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Forty years of the corporate information technology function at Texaco Inc. – A history

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Abstract

This paper is a history of Texaco's Corporate IT Function (IT) from its inception until Chevron acquired Texaco in 2001. The four decades of Texaco IT are best characterized by a contrast between the function's performance and its resources. According to third party measures, Texaco IT was a top performer amongst oil-industry IT functions and third party service providers. Yet starting soon after its inception, the department endured a resource squeeze. As the workload increased, IT's relative resources shrank. Throughout its history, user dissatisfaction with the unit was prevalent. We believe that the Texaco IT story is a typical account of the experiences of many large corporate IT organizations. The unit was a success by the measures of the profession, but failed in the eyes of top management and business units.

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1. Introduction

Oilman "Buckskin" Joe Cullinan and New York Investor Arnold Schlaet founded the Texas Company, later called Texaco, Inc. (Texaco) in 1902 at Beaumont, Texas (Texaco, Inc., 1990b). In 1903, at Sour Lake Texas, Texaco struck oil. In 1905, the company entered the European market. In 1928, Texaco became the first oil-company to market in all 48 states. In 1936, it was amongst the first oil companies to become involved in the Middle East. That year, the firm also started producing and marketing oil products in Africa, Asia and Australia. Over the next 35 years, Texaco grew to be one of the largest global corporations in the world. The firm reached its peak size in 1971 with 71,000 employees, in 1981 with the revenue of $59.4 billion and in 1984 with an asset base of $37.4 billion.

In 1969, Texaco founded a corporate IT department (IT). Over the following three decades, the firm reduced its personnel by 51,000 employees. It diminished in size by automation, outsourcing and by selling under performing units. Measured by impact, Texaco IT was successful. It helped Texaco shed thousands of jobs per automated business process (Hodges, 1999).

IT automated the firm with few resources. Its staff did not exceed 3% of the firm's total personnel. Its annual budget did not top $159 million or 1.1% of the firm's revenue. With these resources, IT automated office functions, financial accounting from exploration to retail operations, and put a PC on nearly every desktop giving access to centralized corporate information (Hodges, 1999).

IT was a competitive service provider (Texaco, Inc., 1988a). In batch processing, Texaco IT's rates were less than 1/2 of EDSs, 1/8 of AVGs and circa 1/9 of GEISCOs (Texaco, Inc., 1988b). In interactive computing, the function charged less than 1/2 compared to EDS, 1/4 compared to AVG and Geisco and 1/5 compared to IBM. Texaco IT was ahead in cost efficiency.[3]

From the users' perspective, however, Texaco IT was a failure. Throughout the life of the unit complaints remained the same: "*IT was delivering too little, too late and charging too much*" (Pilgreen, 1999). Top management actions concerning IT's resources support this conclusion. IT's resources did not grow in proportion with its growing responsibilities (Porra, Hirschheim, & Parks, 2005).

Until now the history of Texaco IT has been an oral tale passed down by Texaco IT employees. We wrote the narrative in order to illustrate that the function was a lifetime success or failure depending on the perspective. We assumed that a narrative that spanned the existence of the unit might help understand some reasons behind top management decisions to shift information system responsibility to business units and third parties away from IT.

[3] Study was done by Real Decisions Corporation. In batch processing Texaco IT's rate was circa $30, while EDS charged circa $70, AVS circa $230 and GEISCO circa $260 for comparable service. In Interactive computing Texaco IT's rate was circa $30, while EDS charged circa $70, AVG circa $110, GEISCO circa $110 and IBM circa $140 for comparable service.

2. Method

Following Mason, McKenney, and Copeland's (1997b) steps of writing histories in the information systems field, we begun with focusing questions.[4] Then, we specified the domain, gathered evidence, critiqued it, determined patterns, told the story and wrote the transcript.

2.1. Focusing questions

Focusing questions formed when we observed the oil industry and Texaco IT between 1990 and 2000.[5] We developed close friendships and professional relationships with Texaco's executives, managers, employees and stockholders. By the end of the 1990's questions about Texaco IT had clustered around success and failure.

Success and failure are good topics for an historical method because the resulting narratives allow studying change over long time periods (Thompson, 1967). The method also allows reconstructing performance in a narrative where formal accounting evidence of performance doesn't exist. In Texaco IT's case, we studied events that contributed to perceptions of success and failure of the function over time.

Over Texaco IT's existence we were interested in change in four broad categories. Most locally, we looked for any significant environmental, strategic, financial and organizational change affecting the IT function. In the second category, we identified similar change affecting the firm at large. The third tier included changes in the oil industry that affected Texaco or its IT. Finally, we searched for significant technological advances that might have changed the circumstances for IT.

- What significant changes did the Texaco IT function face over its existence?
- What significant changes did Texaco face since the initiation of the IT function?
- What were the significant changes in the oil industry over the existence of the IT function?
- What were the significant changes in information technology over the existence of the IT function?

We studied the evidence in the four categories and recorded our findings until the observations seemed redundant.

2.2. Specify the domain

Our focusing questions helped define boundaries of the domain of interest. We were primarily interested in the Texaco IT function. For the decade preceding the inception of the IT function, we focused on the history of the individuals involved with the discovery of computer use at Texaco (Texaco, Inc., 1983a).

[4] For specifics on historical method see, i.e., Bloch (1951), Gottschalk (1969), Hexter (1971), Shafer (1974), Tuchman (1981), Kieser (1994), and Godfrey (1996).

[5] A good source on how research questions form is Cattell (1966).

2.3. Gather evidence

We accumulated a vast amount of data from public and private sources. We studied annual reports, magazine and newspaper articles, previous academic research, oil company histories (i.e., Yergin, 1992), industry statistics, brochures, and relevant web sites. We included thousands of pages of private documents such as IT strategic plans, IT personnel statistics, IT budgets, letters and memos relating to Texaco IT.

During the last decade, data was collected contemporaneously. Between 1990 and 2000, we conducted circa 45 h of formal, tape-recorded individual and group interviews with 54 of Texaco's senior management and IT personnel. Over the years, we also had informal interviews, conversations, lunches, and meetings totaling several hundreds of hours. All formal interviews were conducted using a non-directive technique, which allowed subjects the freedom to expand on areas of personal interest. Subjects were encouraged to tell their story of what happened over the years of their involvement with the firm. All materials leading to this paper were reviewed by two past and one current[6] Texaco executives.

All relevant data was recorded into a timeline in four categories: events primarily affecting IT; Texaco at large; the oil industry; and technological advances that affected IT. With these broad guidelines we read most everything available about Texaco and its IT until we had a general idea of the evolution of the function. From then on we narrowed our recording down to what seemed relevant to the story. Due to the abundance of historical evidence concerning Texaco IT we became selective of what to record in order to produce a history of the function within a reasonable time frame.

We continued to record any strategic, financial, organizational and technological change affecting Texaco or IT over the four decades. Starting in 1970 we recorded IT function personnel and budget for each year. For Texaco at large we recorded revenues, assets, income, and personnel numbers for each year. For significant changes in the oil-industry, we recorded Oil Price/Barrel (Imports OPEC FOB) for each year. For Texaco IT and the firm at large, we recorded any changes in strategy, organization, and information technology. We dated all entries and identified their sources. While computers were part of Texaco since 1959, we focused on the years of the corporate IT function starting in 1970.

In addition to timelines, we produced two figures in order to visualize change in central categories. Fig. 1 entitled "Texaco economic data" consists of oil price per barrel, Texaco total revenue, total assets and net income between 1970 and 1998.

Fig. 2 entitled "Information technology data" consists of total Texaco employees, IT function employees, IT budgets and the number of users with desktop access to information systems (ICS User Base). We used these figures to verify top management actions toward IT compared their actions concerning the firm at large. We included the oil price as the most significant factor of the changes in Texaco revenue and total assets. We included ICS user base as the single most significant force

[6] Carolyn Pilgreen moved to ChevronTexaco in the acquisition.

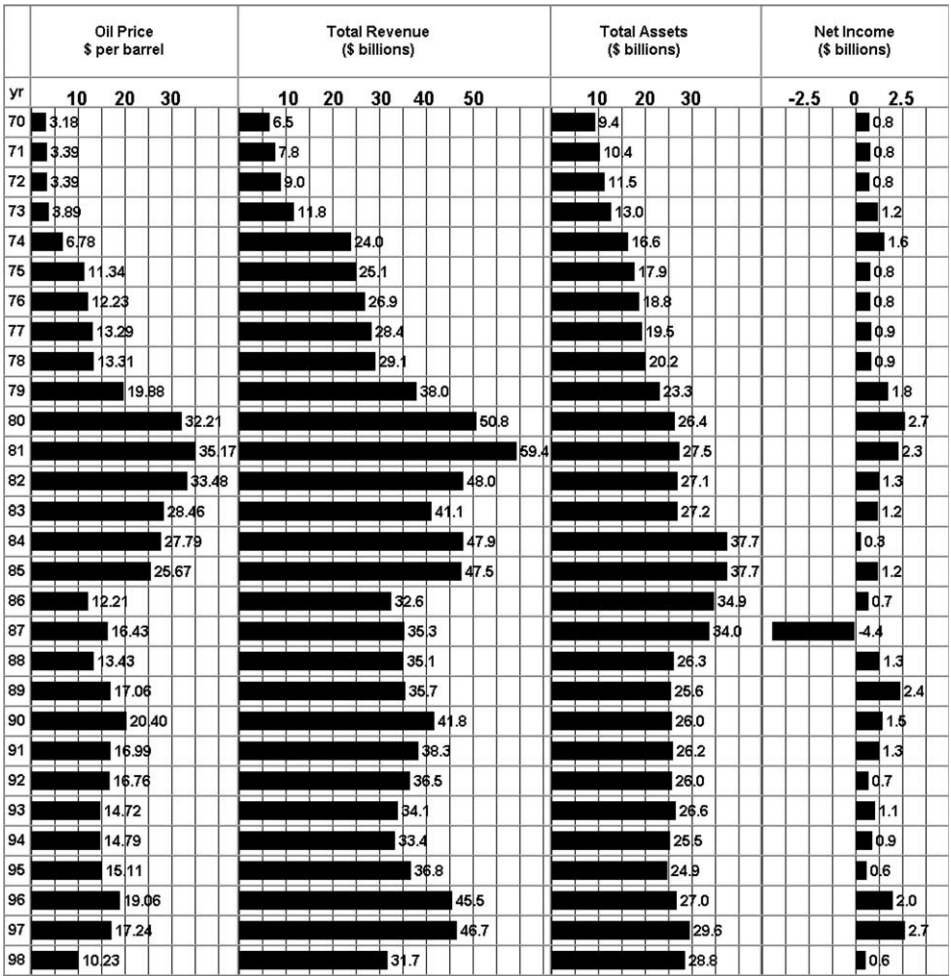

Fig. 1. Texaco economic data 1970–1999.

affecting IT. A more comprehensive discussion of Figs. 1 and 2 can be found in Porra et al. (2005).

2.4. Critique the evidence

We used basic techniques to assure internal coherence of the recorded evidence. We applied logic, systems thinking, basic investigative techniques (such as determining the credibility of the sources), and convergence (counting the times similar information was available from several sources). Recognizing that all historical accounts are open to multiple interpretations and that historical facts cannot speak for themselves, we generated our history using specific analytical techniques. We plotted,

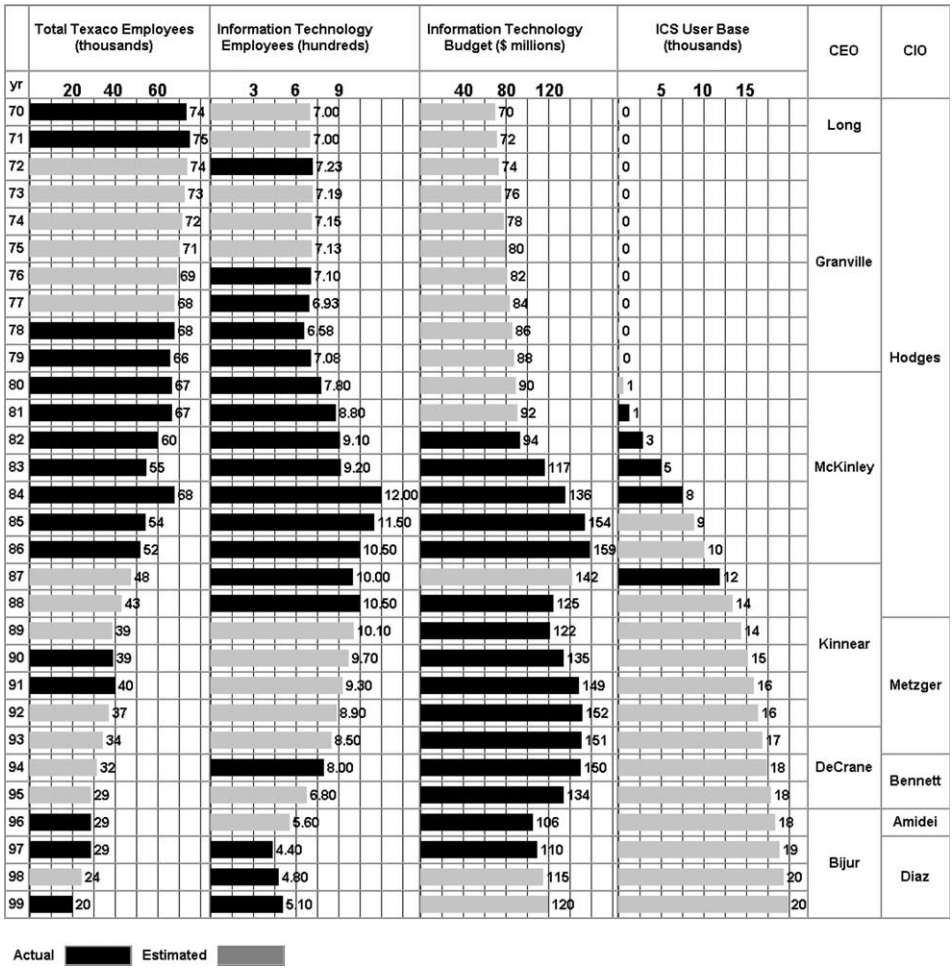

Fig. 2. Information technology data 1970–1999.

reported and estimated data on performance and IT budgets and confirmed this evidence by using multiple sources. We relied heavily on interviews and published statements by key participants in Texaco's IT, confirming their credibility and assembling these views into a coherent narrative account of the IT unit.

2.5. Determine patterns

We identified patterns in the timeline. We were particularly interested in consequential change after environmental shifts. What we interpreted as consequential shifts was affected by our research backgrounds (cf., Porra, 1999; Porra et al., 2005). As authors we became part of the Texaco IT history we constructed (Berger

& Luckmann, 1967). Our preconceived notions influenced what patterns we saw in the evidence. These molded the resulting story.

We focused the narrative around intense change from the perspective of IT. The resulting IT eras are called The Early Years of IT (1957–1966); Forming the Computer Services Department (1967–1978); Growth – Databases and Networks (1979–1982); End-user Computing (1981–1983); The User Base Explodes (1983–1984); Cutting Cost (1985–1986); Giving up IT to the Business Units (1987); The End of an IT Era (1988–1989) and Downsizing, Outsourcing, and Cost Cutting (1990–2001).

2.6. Tell the story

We told a Texaco IT history based on the evidence we had recorded on the timeline. We primarily included significant events affecting the IT function. We also included major events that affected the oil industry or the firm where it helped illustrate how IT was affected by top management actions or outside forces or how was exempt from their consequences. We included technological change when it significantly affected the function.

2.7. Write the transcript

We wrote the Texaco IT history as a narrative of the past (Munslow, 1997). It is our interpretation from a specific perspective rather than a description of the past as it actually was. Since we are part of the narrative we produced, the Texaco IT history is written from the perspective of the information systems profession and from a perspective of information systems researchers (cf., Munslow, 1997).

We borrowed from the hermeneutic tradition that treats the world as a script. Texaco IT history is our attempt at "making sense" of an alien script: the world of the individuals interviewed. We made sense in our language of the meanings expressed by the interviewees in their language. This two-way connection between the interviewees and interviewers is known as the "double hermeneutic" (Bleicher, 1982).

3. The history

3.1. The early years of IT (1957–1966)

At Texaco, the first mainframe computer was installed in 1957 (Hodges, 1986). Local newspapers hailed its arrival in Houston as "*the coming of the 'super brain', which could surely take over the processes associated with most jobs*" (Texaco, Inc., 1987, p. I.B.1). This machine had the processing power of only a few hundred instructions per second. By today's standards, the capacity of this IBM 705 machine would not threaten even an early model personal computer.

The early years of computing were times of excitement of the potential of computers. Texaco was an early adopter. The firm teamed with technology providers to dis-

cover uses for the new technology: "*IBM (International Business Machines) invited us to take a look at their mainframe. Our task was to come up with new creative business uses for the computer they had developed*" (Hodges, 1997).

In 1959, the firm pioneered the application of computer technology to process and plant control with the installation of a process control computer in one of its refineries (Texaco, Inc., 1988a). In the late 1960s when database technology emerged, Texaco teamed with IBM to be an early user of their Information Management System (IMS), which was still under development and unproven in practice. During the first 10 years of computing, the firm worked closely with IBM experimenting with new ways hardware and software could make routine organizational processes more effective and efficient in both administration and on the factory floor.

By 1965, Texaco was committed to computer use. The number of people involved in automation projects increased steadily. Computer activities had spread to practically all Texaco departments (Texaco, Inc., 1984). In eight years, computers had turned from a novelty into a necessity. The early days of computing were characterized by top management's support and intimate involvement with the automation efforts (Hodges, 1999).

3.2. Forming the computer services department (1967–1978)

By the end of the 1960s Texaco top management attitude toward automation had changed. Since the beginning of computing at Texaco some had questioned its financial feasibility. Computer systems seemed expensive and time consuming. Applications appeared to be good for simple tasks such as printing paychecks or producing invoices (Hodges, 1998). The second decade of computing at Texaco was about a perceived need to contain the cost of automation.

In 1967, top management formed a study team to review computing at the firm in order to determine how it could be utilized more effectively and efficiently (Texaco, Inc., 1988a). Based upon this study, Texaco formed the IT function to coordinate the firm's overall computer activities (Texaco, Inc., 1983a). The function was called the Computer Services Department (IT).[7]

Measured by reporting relationship, top management still held computer technology in high regard. The first General Manager of IT, Ward K. Savage Jr., a senior manager from the Refining Department was an "oil man". He reported directly to the chairman of the board (McDonald, 1999). In IT, these times are remembered as "*good times*". "*We were very successful in getting computer applications done in the 60s*" (Hodges, 1998, p.18).

Soon after the initiation of the department, however, IT leader reporting relationship changed. When Les Hodges took over as the General Manager of IT in 1969, he reported to a Senior Vice President instead. Both CEOs of the decade, Augustus C. Long and Maurice F. Granville held this reporting relationship intact. From now on,

[7] For simplicity, we are using "IT" or "IT function" instead of the many names of the department. Also, when we refer to 'IT' we are referring to the corporate IT function within Texaco, Inc.

IT leaders were considered more as "computer men". "Computer men" were not "oil men" and not top management peers.

With the initiation of the IT function, the dealings with top management became more formal. Hodges saw his primary role as an IT educator and as a liaison between top management and the IT personnel. IT strategic plans, monthly meetings, and IT seminars were used to explain technologies and their possible business uses to senior management.

In spite of these changes in the status of the IT leaders at the firm, Hodges enjoyed close personal relationships with top management. The details of computer applications were still negotiated with executives in person. Earlier doubts concerning computer's potential in automating complex tasks were replaced by an awareness of the significant impact of computer applications on the business units' bottom line. The purpose of computing at Texaco was to "*save time or jobs*". The results were impressive. The impact of automation was often measured by thousands of jobs eliminated per software application (Hodges, 1999).

IT staff was acquired from outside Texaco. High school graduates were hired and trained to operate computers. Most programmers held college degrees in mathematics, music or other fields that provided appropriate aptitude skills (Hodges, 1999). Technologies were still relatively few and at Texaco mostly from IBM. Operating systems and assembly languages were difficult to learn but once learned – simple for a programmer to use (Hodges, 1999).

The simple times, however, came to an abrupt end in the 1970s. IT's knowledge and skills expanded in four directions, which all took the department's attention away from accommodating users' immediate needs. First, starting in the early 1970s, IT experienced a "*substantial increase in complexity*" in new technology (Hodges, 1998). The unit started using third generation programming languages (e.g., COBOL) and more sophisticated operating systems (e.g., IBM OS/360). IT staff had to spend more time learning the operating system environments and associated tools and less time with the user (Hodges, 1998). Second, in that same decade, the role of the IT professional expanded to include more sophisticated systems analysis and design techniques. The new IT professional was called a Systems Analyst (Texaco, Inc., 1986a). The department hired its first computer science college graduates. They "*knew plenty about systems analysis and design, programming languages and algorithms, but nothing about the oil business these talents should be applied to*" (Hodges, 1998). The need to learn and master planning, analysis and design techniques further reduced the time IT had for users.

Third, since 1969, IT's workload had expanded geographically. The department assumed computing responsibilities in Texaco offices outside of the United States. Fourth, in 1978 IT assumed responsibility of a whole new realm of computing. The first local area network, an Attached Resource Computer Network (ARCNet) was installed (Texaco, Inc., 1992). From now on IT's skill sets became compartmentalized. Some specialized in application development and others to data communications. Attending to computer network installations further reduced the time IT could spend assisting business units. IT's problem was that the four new sources of work were largely invisible to the customer. The benefits of more complex programming

languages, operating systems, systems analysis and design methods or local area networks were not obvious to the user. They were also not obvious to top management.

Top management tightened control over IT by implementing early stages of what became the 1980's "*charge back systems*" (Hodges, 1999). These additional usage-based "*overhead charges*" to the large user departments allowed IT to justify expenses. By mid 1970s, end-users in most departments had joined top management in raising questions about the value of IT (Texaco, Inc., 1988a). IT noticed its decreasing popularity from a rising level of complaints concerning its prices. The rapidly expanding scope of computer technology had created a backlash of appreciation of the results of automation.

In the 1970s, top management's attention moved away from IT. Executives were no longer necessarily personally involved in application development. Starting in 1973, Texaco leaders had more pressing issues to attend to. The rest of the decade was about responding to a worldwide OPEC oil-crisis. World oil supplies plummeted. Like other US oil companies, Texaco was unable to increase its oil production through its US reserves to offset the reduced oil supply (Texaco, Inc., 1986b). IT was not involved in Texaco's drastic response to the turmoil in the market conditions. Computer technology could not help in solving the firm's immediate problems.

3.3. Growth – databases and networks (1979–1982)

John K. McKinley became the CEO in 1979. The next three years were good years for Texaco. The oil-industry recovered quickly from the oil crisis. Petroleum demand had grown steadily. It peaked in 1979 at 52 million barrels a day (Texaco, Inc., 1983b).

In 1981, oil prices saw their highest annual average since the 1950s. The OPEC import price averaged $35.17 a barrel (Louisiana Energy, 1996) (Fig. 1). The short but lucrative period yielded a significant amount of capital to be invested in the infrastructure.

Texaco started 10 major construction projects to be completed by the end 1983 (Texaco, Inc., 1983b). Top management announced a need to develop a "*comprehensive corporate strategy to respond to significant changes in the nature of the petroleum business*" (Texaco, Inc., 1986b). Texaco upgraded its worldwide manufacturing system at a cost of $2.7 billion. Starting in 1982, the firm also acquired several new production facilities and oil and gas fields.

IT felt the consequences of the firm's expansion in its workload. With each capital acquisition, the unit's responsibilities expanded to support the new infrastructure (Hodges, 1998). IT absorbed the additional work with little new resources. During the four years within this period, the unit gained 172 new employees and $4 million in budget (Fig. 2).

Even before the impact of the latest investment wave, IT had fallen badly behind with application development projects (Texaco, Inc., 1986a). In 1981, the unit had 321 ongoing projects, a backlog of 385 projects and an anticipated 156 new projects waiting to be added to the list. Against this backdrop, Hodges's recollection that the

department was "*barely keeping up with the growth [of its task] to get all the work done*" (Hodges, 1998) is understated. The unit did not have the resources to match its growing task. In 1981, Texaco IT was the smallest IT department among all of its competitors. With 1423 total IT personnel corporate wide (2.1% of the total personnel), Texaco was behind Exxon, Amoco, Gulf, Shell, SoCal, and Mobil[8] (Texaco, Inc., 1983a).

IT continued to use its resources efficiently. Amongst the seven oil companies, it spent the least on computing power. It also had the smallest computer lease expenses (24.1% of the total computer expenses). Despite the tight budget, Texaco was often mentioned as a leader in applying the latest computer technology. IT ranked amongst the fifteen largest in the country in terms of computing power. In 1981 Hodges wrote in the IT strategic plan (Texaco, Inc., 1983a, p. 4): "*In state-of-the art computer hardware and software we are ahead of our competition.*"

IT began promoting its third party performance reviews to the firm at large. The tone of its reports changed. From then on, IT relied on outside authorities to justify its budgets to top management. In IT planning reports, external entities such as the American Petroleum Institute (API), other oil companies and third party service providers were frequently used to compare expenses (Texaco, Inc., 1996).[9] Texaco IT rose to the top as a leader in cost efficiency. IT planning reports communicated the view that Texaco IT was doing better than competitor IT functions with fewer resources.

IT's efforts to promote its good performance did not have the expected impact. Its resource situation became more and more difficult. With each new automated business process, IT's workload grew as the department subsumed them (Hodges, 1998). Between 1979 and 1982, the major revamping of the corporate manufacturing infrastructure and IT's business process automation efforts eliminated 6000 jobs in the firm at large.

IT dealt with internal change. By 1980, IT operating personnel had decreased by 37% within three years due to the unit responding to technologies such as mass storage systems and job entry systems, which automated many computer operators' tasks (Texaco, Inc., 1983a). At the same time there was a shortage of skilled IT professionals on the market. Attracting these high paid specialists became more difficult and costly (Hodges, 1998).

IT also responded to technological change. In 1979, the unit had been renamed the Computer and Information Services Department in order "*to emphasize the growing role of information*" (Texaco, Inc., 1988a, p. 6). Decision support systems, relational databases, and prototyping now characterized IT's computing environment. The function adapted by developing strategies for putting novel database technologies to use in record keeping for example land and oil exploration (Texaco, Inc.,

[8] In 1981, Exxon had 2901, Amoco 2448, Gulf 2113, Shell 1880, SoCal 1945 and Mobil 1722 total computer personnel (Texaco, Inc., 1983a).

[9] An example of a comprehensive comparison between Texaco, SoCal, Amoco, Gulf, Exxon, Shell, and Mobil's IT personnel and computer costs can be found in Texaco, Inc. (1983a). Another example, which includes similar comparisons starting 1982, is Texaco, Inc. (1996).

1984). To accommodate the expansion of its tasks, IT hired 80–100 new personnel a year increasing the number of skilled IT professionals by 73.8% (Texaco, Inc., 1983a). The change in the composition of the department was largely achieved by replacing departing computer operators. On the best year of the four within this period, the department grew by 72 net new employees (Fig. 2).

3.4. End-user computing (1981–1983)

Hodges looked ahead in order to identify the next new technology in need of IT's attention. In the IT strategic plan, Hodges wrote: "*One of our major weaknesses has been in extending the power of the computer and access to* [*the*] *gathered data to the individual in the form of interactive computing*". (Texaco, Inc., 1983a, p. 4). In this spirit, in 1980, Hodges had organized an Information Center "*to enhance end-user productivity*" (Texaco, Inc., 1984). From now on this center was to gain significant importance. It was part of a major shift in IT's history. Users gained access to mainframe based applications through dumb terminals, PCs and intelligent workstations. At first it was not obvious even to the IT leaders that this task of providing end-user access to data was going to exceed IT's already stretched out capacity.

Hodges remembers this time particularly fondly. Consistent with the common views of the times, he was hopeful that end-users would soon relieve IT's workload by taking care of most programming tasks using easy-to-use applications and 4th generation programming languages (Hodges, 1998; Texaco, Inc., 1988a). These mainframe-based applications were to place computing resources and responsibility of end-user application development directly in the end-users' hands. At Texaco, this concept was named an Interactive Computing System (ICS) and the resulting application environment was called Decision Support. From now on, Hodges believed, IT could "*focus on the development of more complex*, *large scale transaction processing systems*" while users took care of their information needs with minimum assistance (Texaco, Inc., 1988a, p. 6).

Releasing automation responsibility from IT to user departments seemed like a good solution for all (Hodges, 1999). User departments welcomed ICS as an answer to the applications backlog. At IT any resources that would help with the workload spelled relief. The ICS initiative rapidly expanded unlike any technology diffusion in the past. By December 1982, the Texaco ICS user base in the United States was nearly 2900 up from a little over 1000 just a year earlier (Texaco, Inc., 1983a) (Fig. 2).

The first years of ICS were good economic times for Texaco. In 1981, Texaco's assets had reached $27.5 billion and its net income was $2.3 billion (Fig. 1). The average oil price had stabilized above $32.00 a barrel (Fig. 1). Starting that year Texaco increased its liquid reserves by 106%; its net production of petroleum liquids by 80%; and its proven natural gas resources by 27% (Texaco, Inc., 1983b).

Texaco continued to search for oil and gas aggressively. There was no reason to anticipate that economic good times were to end within a few years. However, the business environment was about to change and Texaco management was also about to make miscalculations about responding to the change. During the next two years

the IT department was going to be charged with more work partly due to Texaco's actions and partly because it was hit by an environmental shift of its own: an explosion in the ICS user base (Fig. 2).

3.5. The user base explodes (1983–1984)

By 1983 the free world oil demand had declined to 44 million barrels a day (Texaco, Inc., 1983b). Texaco made its most consequential acquisition. It bought Getty Oil Company (Getty). Pennzoil, who had also offered to buy Getty, sued Texaco for $11.1 billion claiming that the company had "*tortuously interfered with an agreement for Pennzoil to acquire 3/7 of Getty*" (Texaco, Inc., 1985b). It would take two more years before the dramatic financial effects of the lawsuit would be felt at the firm.

Starting immediately, however, IT felt the impact of the Getty acquisition in two ways. In 1983, Texaco had "*excess real estate that could be put to use by the CISD [IT] department*" (Pilgreen, 1998). A Getty building was transformed into a second data-center for Texaco outside Houston. Then Getty's IT department and information systems were integrated with Texaco's. Within a year, Texaco's and Getty's computing resources were "*quickly and smoothly*" merged into one corporate operation with one Getty building in Tulsa transformed into a mirror site of IT in Houston (Texaco, Inc., 1988a).

In 1983 and 1984, Texaco IT grew with the expanding company. During the acquisition, the IT budgets and personnel increased as they were combined with Getty IT's (Fig. 2). Users now operated computing equipment in 125 marketing locations, 14 producing locations, 10 refineries and 26 other offices. Abroad, Texaco had computers in Dublin, London, Rotterdam, Brussels, Rome, Oslo, Stockholm, Copenhagen, Hamburg, Athens, Canada, Latin America and West Africa (Texaco, Inc., 1984). Texaco IT penetrated all business units and most functions globally. Support functions (the first automation wave), and the primary downstream functions of manufacturing and marketing (second wave) were all automated to a degree. Texaco's automation was comprehensive.

In 1983, computer applications caught top management's public attention for the first time since the early days of computing at Texaco. According to senior management, the most important of the 1983 new applications was a strategic computerized control system that allowed "*around-the-clock access to US sales terminals enhancing the speed and accuracy of inventory and billing information*" to and from gasoline stations (Texaco, Inc., 1983b). After 25 years of computer use at Texaco, this system was the first computer-based information system specifically mentioned in Texaco's annual reports. Considering the comprehensive state of automation of the firm at the time, information systems were not considered a central indicator of the financial wellness of the firm in reports to shareholders.

Thus far automating Texaco had taken place gradually with no sudden dramatic impact on the organization or personnel. The "*good years*" were experienced throughout the organization. According to a former IT professional, "*There was money everywhere at Texaco and we all spent it*" (Baty, 1998). While some at IT felt

it shared the firm's prosperity this is not evident from IT personnel and budget numbers.

In 1983, IT had a budget of $117 million or less than 0.3% of Texaco's total revenue that year (Texaco, Inc., 1981a). It employed 920 professionals (Figs. 1 and 2).[10] From the 1970s when IT managed a small, local, mainframe-based set of core applications, the unit's budget had grown by $47 million and its personnel by 220. With a relatively small increase in resources IT was now responsible for a global computer network of hundreds of computers from a dozen vendors, an interactive user base of 8000 and an application base that penetrated all functional areas of the firm.

One reason for IT's difficult resource situation may have been that in the 1980s IT had an unrealized impact on the firm. While Hodges had a habit of sending a year-end memo to each business unit manager about the number of jobs saved per software application in that unit during the year, this information was not necessarily used to cut cost in those units (Hodges, 1999). Eight years later the financial press would publish its take on Texaco's prosperity. Both *Business Week* and the *Wall Street Journal* wrote stories indicating that the early 1980s were the times of an inefficient and ineffective Texaco (Sullivan, 1991; Vogel & Bremner, 1991). By the 1990s, it had become obvious that Texaco's good years could not stand the test of competition. Computers had made many more jobs unnecessary than the total of jobs eliminated by top management.

In retrospect Texaco's "good years" were important to IT because management's inefficiency created a space of a few years before IT was charged with assisting Texaco in its final and massive reorganization. IT had time to adapt to two consequential technological advances. In 1983 IT implemented its first relational database system, and created its first corporate wide computer network (Texaco, Inc., 1984, 1988a). With these changes the scope of information systems shifted from local to global and the scope of utilizing data from application specific to shared. It was time to re-evaluate the composition of the IT department for a second time within five years (Texaco, Inc., 1988a). Instead of a college degree, IT now required a computer science or business information system degree from new hires.

Within one year, IT had executed organizational consolidation, adapted to two new technologies and shifted the composition of its personnel. Yet these changes were minor compared to the ICS user base explosion. By 1984, the number of ICS users reached 8000 up by 5000 two years earlier. The number of PCs had grown more than 6-fold (Texaco, Inc., 1984). The expectations of handing information system development responsibilities over to the end-users had proven to be too optimistic. End-user tools turned out to be less easy-to-use and the end-users, less prepared for the interactive computer era than was first estimated by IT. For a second year in a row, Hodges noted in the IT strategic plan: "*The 'training other departments' total hours indicate a significant increase from the year ago numbers due to ICS end-user growth*" (Texaco, Inc., 1984).

[10] The apparent jump in IT personnel from 920 to 1200 and budget numbers from 117 to 136 is a temporary impact of the Getty acquisition, which all but vanished by 1989 in terms of IT budgets and by 1991 in terms of IT employees (Fig. 2).

Funding the expanding responsibilities had become difficult. Hodges's annual request for increased resources were often turned down (Hodges, 1999): "*I still got them [resources], but I got them in strange ways.*" IT did what it could to maintain service levels. Users continued to complain that the function was delivering too little, too late and charging too much (Pilgreen, 1999).

That IT consistently underestimated its resource needs did not help matters. For example, in its five-year plan for the years 1984 through 1988, IT predicted significantly slower annual growth of ICS end-user numbers than was realized (Texaco, Inc., 1983a). IT's resource squeeze was only to get worse due to the fact that Texaco was heading toward rough times.

3.6. Cutting cost (1985–1986)

Year 1985 was a difficult year for Texaco. Between 1979 and 1985 free world demand for oil had dropped by 15%. Oil production significantly exceeded demand. The average price for a barrel of oil had dropped to $23.42, down nearly eight dollars a barrel in four years (Petzinger, 1987; Texaco, Inc., 1981b, 1985b). The change was dramatic, yet only a beginning of a long slide in oil price that continued until recently (Texaco, Inc., 1985b). The oil pricing structure had changed from "*official selling price*" to "*market-related price*". Oil was now a commodity whose price was dynamically determined by the free market. Cash flows were now inadequate to fund exploration at the level that would have maintained previous production levels. Texaco joined many companies announcing major reductions in capital budgets.

The most difficult time for the firm, however, started on December 10th, 1985. Texaco lost the Pennzoil lawsuit (Texaco, Inc., 1985b). Due to the resulting special charge from the loss, the firm's net income plunged from $1233 million in 1983 to $306 million in 1984 (Fig. 1) (Texaco, Inc., 1985b).

Top management presented an aggressive reorganization plan to the shareholders. This plan included "*selling under performing properties both downstream and upstream for at least $3 billion; engaging in refining joint ventures to generate cash and increase profitability; and considering a wide array of options including financial restructuring and outsourcing*" (Texaco, Inc., 1986b).

Externally IT continued to hold a high profile. In August 1985, Texaco installed an IBM 3090 series before any of its competitors (Texaco, Inc., 1988a). This mainframe was state of the art in computing at the time. With the installation IT aimed to "*increase the number of people with direct access to important corporate information by 25%, while delivering information 25% faster and at 25% less cost*" (Texaco, Inc., 1988a, p. 5). A year later Texaco ranked in the top 15 computer organizations in the US based on installed processor power (Texaco, Inc., 1983a).

Internally IT struggled. Since no change in the accounting principles was on the horizon, IT had no formal way of justifying its existence (Hodges, 1998). As overhead, IT was "*unwanted*". As long as most access to applications and data was through a computer operator, however, IT was unavoidable. Moreover, IT's services were to be in high demand. Texaco went through McKinsey's value added analysis (AVA) in order to locate where the firm could achieve further efficiencies.

Hodges recalls (Hodges, 1998): "*the biggest pressure I felt was in mid '80s McKinsey and Company came in and did a value added analysis of the corporation. And then you'd meet, and they'd say, 'Well, we can eliminate this, we can eliminate this, we can eliminate this. We're going to do all these eliminations and try to get by cutting out this. And don't ask for extra people on this.' And they had a whole bunch of pretty good recommendations. I would say that 70% of all the benefits to be derived from that study took CISD (IT) over two years to do. It was basically a transfer of work from people (the business units) to me (IT). We were going to reduce their (the business units') expenses, but mine (IT's expenses) was going to go up! I felt like a forty year old man being circumcised! The pain of it was terrible.*" *(p. 12)*

IT's fundamental problem was in the corporate accounting principles. Business unit tasks that used to be considered as "*cost of doing business*" on a business unit's income statement turned into "*overhead*" as soon as IT automated them and begun managing the automated processes (Hodges, 1998). The more of the business unit processes IT automated the more cost effective business units seemed on their income statements. IT's costs on the other hand seemed to escalate since the accounting principles did not allow IT to report its participation in the business unit operations. With the rising total cost of computing per business unit IT seemed increasingly inefficient.

Hodges recalls the effects of transferring work from the business units to IT (Hodges, 1998): "*We had at that time a hundred and fifty accounting offices around the United States. People took orders to get product. Each office had 20, 30 or 40 people in it. A service station could probably pick up a phone and tell the guy to take the order. He would then call the trucker to come and get the product, load it, and then move it out to the service station [and] prepare the invoice manually. And all that cost was operating expenses. It was called "transportation costs". I automated all that. I put in five computers around the country. Now I have 10 terminals that are computer controlled. There's a couple of Tandem machines. They operate 24 h a day, seven days a week, never go down. Had to put a telecommunications network to every service station in the United States. And it wasn't long after that – and it took six or seven years to do that, as big as we were – I was in a meeting where he (the vice president) was talking to the chairman. And he was saying, 'Man, I have really cut my expenses. I have cut my expenses $50 million. I saved 5000 people, but this damned overhead is eating me up'. We do the same function but all of the sudden it became overhead. I think American businesses have had a bad eye about overhead being so high. And one of my theories about overhead is that we've transferred work to it." (p. 7)*

It did not help IT that for a third time within eight years, the role of an IT professional changed again. Now he/she was a system integrator, database builder and information engineer (Texaco, Inc., 1986a). Again the department responded by changing the composition of its staff.

Dealing with external and internal pressures taxed IT, whose resources were already spread thin. With 1050 employees and a budget of $159 million, IT could no longer respond to business unit automation needs. Year 1986 marks a change in IT's significance to the firm as the provider of automation. IT now accounted

for 47% of the total IT costs compared to business units' total of 53%. With this shift IT begun its final decline.

Hodges created a new plan for his department. On August 5th 1985, a project team begun to review new possible organizational structures (Texaco, Inc., 1985a). The primary objective was to distribute various IT groups to the business units. Only areas such as procurement and recruiting were to remain at IT. This was Hodges's last major initiative before his retirement. Maybe Hodges foresaw that IT's resource situation was only going to deteriorate. Perhaps he was persuaded by the ongoing industry trends toward decentralization. We consider Hodges' recommendation as an attempt to improve business units' perceptions of IT.

In Texaco's 1986 Annual Report, James W. Kinnear, the new CEO, reported to the shareholders the progress of the firm "*the consolidation and elimination of jobs had been completed throughout the organization; decision making authority had been brought closer to the level of implementation; and compensation methods were now more directly linked to performance*" (Texaco, Inc., 1986b). In spite of the upbeat reporting, year 1986 turned out to be one of the most difficult for Texaco since the great depression (Texaco, Inc., 1986b).

In 1986, oil price plunged to $12. Massive downsizing began at Texaco. IT was one of the departments to be downsized. This was difficult for IT since its workload grew as it helped business units cut cost by automating their operations. Hodges recalls finding himself in a "*horrible situation*" (Hodges, 1998). Business units now openly questioned the size of the "*overhead*" that IT now represented on their budgets. IT had become an enemy.

3.7. Giving up IT to the business units (1987)

In 1987, IT's reports note the global scope of the information technology at the firm. According to an informal survey conducted in May 1987, Texaco had nearly 4300 computers installed in the US (Texaco, Inc., 1992). "*Clearly*" wrote Hodges, "*processors and processor power have become an integral part of our business*" (Texaco, Inc., 1987, p. III.B.1). The corporate network now supported 20,000 terminal devices in the US and thousands more abroad (Texaco, Inc., 1992). With the need to focus on supporting the global infrastructure, the core task of IT had shifted from business process automation to technology. To reflect this change IT was renamed the "IT Department" (ITD) that same year (Texaco, Inc., 1988a). With this shift from emphasizing "*information*" to emphasizing "*technology*", IT saw a further decline in its position.

IT leaders held the promotional tone. In 1987, in the departmental report Hodges wrote: "*Texaco continues to be an industry leader in the use of advanced computer technology. In many circles, the company is recognized as having a very efficient and effective central-site-processing environment. American Petroleum Institute industry statistics indicate that Texaco corporate computing function is a low-cost information producer by all comparative measures, yet the company is recognized as the technology leader at the same time. Our analysis is that the two conclusions are tightly linked.*" (Texaco, Inc., 1987, p. 1.B, 1-I.B.2.).

IT kept its cost down by "*aggressively pursuing technology*" (Texaco, Inc., 1988a). Where possible the department automated its own tasks. The significance of the IT function as the provider to other Texaco departments, however, declined rapidly as business units took over the responsibility of their own applications. By the end of 1987, IT provided only 37% of Texaco computing resources. It had lost 10% of its turf to the business units within one year. From the business units' perspective, IT was increasingly peripheral.

IT was still in charge of the corporate information system infrastructure and recommended directions of technologies and standards to the business units, but business units made their own purchase decisions concerning applications and hardware independently. Frequently business units' technology decisions did not comply with IT's recommendations. While they still needed approval from Hodges he routinely granted these in order to avoid "*unnecessary battles*" (Hodges, 1999). With this transfer of authority to decide about infrastructure technologies, IT again lost turf.

IT was also peripheral to top management. Compared to IT's resource and status issues, the firm had more pressing immediate issues to deal with. In 1987 Texaco settled with Pennzoil for $3 billion and subsequently filed for Chapter 11 bankruptcy. It posted a net loss of $4407 million due to the settlement and the restructuring program (Fig. 1). Since 1985, the firm had eliminated over 16,000 jobs through reorganization and sale of low producing units – 4000 of those within the last year.

It is not clear whether IT's position declined because of its increasing focus on technology and infrastructure, due to the corporate restructuring, top management's resource allocation decisions or due to executives focusing their full attention to saving the firm. It is likely that all four factors affected IT's status negatively. IT's misfortune was compounded by the fact that all four developments took place within one year. The following year the era of a corporate IT function ended at Texaco.

3.8. The end of an IT era (1988–1989)

In 1988, Texaco completed the restructuring of its assets. It had sold properties in Canada, West Germany. It had started Star Enterprise, a joint venture with Aramco Services Company (Texaco, Inc., 1988b) (Fig. 1). Since 1985, Texaco had liquidated over $10 billion in assets (Fig. 1). It had eliminated 11,000 jobs. The firm emerged from bankruptcy with a profit of $1304 million dollars (Fig. 1).

The morale amongst the remaining employees was low (Pilgreen, 1992). Kinnear introduced Total Quality Management (TQM) as a promising vehicle for rethinking the lean "*New Texaco*" (Texaco, Inc., 1988a, p. 3). It was hoped TQM's emphasis on teams and team-involved management would raise employee spirits.

At IT, Hodges stepped down making room for a new leader who was to take IT through TQM to its new future (Hodges, 1998). Jim Metzger assumed Hodges' position as the General Manager of ITD (Pilgreen, 1998). While some teams at IT improved their work circumstances by applying TQM, others had a difficult time justifying the time spent on the exercise. Yet others refused to take part at all. It was "*one more thing to do*" for the IT staff that was already spread thin.

From the perspective of IT, however, participating in TQM was minor compared to the end of centralized corporate IT function at Texaco. In 1988 and 1989, Hodges's initiative to distribute IT to the business units took effect. The new, distributed IT organization was described as a "*hybrid-matrix*" (Texaco, Inc., 1988a, p. 3). IT professionals had reporting responsibilities to business units and IT. The reorganization left the task of IT intact. Business units were responsible for "*what*, *when and where*" and IT for "*how*". Half of the authority over IT staff was now formally transferred to the business unit management.

Hodges's initiative to help his staff to work closer with business units turned out to be a first step toward leaner IT personnel in general. Over the next few years, Texaco would continue to reduce IT personnel through retirement and normal turnover (Fig. 2). What central IT remained, emerged from the change displaying mixed feelings (Pilgreen, 1992). The morale of the IT personnel remained low and employee attitude defensive.

The bottoming out of morale was in keeping with the price of oil, which hit lows well below $20a barrel. In his annual plan Metzger, the new General Manager of IT, indicated that for Texaco or IT significant change was not over: *The next three to five years will be a period of great change and upheaval within Texaco*, *as well as a period of great change in the computer industry* (Texaco, Inc., 1988a, p. 2). The decrease in IT personnel stood in contrast with the growing demand for information technology at the firm. At Texaco, the total computer utility processing power had increased 69% over four years. In contrast, IT's expenses continued to decrease because increasingly, the business units provided their own IT services. In 1988, IT's total expenses were $95 million or only 0.27% of Texaco's total revenue of approximately $35 billion.

IT's efficiency continued to be high. In 1988, the IT's manpower rates in categories of programmer, programmer/analyst, system analyst/project leader and supervisor/manager were benchmarked against rates of third parties such as EDS, AVG, GEISCO and IBM, and found to be lower (Texaco, Inc., 1988a). This was in keeping with IT's desire to be '*cost competitive*' with anyone in the industry. It is clear that IT could offer cost-competitive solutions to business units, who increasingly turned to more expensive outsourcing firms. IT's problem continued to be that it had no resources to satisfy its user-base and no formal way to limit its customers or projects. Moreover, the unit still did not have any formal accounting means to demonstrate its performance to top management or business-unit leaders.

3.9. Downsizing, outsourcing, and cost cutting (1990–2001)

By 1990, Texaco had eliminated over 30,000 jobs in six years (Texaco, Inc., 1990a). The firm started another decade of cost cutting, which would leave Texaco with 19,000 less positions at the end of the decade (Fig. 2). Downsizing benefited the firm financially. In 1990, Texaco's net income decreased by $900 million from the previous year (Fig. 1). Half a decade of extreme restructuring moves, however, led outsiders to question Texaco's management.

The financial press was not kind in its reporting on the firm. It was noted that Texaco's management had to restructure due to the pressure by the shareholders (Sullivan, 1991; Vogel & Bremner, 1991). The firm was said to be last of the eight major oil companies in oil production. The financial press also perceived that Texaco had missed the IT boat (Vogel & Bremner, 1991). While its competition was spending billions on computer-aided exploration, Texaco was considered a laggard. Thirty-four years into computing at the firm, Texaco top management's attitude toward computing had caught the public eye.

In 1990, Kinnear seemed to respond to the press directly. In the annual report he emphasized the importance of computer technology: "*Texaco continues to develop and exploit its considerable technological strengths, and its know-how in their application, in every aspect of its business*" (Texaco, Inc., 1990a, p. 4). The letter to shareholders mentioned computer imaging and 3-D seismic methods as specific leading-edge applications. This was only the second time in Texaco's history that computer technology was mentioned in annual reports.

Top management's public acknowledgement of the importance of information technology came too late for IT. In the 1990s, IT's role in corporate computing gradually diminished along with decreasing departmental budgets. Business units ignored IT's role as a standard provider. They continued to follow their own plans of which technologies to procure. This practice had the expected consequences. The lack of central co-ordination led to a dysfunctional and expensive-to-support IT infrastructure (Pilgreen, 1998). By now business units had implemented in excess of 10 incompatible e-mail systems, multiple word processing systems and relied on several desktop vendors to name a few examples of problem areas (Pilgreen, 1998). Diverse technologies required an IT personnel with equally diverse skills. At Texaco, this decade gave a new meaning to information system "*standardization*". "*Standardization meant cutting cost by recommending one or few technologies to choose from''* (Pilgreen, 1998). IT was put in charge.

What seemed cost effective at the corporate level, however, did not necessarily appeal to the business units. Some units took the IT-driven standardization effort as an attempt to regain control of their information technology. These units simply ignored IT: "*while there were a lot of corporate policies that said that these things had to be approved by the central IT organization that didn't happen necessarily*" (Pilgreen, 1998). IT had lost the last of its power.

For a good part of its existence, IT had built its reputation around pursuing the most recent technologies. Past technological innovations such as relational databases, corporate backbone networks and even end-user tools had provided IT with opportunities to be a leader in expertise amongst business units. The 1990s emerging technologies no longer served as the platform for this type of showcase.

Now PCs appeared to provide a simple IT infrastructure (Pilgreen, 1998). "*We went through a problem in the early '90s when you could walk to CompUSA and pick up a PC and take it home and in an hour or two have it out of the box and running. A lot of our executives seemed to believe that if I put a PC on their desktop, I have created a much simpler environment. They really didn't understand that we were creating an environment far more complex than the mainframe environment we had.*" (p. 18)

In 1993 Alfred C. DeCrane replaced Kinnear as the CEO. A year later, Don Bennett, an experienced "cost cutter" replaced Metzger as the IT leader. *"It was as if Don had a mandate from the top to downsize IT"* (Pilgreen, 1998). Within fifteen months, Bennett closed the Tulsa office and associated data-center (formerly Getty's) and outsourced distributed services to IBM. IT was reduced from over 800 employees to 480 (Fig. 2).

In 1995, Peter I. Bijur became the CEO. Next year, Les Amidei became the new General Manager of IT. During his 18 months with the department, Amidei introduced a matrix organization to replace the traditional hierarchy that was characteristic of Texaco. Although the process included many good ideas such as improved resource management across managers, teams and projects, the remaining IT professionals received it with cool resignation.

Some felt Amidei was a victim of circumstance (Pilgreen, 1999). IT was already spread so thin that additional resources necessary for well-managed organizational change such as Amidei suggested were simply not available. Moving to a matrix organization was of less importance in an atmosphere of struggling for survival. At the time of Amidei's departure, the morale of Texaco's IT professionals was said to be at its lowest ever. Measured by IT personnel numbers or budgets, Amidei did not necessarily deserve the polite distrust of the department. Through his short stay Amidei maintained both the employee numbers and budgets intact (Fig. 2).

Since the end of 1997 until Chevron acquired Texaco (cf., Sorkin & Banerjee, 2000), IT was called "*Global Information Services*" (GIS). The unit was led by Rick Diaz. Diaz took over a department of only 480 people. In 1999 many at IT believed that the worst was over (Pilgreen, 1999). Morale was improving. At IT, one of the signs of improving times for the unit was considered to be Diaz's reporting relationship. He was the first IT leader since Hodges who directly reported to Texaco's executive management (Pilgreen, 1999). Diaz was also the first IT leader at Texaco to carry the title "CIO".

IT was still reorganized several times. IT was so used to the turmoil that change was not considered a surprise. IT continued to decrease in size. In 1999, with a little over 400 employees, IT continued to manage the desktop outsourcing contract, the corporate IT infrastructure and give advice to the business units about the future directions of technology.

At the end, joint ventures with Shell and Aramco had subsumed all of Texaco's downstream operations. The "*new Texaco*" consisted ostensibly of upstream operations in the United States and worldwide. Replacing the US and international operations with a single global Texaco, cut out one management level corporate wide. While Texaco's US production organization still had a sizeable IT unit, downstream operations had turned most of their IT functions over to the Shell/Texaco joint venture Equiva Services (Pilgreen, 1999). At IT some had the opinion that the rough times for IT were still not over. Instead, '*downstream operations are leading the way in further reducing IT costs*' (Pilgreen, 1999).

In 2001, Chevron acquired Texaco (cf., Sorkin & Banerjee, 2000). When the acquisition became an apparent reality, the IT function became tight-lipped in its responses about the future of the department. No one wished to speculate about the

future. Since 1999, a common answer to any question about the status of future of the department began with "*I cannot comment about the future, but as of today . . .*" (Pilgreen, 1999).

4. Conclusions

Texaco IT failed because it subsumed the work of the business units. The lack of formal accounting of IT's contributions to the corporate bottom line allowed business unit processes to turn over to IT their overhead cost and the responsibility of their cost containment. Since business units seemed increasingly efficient due to this practice, it was in their interest to continue to transfer work to the IT function. Some recent progress has been noted in formal accounting practices related to capitalizing IT assets (cf., Porra et al., 2005). But the lack of capitalization of the IT infrastructure built by the IT unit and the failure to use equitable charge-back systems even for its operation diminished the image of IT. This image became overhead to be managed, not a profitable information infrastructure asset to be grown.

Texaco's IT narrative shows that the practice of replacing cost of operation with overhead cost, however, makes little sense at the corporate level. The firm was left to deal with the overhead. As a result, Texaco outsourced to more expensive providers and withheld resources from IT. A central lesson of the Texaco IT history is that Texaco top management took no action to change the course of the IT function even when doing so would have made good financial sense.

While the IT function leaders articulated the resource squeeze in memos, letters and plans at the time it occurred, the function also worked to "rise to the occasion". In retrospect, it seemed as if the department was a victim of its own success (cf., Hirschheim, Porra, & Parks, 2003). Since IT had been successful before even in the eyes of third parties, it attempted to repeat the performance even under less than perfect circumstances.

Perhaps most importantly, however, no one at Texaco attempted to change the ground rules for the IT function. Top management, business unit leaders and IT alike acted as if the organizational arrangement was working properly. Yet, in retrospect a radical action to change the formal accounting of IT's contributions to the company bottom line might have been beneficial to all involved.

5. Implications to practitioners

This research has implications for IT leaders. The Texaco IT history suggests that no substitute for a formal performance record of the function exists. Without a paper trail of demonstrated success, IT functions can become prey for users' perceptions of their performance instead.[11]

[11] See Porra et al. (2005) for more on this topic.

This research also suggests changes for top management. It is essential to institute formal performance measures for IT functions because failing to do so may lead to inferior financial decisions concerning IT services of the firm in the long run. For business unit managers, this study emphasizes a need to manage overall cost of operations across organizational units and corporate boundaries not artificially isolating the "cost of operation" from "overhead". Based on the Texaco IT history, we suggest that all parties would benefit from instituting formal ways of assessing the IT function's contributions to the firm's bottom line.

A better understanding of the IT function's performance may lead to improved financial decisions concerning corporate information system support in general. Internal IT functions may be a far more cost effective solution to corporate information system needs than external outsourcing vendors (Lacity & Hirschheim, 1995). Moreover, the 1990s "standardization" efforts suggest that business units may need to be more receptive of the fact that corporate level co-ordination of the information system infrastructure is necessary in order to avoid significant costs of connecting islands of automation later.

The IT profession at large needs to be aware that attending to information technology issues that do not produce immediate, tangible results for business units should be minimized if the primary goal is positive perceptions of IT. Top management and business units on the other hand need to acknowledge that ensuring long-term success of the firm means that some amount of learning about technologies must be funded as part of the information system development and support.

6. Academic implications

Thus far, the historical method has not played a significant role in the IS research. Two decades ago, McFarlan (1984) noted the absence of historical studies in the field. More than a decade later, Mason, McKenney, and Copeland (1997a, 1997b) renewed the call for attention to this omission. Since Mann and Williams (1960) study of the dynamics of organizational change associated with computer implementations there have been few historical studies relating to information systems in organizations (i.e., Copeland & McKenney, 1988; McKenney, Mason, & Copeland, 1997; Porra et al., 2005). With this research, we again renew this two decades old call.

Historical research like the Texaco IT narrative, can have a significant academic contribution. IT function histories provide a backdrop for understanding IT organizations from a long-term perspective. Texaco IT history has already served as a basis of a study on the evolution of the corporate IT function and the role of the CIO (Hirschheim et al., 2003) and as a basis of a systems theoretical interpretation of Texaco IT's success and failure (Porra et al., 2005). These studies have helped understand what are some of the potential reasons behind persistent negative perceptions of IT by top management and users. For example, Porra et al. (2005) suggest that Texaco IT function was a colony. Its identity evolved independently from that of the firm. Hirschheim et al. (2003) point to a widening perceptions gap of the unit's per-

formance as a reason for top management's distrust.[12] Both historical studies confirm that previous research results on IT function success factors may not hold when the unit is studied over several decades (Porra et al., 2005).

Continuing the research stream, several future studies can have their starting point in the Texaco IT history. Such research opportunities include a Texaco top management perspective, contrasting Texaco IT function history with histories of software and hardware industries (cf., Cambell-Kelly, 2003; Yates, 1993) and a case study on ChevronTexaco after the consolidation of the IT functions of the two firms. The Texaco IT narrative can also be used to re-evaluate research results relating to IT function success factors (Porra et al., 2005). In the Texaco IT case, such comparisons show that an IT function that fulfills most IT function success factors at some point of its lifetime may fail over its lifetime.

IT function histories like this can also be used to redirect research. For example, we can only conclude that Texaco top management turned a deaf ear to IT's performance reports. More research on top management perceptions of IT function performance is needed in order to understand why IT leaders' extensive communication and third party research on the good performance of the unit can be consistently ignored to the extent that the firm chooses to outsource to more expensive service providers and to dismantle IT. Clearly, more research is needed to understand such curious information system decisions from top management perspectives.

Our overall conclusion is that too little is recorded of the history of IT functions in general. This omission leaves the profession prey to being measured by an oral tradition and perception only. Texaco IT history shows that the oral tradition of the IT function tale by top management and users may be much more unfavorable than a written history based on historical evidence.

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[12] See also Akera (2001) about a software group called SHARE developing its own identity and growing apart from the users.

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