AN EMPIRICAL INVESTIGATION OF INFORMATION TECHNOLOGY SOURCING PRACTICES: LESSONS FROM EXPERIENCE[1]

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Abstract

Following Kodak's landmark information technology (IT) outsourcing decisions in 1989, the IT outsourcing market grew to 76 billion dollars in 1995. As the outsourcing market continues to grow and as new contracting options emerge, the accumulated experiences of firms offer significant opportunities for learning. This paper builds on a previous collection of data on 61 IT sourcing decisions made in 40 U.S. and U.K. organizations during the period 1991 to 1995. This paper reanalyzed transcribed interviews from 145 participants. Using "expected cost savings achieved" as an indicator of success, five best practices were identified in the case companies. First, selective outsourcing decisions had higher success rates than total outsourcing or total insourcing decisions. Second, senior executives and IT managers who made decisions together had higher success rates than either stakeholder group acting alone. Third, organizations that invited both internal and external bids had higher success rates than organizations that merely compared external bids with current IT costs. Fourth, short-term contracts achieved higher success rates than long-term contracts. Fifth, detailed fee-for-service contracts had higher success rates than other types of fee-for-service contracts. The critical elements of three contracting models are described: fee-for-service contracts, strategic alliances/partnerships, and buying-in of vendor resources. When the practices generated from the case studies are compared with current practices, we begin to understand which practices are proving robust and why new practices emerge. For example, in the participating companies, the rhetoric of a "partnership" was misused to describe contracts that are actually fee-for-service contracts. Today, practitioners who understand the inherent conflicts in fixed fee-for-service contracts are demanding what they perceive to be more favorable contracting options, such as flexibly-priced contracts, performance-based contracts, and strategic alliances based on shared risks and rewards. This analysis reconciles some of the apparent discrepancies in past findings about the best ways to source IT.

Keywords: Empirical research, management of computing and IS, measuring IS succes, contract, strategic alliances, outsourcing of IS

ISRL Categories: A1014; AF1303; AM0201; EL0302; EL07; UF

[1] Allen Lee was the accepting senior editor for this paper.

Introduction

Ever since Kodak's landmark decision to outsource the bulk of their information technology (IT) functions in 1989, IT outsourcing has been a widely-publicized practice. Most readers are familiar with a number of other high-profile IT outsourcing mega-deals besides Kodak. Companies that have outsourced significant portions of their IT functions by transferring their IT assets, leases, licenses, and staff to outsourcing vendors include British Aerospace, British Petroleum, Chase Manhattan Bank, Continental Airlines, Continental Bank, DuPont, Enron, First City, General Dynamics, McDonnell Douglas, and Xerox. When such mega-deals are first signed, the trade press reports *expected* outcomes, including reduced IT costs, better service, access to new technology, and an ability to refocus in-house staff on higher-value work, but there is substantial debate about the long-term consequences of such deals.

Proponents point out, "IT outsourcing is a harbinger of the transformation of traditional IT departments and provides a glimpse at the emerging organizational structures of the information economy" (McFarlan and Nolan 1995, p. 11). Opponents argue that companies that sign long-term contracts lose control of their IT assets and capabilities. Critics admonish "Outsourcing: the Scam May Be on You" (Gantz 1994), "Outsourcing, a Game for Losers" (Strassmann 1995), and "Selling One's BirthRight" (Dorn 1989). For example, a senior vice president of International Data Corporation (IDC) concluded from a survey of 900 organizations

> Early outsourcees are becoming discontent with their fixed-price deals, which they feel don't reflect today's costs. At the same time, they've discovered that information technology has become more strategic to their firm—now that they've turned it over to someone else (Gantz, 1994, p. 41).

Despite the debate, the continued growth of the IT outsourcing market is undeniable:

- IDC estimated the global outsourcing market for 1995 at $76 billion and predicted that it will exceed $121 billion by the year 2000 (reported on May 20, 1996, http://www.outsourcing.com).

- The Outsourcing Institute's survey of 1200 companies indicated that one-twelfth of IT dollars spent in 1995 flowed through an outsourcing contract (reported on May 20, 1996, http://www.outsourcing.com)

As companies accumulate experience with IT outsourcing, there is an opportunity to assess the practices that differentiate success from failure. In-depth case studies have been conducted since 1991. This paper reports on 19 case studies conducted in the United States and 21 case studies conducted in the United Kingdom. The combined case studies cover 61 IT sourcing decisions in 40 organizations. In total, 145 business executives, chief information officers, outsourcing consultants, and vendor account managers were interviewed. Although this research base has been used in the past, previous works focused on individual case studies (Lacity and Hirschheim 1993b, 1995; Willcocks and Fitzgerald 1994); three IT outsourcing myths and 14 contracting clauses (Lacity and Hirschheim 1993a); transaction cost theory as an interpretive lens for understanding the IT sourcing phenomenon (Lacity and Willcocks 1996); reasons for outsourcing (Lacity et al. 1994); and prescriptive frameworks based on business, economic, and technical factors (Lacity et al. 1995, 1996). Tracking of the case companies continues. Long-term deals, in particular, require long-term study to effectively assess outcomes. Indeed, there are still a number of deals for which it is too soon to declare whether expectations have been met.

In this paper, a contribution is made to the growing understanding of how best to use the IT outsourcing market. A different analysis from previous works was conducted that more rigorously supports the anecdotally based lessons (Lacity et al. 1995, 1996). Additional findings on size and contract types have been generated. New insights are offered by comparing the case company experiences to emerging market trends. Based on this

analysis, five practices that differentiated those decisions that achieved expected cost savings from those that did not are described:

Finding 1: Selective outsourcing decisions achieved expected cost savings with a higher relative frequency than total outsourcing or total insourcing decisions.

Finding 2: Senior executives and IT managers who made decisions together achieved expected cost savings with a higher relative frequency than when either stakeholder group acted alone.

Finding 3: Organizations that invited both internal and external bids achieved expected cost savings with a higher relative frequency than organizations that merely compared external bids with current IT costs.

Finding 4: Short-term contracts achieved expected cost savings with a higher relative frequency than long-term contracts.

Finding 5: Detailed fee-for-service contracts achieved expected cost savings with a higher relative frequency than other types of fee-for-service contracts.

In addition to the five best practices, two other findings provide insights into the sourcing experiences of the case companies:

Finding 6: Recently signed contracts achieved expected cost savings with a higher relative frequency than older contracts.

Finding 7: Size of IT function did not usefully differentiate financially successful decisions from financially unsuccessful decisions.

Although contract date and size of IT function cannot be manipulated by organizations (as is the case with managerial practices), they do provide additional understanding. In particular, the higher success rates of recently signed contracts indicated that customers are learning to make better decisions and negotiate more favorable deals, and managerial practices may be more important than economies of scale associated with size when seeking IT cost reductions.

Finally, the best practices from the cases are compared with prior research and current market trends. This comparison reconciles some of the apparent discrepancies in past findings about the best ways to source IT. In particular, the critical elements of three contracting models are clarified: (1) fee-for-service contracts, (2) strategic alliances/partnerships, and (3) buying-in of vendor resources. Practitioners in the cases often mislabeled fee-for-service contracts as "strategic partnerships." In reality, the rhetoric of a partnership was used to describe poorly-defined, fee-for-service contracts. Certain practices that were uncovered—selective outsourcing using short-term, detailed contracts—were successfully used to mediate risk, motivate vendor performance, and facilitate change and learning. Other emerging practices (such as flexibly-priced contracts and performance-based contracts) promise—at least in principle—similar results. Emerging practices, however, will need to be monitored and studied before assessing their viability.

Research Method

The initial interest in IT sourcing practices began in 1990 with a white paper on IT productivity. Five case studies were conducted to determine best practices to increase IT productivity (Green et al. 1990). One case company was a large U.S. bank that had recently signed a 10-year, total outsourcing contract for virtually all IT services. The bank expected savings of 20%. Following the decision, it was unclear how savings would be achieved, as the vendor took over the bank's data center, IT assets, leases, licenses, and personnel. The vendor centralized staff and created a user-IT liaison group, but were these practices enough to realize expected cost savings while still earning the vendor a reasonable profit? Six months after interviews at the bank, bank employees were placed under a gag order as a judge mediated a dispute between the bank and the vendor.

Subsequent case studies of eight total outsourcing deals and five total insourcing deals were conducted (Lacity 1992). A multiple case

study approach was adopted to gain an in-depth understanding of IT sourcing decisions, including the process, expectations, and outcomes. At each case site, face-to-face interviews were conducted with individuals directly responsible for the sourcing decision on behalf of the organization or outsourcing vendor. Each interview lasted from one to three hours. Interviewees included senior business executives and IT managers who sponsored the sourcing evaluations, consultants hired to assist contract negotiations, and vendor account managers responsible for the execution of the resulting contract. IT personnel who were responsible for gathering technical and financial information to evaluate proposals were also interviewed. All interviews were conducted at the company site. Participants were assured of anonymity to promote open discussions. (Please refer to Appendix C for more details on the interview protocol.)

In May of 1992, the results of this study were presented at Templeton College, Oxford University. Members of the audience noted a gap in the case studies, namely the option of selective outsourcing. By adopting the U.S. interview scripts and research method, 21 U.K. case studies were carried out, including selective outsourcing, total outsourcing, and total insourcing cases. Six more case studies were conducted in the U.S., again using the same research method and interview scripts.

The case studies described above comprise 61 sourcing decisions made in 40 organizations and constitute the research base for this study. In total, interviews from 145 participants were transcribed to over 1,200 single-spaced pages. (For titles of people interviewed, refer to the "participants" column in Appendix A.) Over 200 documents were gathered and reviewed, including annual reports, organizational charts, IT budgets, requests-for-proposals, bid analysis documents, internal memos, press releases, and contracts.

Data analysis and interpretation

This large body of qualitative data needed to be interpreted in a succinct and meaningful way to clearly communicate the findings. In this paper, a qualitative approach was selected for communicating the findings: coding the text data along meaningful data "categories," calculating frequencies for these categories, and cross-tabulating these categories against an indicator of success based on "expected cost savings achieved" (Coffey and Atkinson 1996; Lacity and Janson 1994). Codes are a useful tool for succinctly reducing 1,200 pages of qualitative data. The use of such "hard numbers," however, can give a false impression of objectivity. The codes are the creations of the researchers in that they identified and selected them. Some categories were expanded, changed, or discarded as ideas developed through repeated interactions with the data.

Seven factors[2] considered potential differentiators of success and failure in the cases were investigated:

1. **Decision scope:** total outsourcing versus total insourcing versus selective outsourcing.
2. **Decision sponsorship:** senior executive sponsorship versus IT manager sponsorship versus joint sponsorship.
3. **Evaluation process:** no formal bid process versus external bids only versus internal and external bids.

[2] Although participants identified other critical factors, these other factors were idiosyncratic to a particular case and therefore not useful in explaining the experiences in other cases. Idiosyncratic factors included a new CIO at UNIVERSITY who was previously a senior executive at IBM—he knew how to replicate vendor practices without outsourcing; two companies facing bankruptcy (PETRO3; TRANS) and therefore were seeking a cash infusion; a unionized IT department (TCOM) that had erected barriers to IT improvement; a company that selected their vendor account manager based on his prior experience as a demanding customer for General Motors before joining the vendor (MINE); a company whose new account manager was a previous employee (GLASS) and therefore understood the customer's operations.

4. **Contract duration:** short-term contracts versus long-term contracts.
5. **Contract type:** standard versus detailed versus loose verses mixed fee-for-service contracts.
6. **Contract date:** recently-signed contracts versus older contracts.
7. **Size of IT function:** small versus large IT functions.

(For details, see Appendix A for the first six factors and Appendix B for details on the size of IT functions. For a summary, please see Table 1.)

Indicator of success

The objective was to develop an indicator of success based on participants' perceptions of whether the outcome of their IT sourcing decisions met their expectations. Not surprisingly, participants cited a variety of expectations (anticipated and hoped-for outcomes) and reasons (justifications or explanations) for their sourcing decisions. Fifteen categories of "expectations/reasons" for sourcing were identified (see Table 2).

Each participant's expectations/reasons were mapped into the 15 chosen categories. In many instances, participants stated more than one expectation/reason. The unit of analysis was then shifted from the participant to the decision. In each of the 15 categories, the number of decisions (out of 61) were counted in which at least one participant from a given organization cited a particular expectation/reason. For example, at least one participant from 49 of the 61 decisions cited "reduce IT costs" as an expectation/reason for their sourcing decision.

Because of the richness and complexity of the data, a heuristic was developed to provide a reasonable indicator of success that was appropriately comparable across companies. "Expected cost savings achieved" was selected as the indicator of success for four reasons. First, "reduced IT costs" was the most-cited expectation/reason in the research. Participants cited cost reduction as a major expectation/reason in 80% of the decisions. Second, "expected cost savings achieved" was the best surrogate indicator of success in terms of soliciting agreement among stakeholders within a given organization: in 48 of the 61 sourcing decisions, participants had clear indications of financial expectations and outcomes. Third, "expected cost savings achieved" was the easiest outcome to verify. For expected cost savings, participants supported their numbers with formal bid analysis documents, internal memos, and statements made by senior executives in annual reports and press releases. For cost outcomes, participants cited whether IT budgets increased or decreased for the baseline bundle of services, cited the level of excess fees for items they assumed were covered in the contract, and identified the relative cost for new systems and technologies vis-a-vis benchmarks, initial contracts, and initial estimates. Fourth, many of their other expectations/reasons can be interpreted from a cost efficiency perspective. Access to technical talent can be interpreted as receiving this talent at a lower cost through a vendor rather than incurring costs through training internal staff; focusing on core competencies can be interpreted as accessing market efficiencies for non-core activities; improving cost controls can be interpreted as eliminating waste by forcing users to associate a cost with individual requests, etc. Although confident that the best indicator of success possible was defined, the limitations of this and other definitions are addressed in later sections.

In Appendix A, both "expected cost savings" and "expected cost savings achieved" are listed. "Expected cost savings achieved" was used as the decision outcome indicator. Specifically, the 61 sourcing decisions were categorized as follows:

- Thirty-four decisions achieved expected cost savings (56%)
- Fourteen decisions did not achieve expected cost savings (23%)
- Ten decisions were deemed "unable to determine" (16%)

Table 1. Summary of Data Categories

Categories	Values and Percentages	Empirical Indicator
Decision Scope (n = 61 sourcing decisions)	(23%) Total Outsourcing (25%) Total Insourcing (52%) Selective Outsourcing	Percentage of annual IT operating budget outsourced
Decision Sponsorship (n = 61 sourcing decisions)	(29.5%) Senior Executive (41%) IT Manager (29.5%) Joint Senior Executive/ IT Manager	Open-ended questions about the roles of stakeholders, including sponsor
Evaluation Process (n = 61 sourcing decisions)	(18%) No Formal Bid Process (67%) Compare Vendor Bids with Current IT Costs (15%) Compare Vendor Bids with Newly Prepared Internal Bid	Open-ended questions about the evaluation process
Contract Duration (n = 46 outsourcing decisions)	(48%) Shorter than Four Years (28%) Longer than Four Years and Shorter than Seven Years (24%) Longer than Seven Years	Open-ended questions about the contract terms; copies of contracts were analyzed
Contract Type (n = 46 outsourcing decisions)	(4%) Standard Contracts (72%) Detailed Contracts (7%) Loose Contracts (17%) Mixed Contracts	Open-ended questions about the contract terms; copies of contracts were analyzed
Contract Date (n = 46 outsourcing decisions)	(24%) Before 1989 (43%) 1989 to 1991 (33%) After 1991	Open-ended questions about the timing of the decision; contracts also specified date
Size of IT Data Centers (n = 40 data center decisions)	(56%) Small (< 150 MIPS) (44%) Large (>=150 MIPS)	Number of MIPs
Size of IT Operations (n = 61 sourcing decisions)	(33%) Small (33%) Medium (33%) Large	IT budget, IT headcount
Decision Outcome (n = 61 sourcing decisions)	(56%) Cost Expectations Realized (23%) Cost Expectations Not Realized (16%) Unable to Determine (5%) Too Early to Tell	Expected cost savings achieved, assessed through interviews and documentation

Table 2. Participant Expectations/Reasons

Expectation/Reason	Number of Decisions Out of 61 in Which at Least One Participant Cited This as an Expectation/Reason	Percentage of Decisions in Which at Least One Participant Cited This as an Expectation/Reason
1. Reduce IT costs	49	80%
2. Improve technology or technical service	36	59%
3. Jump on the bandwagon; outsourcing perceived as a viable, irreversible trend within their industry	23	38%
4. Focus business on core competencies; IT perceived as non-core	19	31%
5. Restructure IT budgets from capital budgets to fixed operating budgets	18	30%
6. Play good corporate citizen; IT managers perceive an outsourcing evaluation demonstrates their willingness to subordinate the good of IT department for the good of the overall business.	18	30%
7. Focus internal IT staff on critical IT activities, such as development, while outsourcing more stable and predictable IT activities, such as data center operations.	13	21%
8. Prove efficiency; invite bids to receive a free benchmark	9	15%
9. Eliminate an IT burden; assume a vendor will solve problematic IT function(s)	8	13%
10. Downsizing—the entire company is pressured to reduce headcount	7	11%
11. Preemptive move by IT managers to expose exaggerated claims made to senior executives by consultants or vendors	6	10%
12. Improve cost controls	5	8%
13. Forced market testing by the UK government	5	8%
14. Justify new IT resources by bundling capital budget requests with "proof" that vendors cannot do it cheaper	3	5%
15. Facilitate mergers and acquisitions—vendors are perceived as experts in merging data centers quickly	3	5%

- Three decisions were deemed "too early to tell" (5%)

Much of the analyses focuses on the 48 decisions with definitive cost outcomes. Nonetheless, the 10 "unable to determine" cases also offer insights to the participants' experiences. For example, participants from half of the total outsourcing decisions could not determine the financial effects of their decision or else participants disagreed as to whether cost savings were achieved. Participants could not always assess how transition costs (transfer license fees, cash payments for assets, legal fees, consulting fees, and benchmarking fees) and excess fees affected initial cost reduction estimates. In some instances, participants argued that the centralized IT budget was just redistributed to user budgets, and therefore they contested the claims of cost reduction made by other participants. With total insourcing, all participants were able to determine whether expected cost savings were achieved because they could directly compare IT budgets before and after the decision. There were no initial transition fees to complicate the financial assessment. Thus, if a customer's goal is to reduce IT costs, it is useful to see how certain practices complicate a customer's ability to assess financial outcomes.

Findings From the Sourcing Experiences

Finding 1

Selective outsourcing decisions achieved expected cost savings with a higher relative frequency than total outsourcing or total insourcing decisions.

The cases represent a wide range of sourcing decisions. Some organizations almost exclusively used internal IT functions to provide IT services. On the opposite end of the spectrum, other organizations engaged in 10-year, multibillion dollar contracts with external providers for most of their IT needs. Still others assumed a "middle-of-the-road" approach by contracting for only select subsets of IT activities. These three sourcing options were defined as follows:

Total outsourcing: the decision to transfer the equivalent of more than 80% of the IT budget for IT assets, leases, staff, and management responsibility to an external IT provider.

Total insourcing: the decision to retain the management and provision of more than 80% of the IT budget internally after evaluating the IT services market.[3]

Selective outsourcing: the decision to source selected IT functions from external provider(s) while still providing between 20% and 80% of the IT budget internally. This strategy may include single or multiple vendors.

With total outsourcing and total insourcing arrangements, over 80% of the IT budget is almost always provided by *one* supplier, either the internal staff or one external vendor. PETRO1 was the only case in which more than 80% of the IT budget was outsourced to multiple suppliers.

Using these definitions, the 48 sourcing decisions with discernible cost outcomes were categorized as follows:

- Seven decisions resulted in total outsourcing (15%)
- Fifteen decisions resulted in total insourcing (31%)
- Twenty-six decisions resulted in selective outsourcing (54%)

[3] Included in the definition of insourcing is the buying-in of vendor resources to meet a temporary resource need, such as the need for programmers in the latter stages of a new development project or the use of management consultants to facilitate a strategic planning process. In these cases, the customer retains responsibility for the delivery of IT services—vendor resources are brought in to supplement internally managed teams.

Selective Outsourcing

Selective outsourcing decisions achieved expected cost savings more frequently than all-or-nothing approaches (see Table 3). Few vendors or internal IT departments possessed the expertise to perform all IT activities most efficiently. With selective outsourcing, organizations could select the most capable and efficient source—a practice some participants referred to as "best-of-breed" sourcing. The most commonly outsourced functions were mainframe data centers (10 cases), software development and support services (seven cases), telecommunications/networks (five cases), and support of existing systems (five cases). In most cases, vendors were judged to have an ability to deliver these IT products and services less expensively than internal IT managers. Sometimes, the ability to focus in-house resources to higher-value work also justified selective outsourcing.

Total Outsourcing

In general, the all-or-nothing sourcing decisions achieved their expected cost savings less frequently than selective outsourcing decisions. With total outsourcing, only two companies achieved expected cost savings: BANK1 and ELECTRIC. Rather than upgrade their aging data center, BANK1 now runs their systems at an IBM data center in Atlanta. However, BANK1 kept their small systems development staff in-house. ELECTRIC's arrangement was unique among the participating cases. ELECTRIC spun-off their IT department to a wholly owned subsidiary. Because the new company's only source of revenue at the time of the interviews was from ELECTRIC, they were highly motivated to meet ELECTRIC's cost expectations.

In five of the seven total outsourcing cases with discernible cost outcomes, however, cost expectations were not realized. Participants encountered one or more of the following problems realizing expected cost savings:

- Excess fees for services beyond the contract or excess fees for services participants assumed were in the contract;
- "Hidden costs" such as software license transfer fees;
- Fixed-prices that exceeded market prices two to three years into the contract;
- Inability to adapt the contract to even minor changes in business or technology without triggering additional costs.

This study shows that such problems are endemic to senior executive sponsorship and to long-term, fee-for-service contracts.

Total Insourcing

Exclusive sourcing by an internal IT department was generally successful (67%). However, in five of the cases, internal IT "monopolies" promoted complacency and erected organizational obstacles against continuous improvement. IT managers who exploited total outsourcing failures and adamantly refused to deal with outsourcing vendors were often blamed when their own IT departments failed to demonstrate value for money. For example, the vice president of IS at DIVERSE2, a waste management company, tried to deflect his CEO's interest in outsourcing by producing a white paper highlighting outsourcing failures. The CEO eventually dismissed the white paper and signed—six months after being interviewed—an outsourcing contract for all applications development and support.

Finding 2

> *Senior executives and it managers who made decisions together achieved expected cost savings with a higher relative frequency than when either stakeholder group acted alone.*

One interest of this study was in knowing which sponsors—senior executives, IT managers, or

Table 3. Sourcing Decision Scope

Sourcing Decision	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions Perceived as Successful*
Total Outsourcing	2	5	7	29%
Total Insourcing	10	5	15	67%
Selective Outsourcing	22	4	26	85%
TOTAL NUMBER OF DECISIONS	34	14	48	71%

n = 48 sourcing decisions with discernible cost outcomes.
*(# of "cost expectations realized" decisions) / (# of "cost expectations realized" decisions + # of "cost expectations not realized" decisions).

users—made the most successful sourcing decisions. Decision sponsor was defined as the person who initiated or championed the sourcing decision and who made or authorized the final decision. Using this definition, participants were asked to identify the decision sponsor (which may have been the interviewee), the sponsor's job title, their reporting level in the organization, and the extent of the sponsor's participation in the decision process.

If the sponsor's reporting level was above the IT department, the sponsor was categorized as a "senior executive." Job titles in this group included CEO, CFO, controller, and treasurer. If the sponsor was from the IT department—including the head of the IT department—the sponsor was categorized as an "IT manager." Job titles in this group included CIO, VP of information systems, and manager of information systems. (In no cases were users identified as a sponsor.) If participants identified multiple sponsors, they were categorized based on their job titles and reporting levels. For example, at TRANS, the CEO and CFO jointly sponsored the decision; thus the decision was categorized as "senior executive sponsorship." If a senior executive and an IT manager jointly sponsored the decision, it was categorized as "joint senior executive/IT sponsorship." For example, at ELECTRIC, the IS director and the marketing manager jointly sponsored the decision.

Using these definitions, the 48 sourcing decisions with discernible cost outcomes were categorized as follows:

- Fourteen decisions were sponsored by senior executives (29%)
- Nineteen decisions were sponsored by IT managers (40%)
- Fifteen decisions were jointly sponsored by senior executives and IT managers (31%)

In this study, sourcing decisions made jointly with both senior executive and IT input achieved their expected cost savings more frequently than sourcing decisions made with either stakeholder group acting alone (see Table 4). It appears that successful sourcing decisions require a mix of political power and technical skills. Political power helped to enforce the larger business perspective—such as the need for organization-wide cost cuts—as well as the "muscle" to implement such business initiatives. Technical expertise on IT services, service levels, measures of performance,

Table 4. Decision Sponsor

Decision Sponsor	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions Perceived as Successful
Senior Executive	7	7	14	50%
IT Manager	14	5	19	74%
Joint Senior Executive/IT	13	2	15	87%
TOTAL NUMBER OF DECISIONS	34	14	48	71%

(n = 48 sourcing decisions with discernible cost outcomes).

rates of technical obsolescence, rates of service growth, price/performance improvements, and a host of other technical topics were needed to develop requests-for-proposals, evaluate vendor bids, and negotiate and manage sound contracts. In some cases, this mix of political power and technical knowledge was encompassed in one stakeholder group, as evident by seven successful decisions sponsored solely by senior executives and 14 successful decisions sponsored solely by senior IT managers; but in general, the joint-decisions lead to a higher rate of financial success in the case companies.

Case PSB4 provides an example of joint sponsorship. In 1988, senior executives of this U.K. broadcasting organization were approached by a major vendor. The vendor offered a 40% reduction in IT costs, additional disaster recovery, lower in-house management involvement, career opportunities for transferred staff, and redirected capital from ownership of IT assets to core business activities. Working together, a senior executive (a program manager) and in-house IT managers produced a detailed, less promising analysis of the vendor's assumptions. The vendor's estimated £11 million saving over five years was based on unrealistic assumptions of no growth in workload or change in requirements. It was unclear where staff cost savings of 33% could be made. The vendor's legitimate cost reduction idea proposed savings by consolidating five mainframe data centers into two. The joint business/IT decision was to implement cost savings in-house, partly through data center consolidation and refinancing hardware leases:

> We decided we could do just as well internally as they would. In fact, do better. At that point, we still had a growing mainframe workload . . . we were operating a significantly large number of mainframes, so nearly all the ways that the vendor could reduce costs were open to us. They had an edge on us in staffing costs, but of course we were not charging a management fee, which they would. So the decision was to stay in-house (Production Manager, PSB4).

This joint senior executive/IT manager decision exploited the vendor bid to prompt improvements in-house. Three years later, the same sponsors made a financially successful decision to selectively outsource the data centers when technical and business conditions changed.

The need for joint sponsorship is most apparent when outsourcing and insourcing decisions are analyzed separately:

Finding 2a: Senior executives realized their expected cost savings only 40% of the time when they outsourced IT.

When senior executives sponsored decisions that led to outsourcing, a low percentage of decisions were financially successful (refer to "Senior Executive" row in Table 5). Senior executives often focused on the short-term financial aspects of outsourcing, primarily because their companies were in poor financial straits, and they saw outsourcing as a way to refinance the company. As recently noted, "Strategy isn't driving outsourcing. Statistics show the real reason companies outsource is simple: They're in financial trouble" (Strassmann 1995). Vendors offered senior executives attractive financial proposals by transforming IT capital budgets to fixed-fee operating budgets, paying cash for IT assets (worth $300 million in the case of AERO), purchasing company shares, and/or postponing payments until the latter part of the contract. From a net present value perspective, senior executives viewed outsourcing as a sound decision. Such evaluations were based on false assumptions, including the belief that IT requirements would remain stable over a long-term relationship—or if they changed, that the vendor would willingly adapt under the spirit and trust of a "strategic partnership." While these "CEO-handshake" deals may have saved companies money in the short-term, the relationship deteriorated in several cases as the consequences of a poorly negotiated deal became evident.

> What generally happened is senior managers way up here at the 40,000 foot level cut the deal. The people who have to implement it are down here. They are really faced with a different set of problems (Vendor Account Manager, Prior VP of Computer Utility, DIVERSE1).

Finding 2b: IT managers realized their expected cost savings only 56% of the time when they insourced IT.

IT managers fared only slightly better at making insourcing decisions than senior executives fared at making outsourcing decisions. In four cases, IT managers did not appear to conduct an "objective" evaluation but rather used the guise of an outsourcing evaluation to prevent senior management from conducting the evaluation themselves (refer to "IT Manager" row in Table 6). In three of the four IT manager-sponsored insourcing decisions that did not achieve cost savings, IT managers initiated outsourcing evaluations after learning that EDS was wooing their senior management:

Table 5. Decision Sponsor for Outsourcing Decisions

Decision Sponsor	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions Perceived as Successful
Senior Executive	4	6	10	40%
IT Manager	9	1	10	90%
Joint Senior Executive/IT	11	2	13	85%
TOTAL NUMBER OF DECISIONS	24	9	33	73%

n = 33 outsourcing decisions with discernible cost outcomes.

Table 6. Decision Sponsor for Insourcing Decisions

Initiator of the Decision	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions With Discernible Cost Outcomes Perceived as Successful
Senior Executive	3	1	4	75%
IT Manager	5	4	9	56%
Joint Senior Executive/IT	2	0	2	100%
TOTAL NUMBER OF DECISIONS	10	5	15	67%

n = 15 insourcing decisions with discernible cost outcomes.

> There was a letter, the chairman of the board of EDS wrote a letter to our CEO saying that they would be interested in paying substantial cash for our whole IS organization (VP of IS, PETRO2).

By initiating their own evaluation, IT managers may have hoped that the best defense was a good offense. Their evaluations were either cursory, such as simply calling a few vendors on the phone, or else the evaluation was sabotaged through suspicious numbers:

> It really came down to an exercise. We did not try to make outsourcing work. What we were really trying to do was to come up with the justification for why we shouldn't outsource. That's what it boiled down to (Manager of Technical Support, PETRO4).

In the four IT manager-sponsored insourcing decisions that did not lead to expected cost savings, senior management either did not believe in the IT manager's outsourcing evaluation and subsequently outsourced (DIVERSE1, DIVERSE2, FOOD2) or fired the IT manager (CHEM2).

> I honestly attempted to be as objective as possible, but I admit that even when I presented to [the vice president and controller], I probably would not ever be perceived as completely unbiased and non-prejudiced (Manager of Data Processing, CHEM2).

Finding 3

> *Organizations that invited both internal and external bids achieved expected cost savings with a higher relative frequency than organizations that merely compared external bids with current it costs.*

One question the study focused on was which evaluation process was most successful in terms of achieving cost savings? During the interviews, participants were asked to describe the sourcing evaluation process in detail. After analyzing the transcripts, three general evaluation processes were defined:

No formal bid process: the organization made the sourcing decision without creating a request-for-proposal or inviting external bids.

Compare vendor bids with current IT costs: the organization made the sourcing decision by creating a request-for-proposal and inviting external bids from service providers. These bids were compared with current IT costs.

Compare vendor bids with newly prepared internal bids: the organization made the sourcing decision by creating a request-for-proposal and inviting external bids from service providers as well as a bid from the internal IT department.

Using these definitions, the evaluation processes for the 48 sourcing decisions with discernible cost outcomes were categorized as follows:

- Ten decisions were made based on no formal bid process (21%)
- Twenty-nine decisions were made by comparing vendor bids with current IT costs (60%)
- Nine decisions were made by comparing external vendor bids with newly submitted internal bids (19%)

The decision process that most often led to realized expected cost savings was the one that allowed internal IT departments to submit a competitive bid along with external vendors (see Table 7). The belief here is that this was because formal external vendor bids were often based on efficient managerial practices that could be replicated by internal IT managers. The question was: If IT managers could reduce costs, why didn't they?

In some cases, IT managers could not implement cost reduction tactics because the internal politics of user departments often resisted cost reduction tactics such as consolidating data centers, standardizing software packages, and implementing full-cost chargeback schemes. For example, users in two divisions at FOOD1 did not want to consolidate their data centers into the corporate data center:

> In 1986, [the two divisions] didn't want to come to corporate IS in the first place. They didn't want to close their data centers, a control thing, "my car is faster than your car" thing (Data Center Director, FOOD1).

Senior executives at FOOD1 felt that IT costs had become too expensive and decided to outsource its large corporate data center. The Data Center director lobbied to submit an internal bid. Once granted permission, he prepared an internal bid that beat an external bid on cost. Within three years, the internal IT department cut costs by 45% by consolidating and standardizing.

In other cases, IT managers were not motivated to improve costs, particularly if the legacy of insourcing had created an environment of complacency. For example, the unionized IT employees at TCOM had maintained inefficient work practices to protect their jobs. It was not until the union was threatened with losing the job site through outsourcing that union representatives acquiesced and improved efficiency. One of the union representatives expressed the following view: "When you are in the frying pan, you get creative."

In all of the cases, however, the IT managers had to convince management to allow an internal bid submission. The following quote provides an example of IT management's initiative in establishing an internal bid:

> The IS management said that there is no reason we should be excluded from the party. You cannot assume, it's not fair to say that we'll just do what we've been doing. We ought to have some freedom to make decisions that the outsourcers are making (Corporate Manager of Technology, PETRO3).

In some cases, senior management granted a request for an internal bid more as a "morale preserver" than as a serious contender against external bidders. Once given free rein to compete based on cost efficiency, internal IT managers often surprised senior management by submitting the low cost bid. Furthermore, in eight of the nine cases involving internal bids, IT managers subsequently achieved expected cost savings. The threat of outsourcing in the future may have been a driving force behind implementing the internal bid proposals:

> The repercussions of this exercise are that I suspect we will go through this exercise in another year or two—if we find out that we can do it cheaper outside, we have to seriously consider that option (Assistant Treasurer, PETRO4).

Finding 4

Short-term contracts achieved expected cost savings with a higher relative frequency than long-term contracts.

This study was interested in the contract duration to determine whether short-term or long-term contracts were more successful in terms of achieving expected cost savings. Contract duration was classified into three categories: "less than four years," "between four and seven years," and "more than seven years." "Less than four years" was selected as the first cut-off point because many participants expressed that they could not define their IT requirements past a three-year time horizon. Seven years was selected as the second cut-off point because it was midway between the duration of four years and the longest contract studied, 10 years.

Using these contract duration categories, the 33 outsourcing decisions with discernible cost outcomes are classified as follows:

- Eighteen outsourcing decisions were sealed with shorter than four-year contracts (55%)
- Ten outsourcing decisions were sealed with four to seven year contracts (30%)
- Five outsourcing decisions were sealed with longer than seven-year contracts (15%)

Among these 33 outsourcing cases, short-term contracts realized expected cost savings more frequently than long-term contracts (see Table 8). Short-term contracts involved less uncertainty, motivated vendor performance, allowed participants to recover from mistakes quicker, and helped to ensure that participants were getting a fair market price.

One reason for the financial success of short-term contracts is that participants only outsourced for the duration in which requirements were stable, thus participants could adequately analyze the cost implications of their decisions. GLASS, for example, initially only signed a two-year contract for their data center and systems development:

> Here we are dealing with a terrific amount of change within the business and within the head office. We didn't know what it was going to look like in the end . . . so a long contract would have been quite inappropriate here.

Table 7. Evaluation Process

Process	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions Perceived as Successful
No Formal Bid Process	5	5	10	50%
Compare Vendor Bids with Current IT Costs	21	8	29	72%
Compare Vendor Bids with Internal Bid	8	1	9	89%
TOTAL NUMBER OF DECISIONS	34	14	48	71%

n = 48 sourcing decisions with discernible cost outcomes.

> There is too much change involved (Manager of IS, GLASS).

Second, some participants noted that short-term contracts motivated vendor performance because vendors realized customers could opt to switch vendors when the contract expired. As the IS director of AVIATION commented, "It's no surprise to me that the closer we get toward contract renewal, it's amazing what service we can get."

Third, in some cases short-term contracts allowed companies to recover faster from mistakes. RETAIL3 provides an example of this. In 1990, the IT director of RETAIL3 outsourced corporate telecommunications as a discrete commodity service to achieve an estimated 25% savings in a three-year contract. However, the contract was not detailed enough:

> The vendor largely wrote it and we signed it...many of the contractual statements were ambiguous in the way they had been written (Contract Manager, RETAIL3).

Contract disputes were driven by poorly defined service levels. The contract resulted in cost savings that were achieved primarily through deteriorating service levels. RETAIL3 motivated an improvement in vendor service only after assigning additional workload to another vendor. When the first contract expired, RETAIL3 selected another vendor and detailed a much better contract, resulting in higher cost savings and higher service levels.

Finally, short-term contracts ensured that the participant's fixed prices were not out of step with market prices. While a vendor's bid to discount current IT costs by 20% may have sounded appealing in year one, by year three contract prices were often above market prices. For example, METAL agreed to pay $100 per processed form in 1990, but by 1993, the vendor was charging $50 per processed form to other customers. Because of METAL's fixed-price contract, they had been unable to achieve the lower rate. Another related problem with most fixed-fee contracts was that the customers in the study were required to pay for a minimum volume (50% to 100% of baseline volumes), even if their volumes significantly declined during the contract. For example, DIVERSE1 signed a 10-year total outsourcing contract in the late 1980s. At that time, the majority of the company's systems were

Table 8. Contract Duration

Contract Duration	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions With Discernible Cost Outcomes Perceived as Successful
Shorter than four years	15	3	18	83%
Longer than four years, shorter than seven years	7	3	10	70%
Longer than seven years	2	3	5	40%
TOTAL NUMBER OF DECISIONS	24	9	33	73%

n = 33 outsourcing decisions with discernible cost outcomes.

running on mainframe technology. With the advent of client-server technology, the company wanted to migrate to the smaller platform. They found that their outsourcing contract obligated them to pay a fixed-fee for the mainframe, regardless of the reduction of use. In the end, business unit managers were forced to use discretionary funds to build client-server systems, while still meeting their contractual obligations for the increasingly obsolescent mainframe.

Finding 5

Detailed, fee-for-service contracts achieved expected Cost savings with a higher relative frequency than other types of fee-for-service contracts.

Many different types of contracts are used to govern IT outsourcing relationships. In general, IT outsourcing contracts can be categorized as follows:

Fee-for-service contract: A customer pays a fee to a supplier in exchange for the management and delivery of specified IT products or services. Among the 46 outsourcing decisions studied, 45 are fee-for-service contracts. These decisions were further categorized fee-for-service contracts using the following definitions:

> **Standard contracts:** the customer signed the vendor's standard, off-the-shelf contract.
>
> **Detailed contracts:** the contract included special contractual clauses for service scope, service levels, measures of performance, and penalties for non-performance.
>
> **Loose contracts:** The contract did not provide comprehensive performance measures or contingencies but specified that the vendors perform "whatever the customer was doing in the baseline year" for the next five to 10 years at 10% to 30% less than the customer's baseline budget.
>
> **Mixed contracts:** For the first few years of the contract, requirements were fully specified, connoting a "detailed" contract. However, participants could not define technology and business requirements in the long run, and subsequent requirements were only loosely defined, connoting a "loose" contract.

Strategic alliance/partnership: Collaborative interorganizational relationships involving significant resources of two or more organizations to create, add to, or maximize their joint value. In the contract, the partners agree to furnish a part of the capital and labor for a business enterprise, and each shares in profits and losses. Among the cases, only one outsourcing relationship is a strategic alliance—ELECTRIC's joint venture with a Dutch software company. (This exception is discussed in the managerial implications section.)

Buy-in contract: A customer buys in vendor resources to supplement in-house capabilities, but the vendor resources are managed by in-house business and IT management. Because the customer retains responsibility for the delivery of IT services, this option has been labeled "insourcing." (This contract type is discussed in the managerial implications section.)

Focusing the analysis on the 32 fee-for-service contracts with discernible cost outcomes, the contracts are categorized as follows:

- Two standard fee-for-service contracts (6%)
- Twenty-two detailed fee-for-service contracts (69%)
- Three loose fee-for-service contracts (9%)
- Five mixed fee-for-service contracts (16%)

Among them, detailed, fee-for-service contracts achieved expected cost savings with greater relative frequency than other fee-for-service types of contracts (see Table 9). These organizations understood their own IT functions very well and could therefore define their precise requirements in a contract. They also spent significant time negotiating the details of contracts (up to 18 months in some cases), often with the help of outside experts. For example, the financial manager at BANK1 spent three months negotiating the data center contract, assisted by the VP of IS, internal attorneys, and two hired experts:

Table 9. Contract Types

Contract Type	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions Perceived as Successful
Standard Fee-for-Service	1	1	2	50%
Detailed Fee-for-Service	20	2	22	91%
Loose Fee-for-Service	0	3	3	0%
Mixed Fee-for-Service	2	3	5	40%
TOTAL NUMBER OF DECISIONS	23	9	32	72%

n = 32 fee-for-service outsourcing contracts with discernible cost outcomes.

> And that's when [the VP of IS] and I and the attorneys sat down everyday for three solid months of drafting up the agreement, negotiating the terms, conditions, and services (Financial Manager, BANK1).

In contrast to the success of the detailed contract, all three of the loose contracts were disasters, not only in terms of not achieving expected cost savings, but in terms of service. Two of these companies, CHEM1 and RUBBER, actually terminated their outsourcing contracts early and rebuilt their internal IT departments. One of these companies, DIVERSE1, threatened to sue the vendor. Senior executives in the three companies had signed flimsy contracts under the rhetoric of a "strategic alliance." However, the essential elements of a strategic alliance were absent from these deals. There were no shared risks, no shared rewards, and no synergies from complementary competencies. Instead, these loose contracts created conflicting goals. Specifically, the customers were motivated to demand as many IT services as possible for the fixed-fee price by arguing "you are our partners." Vendor account managers countered that their fixed-fee price only included services outlined in the contract. The additional services triggered vendor costs that were passed to the customer in terms of excess fees. Because the three customers failed to fully specify baseline services in the contract, the customers were charged excess fees for items they assumed were included in the fixed price.

Two of the five "mixed" contracts with discernible cost outcomes achieved expected cost savings. The two contracts (one contract at ELECTRIC and one contract at GLASS) contained either shared risks and rewards or significant performance incentives. It has already been noted that ELECTRIC's mixed contract involved a spin-off of the IT department to a wholly-owned subsidiary in 1991. Because the newly-formed company's only source of revenue was from ELECTRIC, it was highly motivated to satisfy ELECTRIC's needs. (If this subsidiary is ever successful at attracting external customers besides ELECTRIC, the relationship may evolve into more of a strategic alliance.)

In the case of GLASS, the company initially signed only a two-year contract with the vendor for data center operations and systems development. The promise of contract renewal and additional work in GLASS's multinational divisions motivated vendor performance. In addition, the relationship dimension was strong because the in-house IT manager became the vendor account manager. The initial contract was so successful that it was renewed for three years.

In contrast, three mixed contracts at PETRO1, BREWER, and FOOD3 did not achieve expected cost savings. Expected cost savings

did not materialize for a variety of reasons. In PETRO1, cost inefficiencies were driven out prior to signing three total outsourcing agreements. Although there were additional expected savings of 15% to 25% for PETRO1's seven divisions, PETRO1 participants experienced problems trying to coordinate additional savings among the three vendors. The overall effect was cost containment rather than cost reduction. At BREWER, the company outsourced primarily to provide jobs to IT employees rather than make them redundant. Although the goal of the contract was to break even on costs, poor pricing of future work triggered higher than expected costs. FOOD3 signed a mixed contract for factory software development. Because business requirements were loosely defined, FOOD3 paid twice the original contract price due to excess fees triggered by undocumented requirements. In hindsight, participants believe the wrong activity was outsourced. They perhaps should have brought in vendor expertise to work on an in-house project development team, rather than contract management and delivery of the system to a third party.

In addition to the five best practices, two additional categories were studied: contract date and size of IT function. Although these "variables" cannot be manipulated by an organization as is the case with managerial practices, they do shed significant light on the sourcing experiences.

Finding 6

Recently signed contracts achieved expected cost savings with a higher relative frequency than older contracts.

The contract date was analyzed to determine whether customers were getting better at negotiating contracts. Decisions were classified into three categories: before 1989, between 1989 and 1991, and after 1991. Kodak's outsourcing decision, which may have triggered a bandwagon effect throughout Fortune 500 companies (Loh and Venkatraman 1992), was made in 1989, so that year was chosen for the first cut-off point. The second cut-off point selected was 1991 because it represents the midpoint between 1989 and 1994, the last contract date studied. Using these categories, the 33 outsourcing contracts with discernible cost outcomes were classified as follows:

- Ten contracts were signed prior to 1989 (30%)
- Thirteen contracts were signed between 1989 and 1991 (39%)
- Ten contracts were signed after 1991 (30%)

It is evident that recent contracts achieved expected cost savings more often than older contracts. Two explanations are offered. First, customers were accumulating experience with IT outsourcing and were thus getting better at negotiating deals (see Table 10). In fact, some

Table 10. Contract Date

Year Decision Was Made	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions Perceived as Successful
Before 1989	4	6	10	40%
1989 to 1991	11	2	13	85%
After 1991	9	1	10	90%
TOTAL NUMBER OF DECISIONS	24	9	33	73%

n = 33 outsourcing decisions with discernible cost outcomes.

of the participants adopted incremental outsourcing precisely to develop an in-house knowledge base learned from the outsourcing experience. With incremental outsourcing, organizations outsourced a small and discrete part of their IT activities, such as third-party maintenance or shared processing services. The experience gained from this first incremental approach was then fed back into further outsourcing. In two cases, PETRO1 and ELECTRIC, organizations found themselves ultimately engaging in total outsourcing.

Second, recent contracts may have achieved expected cost savings more frequently because the outsourcing market has been changing in the customer's favor. Once dominated by a few big players, such as EDS, Andersen, CSC, and IBM, the IT outsourcing market has fragmented into many niche services. As competition in the outsourcing market increases, companies have more power to bargain for shorter contracts, more select services, and better financial packages. For example, in the 1980s, CHEM1 and RUBBER received only one vendor bid. In 1992, PSB3 received many responses: "We put an advert in the press looking for interested parties, and had about 22 responses" (Manager of IS, PSB3). In 1993, PETRO1 reviewed a list of 115 potential suppliers.

Finding 7

Size of IT function did not usefully differentiate financially successful decisions from financially unsuccessful decisions.

The study was interested in the size of IT function because of the theoretical argument that external service providers have lower average costs than internal IT functions due to mass production and labor specialization efficiencies. Organizations with small IT functions would be expected to gain significant savings by accessing a vendor's economies of scale through outsourcing. Organizations with large IT functions would also be expected to have equivalent economies of scale as a vendor and therefore could achieve cost savings on their own through insourcing. This prompts the question: Do companies with small IT functions successfully outsource, while companies with large IT functions successfully insource?

There are many possible indicators of size of IT function.[4] The study adopted three that allow consistent evaluations across the cases (see Appendix B for details):

1. Data center MIPS
2. Size of IT budget
3. Size of IT headcount

Data center MIPS (millions of instructions processed per second) was selected because this indicator has been systematically tied to theoretical economies of scale. Benchmarking organizations have estimated that theoretical economies of scale are achieved at 150 MIPS, approximately equal to the size of one large IBM mainframe (Lacity and Hirschheim 1994). Based on this finding, large and small IT functions were defined as follows:

Small IT function: the data centers in the scope of the evaluation are less than 150 MIPS.

Large IT function: the data centers in the scope of the evaluation are greater than 150 MIPS.

These definitions were operationalized by counting the total number of data center MIPs that were included in the scope of the evaluation. In some cases, size translated to the total data center MIPS within a company. For example, TRANS made a total outsourcing

[4] Revenue and IT budget as a percentage of revenue were also analyzed. These analyses were not included in the paper because revenues were captured at the company level in annual reports and IT budgets were captured at the level of the unit within the company conducting the outsourcing evaluation. IT headcount per $1 million spent on IT and MIPS per $1 million spent on IT were also considered. The last two are surrogate indicators of headcount intensity versus hardware/software intensity, but are relative measures rather than absolute size measures. Appendix B, however, documents these indicators of size for each case.

decision for the entire company, which totaled 880 MIPS across all their corporate and regional data centers. In some cases, size translated to the total MIPs for one strategic business unit (SBU). For example, TCOM is a large U.S. telecommunications company with over 300 MIPs in the company, but only the 32 MIPS associated with the SBU making the sourcing decision were counted. (TCOM's other data centers are located in different cities throughout the Northeast and were excluded from the RFP.)

The analysis was confined to the 31 data center decisions with discernible cost outcomes. Using these definitions, the size of IT function was categorized as follows:

- Twenty decisions involved small data centers (65%)
- Eleven decisions involved large data centers (35%)

The two other indicators of size are IT budget and IT headcount. Like data center MIPS, the IT budget and IT headcount for the IT function considering outsourcing, usually the centralized IT function were counted. (Discretionary money spent on IT within user divisions and people working on IT within user divisions could not be readily determined by participants.) The largest IT budget was a U.K. commercial bank (BANK3), spending $1.12 billion annually on IT. This bank also had the largest IT headcount, with over 3,000 IT staff. A U.K. insurance company (INSURANCE) in its start-up year and a U.K. food manufacturer (FOOD3) had the smallest IT budgets at $3 million and the smallest IT headcounts at 20.

Unlike data center MIPs, size of IT budget or headcount have not been theoretically tied to economies of scale. To conduct an analysis, the common heuristic of dividing the data into thirds was used, and the smallest third was compared with the largest third (Mosteller and Touky 1977).[5] The analysis was then limited to the 48 decisions with discernible cost outcomes.

In this study, the findings are apparently contrary to expectations based on the theoretical arguments. All three indicators of size suggested that the large IT insourcing cases did not achieve expected cost savings with greater frequency than the small IT insourcing cases. Using MIPS, insourcing large data centers achieved expected cost savings 75% of the time, compared with insourcing small data centers which achieved expected cost savings 64% of the time. Using IT budget, insourcing large IT functions achieved expected cost savings 33% of the time, compared with insourcing small IT functions which achieved expected cost savings 75% of the time. Using IT headcount, insourcing large IT functions achieved expected cost savings 33% of the time, compared with insourcing small IT functions which achieved expected cost savings 60% of the time. The last two indicators of size found that organizations with small IT functions actually successfully reduced costs by insourcing with greater relative frequency than organizations with large IT functions.

In general, all the size indicators suggested, as the theory of economies of scale predicts, that the small IT cases were able to reduce costs through outsourcing. However, small IT outsourcing cases did not achieve expected cost savings with greater frequency than the large IT outsourcing cases. Using MIPS, outsourcing small data centers achieved expected cost savings 67% of the time, compared with outsourcing large data centers which achieved expected cost savings 57% of the time. Using the IT budget size indicator, outsourcing small IT functions achieved expected cost savings 79% of the time. Similarly, outsourcing large IT functions achieved expected cost savings 77% of the time. Using the IT headcount size indicator, outsourcing small IT functions achieved expected cost savings 75% of the time, compared with outsourcing large IT functions which achieved expected cost savings 69% of the time.

The above analysis demonstrates that, when all indicators of size are considered, size does

[5] When data categories are arbitrary, it is more conservative to evaluate data points at the extremes rather than dividing data into "high" or "low" categories by the median.

not usefully differentiate an organization's ability to achieve expected cost savings. The following interpretation of this finding is suggested: In practice, the ability to reduce IT costs may depend more on IT managerial practices than inherent economies of scale associated with size.

For example, the study witnessed some very small IT functions that achieved unit costs comparable to a vendor, as assessed by a benchmarking firm. These internal IT managers aggressively kept costs low by buying used hardware (PETRO5), becoming beta test sights in exchange for free software (UNIVERSITY), or automating operations and implementing other efficient practices (TCOM). Other managerial practices that reduced costs included consolidating data centers, standardizing software platforms, empowering employees (which meant less supervision), negotiating tougher deals for hardware leases, consolidating hardware maintenance contracts, replacing printed reports with on-line reports, eliminating IT services (such as quality assurance teams), and implementing chargeback systems to curtail user demand. So, if cost reduction is the goal, there are many managerial practices that can be implemented by both small and large organizations. One of the case participants summarized the issue as follows:

> Some small data centers outperformed others that were five times their size. There are, however, significant economies of scale. From a pure theoretical point of view, a 1000 MIPS data center should be able to outperform smaller data centers. Our conclusion is that it is all a question of management (President of a major benchmarking firm who has assessed over 165 data centers).

Limitations of the Research

The findings in this study must be tempered by recognizing several limitations. These limitations include the selection of cases, interview method, and data analysis.

Selection of cases

This research is based on a theoretical sample, not a statistical sample. Therefore, the findings are based on the particular experiences of 61 sourcing decisions made in 40

Table 11. Data Center Sourcing Decisions

SIZE of Data Center in MIPS	Sourcing Decision	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL NUMBER OF DECISIONS	Percentage of Decisions With Discernible Cost Outcomes Perceived as Successful
< 150 MIPS	Outsourcing	6	3	9	67%
	Insourcing	7	4	11	64%
	Subtotal	13	7	20	65%
>=150 MIPS	Outsourcing	4	3	7	57%
	Insourcing	3	1	4	75%
	Subtotal	7	4	11	64%
TOTAL NUMBER OF DECISIONS		20	11	31	65%

n = 31 data center decisions with discernible cost outcomes.

Table 12. Size of IT Function

IT Budget	Cost Expectations Realized	Cost Expectations Not Realized	TOTAL	Percentage of Decisions With Discernible Cost Outcomes Perceived as Successful
1/3 smallest IT budget: Outsourcing	11	3	14	79%
1/3 smallest IT budget: Insourcing	3	1	4	75%
1/3 smallest IT budget: Total	14	4	18	
1/3 largest IT budget: Outsourcing	10	3	13	77%
1/3 largest IT budget: Insourcing	1	2	3	33%
1/3 largest IT budget: Total	11	5	16	
IT Headcount				
1/3 smallest IT headcount: Outsourcing	9	3	12	75%
1/3 smallest IT headcount: Insourcing	3	2	5	60%
1/3 smallest IT headcount: Total	12	5	17	
1/3 largest IT headcount: Outsourcing	9	4	13	69%
1/3 largest IT headcount: Insourcing	1	2	3	33%
1/3 largest IT headcount: Total	10	6	16	

n = 48 sourcing decisions with discernible cost outcomes.

organizations and may not be generalizable outside of the study.

Although the cases were purposefully selected to capture a wide range of sourcing experiences, the cases were all fee-for-service contracts with the exception of one strategic alliance. This bias existed because decisions studied were made between 1985 and 1994, when fixed-price, fee-for-service contracts were the dominant contracting model. Past decisions were selected because it was desirable to study actual outcomes instead of anticipated outcomes. However, new contracting models are emerging, and the loose contracts that led to financial failures in the case companies may no longer be prominent. It is believed, however, that these companies nonetheless provide significant opportunities for other organizations to learn from their sourcing experiences.

Interview method

The interview method relied on self-reported data after-the-fact. Ideally, subjects would have been interviewed before and after the decision to better access the a priori expectations and actual outcomes. By relying on hindsight, one can reasonably question whether a decision sponsor would adjust their predecision expectations to rationalize the decision as successful, regardless of the "actual" expectations and "actual" outcome. By using "expected cost savings achieved," the study sought to minimize the chance of altered expectations. In the cases, expected cost savings were either documented in bid analysis documents, which were created prior to the decision, or in press announcements, annual reports, and/or other documents released shortly after the contract was signed. It is also believed that multiple stakeholder perceptions minimized the chance of altered outcomes, as the notion of success in this study was based on the consensus of whether cost savings were achieved. In addition, a bias against outsourcing might be expected given the preponderance of IT managers in the study. Because these results are not seen, it is believed that the bias of self-reported interviews did not significantly skew the study findings.

Data analysis

Although "expected cost savings achieved" was deemed the best of all surrogate indicators considered, caution is prudent in interpreting the results. The results obviously depend on cost efficiency being the main reason for IT outsourcing. Consequently, this indicator of success likely biased the results in favor of detailed fee-for-service contracts. Detailed contracts may be appropriate when trying to reduce IT costs, but other contract types appear better suited to other sourcing objectives, such as technology transfer. This is discussed further in the managerial implications section below.

In addition, "expected cost savings achieved" ignores the political behavior we viewed at some organizations, such as using the evaluation to obtain a free benchmark from IT vendors. In another paper, the 15 reasons/expectations for outsourcing were examined and practitioner prescriptions for specifically meeting those expectations were developed (Lacity et al. 1994). However, that analysis was based on only a few case studies per reason/expectation because of the large number of categories involved. Our paper aims to extract more general experiences based on a larger number of cases.

Another important characteristic to consider is that the data categories in this study are highly related. For example, most of the recent contracts were short-term contracts and each of the three loose contracts was sponsored by senior executives without IT input. Although it is possible to cross-tabulate the categorical variables to assess the overlap by using Appendix A, the volume of additional data adds little value. By keeping the analysis simple, the hope was to clearly communicate findings.

Finally, the frequencies and percentages used to summarize experiences depend on the definitions of decision domain, decision sponsorship, evaluation process, contract duration, contract type, contract date, and size of IT function. It is reasonable to question how the results would change if the definitions changed. In Appendix D, a sensitivity analysis on the data categories is provided.

Managerial Implications: Fee-for-Service Contracts or Strategic Alliances?

IT outsourcing has been a widely publicized and much debated practice. In particular, practitioners and academics have argued about the validity of long-term, total outsourcing. The debate is clarified by distinguishing among three types of IT outsourcing contracts: fee-for-service contracts, strategic alliances/partnerships, and buy-in contracts. By highlighting the critical elements of various contracting models,

some of the apparent discrepancies in past findings about best ways to outsource IT may be reconciled.

Fee-for-service contracts

Of the 46 outsourcing relationships, 45 were governed by fee-for-service contracts. It was found that fee-for-service relationships require *detailed contracts* that fully specify requirements, service levels, performance metrics, penalties for non-performance, and price, and *short-term contracts* that last only for the duration for which requirements are known.

In the research, a fee-for-service contract was found to be best suited for IT activities where companies could clearly define their needs in an air-tight contract. For example, where the technology was mature and stable (particularly mainframe operations), case participants could negotiate detailed contracts that subsequently realized cost expectations (examples include BANK1, GOODS, BANK2, and FOOD3).

Fee-for-service contracts were not suited for IT activities in which the technology was ill-defined, immature, or unstable. In these cases, the customer's inability to define baseline requirements, together with subsequent unreasonable expectations that additional/undocumented services would be provided without additional costs, caused relationships to deteriorate.

An important insight from the study is that several of the case companies signed fee-for-service contracts, but mislabeled them as strategic alliances or strategic partnerships. The rhetoric of a "partnership" prompted the signing of loosely-defined, fee-for-service contracts (perhaps more aptly labeled "flimsy" contracts). Vendors' bids were based on the ill-defined baseline services the customers originally specified. Customers believed vendors would provide additional services free or at reduced prices under the spirit and trust of the "partnership." In reality, additions or changes to the fee-for-service contract triggered additional vendor costs that were recovered through excess fees. Such excess fees contributed to the customer's inability to realize expected cost savings. It was noted how three of our "loose" contracts were originally labeled as "strategic partnerships" by participants: DIVERSE1, CHEM1, and RUBBER.

PSB1 provides another example. PSB1 signed a fixed-fee for service, ten-year, £1 billion contract for most of PSB1's product and services. In 1994, when the interviews were first conducted, the IT director referred to the vendor as a "strategic partner":

> As to why we have gone for a single strategic partner rather than a number of partners each doing different things, much of a modern IT business like ours is an integrated business and carving it up does not become sensible.

By 1995, excess fees included £100,000 for unexpected software license transfer fees, an additional £5 million a year to cover inaccuracies in the original tender documents, and an additional £15 million a year for hardware maintenance. Furthermore, PSB1 could not meet some of the contractual terms, such as specifying requirements for 48 skill types 13 months in advance. In a follow-up interview in 1996, the IT director had ceased referring to the vendor as a strategic partner. Participants from other cases also decided that it was best to abandon the rhetoric of partnerships when deals were essentially fee-for-service:

> There is a lot of rubbish talked about partnerships. What are called "strategic partnerships" are easy when everything is going well. It's good if you can work together, but it's not a true partnership unless you have a joint financial venture (IS Director, RETAIL3).

Strategic alliances/partnerships

In the context of IT, the idea that outsourcing vendors should be treated as "strategic partners" may be attributed to Eastman Kodak. A Kodak manager overseeing the contracts told an audience of practitioners, "We think of our alliances as partnerships because of their cooperative and long term qualities" (Lacity and Hirschheim,1993b). Kodak's original con-

tracts were only a dozen or so pages long. The importance of Kodak's IT outsourcing model cannot be over-stated: statistical analysis shows that the IT outsourcing trend can be attributed to imitative behavior of Kodak's decision (Applegate and Montealegre 1991; Loh and Venkatraman 1992).

In a separate study, over 500 interviews on 37 strategic alliances were conducted, and eight essential factors for successful alliances were found (Kanter 1994):

1. *Individual excellence:* both partners are strong and have something of value to contribute.
2. *Importance:* the relationship plays a key role in both partners' long-term strategic plans.
3. *Interdependence:* neither can accomplish alone what both can do together.
4. *Investment:* partners invest in each other.
5. *Information:* communication is reasonably open.
6. *Integration:* partners develop organizational linkages so they work together smoothly.
7. *Institutionalization:* the relationship extends beyond the deal-makers and cannot be broken on a whim.
8. *Integrity:* the partners behave in honorable ways toward each other.

Given these criteria, only one of the cases in the present study can be described as a strategic alliance: ELECTRIC's joint venture with a Dutch software company. ELECTRIC provided 1,000 IT employees and owns over 30% of the venture. The Dutch software company provided sales and marketing capabilities. The partners develop and support application software for external customers.

Outside of the cases studied, there have been a number of reported IT strategic alliances that may meet most of Kanter's criteria. In principle, these strategic alliances will combine strengths to add value by selling jointly developed IT products and services to the external marketplace. Because each party will share in the revenue generated from external sales, the deals are not based on fee-for-services, but rather on shared risks and rewards, often accompanied by joint investment. Some examples of strategic alliances announced in the trade press include:

- The Xerox-EDS contract provides for future shared revenues from the development and sale of a global electronic document distribution service. At the time of the contract signing, the President of EDS and CEO of Xerox announced:

  > We realized that each of our companies brought to the table specific best-in-class capabilities that enabled a level of performance that neither could achieve independently. This is a case of two technology companies enabling one another to achieve a shared vision for adding value for their customers (reported on October 10, 1996 on WWW at http://www.xerox.com/PR/NR950321-EDS.html).

- Andersen Consulting and Dow Chemical formed a strategic alliance in which the partners plan to sell any systems developed for Dow to external customers (Moran 1996).

- Swiss Bank signed a 25-year outsourcing deal with Perot Systems worth $6.25 billion. The partners will sell client/server solutions to the banking industry (Schmerken and Goldman 1996).

- In Australia, when Lend Lease outsourced all its information systems to ISSC, it took a 35% holding in ISSC Australia (Hirschheim 1996).

- Telestra (Australia's telecommunications company) is negotiating to outsource its IT to ISSC, which in turn would outsource its network operations and management to Telestra. Additionally, Telestra would take a 26% stake in ISSC (Hirschheim 1996).

Such deals have high expectations for success, but the partners must truly add value by offering IT products and services demanded by customers in the market. One widely publicized deal has failed this litmus test. When Delta Airlines and AT&T(NCR) formed TransQuest to provide IT solutions to the airline/travel industry, their goal was to generate $1 million a year for the 50-50 partnership. Under the $2.8 billion,10-year agreement, Delta transferred 1,100 employees and 3,000 applications to TransQuest while NCR contributed 30 employees, software, and cash. In 1996, however, the joint venture was terminated and Delta brought everything back in-house. A recent article speculated that NCR's inexperience with large-scale professional service deals was a major contributing factor to the early termination (Hoffman 1996).

Buy-in contracts

One contract model that emerged from the study was the buying in of vendor resources to supplement in-house abilities. This was labeled an insourcing option because the customers managed the IT activity and vendor resources internally. This strategy was most successful for the development of applications dependent on new technologies. In these cases, companies wished to access the vendor's technical expertise but could neither negotiate a detailed contract (because they didn't fully understand requirements), nor could they afford to miss a learning opportunity. An example of this buy-in strategy is the development of a first client/server system. The companies studied, FOOD and INSURANCE, for example, lacked the technical skills to develop the systems, but felt that their own business expertise was required for the client/server applications, which included manufacturing scheduling, claims processing, and customer order processing. Outside experts were hired on an hourly basis to participate on the project team. After the systems were completed, the knowledge had been transferred and the companies opted to support the systems internally. Other examples from CHEM3, RETAIL3, BANK3, GLASS, and UTILITY2 included buying-in vendor expertise to help develop applications using new technologies such as relational databases, neural networks, and expert systems.

In summary, the three general contract models identified above provide a good starting point for understanding customer/supplier relationships. These definitions also reconcile some of the apparent debates in the literature. For example, in a study where over a dozen total outsourcing contracts were examined (McFarlan and Nolan 1995), the findings are contrary to those of the present study on a number of points, including assessment of the viability of long-term IT outsourcing and a call for flexible contracts. The differences in findings may be attributed to the types of deals each study examined. That study primarily examined strategic alliances; this study examined fee-for-service contracts.

Future Market Trends

Sourcing information technology capability remains a problematic area. The increasing number of vendors and services available in the marketplace provides more opportunities, but also complicates decision making, contracting, and management issues. As the market evolves and long-term contracts mature, our understanding of IT sourcing and the implications for sound practices will also evolve. There are many opportunities for further research in the area, including identifying IT capabilities that can and cannot be outsourced, adapting sourcing decisions to changes in business and technology, and developing alternative legal arrangements such as strategic alliances or creative variations on fee-for-service contracts.

The case studies contribute to the mounting experience base, particularly in the area of fee-for-service contracts, and especially for contracts directed at cost reduction. Detailed, short-term contracts worked well for the firms studied if participants clearly defined their requirements. This ensured they were paying market prices, motivated vendor performance

(perhaps with a threat to switch suppliers when the contract expired), allowed organizations to gradually learn how to competently outsource, and, in some cases, allowed organizations to recover from their mistakes more quickly. Ongoing research finds a number of emerging practices that in principle will achieve success through other means. Such practices will need to be monitored and studied before assessing their viability. These practices include flexible pricing, competitive bidding beyond the baseline contract, beginning long-term relationships with a short-term contract, and performance-based contracts.

Flexible pricing

Customers are well aware that unit costs drop 20% to 30% annually, and they want this reflected in their price. In these cases, it was found that relying on loose contracts to adapt to changes proved a poor option. Although the study showed how short-term contracts avoided this trap in the case companies, recent practices have tried an alternative route through flexible pricing.

The term "flexible pricing" has been used to cover a variety of pricing mechanisms, including vendor-cost-plus pricing, market pricing, and preferred-customer pricing. One aerospace company currently under study is tracking vendor costs with "open book accounting" clauses and demanding a percentage of vendor savings. One U.S. government agency is relying on annual third-party benchmarks to assess current market prices. A U.S. county government under study has a clause to remain on the vendor's preferred customer list during the 10-year contract.

Competitive bidding for services beyond the contract

This study found that the decision process that led most often to achieving expected cost savings entailed inviting both external and internal bids. The additional competition from internal bids served to motivate all bidding parties to produce cost competitive proposals. Similarly, customers are increasingly using competition once an outsourcing contract is signed to ensure cost efficiency for services beyond the baseline contract. Customers are protecting themselves by including contract clauses that specify that the customer will competitively bid any service beyond the contract. Specifically, customers hope to ensure vendor motivation and competitive pricing. For example, DuPont's $4 billion contract with CSC and Arthur Andersen allows for competitive bidding beyond the baseline contract.

Two cases were observed where this practice did not protect the customer. The first time AERO went outside of their multibillion dollar outsourcing contract, the vendor refused to continue to support desktop computing:

> Our contract says we can go elsewhere. When [the vendor] wanted to charge us $2,500 to upgrade each of our HP workstations to two gigabyte harddrives, we went elsewhere and bought them for $1,000. Now [the vendor] won't support our machines because we put somebody else's hardware in them (User, AERO, year two into a 10-year contract).

In a similar circumstance, DIVERSE1 awarded a large-scale development effort to a company other than their primary contractor. After the system was developed, the vendor refused to run the application on their mainframes unless they were awarded the support contract. From the vendors' perspective, they did not wish to be held accountable for the maintenance of products or services delivered outside the original contract.

Begin long-term relationships with a short-term contract

The study found that short-term fee-for-service contracts most frequently led to achieving expected cost savings. A related emerging practice is to sign short-term contracts that are periodically renewable. Each party intends for a long-term relationship, but the original

commitment is short-term. ELECTRIC and GLASS originally signed short-term contracts with renewable options. More recently, executives at Cigna Healthcare of Atlanta Georgia wanted a long-term relationship with their IT outsourcer, Entex Information Services. Cigna, however, pushed for a one-year contract even though Entex would be required to make significant investments in Cigna, without any guarantee for the future. But the short-term contract served to motivate both sides: Entex wanted the renewal to reap their investment, Cigna wanted the renewal to avoid incurring the costs of finding and switching to a new outsourcer. The strategy apparently worked well for both companies, as the contract has been extended (Guterl 1996).

Performance-based contracts

In the fee-for-service contracts studied here, performance measures focused on ensuring the vendor's technical performance, such as online availability and response time. Some contracts now rely on the vendor's business performance. An example is EDS's contract with a U.S. pharmaceuticals company in which the rate of payment is based on the ability of EDS to reduce the time to register new drugs (Moran 1996). Perot Systems and SystemHouse are also reported to be negotiating deals in which price will be determined by their business performance (Caldwell 1996a, 1996b). Performance-based contracting, however, is still a new concept and accounts for only a small percentage of revenues. Ted Shaw, VP of EDS's banking services division, noted "EDS is still primarily a fee-based outsourcing business" (O'Heney 1996).

In conclusion, practitioners want to source their IT portfolios to minimize costs, maximize service, and leverage resources to deliver real value, today and in the future. The five practices identified from prior company experiences are viable practices to help achieve sourcing objectives, particularly when reduced IT costs are the primary objective. These practices were selective outsourcing, joint IT/senior executive sponsorship, comparing external bids with newly prepared internal bids, short-term contracts, and detailed fee-for-service contracts. This research also provides insights into why practices such as strategic alliances and variations of fee-for-service contracts are emerging. Emerging practices stem from organizational learning about the benefits and pitfalls of past IT outsourcing experiences. Future research in this area will serve to uncover additional practices that ensure that sourcing expectations are met.

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Appendix A

Case Study Profiles

This appendix documents the categorical variables for the 61 sourcing decisions. The last two columns, "expected cost savings" and "expected cost savings achieved" indicate financial outcome. To explain how financial outcome was assessed, the first three cases were used as examples.

BANK1 achieved its expected cost savings. In the late 1980s, BANK1 suffered meager earnings due to the recession which halted housing starts. The CEO sought corporation-wide cost reduction. The senior vice president of Operations asked the VP of IS to cut her $25 million annual IT budget. She hired an outside consulting firm to assess IT costs. The results of this study indicated that BANK1's small applications department was very cost competitive—they even sold systems to the U.S. Treasury Department. However, the bulk of IT costs (over $20 million) were spent on data center operations, which ran back-office systems. The data center was outdated and needed to be upgraded. The VP of IS notes, "They basically said that you run a great shop if this was 15 years ago." Rather than incur investment costs, the VP of IS outsourced data center operations to a single supplier for 10 years at an estimated cost savings of 15% to 18%. She hired a number of IT consultants and lawyers to negotiate

a detailed contract. Within the first year of the contract, the vendor migrated BANK1's data center to one of their data centers in Atlanta. When the VP of IS was first interviewed in 1991, expected cost savings had been achieved because the monthly bill was 15% less than previous costs. But she indicated, "This is also the honeymoon year. You interview me a year from now and I will probably feel different." In 1994, she conducted an outsourcing seminar at the University of Virginia. She documented how cost savings continued to be realized for data center operations (although subsequent outsourcing of applications was not successful).

DIVERSE1, decision (a) did not achieve expected cost savings. Early in 1988, DIVERSE1's senior management reorganized the IT department by centralizing data operations for the operating divisions. The annual IT budget was then a very visible $100 million. The VP of Operations noted, "When top management saw those dollars, it was extremely stressful." The IT budget was growing to accommodate a number of mergers and acquisitions. For example, the data center more than doubled in output from 60 MIPS to 135 MIPS. During this expansion, the CEO kept telling the manager of IS to reduce IT costs. The VP of the centralized computer utility said, "That was one of the hardest things for senior management to understand, that you can't shut the budget and control this." The conflict between cost reduction and IT growth was putting the manager of IS in a very difficult position. He and the VP of the centralized computer utility knew that they had to find a way to justify their IT budget to senior management. They told senior management that they had evaluated outsourcing as a possible way to reduce costs. They called one vendor and had a few informal discussions. The manager of IS and VP then wrote a report to senior management stating that outsourcing would be more costly because they could not predict their data processing requirements:

> [The vendor] makes sense in a very stable environment where resource requirements and growth can be realistically predicted and the company can provide [the vendor] with a complete and detailed forecast of services. Deviations are costly and if they do not fit [the vendor's] operating standards, extremely costly to obtain.

As a result of this evaluation, no cost improvements were made. The same year, the CEO dismissed the initial evaluation and negotiated a 10 year outsourcing deal (decision b).

METAL could not determine if cost savings were achieved. METAL's IT department was significantly understaffed. There were only 40 IT professionals servicing 7,000 users. The 20 MIP data processing center ran outdated hardware and the mainframe required an immediate upgrade because it was running at full capacity. Senior management refused to allow the manager of IS to hire additional personnel or to increase the IT budget. Instead, the manager of IS sought outsourcing as a way to avoid investment, to reduce costs by an estimated 16%, and to access vendor staff on an as-needed basis. In 1990, METAL signed a 10 year, total outsourcing contract with a single supplier. Unfortunately, METAL's systems analysts quit instead of transferring to the vendor. In the area of data center operations, cost savings were achieved when the vendor migrated METAL's data center to one of the vendor's efficient megadata centers. However, in the area of applications, lack of business expertise was a problem: "I guess the most significant problem we face, and we are trying to compensate for it, is loss of METAL's perspective relative to running the business" [manager of Systems Development]. METAL paid a premium to the vendor for additional people. "None of it is cheap. I guess there is a perception that once you have an outsourcer hooked in that you have a conduit to all this expertise, but you pay" [manager of Purchasing]. When the entire portfolio of IT activities is considered, none of the participants provided a clear understanding of whether cost savings were achieved.

COMPANY PSEUDONYM AND INDUSTRY (n = 40)	PARTICIPANTS (n = 145)	SOURCING DECISION(S) SCOPE* (n = 61)	DECISION SPONSOR	EVALUATION PROCESS	CONTRACT DURATION	CONTRACT TYPE	DECISION YEAR	EXPECTED COST SAVINGS	EXPECTED COST SAVINGS ACHIEVED
1. BANK1 U.S. Commercial Bank	1. VP of IS 2. Financial Manager 3. Manager of IS Group 4. Outsourcing Consultant	1.Total Outsourcing	Senior Manager	1 external bid	10 Years	Detailed	1990	15-18%	YES achieved anticipated savings as of 1994
2. DIVERSE1 U.S. Diversified Services	5. Manager of IS 6. VP, Operations 7. Vendor Account Manager 8. VP of Computer Utility 9. Outsourcing Consultant	2.(a) Total Insourcing 3.(b) Total Outsourcing	(a) IT Manager (b) Senior Manager	(a) No formal bid process (b) 1 External Bid	(a) N/A (b) 10 years	(a) N/A (b) Loose	(a) 1988 (b) 1988	(a) CEO expected cost reductions (b) 20%	(a) NO (b) NO
3. METAL U.S. Metals	10. Manager of IS 11. Manager of Systems Development 12. Manager of Purchasing 13. Vendor Account Manager 14. Outsourcing Consultant	4. Total Outsourcing	IT Manager	2 external bids	10 years	Detailed, with major loopholes	1990	16%	Unable to determine
4. TRANS U.S. Transportation	15. Chief Financial Officer	5. Total Outsourcing	Senior Manager	1 external bid	10 years	Detailed	1991	20%	Unable to detemine
5. MINE U.S. Mining	16. Controller 17. Vendor Account Manager	6. Total Outsourcing	Senior Manager	1 external bid	10 years	Detailed, with loopholes	1991	Savings anticipated but not quantified	Unable to Determine

6. AERO U.S. Aerospace	18. Director of Processes and Tools	7. Total Outsourcing	Senior Manager	1 external bid	10 years	Detailed	1993	No savings estimated	Unable to determine
7. CHEM1 U.S. Chemicals	19. Manager of DP	8.(a) Total Outsourcing 9. (b) Total Insourcing (Return In-house)	(a) Senior Manager (b) IT Manager	(a) No formal bid process (b) No formal bid process	(a) 7 years (b) indefinitely	(a) Loose (b) N/A	(a) 1984 (b) 1988	(a) Savings anticipated, not quantified (b) Savings anticipated	(a) NO, terminated contract early (b) YES
8. RUBBER U.S. Rubber and Plastics	20. VP of IS	10. (a) Total Outsourcing 11.(b) Total Insourcing (Return In-house)	(a) Senior Manager (b) IT Manager	(a) No formal bid process (b) No formal bid process	(a) 7 years (b) N/A	(a) Loose (b) N/A	(a) 1987 (b) 1991	(a) Savings anticipated but not quantified (b)Savings anticipated, not quantified	(a) NO, IT costs rose to 4% of sales; contract terminated early (b) YES, costs dropped to 1% of sales
9. RETAILER1 U.K. Clothing and Housewares Retailer	21. Logistics Director 22. Contract Manager 23. Vendor Account Manager 24. Branch Manager	12. Total Outsourcing	IT Managers	4 external bids	10.5 years	Mixed	1993	25%	Too early to determine
10. PETRO1 European Oil	25. IT Manager 26. In-house Consultant 27. In-house Consultant 28. Vendor Account Manager 29. Contract Manager	13. (a) Selective: Diverse Services 14. (b) Selective: Accounting Services 15.(c) Total Outsourcing	(a) IT Managers (b) Senior Managers (c) Senior Managers	(a) 4 external bids (b) 3 external bids (c) 6 external bids	(a) 3 years (b) 4 years (c) 5 years	(a) Detailed (b) Detailed (c) Mixed	(a) 1988-1990 (b) 1991 (c) 1993	(a) 15-20% (b) 20% (c) 20-25%	(a) YES (b) YES (c) NO

11. ELECTRIC European Electronics	30. IS Director 31. Vendor IS Manager 32. Senior Manager 33. Marketing Manager	16. (a) Selective: Software Development and Support 17. (b) Total Outsourcing	(a) Senior and IT Managers (b) Senior and IT Managers	(a) No formal bid process (b) No formal bid process	(a) 5 years (b) annually renewable	(a) Mixed (b) Strategic Alliance	(a) 1989 (b) 1991	(a and b) Desire to move from capital budget to operating budget.	(a) YES (b) YES
12. INSURANCE U.K. Insurance	34. IS Director 35. Vendor Account Manager 36. Senior Manager 37. Consultant	18.(a) Total Outsourcing 19. (b) Selective Outsourcing: Systems Maintenance 20. (c) Total Insourcing	(a) Senior and IT Managers (b) Senior and IT Managers (c) Senior and IT	(a) Compared 1 external with internal bid (b) Compared 1 external with internal bid (c) Compared 2 external with internal bid	(a) 1 year (b) 1 year (c) 1 year	(a) Detailed (b) Detailed (c) Detailed	(a) 1990 (b) 1991 (c) 1993	(a) IT costs expected to be low in this start-up company (b) 25-30% (c) 30%	(a) NO (b) YES (c) YES
13. PSB1 U.K. Inland Revenue Service (PSB)	38. IS Director 39. Line Manager 40. IS Operation Manager 41. Outsourcing Consultant	21. Total Outsourcing	Government, Ministers and IT Manager	6 external bids	10 years	Mixed	1994	Some savings envisaged	Too early to determine
14. CHEM2 U.S. Chemicals	42. Manager of IS 43. Manager of DP 44. Network Services Supervisor	22. Total Insourcing	IT Manager	3 external bids	N/A	N/A	1991	IT costs perceived as too high	NO cost savings achieved
15. DIVERSE2 U.S. Diversified Services	45. Director of Advanced Technology	23. Total Insourcing	IT Manager	no formal bid process	N/A	N/A	1991	Senior managers wanted lower IS costs; IS managers wrote a white paper against outsourcing.	NO cost savings achieved

16. PETRO2 U.S. Petroleum Refining	46. VP of IS 47. Director of Systems Coordination 48. Director of Technical Support 49. Director, World Communications	24. Total Insourcing	Senior Manager	No formal bid process	N/A	N/A	1988	Facing bankruptcy, senior managers looked for ways to reduce overhead or raise money through outsourcing	NO cost savings achieved
17. PETRO3 U.S. Petroleum Refining	50. Corporate Manager of Planning 51. Division Manager 52. Corporate Manager of Technology 53. Manager of Software Strategies 54. Manager of Computing Strategies	25. Total Insourcing	Senior Manager	Compared 2 external with internal bid	5 years	N/A	1991	43%	YES, achieved within five years
18. PETRO4 U.S. Petroleum Refining	55. Assistant Treasurer 56. Director of IS 57. Manager of Technical Support	26. Total Insourcing	IT Manager	2 external bids	open time limit	N/A	1990	Senior managers complained IS costs were too high	NO, costs remained the same

19. RETAIL2 U.S. Shoe Apparel	58. VP of IS 59. Director of IS Administration 60. Insourcing Consultant	27. Total Insourcing	IT Manager	No formal bid process	N/A	N/A	1988	54%	YES, achieved within four years
20. UNIVERSITY U.S. Public University	61. Chief Information Officer 62. Member, Interfaculty Council	28. Total Insourcing	IT Manager	Compare 1 external with internal bid	N/A	N/A	1992	20%	YES, achieved within one year
21. FOOD1 U.S. Food Manufacturer	63. Data Center Director 64. Insourcing Consultant	29. Total Insourcing	Senior Manager	Compare 1 external with internal bid	N/A	N/A	1988	45%	YES, achieved within three years
22. TCOM U.S. Telecom-munication	65. Manager of IS 66. Internal Lawyer 67. Previous Manager of IS 68. Data Center Manager 69. Facilities Management Director 70. Chair, RPF Team 71. Chair, Internal Bid Team	30. Total Insourcing	Senior Manager	Compare 2 external with internal bid	5 years	N/A	1991	46%	YES, achieved within two years
23. UTILITY1 U.K. Water Company	72. Business Manager 73. IS Director 74. Manager of Operations 75. Vendor Account Manager	31. Selective Outsourcing: Customer Billing System	IT Manager	2 external bids	5 years	Detailed	1991	20%	YES

24. PETRO5 U.S. Petroleum Refining	76 Director of IS 77. Controller 78. Manager of Network Services 79. Data Center Manager 80. Supervisor of Tech Support 81. Manager of Applications	32. Selective Outsourcing: Data Center	IT Manager	2 external bids	5 years	Detailed	1991	16%	Unable to determine
25. RETAIL3 U.K. Retail and Distribution	82. Principal, IT Consultant 83. Group IS Director 84. Vendor Account Manager 85. Business Manager	33.(a) Selective Outsourcing: Corporate Telecom. 34.(b) Selective Outsourcing: Telecom.	(a) IT Managers (b) IT Managers	(a) 3 external bids (b) 3 external bids	(a) 3 years (b) 2.5 years	(a) Standard (b) Detailed	(a) 1990 (b) 1992	(a) 20% (b) 30%	(a) YES (b) YES
26. CHEM3 U.K Chemicals Manufacturer	86. Group IT Manager 87. Manager of Applications Development 88. Manager of European and UK Operations 89. Manager of IT Development	35. (a) Selective: System Support 36. (b) (b) Selective: Development and Support 37. (c) Selective: Development and Support	(a) Senior and IT Managers Senior and IT Managers (c) Senior and IT Managers	(a) 3 external bids (b) No formal bid process (c) 4 external bids	(a) 2 years (b) 2 years (c) 3 years	(a) Detailed (b) Detailed (c) Detailed	(a) 1985 (b) 1991 (c) 1992	(a) 40% (b) 30% (c) 20%	(a) YES, 50% over eight years (b) Unable to determine (c) YES
27. FOOD2 U.K. Food Manufacturer	90. Manager of IT Services 91. Managing Director of Group Services 92.Consultant (Vendor) 93. Senior Manager	38. (a) Total Insourcing 39. (b) Selective: Factory Software Development	(a) IT Manager (b) Business and IT Managers	(a) 2 external bids (b) 3 external bids	(a) N/A (b) 2.5 years	(a) N/A (b) Detailed	(a) 1990 (b) 1991	(a) 20-30% (b) 25%	(a) YES (b) NO

28. GOODS U.K. Consumer Product Manufacturer	94. Director of IS 95. Manager of Operations 96. Manager of Operations 97. Vendor Account Manager	40. (a) Total Outsourcing 41. (b) Selective: Data Center	(a) Senior and IT Managers (b) Business and IT Managers	(a) 5 external bids (b) 4 external bids	(a) 5 years, did not renew (b) 3 years	(a) Detailed (b) Detailed	(a) 1985 (b) 1988	(a) 15% (b) 20%	(a) NO (b) YES
29. BANK2 U.S. Commercial Bank	98. Contract Manager 99. Vendor Consultant 100. Senior Business Manager 101. Data Center Manager	42. Selective: Data Centers	Senior Business Manager	5 external bids	5 years	Detailed	1992	25%	YES
30. BANK3 U.K. Commercial Bank	102. Managing Director of IT 103. Manager of IT Operations 104. Vendor Account Manager 105. Senior Manager	43. (a) Selective: Systems Support 44. (b) Selective: Systems Support and Enhancement	(a) Business and IT Managers (b) Business and IT Managers	(a) 4 external bids (b) 4 external bids	(a) 3 years (b) 2 years	(a) Detailed (b) Detailed	(a) 1991 (b) 1992	(a) 15-20% (b) 20%	(a) YES (b) YES
31. GLASS U.K. Glass and Plastics Manufacturer	106. Group IS Director 107. Vendor Account Manager 108. Manager of IS	45. Selective: Data Center and Systems Development	Senior and IT Managers	5 external bids	2 years + renewed for 3 years	Mixed	1992	24%	YES
32. BREWER U.K. Brewing and Distribution	109. Director of Systems Services 110. Vendor Director 111. Contract Manager 112. Production Manager	46. Selective: Central Systems Development and Support	IT Managers	4 external bids	5 years	Mixed	1993	Break even over 5 years	Unable to Determine

33. RETAIL4 U.K. Clothing and Food Retailer	113. Operating Services Manager 114. Senior Business Manager 115. Senior Business Manager 116. Vendor Account Manager 117. Manager of IT	47. (a) Selective: Data Center 48. (b) Selective: PC Maintenance 49. (c) Selective: Mainframe Maintenance	(a) IT Managers (b) IT Managers (c) IT Managers	(a) 3 external bids (b) 4 external bids (c) 2 external bids	(a) 3 years (b) 3 years (c) 3 years	(a) Detailed (b) Detailed (c) Detailed	(a) 1988 (b) 1988 (c) 1990	(a) None (b) 15% (c) 20%	(a) Unable to Determine (b) YES (c) YES
34. FOOD3 U.K. Food Manufacturer	118. Manager of IS 119. Manager of Software Development 120. Manager of Systems Management 121. Vendor Account Manager	50. (a) Selective: Factory Software Development 51. (b) Selective: Data Center	(a) Senior Manager (b) IT Manager	(a) 4 external bids (b) 5 external bids	(a) 2 years (b) 3 years	(a) Mixed (b) Detailed	(a) 1988 (b) 1992	(a) None (b) 30-33%	(a) NO, Costs doubled (b) YES
35. UTILITY2 U.K. Electricity Supply	122. Manager of IT Operations 123. Contract Manager 124. Services Manager	52. Selective: Distributed PC Networks and UNIX Servers	Divisional Manager	6 external bids	2 years	Detailed	1992	30%	YES, as of 1994
36. PSB2 U.K. Public Health Authority	125. Director of IS 126. IS Staff member 127. IS staff member 128. Contract Manager 129. Regional Manager	53. Selective: Data Center and Software Packages	IT Manager	4 external bids compared with internal bid	5 years	Detailed	1991	20-25%	YES

37. PSB3 U.K. County Council	130. Manager of IS 131. Department Manager 132. Vendor Consultant 133. Outsourcing Consultant 134. Contract Manager	54. (a) Selective: Data Center and Telecom. 55. (b) Selective: Office Systems Support	(a and b) IT, Finance and Business Service Managers	(a) 6 external bids (b) 1 external bid	(a) 5 years (b) 4 years	(a) Detailed (b) Detailed	(a) 1991 (b) 1992	(a) 20% (b) 17%	(a) YES (b) YES
38. PSB4 U.K. Broadcasting Corporation	135. Director of IS 136. Contract Manager 137. Production Manager	56. (a) Total Insourcing 57. (b) Selective: Data Center	(a) Senior and IT Managers (b) IT Manager	(a) 1 external compared with internal (b) 5 external bids	(a) N/A (b) 7 years	(a) N/A (b) Detailed	(a) 1988 (b) 1992	(a) 25% (b) 35%	(a) YES (b) YES
39. AVIATION U.K. Aviation Authority	138. Manager—Internal IS Consulting Group 139. Contract Manager 140. Vendor Consultant 141. Vendor Manager	58. (a) Selective: Payroll and Financial Systems 59. (b) Selective: PCs and Networks 60. (c) Selective: Financial Packages	(a) Senior Manager (b) IT Manager (c) IT Manager	(a) 2 external bids (b) 3 external bids (c) 1 external bid	(a) 5 years (b) 4 years (c) 5 years	(a) Standard (b) Detailed (c) Detailed	(a) 1988 (b) 1989 (c) 1990	(a) 15% (b) Some (c) Some	(a) NO (b) Unable to determine (c) Unable to determine
40. UTILITY3 U.K. Water Company	142. Director of IS 143. Vendor Representative 144. Contract Manager 145. Senior Manager	61. Selective: Data Center	Senior Managers	3 external bids	3 years	Detailed	1994	15-20%	Too early to determine

*Some companies evaluated outsourcing on multiple occasions.

Appendix B

Case Study Profiles: Size in terms of Revenue, IT Budget, IT Headcount, and MIPS*

COMPANY and INDUSTRY (n = 40)	Annual revenues at time of sourcing evaluation in millions	IT budget at time of sourcing evaluation in millions	IT budget as percentage of revenue	IT headcount at time of sourcing evaluation	Headcount per $1 million spent on IT	Mainframe MIPS at time of sourcing evaluation	Mainframe MIPS per million spent on IT
1. BANK1—U.S. Commercial Bank	$6,000	$25	.004	160	6.4	180	7.20
2. DIVERSE1—U.S. Diversified Services	$6,000	$100	.017	530	5.3	135	1.35
3. METAL—U.S. Metals	$2,000	$20	.010	40	2.0	20	1.00
4. TRANS—U.S. Transportation	$6,000	$300	.050	2,000	6.7	880	2.93
5. MINE—U.S. Mining	$500	$7	.014	45	6.4	150	21.43
6. AERO—US. Aerospace	$16,000	$300	.019	1450	4.8	>300	>1.00
7. CHEM1—U.S. Chemicals	$700	$4	.006	40	10	<150	<37.5
8. RUBBER—U.S. Rubber and Plastics	$6,000	$240	.040	1000	4.2	>150	>.63
9. RETAILER1—U.K. Clothing and Housewares	$1,000	$21	.021	120	5.7	>150	>7.14
10. PETRO1—European Oil	$11,000	$176	.016	1400	8.0	>150	>.85
11. ELECTRIC—European Electronics	$27,000	$192	.007	450	2.3	>150	>.78
12. INSURANCE—U.K. Insurance	start-up year	$3	N/A	20	6.7	<50	<16.67
13. PSB1—U.K. Inland Revenue Service	$13,000	$400	.030	2300	5.8	>150	>.38
14. CHEM2—U.S. Chemicals	$5,000	$17	.003	60	3.5	28	1.65
15. DIVERSE2—U.S. Diversified Services	$3,000	$30	.010	184	6.1	<150	<5.0
16. PETRO2—U.S. Petroleum Refining	$35,000	$240	.007	1800	7.5	>300	>1.25
17. PETRO3—U.S. Petroleum Refining	$10,000	$32	.003	134	4.2	200	6.25
18. PETRO4—U.S. Petroleum Refining	$3,000	$6	.002	25	4.2	17	2.83
19. RETAIL2—U.S. Shoe Apparel	$2,000	$27	.014	125	4.6	56	2.07
20. UNIVERSITY—U.S. Public University	$250	$7	.028	110	15.7	106	15.14
21. FOOD1—U.S. Food Manufacturer	$7,000	$18	.003	80	4.4	180	10.0
22. TCOM—U.S. Telecommunications	$500	$7	.014	39	5.6	32	4.57
23. UTILITY1—U.K. Water Company	$300	$10	.033	45	4.5	20	2.00

24. PETRO5—U.S. Petroleum Refining	$400	$4	.010	40	10.0	>150	>37.5
25. RETAIL3—U.K. Retail and Distribution	$3,000	$64	.021	200	3.1	>300	>4.69
26. CHEM3—U.K. Chemicals Manufacturer	$3,000	$11	.004	65	5.9	>150	>13.64
27. FOOD2—U.K Food Manufacturer	$27,000	$43	.002	180	4.2	76	1.77
28. GOODS—U.K. Consumer Products	$29,000	$19	.001	200	10.5	>150	>7.89
29. BANK2—U.S. Commercial Bank	$18,000	$32	.002	75	2.3	>150	>4.69
30. BANK3—U.K. Commercial Bank	$16,000	$1,120	.070	3000	2.7	>150	>.134
31. GLASS—U.K. Glass and Plastics Products	$4,000	$6	.002	45	7.5	40	6.67
32. BREWER—U.K. Brewing and Distribution	$1,000	$48	.048	160	3.3	>300	>6.25
33. RETAIL4—U.K. Clothing and Food Retailer	$9,000	$528	.059	800	1.5	150	.28
34. FOOD3—U.K. Food Manufacturer	$500	$3	.006	20	6.7	<50	<16.67
35. UTILITY2—U.K. Electricity Supply	$600	$5	.008	30	6.0	<100	<20.0
36. PSB2—U.K. Public Health Authority	$2,000	$8	.004	110	13.8	<100	<12.50
37. PSB3—U.K. County Council	$100	$13	.130	50	3.8	<50	<3.85
38. PSB4—U.K. Broadcasting Corporation	$2,000	$64	.032	90	1.4	<100	<1.56
39. AVIATION—U.K. Aviation Authority	$750	$32	.043	120	3.8	<100	<3.13
40. UTILITY3—U.K. Water Company	$1,000	$29	.029	70	2.4	<100	<3.45

* Dollar figures are rounded to protect company identity; £ converted to $ using 1.6 exchange rate; PSBs show size of budget; banks show deposits; IT budget, Headcount, and MIPS were gathered only for the IT function conducting the sourcing evaluation, typically the centralized IT department.

Appendix C

Interview Protocol

Each interview followed the same protocol. At the beginning of each interview, it was briefly explained that the goal of the research was to investigate different information technology sourcing strategies and to identify best practices associated with each strategy. The participants were also given a confidentiality document explaining that their identities and the identities of their companies would remain anonymous. The interviewee was then asked unstructured and semistructured questions. During the unstructured portion, participants were asked to tell their sourcing story. The unstructured format allowed the participants freedom to convey their interpretations. After participants completed their stories, they were asked semistructured questions designed to solicit information on specific sourcing issues that may have been absent from their previous recollections. These issues included coverage of the scope of the decision, sponsors of the decision, the sourcing evaluation process, contract negotiations, and contract management. Participants were also asked what they were expecting to gain from these sourcing decisions and whether these expectations had been met. The plan was to use this question to assess the outcome in terms of "success" or "failure." When participants expressed a viewpoint, they were prompted to provide specific supporting evidence. The evidence consisted of anecdotes as well as documentation such as benchmarking reports, IT budgets, requests-for-proposals, and outsourcing bids, and contracts. In cases of outsourcing, a copy of the actual contract, a version of the contract in which prices and other confidential items were expunged, or a manager's guide to the contract, particularly for contracts which were hundreds of pages long was received. The detailed interview guide used during the data collection process is available on the world wide web at: http://www.umsl.edu/~lacity/guide.html

Appendix D

Sensitivity Analysis of Data Categories

This Appendix discusses how results are modified if data categories are redefined.

Decision Domain. The study used 20% and 80% as the ranges because the data neatly fell into these categories. Several surveys suggest that these ranges may be typical:

- In a survey of 300 IS managers in the U.S., on average less than 10% of the IT budget was outsourced (Caldwell 1996a).
- A survey of 110 Fortune 500 companies found that 76% spent less than 20% of the IT budget on outsourcing, and 96% spent less than 40% (Collins and Millen 1995).
- A survey of 365 US companies found that 65% outsourced one or more IT activities, but only 12 outsourced IT completely (Dekleva 1994).

- A survey by IDC found that "in the United States, outsourcing takes around 17 per cent share of the IT services market" (Foley 1993).

- A survey of 162 U.K. companies found that even in the cases of "total" outsourcing, long-term contracts, organizations retain some in-house capability, representing 10% to 20% of the IT budget. For selective outsourcing, the respondents spent 24% of their IT budget on outsourcing in 1993, projected to grow to 36% for 1998 (Willcocks and Fitzgerald 1994).

If 85% of the IT budget had been selected as a cut-off for total outsourcing, one of the cases would be recategorized to the selective outsourcing category based on percentage of IT budget outsourced (BANK1). This would increase the success count for selective outsourcing by one and decrease the success count for total outsourcing by one. If a slightly higher percentage for total insourcing—such as 25%—had been selected, then no cases would be recategorized. Cases would only be recategorized from selective outsourcing to total insourcing if the range were raised to 30%. In this instance, four arrangements would be reclassified from selective outsourcing to total insourcing (PETRO1a, PETROb, RETAIL3a, and CHEM3a). While recognizing the limitations in "artificial" ranges, it is believed the categories of decision domain are quite robust as the general findings would not be altered by shifts in range, although the frequencies and percentages might change slightly.

Decision Sponsorship. CIOs and heads of IT departments were categorized as IT managers rather than as senior executives. It is believed that these categories represent the vested interests of the different stakeholders. If CIOs had been categorized as senior executives, all of the total outsourcing decisions would be recategorized as decisions made by senior executives. The selective outsourcing decisions would not be significantly altered because most of the IT managers conducting the evaluations were in charge of the particular IT function, such as applications development, telecommunications, or applications support. Several of the total insourcing decisions would be recategorized as being conducted by a senior executive rather than an IT manager.

Evaluation Process. The evaluation process was divided into three categories: no formal evaluation process, comparing external bids with current costs, and comparing external bids with a newly prepared internal bid. Additional categories could have been created, such as:

- comparing one external bid with current costs

- comparing more than one external bid with current costs

- comparing one external bid with a newly prepared internal bid

- comparing more than one external bid with a newly prepared internal bid

Although these additional categories are possible (Appendix A provides these details), it is the view in this study that the limited number of cases was better analyzed with fewer categories.

Contract Type. Other categories of contract type are possible, such as categorizing mixed contracts as loose contracts. This would alter the finding that no loose contracts were successful. Instead, one third of loose contracts would be successful.

Contract Duration and Date. The rationale for categorizing the contract duration and date has already been discussed. The variables are listed for each company in Appendix A and can be readily analyzed using different ranges, or analyzed by creating fewer or more categories. However, the general findings

that shorter contracts and more recent contracts were more successful than longer contracts and older contracts are robust. For example, if we divide the contract duration into two categories, "less than four years" and "four years or longer," the first category would have a perceived success rate of 83% and the latter 60%.

Size of IT. Each surrogate indicator of size may be individually criticized. The aim in this study was to determine how economies of scale in IT affected sourcing success. MIPs can be criticized as only capturing mainframe data center size, excluding the size of IT operations based on client/server and other technologies. Also, IT budgets only capture centralized IT dollars, not dollars spent on IT from other budgets. IT headcount may also reside in several locations, and again, headcount only captured the centralized IT department. Given these limitations, multiple indicators were used to produce a reasonable assessment of the relationship between size of IT operations and sourcing success.