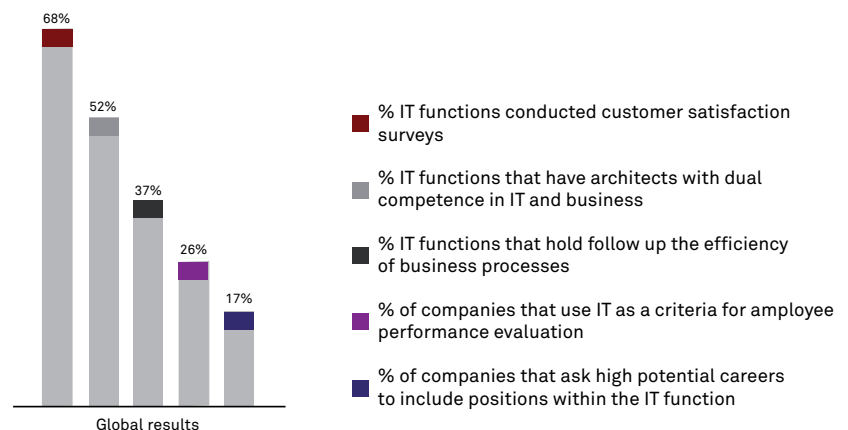
However as well as talking about improving the monitoring of usage, IT and the business must first improve their ability to identify and promote “bilingual” managers and workers with both IT and business competencies. A workforce fluent in both disciplines will have the capacity and insight needed to investigate information usage value. Only one out of two managers and workers have a dual competence in business and IT.

Significantly, in only one case out of six, the IT function provides a route to a senior management position. This shows that IT is rarely close enough to business to enable its managers to evolve beyond their IT function responsibilities.

CIOs delivered a below-average assessment of the maturity of their organisations’ IT practices relating to information usage value: employees are not trained, motivated or incentivised to collect, use and update information, and consequently the ratings for the understanding of the potential value of information and what constitutes appropriate usage are low.

The CIOs report that people in their organisations are not good at using information effectively and that there is a need for management disciplines designed to foster the sort of behaviour that would encourage the sharing and appropriate use of information. Rather tellingly, it emerges that most companies are poor at promoting openness in information usage and do not have practices in place to prevent the fabrication of information to justify decisions.

**Figure 12 - Level of maturity for some questions relating to IT usage**



CIOs are therefore struggling to break through the barrier that prevents companies from taking advantage of the existing unexploited information usage value. The key to this breakthrough resides with the people in the organisation and requires changes in behaviour and culture to take effect. This means that people working in the IT function must start thinking about how to create business value from the use of information, and people making strategic business decisions must start viewing the information handled by the IT function as a tangible business asset.

**“**One of the primary goals of our IT team is to continue to strengthen the relationship with the business and work closely together to achieve outstanding results.”  
**CIO from North America**

**Figure 13 - Level of maturity of capabilities relating to information usage**  
**Ranking of CIOs’ responses to questions contained**  
**in the information usage analysis**

Promoting openness in effective information use	Average -
Training employees to keep information up-to-date	Average -
Sharing information across functional boundaries, such as sales and manufacturing	Average -
Preparing our people to actively seek new information	Average -
Valuing the potential of using information to solve problems	Average -
Understanding what constitutes appropriate uses of information	Average -
Avoiding the fabrication of information to justify decisions	Average -

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## Our point of view

*IT function and business managers must start working on the creation of a solid foundation to improve technology and information usage value.*

*For example:*

- *Company managers can identify strengths and weaknesses in information management by launching more frequent and deeper post-project audits and reviews within the company.*
- *Company managers can monitor the usage of applications by developing usage key performance indicators, such as the level of usage of business applications and more sophisticated indicators of the efficiency of business processes.*
- *CIOs can set up a “usage value team” that will be dedicated to identifying the usage of business applications, participating in new projects and following up the improvement in information and technology usage within the company.*
- *CIOs can work on IT competitive intelligence to identify best practices, to measure competitors and to adapt the IT or business organisation accordingly.*

**//**  
*Crisis is a unique opportunity for the CIO to show the value of IT for the enterprise."*  
**CIO from the Netherlands**

### 82% of CIOs undertook a cost reduction plan

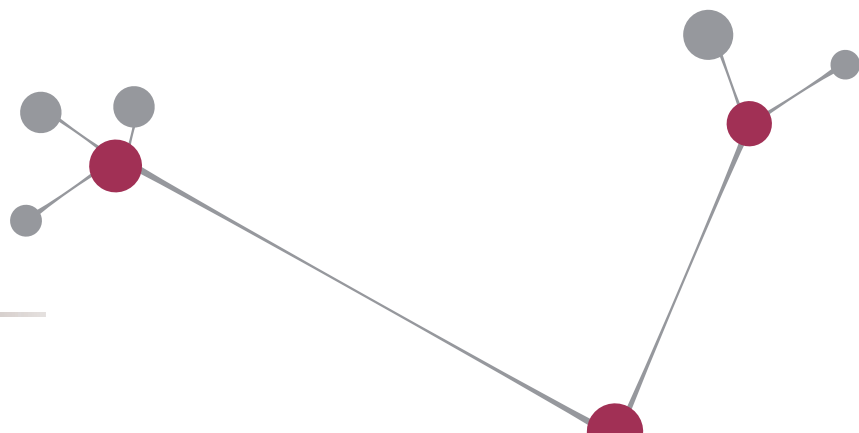
In 2009, 50% of public sector CIOs had to implement a cost reduction plan. In the private sector, the percentage is even higher: 82% of CIOs have undertaken cost reduction measures of, on average, 15%. This means that CIOs face both challenges and opportunities: on the one hand cost reduction can mean fewer resources being made available; on the other hand if CIOs can unlock some of the value contained within their IT functions and applications, the business will gain a competitive advantage and be more at ease with the level of IT investment.

Through our study we identified five main cost reduction measures:

- Revision or renegotiation of supplier contracts.
- Acceleration of on-going projects with high business impact.
- Prioritisation of projects with short returns on investment.
- Outsourcing of some services.
- Reorganisation of the IT function.

However, the use of these measures significantly vary from one cluster to another. CIOs from the Business Technology cluster have again differentiating characteristics:

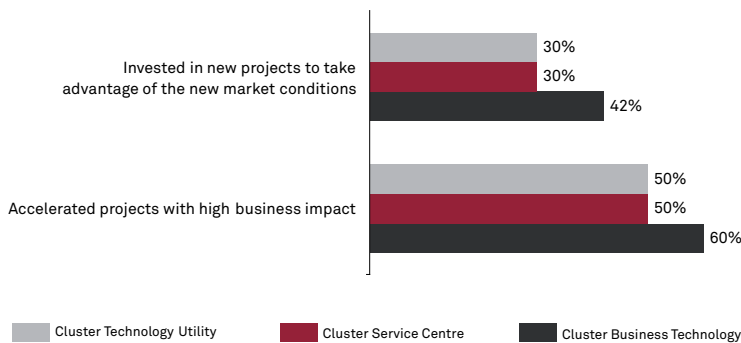
- They are faster at defining and executing a cost reduction plan.
- They have a lower cost reduction target.
- They are more able to accelerate on-going projects with high business impact and to launch new projects with immediate value creation.



This shows that having a business-oriented IT function means that it can participate more fully in the rapid recovery of a company in a down-turn.

Interestingly, the impact of the global economic crisis has obliged all CIOs to focus not just on IT costs but on the ratio of costs to business value. This has led, in some cases, to the IT function being considered as an equal partner to the business units for the first time, with CIOs reviewing their project portfolios in full collaboration with business managers.

**Figure 14 - Use of strategic measures to face the down-turn by cluster**

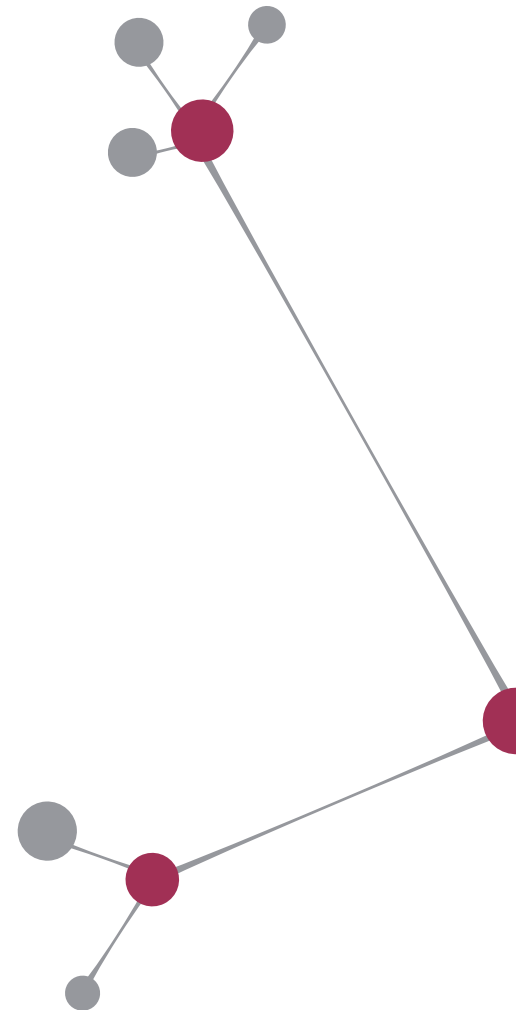


## Our point of view

*The current economic context has acted as a catalyst for change in the relationship between the IT functions and businesses. The main difference between today's economic crisis and the previous one of 2001–2002 is that now most companies acknowledge that IT is more than a basic utility. Business managers are therefore willing to be proactively involved in planning IT cost reductions to make sure they save their most valuable projects.*

*Today's crisis is a unique opportunity to bring business and IT even closer together and accelerate the progress of the IT function maturity.*

*The IT function is increasingly viewed as providing a route out of the current crisis. The effective use of information is going to be an important factor in deciding who will be the industry leaders of the future.*



## A new perspective for companies

Our study also assesses how CIOs view their companies' ability to use information competitively to become a leader in their industry.

The results show that CIOs from the Technology Utility and Service Centre clusters are pessimistic about their companies' ability to use information competitively. Specifically, these CIOs do not believe that their companies can improve their performance by using technology and information more effectively.

Indeed, CIOs from the Technology Utility cluster believe that their companies are not sufficiently focused on improving the way they use information when they do business with the customers such as embedding high quality information in the company's products and services to differentiate them from those of their competitors. Many felt that their companies could do more to involve customers in after-sales information exchange as a way of increasing customer loyalty.

CIOs from the Service Centre cluster share responsibility for the management of competitive information with business managers but like the CIOs from the Technology Utility cluster, they do not believe that their companies are sufficiently focused on the way they do business with the customer. On a positive note, CIOs believe that their companies are good at exploiting information received from customers and partners to win new markets.

Only CIOs from the Business Technology cluster think their companies can be leaders in their industry sector. There is a huge gap of maturity on this subject between the first two clusters and the Business Technology one. However, the answers show that companies with a Business Technology profile still have room for improvement and that there are significant challenges to overcome in order to become "digital winners".

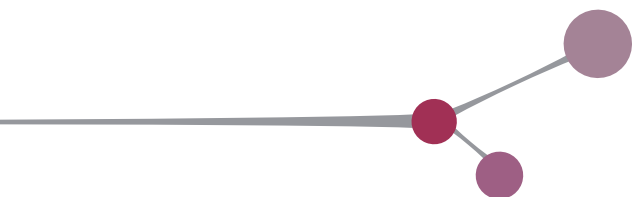




Figure 15 - Future industry leadership in competing with information

		Cluster Technology Utility	Cluster Service Centre	Cluster Business Technology
Competitive information	Sensing competitive information to shape our business strategies	Weak	Average -	Average +
	Leveraging information to ensure partner loyalty	Weak	Average +	Good
	Using information to select and control our suppliers	Average +	Average +	Good
	Exploiting information received from customers and partners to win new markets or operate more efficiently	Weak	Average +	Average +
	Using information to streamline our supply chain and eliminate middlemen	Weak	Average +	Average +
	Gaining access to competitive information that is not available to our competitors	Weak	Average -	Weak
	<b>Competitive information total</b>	Weak	Average +	Average +
Customer information	Detailing customers' needs so that we can offer customised products and services	Weak	Weak	Average +
	Engaging in two-way information exchanges with our customers to better understand why they buy our products and services	Very weak	Weak	Average +
	Embedding high quality information in our products and services to differentiate them from those of our competitors	Very weak	Very weak	Average -
	Pushing information to our customers to encourage consumption of our products/services and to offer incentives for moving them to new product/service offerings	Very weak	Weak	Good
	Linking customers in after-sales information exchanges to help increase customer loyalty	Very weak	Weak	Good
	Gaining access to customer information that is not available to our competitors	Weak	Very weak	Weak
	<b>Customer information total</b>	Very weak	Weak	Average +
Operational information	Monitoring information about our company's business processes to cut costs and reduce cycle times	Weak	Weak	Average +
	Delegating decision making to the lowest levels possible in our company by delivering the right information to the right place at the right time	Average -	Average -	Average -
	Allowing our people to work more effectively in groups by using information to coordinate activities and people	Average -	Average -	Average +
	Reducing the need for the physical movement of people, projects, and facilities by using information to coordinate activities and people	Average +	Average -	Average +
	Exploiting network-based coordination and monitoring to take full advantage of outsourcing opportunities	Average -	Average -	Average +
		<b>Operational information total</b>	Average -	Average -

“*IT is product centric. We have actually shifted our strategy to a "customer-centric" model away from being product centric.*”  
**CIO from North America**



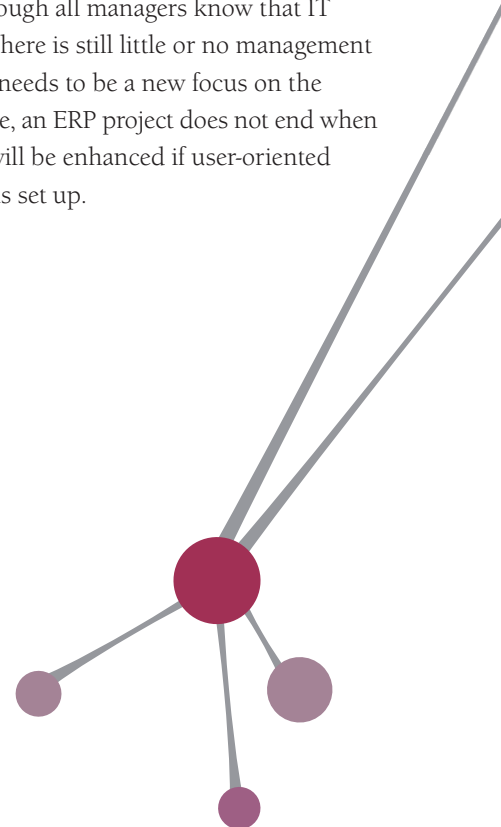
## Conclusion: Three challenges to face

### CIOs and companies are facing three challenges:

- Having to deal with the arrival of new technologies such as cloud, that may disrupt CIOs' efforts to increase levels of industrialisation and IT maturity.
- Increasing the focus of IT usage on value creation for the business at the same time as improving operational performance.
- Harnessing the usage of information from a broader range of sources, including suppliers, customers and social networks.

Capgemini's 2009 Global CIO Report shows that, in terms of IT deployment, a vast majority of CIOs have reached the point where they manage their IT in an industrialised way. These solid foundations have enabled companies to obtain the right IT applications and infrastructure to support business processes effectively. Building on this, significant numbers of CIOs are now turning their focus towards collaboration with business at strategic and operational levels. However, the advent of new technologies such as SaaS and the cloud, is currently challenging the IT function's industrialisation model. CIOs have to be prepared to revisit it drastically.

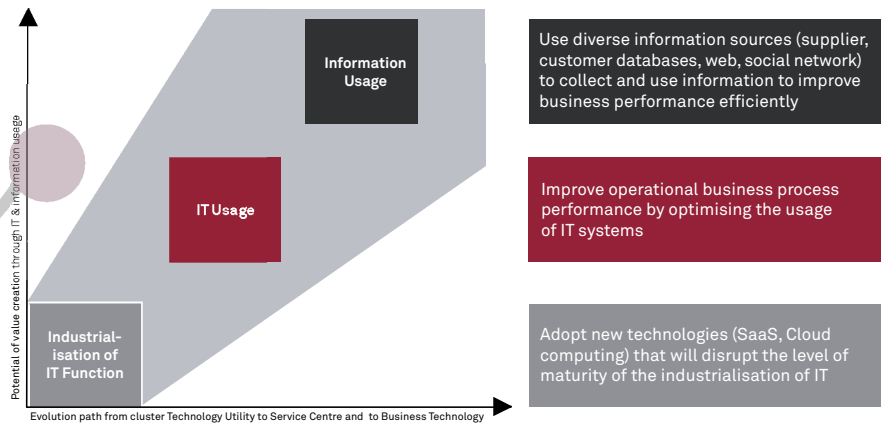
Though providing efficient IT systems for the business is difficult enough, operational business process performance does not depend on the efficiency of the IT systems alone. More important is the extent to which employees can derive a business benefit by using IT efficiently. Although all managers know that IT usage is critical for operational performance, there is still little or no management of the value that needs to be delivered. There needs to be a new focus on the creation of value through IT usage. For example, an ERP project does not end when it goes live; the business value that it creates will be enhanced if user-oriented governance, with business and IT indicators, is set up.



Companies also face the challenge of creating value through leveraging a broader range of information sources in order to become a “digital winner”. Evolution towards this goal will involve altering behaviour patterns and redefining the values of employees and managers. It will require that all employees are trained and given incentives to collect, organise, maintain and update information from diverse sources, such as supplier and customer databases and social networks. In a digital world, this is a fundamental part of creating value through the usage of information.

The three challenges are opportunities for CIOs to take the lead and provide the board with value creation propositions and new governance models.

**Figure 16 - Increasing the potential of value creation through IT and information usage moving from the Technology Utility cluster up to the Business Technology cluster**



## About the survey method

In this report, we used two analysis tools to assess the current level of usage value of technology and information across a range of industry sectors:

- A questionnaire completed during a series of face-to-face interviews with 490 CIOs from companies and institutions based in 14 countries. This enabled us to define the main purpose and intended direction of the IT function within each CIO's company and then ascertain the level of maturity across five practice domains identified from third-party research.
- An online information orientation diagnostic tool developed by Professor Donald Marchand of IMD, Lausanne, Switzerland. This is a proven resource designed to evaluate an organisation's potential to create business value through effective information usage.

The combined use of these two instruments provided a unique opportunity to compare and cross-reference information and IT usage value within the same cohort of CIOs.

### IT face-to-face Questionnaire

Between June and October 2009 principals and vice presidents from Capgemini Consulting conducted 490 face to face interviews with CIOs from 14 countries and a broad range of industries. Each interview, which lasted approximately one hour, involved the completion of a detailed questionnaire designed to shed light on the ability of each respondent's company to derive business value from the use of its information systems. The results were analysed using SAS statistical software (see About SAS).

Each interview explored the respondent's IT practices over the five domains of practice (fundamentals, levers, governance, performance and CIOs' roles and responsibilities). These domains of practice were identified in 2008 by CIGREF, the association representing IT users from France's leading companies, as indicating the value-creation capability of the IT function.

**Figure 17 - Breakdown of interviews per industry**

	N° of companies	%
Public	123	25%
Manufacturing	77	17%
Energy & Utilities	50	11%
Banking	46	10%
Consumer Products & Retail	45	10%
Insurance	39	8%
Pharmaceuticals & Life Sciences	23	5%
Media & Entertainment	19	4%
Telecom	18	4%
Business Services	14	3%
Tourism, Transport & Travel	12	3%

**Figure 18 - Breakdown of interviews per region**

	N° of interviews	%
France	90	18%
Netherlands	63	13%
Germany / Switzerland	45	9%
Spain	42	9%
Norway	38	8%
Italy	37	8%
North America	37	8%
Sweden	37	8%
India	20	4%
United Kingdom	20	4%
Australia	19	4%
Austria / Eastern Europe	17	3%
Belgium	11	2%
Finland	10	2%



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**Figure 19 - Information Orientation Benchmark scale**

Legend	
Excellent	Top 5%
Very good	Top 20%
Good	Top 35%
Average +	Above 50%
Average -	Below 50%
Weak	Bottom 35%
Very weak	Bottom 20%
Insufficient	Bottom 5%

## IO Diagnostic™

In order to challenge the findings of the IT questionnaire and delve deeper into the importance of usage value, we conducted a second analysis using the Information Orientation (IO) maturity framework.

We invited all CIOs to complete the online IO Diagnostic™ developed by Professor Donald Marchand of IMD. A subset of 108 of the 490 CIOs completing the IT questionnaire completed the IO Diagnostic™. While this cohort of CIOs was self-selected, their profiles correlated very closely with the total cohort of 490 CIOs with regard to industry sector, cluster and domains of practice.

Professor Marchand analysed the results completed by respondents on the enterpriseIQ® international benchmark database, and conducted several workshops with the Capgemini Consulting team to interpret the data.

The IO results were graphically displayed to illustrate the ranking of managers' responses to questions in the IO Diagnostic™ based on the enterpriseIQ® international benchmark database.

**enterpriseIQ®** is the first global business analytics company offering proven metrics that link superior performance to how effectively a company manages and uses knowledge, information, people and technology. The Information Orientation (IO) maturity metric was developed during a four-year research project conducted at IMD International, one of Europe's leading business schools, based in Lausanne, Switzerland. enterpriseIQ® was established as a spin-off of the IMD research project in response to demand from companies wanting to use the metric to leverage knowledge and information for competitive advantage. [www.enterpriseIQ.com](http://www.enterpriseIQ.com)

Figure 20 - Information Orientation Diagnostic framework



Source: Donald A. Marchand, William J. Kettinger and John D. Rollins, Making the Invisible Visible: How companies win with the right information, People and IT, New York and London: John Wiley and Sons, 2001.

## The following organisations were interviewed for the Global CIO Report:

### Business Services

- Adecco Spain
- Amadeus
- Bureau Veritas
- CARE Schadeservice
- CRV
- De Post
- Descours et Cabaud
- Fast Search & Transfer
- Invivo
- Loyalty Partners Solutions
- Mayer Brown
- OSEO
- SAP
- Securitas
- Sick

### Consumer & Product Retail

- Ahold
- Akzo Nobel
- Beiersdorf Shared Services
- Cadbury
- Canon Europe
- Carrefour
- Chanel
- Coop
- CORA
- Damm
- Danone
- Del Monte
- Essilor
- Felleskjøpet Agri
- Foster's Group
- Fressnapf Tiernahrungs
- Gerolsteiner Brunnen
- GO Sport
- Groupe BEL
- Gruppo Bacardi & Martini
- ICA
- Japan Tobacco International (UK)
- La compagnie des Alpes
- Les Mousquetaires
- L'oréal
- LVMH
- Mahou-San Miguel
- Marico Limited
- Mars
- Maxeda
- Metro
- Midelfart Sonesson
- Nestlé Nederland
- Office Depot
- Onninen
- Pernod Ricard
- Pioneer
- Rexel
- Royal FrieslandCampina
- SABMiller Europe
- Schuitema
- Scotts
- Seur
- Swedish Match Nordic
- The Carphone Warehouse Group
- The Phone House
- Titan Industries
- United Breweries

### Energy & Utilities

- ACEA
- Acergy
- Agder Energi
- Alpiq
- Anonima Petroli Italiana
- Areva
- Arkema
- Baker Hughes
- BKK
- Bruce Power
- Caltex
- Cepsa
- Covanta
- EDF
- EDF DCO DPP

- Edison
- Elia
- Enagas
- Eneco Energie
- ENEL
- Energy Future Holdings
- ENI
- E.ON (UK)
- ERDF
- Fluxys
- Gaz de France
- Göteborg Energi
- Hafslund
- Integrys
- LDE
- Media-Saturn-Holding
- Neste Oil
- NiSource
- NTE
- Oil and Natural gas Corporation Limited
- OMV
- Ontario Power Generation
- Poweo
- Reliance Infrastructure Ltd.
- Rhodia
- Schlumberger
- Sibelga
- SPE Luminus
- Statkraft
- StatoilHydro E&R
- TenneT
- Upstream of major energy company (BP) Vattenfall
- Vattenfall Europe
- Veolia Eau
- Véolia Environnement

### Financial Services

- Adelas
- Agrupació Mutua
- Aktiv Kapital
- Allianz
- Allianz
- APG
- Asisa
- AXA
- AXA France
- Banca Popolare di Milano
- Bancaja
- Banco de España
- Banca Popolare di Verona
- Banco Popular
- Bank Gospodarki Żywnościowej
- Bankadati - Services Company of Gruppo Credito Valtellinese
- Caisse d'Épargne
- Caja de Ávila
- Caja de Guadalajara
- CFF
- Credit Agricole Group Belgium
- De Lage Landen
- Deutsche Bausparkasse Badenia
- Dexia Bank Belgium
- Euroclear
- GE Money Bank
- GE Money Bank a.s.
- GE Money Bank
- GE.SI.ass.
- Generali
- Generali Business Solutions
- Genworth Financials
- GMF
- Handelsbanken
- HDFC Bank
- Humley Insurance
- ICICI Bank
- If
- ING Belgium
- International Card Services
- Intesa San Paolo
- KAS Bank
- KBC Group

- Komerční Banka
- La Banque Postale
- Länsförsäkringar
- Liberty Seguros
- Línea Directa Aseguradora
- London Metal Exchange
- MAIF
- Mapfre
- Max New York Life Insurance Company
- Mazars
- Mutua Pelayo
- Nordea
- OAMPS Insurance Brokers
- PGGM
- R+V Versicherung
- Raiffeisenbank
- Sanitas
- SBI Life Insurance Company
- SCOR
- SegurCaixa holding
- SI2M
- Siemens Financial Services
- Skandia Retail
- Société Générale - Bque de détail France
- Sparebank1 Midt-Norge
- Sparebank1 Skadeforsikring
- Superpartners
- Swedbank
- Teller
- UVIT
- Volksbank Slovensko
- Westfarmers Insurances
- WestLB
- Westpac
- Zürich Financial Services

### Manufacturing

- ABB
- Aditya Birla Group
- Aker Solutions
- Alenia Aeronautica
- Arc International
- Arcelor
- ArcelorMittal
- ASML
- Avebe
- Bayer MaterialScience
- Beam
- BENNET
- Benteler
- Bluestar Silicones International
- Canberra
- Cargill
- Celanese
- CSM
- DCNS
- Deutsche Amphibolin-Werke
- Draka Holding
- Elis
- Eramet
- Ericsson
- Famosa
- Fedrigoni Cartiere
- Freescale
- Fujifilm Europe
- Getinge
- GI Group
- GMR Group
- Goldsmith Seeds (Syngenta)
- Goodrich
- Grupo Cementos Portland Valderribas
- Gruppo BREMBO
- H.C. Starck
- Hero Honda Motors
- Holden (General Motors)
- Honda SIEL Cars India
- Kemira
- Lafarge
- Lanxess Pte
- Luigi Lavazza
- Manpower

### Public Sector

- Academisch Medisch Centrum
- ACOSS
- Adif
- AENA
- AGIRC ARCCO
- Airport Authority of India
- Ajuntament de Barcelona
- Alfa-College
- Amphia Ziekenhuis
- Australian Department of Agriculture, Fisheries and Forestry
- Australian Department of Veterans Affairs
- Australian Tax Office
- Banque de France
- Bayerisches Staatsministerium der Finanzen
- Brønnoysundregistrene
- Bundesministerium der Justiz
- Bundesministerium des Innern
- Bundesministerium für Verkehr, Bau und Stadtentwicklung
- Bundespräsidialamt
- Business Link Pty
- Caisse des dépôts
- Catharina Ziekenhuis
- CenITex
- Centraal Bureau voor de Statistiek
- CGAP
- Cnaf
- CNP
- Crown Prosecution Service
- CTTi (Centre de Telecomunicacions i Tecnologies de la informació)
- Departament de Salut (Generalitat de Catalunya)
- Departamento de Informática (Agencia Estatal de la Administración Tributaria)
- Department for Children, Schools and Families
- Department of Education and Training
- Deutscher Wetterdienst



- DGA
- DGME
- Dienst Justitiële Inrichtingen
- Domstolsadministrasjonen
- Environment Climate Change and Water
- Etelä-Karjalan sosiaali- ja terveystieteiden tutkimuskeskus
- European Commission
- EXPO 2015 S.p.a.
- Ferrocarriles de la Generalitat de Catalunya
- Freie und Hansestadt Hamburg
- Gemeente Amsterdam
- Gemeente Breda
- General Teach Council for England (GTCE)
- Göteborgs Stad
- Government of New South Wales
- Gruppo FERROVIE DELLO STATO
- Helse Vest
- Her Majesty's Revenue and Customs (HMRC)
- Immigratie- en Naturalisatiedienst
- India Post, Department of Posts
- INRIA
- Istituto Poligrafico Zecca dello Stato
- International Olympic Committee
- Interprovinciaal overleg
- Ipse de Bruggen
- Kadaster
- Kuntien eläkevakuutus
- La Poste
- Land Berlin
- Land Hessen
- Landstinget Gävleborg
- Lånkekassen
- Lantmateriet
- Learning and Skills Council
- Leibniz-Rechenzentrum
- Leids Universitair Medisch Centrum
- MINEFI
- Ministère de la Défense
- Ministerie van Binnenlandse Zaken en Koninkrijksrelaties
- Ministerie van Buitenlandse Zaken
- Ministerie van Economische Zaken

- Ministerie van Landbouw, Natuur en Voedselkwaliteit
- Ministerie van Onderwijs, Cultuur en Wetenschap
- Ministerie van Verkeer en Waterstaat
- Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer
- Ministerio de Defensa
- Ministerio de Industria, Turismo y Comercio
- Ministerio de Justicia
- Ministerio de la Presidencia
- Ministerio dell' Interno
- Ministry of Justice
- Ministry of Transport and Water
- MSA
- National Offender Management Service (Ministry of Justice)
- NAV
- NSW Attorney General's Department
- NSW Office of State Revenue
- NSW Services Technology and Administration
- Octrooicentrum Nederland
- Office for Standards in Education, Children's Services and Skills (Ofsted)
- Openbaar Ministerie
- Österreichisches Patentamt
- Oulun kaupunki
- Parnassia Bavo Groep
- Pôle Emploi
- Politidirektoratet
- Politie Amsterdam Amstelland
- Power Finance Corporation Limited
- Puolustusministeriö
- RATP
- Region Skåne
- RFF
- Rikspolisstyrelsen
- RSI
- Sächsisches Staatsministerium des Innern
- SENASA
- SINTEF
- Skatteetaten
- Skatteverket
- Skyguide
- SPK

- Statens Vegvesen
- Statistisches Bundesamt
- Stichting Rivierduinen
- Stockholm Stad
- Stockholms Läns Landsting SLL
- TAD
- Tampereen kaupunki
- Transport for London (TfL)
- Tullihallitus
- Universitair Medisch Centrum Utrecht
- Västra Götalandsregionen VGR
- Vereniging van Nederlandse Gemeenten
- Ville de Grenoble
- Voorziening tot Samenwerking Politie Nederland
- West Sussex County Council

#### Telecom, Media & Entertainment

- Arris
- Canal +
- Club Med
- COLT
- Corporation RTVE
- Dagens Nyheter
- EMI UK
- Eurodisney
- Euskaltel
- France Télévision
- Hub Telecom
- Hutchison 3G Austria
- IL SOLE 24 ORE
- Mc Graw-Hill
- Multi Screen Media Private Limited (Sony Entertainment Television)
- NetCom
- Orange UK
- Radio France
- R-Cable
- Scholastic At Home
- SEAT Pagine Gialle
- Swets
- TDF
- Telecinco
- Telenor
- Viacom
- Vonage
- Westwood One

#### Travel, Transport & Logistics

- ADAC e.V.
- Aéroports de Paris
- Air France KLM
- ASF
- BCD Travel
- De Lijn
- Deutsche Lufthansa
- DHL Leimur Logistics Pvt
- Geodis
- GVK Mumbai International Airport
- Jernbaneverket
- Leif Höegh & Co
- NH Hoteles
- Norbert dentressangle
- NSB
- Posten Norge
- Qantas
- SAS
- SJ
- SNCM
- TNT Post
- Vopak
- WMS

#### Pharmaceuticals & Life Science

- Actelion
- Amerisource Bergen Specialities
- AstraZeneca
- Bayer Healthcare
- Capiro
- Covance
- Eli Lilly
- EMD Serono
- McKesson
- Medical Action Industries
- Merial
- Sanofi Pasteur
- Sanofi Pasteur MSD
- Sanofi Pasteur R&D
- Sanofi-Aventis
- Sartorius
- Shering Plough
- Shire
- Smith & Nephew
- UCB

**A Korean publication of the CIO Report has been developed by Samsung SDS in parallel with the Global CIO Report and a specific report will be published in the Korean market.**

**The following Korean organisations were interviewed for the Global CIO Report:**

- Ajou University Medical Center
- AMOREPACIFIC
- BC Card
- Cheil Industries
- Cheil Worldwide
- CJ CheilJedang
- CJ Systems
- Daekyo
- Daesung Industrial
- Dong Kuk Steel Mill
- Dong Suh Food
- DONG-A PHARM
- Dongbu Hitek
- Dongbu Insurance
- Dongbu Securities
- Dongbu Steel
- Doosan
- Doosan Infracore
- GS Retail
- Hallym University Medical Center
- Hana Bank
- Hansol PNS
- HanWha Securities
- Hanyang Cyber University
- Heungkuk Life Insurance
- Hotel Shilla

- Hynix Semiconductor
- Hyundai Heavy Industries
- Hyundai Hysco
- Hyundai Ipark Mall
- Hyundai Mipo Dockyard
- Hyundai Motor Company
- Ildong Pharmaceutical
- Il-Yang Pharm
- IMARKETKOREA
- Industrial Bank of Korea
- ING Korea
- KEIST (Korea Institute of environmental Science and Technology)
- KIAT(Korea Institute for Advancement of Technology)
- Konkuk University
- Korea Custom Service
- Korea Development Bank
- Korea Enterprise Data
- Korea Hydro & Nuclear Power
- Korea Institute of Radiological & Medical Sciences
- Korea Land Corporation
- Korea Securities Depository
- Korea Tourism Organisation
- Korea University Medical Center

- Korean Air
- Koscom
- Lotte CFD
- Lotte Engineering & Construction
- Mirae Asset Life Insurance
- NongHyup
- NongShim
- Prudential Korea
- Pulmuone
- S1 Corporation
- Samsung Advanced Institute of Technology
- Samsung BP Chemical
- Samsung C&T – Engineering and Construction
- Samsung C&T - Trading & Investment
- Samsung Corning Precision Glass
- Samsung Digital Imaging
- Samsung Electro-Mechanics
- Samsung Electronics - Corporate
- Samsung Electronics – DS
- Samsung Engineering
- Samsung Everland
- Samsung Fine Chemical
- Samsung Fire&Marine Insurance
- Samsung Heavy Industries -

- Engineering & Construction
- Samsung Heavy Industries - Shipbuilding & Offshore
- Samsung Hospital – KangBuk
- Samsung Investment Trust Management
- Samsung LED
- Samsung Life Insurance
- Samsung Mobile Display
- Samsung Networks
- Samsung Petrochemical
- Samsung SDI
- Samsung SDS
- Samsung securities
- Samsung Techwin
- Samsung Total
- SeAH Besteel
- Seoul City Hall
- Shinsegae I&C
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