The Untapped Potential of IT Chargeback

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May 1997

CISR WP No. 300
Sloan WP No. 3956

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ABSTRACT: IT chargeback is generally regarded as a necessary evil in which central IT costs are, as accurately as possible, divided among the business units that benefit from them. In this study of IT chargeback practices at ten large U.S. firms, we found that IT chargeback had the potential to be a valuable management tool. We observed three approaches to chargeback that differed according to their objectives, their policies regarding sourcing and level of accountability, and their administrative processes. While all three approaches led to cost reduction efforts by chargeback statement recipients, they had different impacts on business unit attitudes toward the IT unit. In particular, we found that chargeback could facilitate useful discussions between the IT unit and business units about business priorities and the value of IT services. In most cases, however, chargeback, while encouraging business unit managers to manage the demand for IT services, left them questioning whether the IT unit was effectively managing the supply of those services. Based on these findings we offer recommendations as to how firms can design chargeback systems that will generate positive attitudes and economic returns.

26 Pages

This paper is also available from the Sloan Working Paper Series as Sloan Working Paper No. 3956.

THE UNTAPPED POTENTIAL OF IT CHARGEBACK

INTRODUCTION

IT chargeback has long been a source of consternation for IT practitioners and researchers. Ostensibly intended to allocate costs for accounting purposes, chargeback is widely believed to have the potential to encourage wise decision-making on IT investment and use (Allen, 1987; Bergeron, 1986b; Nolan, 1977b), but there is little agreement as to the conditions under which chargeback can deliver on this potential (Butler, 1992; Drury, 1982; McKell, Hansen and Heitger, 1979). Moreover, there is some evidence that chargeback exacerbates tensions between the IT unit and its clients (Nolan, 1977a; Olson and Ives, 1982). Several recent developments have intensified managerial focus on IT chargeback systems.

First, increased global competition has led to growing cost consciousness throughout businesses, including greater scrutiny of IT costs. This scrutiny of IT costs has intensified the search for reliable measures of IT value (Hitt and Brynjolfsson, 1996). Efforts to determine the value derived from individual investments and expenditures naturally leads to questions of IT costs as reflected in IT chargeback reports.

Second, many organizations, even those that are otherwise decentralized, are expanding their central IT infrastructures (Broadbent and Weill, 1997; Ross, 1995). Corporate infrastructures now often include global shared networks, data warehouses, core systems such as e-mail, intranets, and Lotus Notes, shared expertise in the form of help desks and technical support, and even shared business applications such as SAP and PeopleSoft (Broadbent and Weill, 1994). The expanded infrastructure means that expenses for shared products and services represent an increased percentage of total IT costs, which, to any given line manager, appears to make a larger percentage of IT costs unavoidable.

Finally, the emergence of an external IT services market has created a viable alternative to internal IT provisioning. Outsourcing is an option for IT managers who want to focus their attention on strategic priorities and for senior business managers who are dissatisfied with existing IT service levels or who question the value they receive from their internal IT unit. The many different alternatives for packaging IT services such as informal problem diagnosis and user assistance, development of technical, business, and interpersonal skills, research and development, user relationship management, and vendor management make it difficult to compare internal and external prices. Nonetheless, IT chargeback reports provide benchmarks against which IT outsourcing proposals are often compared (Lacity and Hirshheim, 1993).

IT chargeback was contentious when the infrastructure was dominated by mainframe processing, even though mainframe processing costs could be reasonably associated with the systems that ran on the mainframe. The growth of network computing has resulted in fewer direct links between IT costs and the individual services they support. At the same time, the demand for costly infrastructures to support rapid application development and process integration portends continued debate over who should pay for shared services. The pricing of IT infrastructure services has become much more complex at the same time it has become more important.

The authors gratefully acknowledge the support of MIT's Center for Information Systems Research and Ernst & Young's Center for Business Innovation. This work has benefitted from the helpful comments of Blake Ives, Judith Quillard, John Rockart, Christopher Sullivan, and Peter Weill.

IT chargeback might appear to be simply a tactical issue, but in this paper we report that chargeback can have important implications for IT management. We observed that IT managers tended to view chargeback as a tool for helping business units curb the demand for IT services, but effective chargeback systems also helped the IT unit manage the supply of IT services it made available. We identified three different approaches to IT chargeback and one of them, a communication-intensive approach, facilitated IT-business unit partnership. The other two approaches often generated resentment toward the IT unit because business unit managers felt that while they were struggling to reduce costs, the IT unit was transferring unnecessary and unmanaged costs to them. We also found that IT managers' understanding and control of infrastructure costs was important to the IT unit's credibility. It was how that understanding was used to define IT service offerings—not the chargeback rates themselves—that influenced business unit attitudes. We conclude that IT chargeback has the potential to be a valuable IT management tool.

This paper first describes prior research on the characteristics and outcomes of alternative chargeback systems and introduces a general model of transfer pricing that provided the theoretical foundation for this study. This is followed by a brief description of our methodology and the findings from the study. We then categorize the sample firms according to their chargeback systems and analyze chargeback system outcomes by category. The final section describes a model for IT chargeback and discusses its implications for practice.

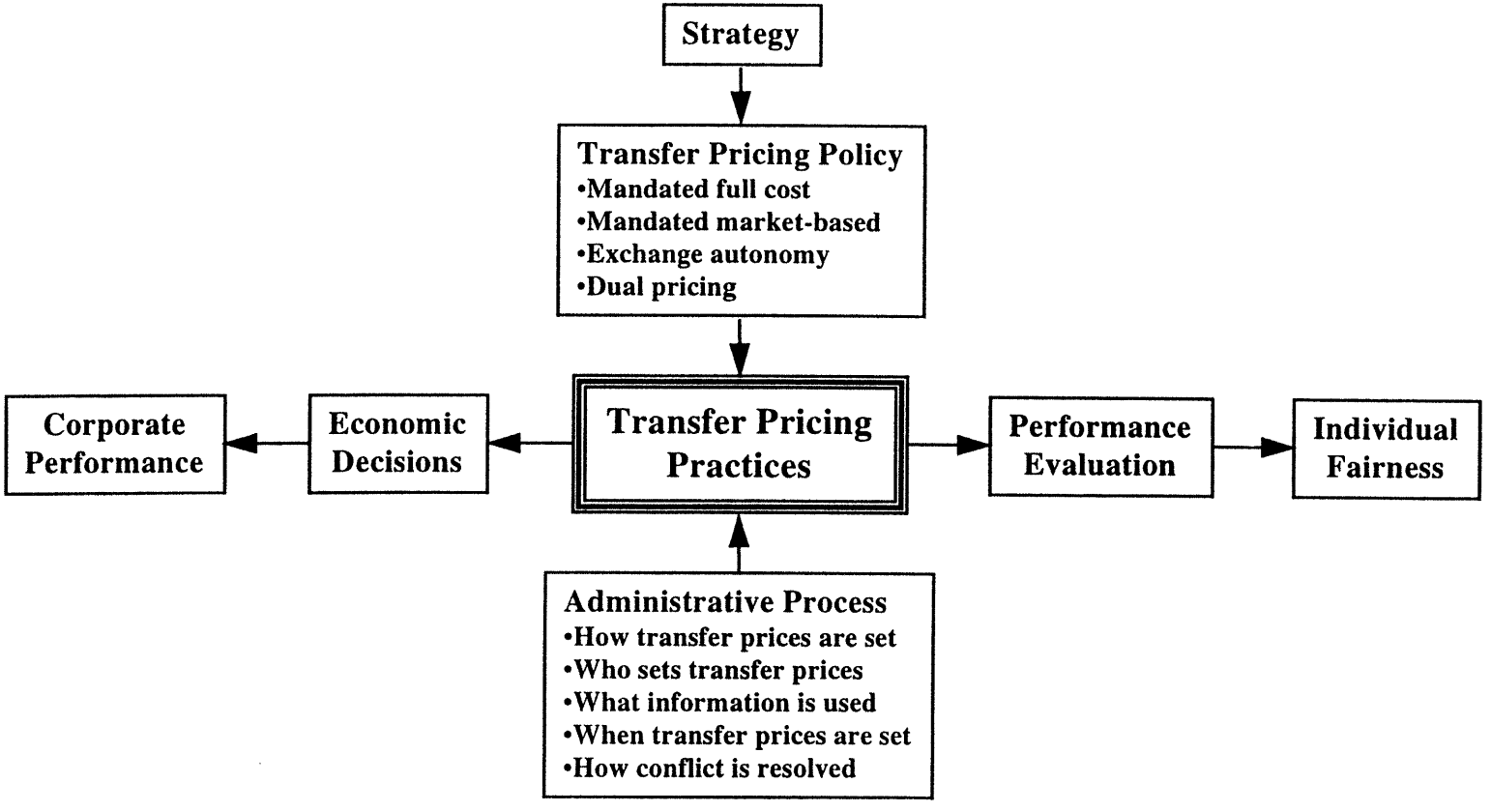
BACKGROUND

IT chargeback is a type of transfer price—a familiar concept in most decentralized organizations. Transfer prices act as coordinating devices for managing the interdependencies that exist among individual business units (Hufnagel and Birnberg, 1989). They allow firms to create simulated market economies in which prices are used to allocate scarce resources. In addition, they distribute shared costs to individual business units in a manner that approximately attributes the costs of operating a business unit to the revenues the business generates. This enables assessment of the financial performance of individual business units. Consequently, as coordinating mechanisms, transfer prices have two important objectives. First, they are expected to motivate divisional managers to make sound economic decisions that optimize resource allocation within the firm. Second, they are expected to support performance assessment of individual business unit managers (Kaplan, 1982).

Eccles (1985) developed a model (See Figure 1) that identifies the design decisions that determine how well a transfer pricing system meets each of these two purposes. According to Eccles' model, the impact of a transfer pricing system on economic decisions represents an intermediate outcome that ultimately affects firm performance, while the system's impact on individual performance evaluations ultimately influences individuals' assessments of the fairness of the transfer prices. These outcomes result not only from the actual transfer prices, but from the organizational policies that guide internal exchanges of goods and services and from the administrative processes associated with the calculation and communication of charges. A well-designed transfer price influences both buyers and sellers in internal exchanges to make decisions that maximize firm performance.[1]

[1] Zimmerman (1979) notes that in complex organizations managerial decisions that maximize individual business unit performance are often different from decisions that maximize firm-wide performance. Thus, the outcomes of transfer prices often create competing rather than consistent demands on the design of the transfer pricing system.

Figure 1. A Theory of Transfer Pricing



Like other transfer pricing schemes, IT chargeback has been shown to impact economic decisions (Allen, 1987; Bergeron, 1986a; Dewan, 1996; Drury, 1982; McKell, Hansen, and Heitger, 1979; Mendelson, 1985; Smidt, 1968). By exposing the costs of IT-related services, chargeback *can* promote thoughtful assessment of the relative importance and usefulness of IT applications, thereby contributing to more effective use (Nolan, 1977a, Olson and Ives, 1982). In the IT literature, the concept of optimal IT economic decisions is often equated with reduced resource consumption (Bergeron, 1986a; 1986b; Drury, 1982; McKell et al, 1979; Nolan, 1977b) even though Eccles (1985) notes that transfer prices can improve economic decisions by influencing both the supply of and demand for products and services. Some researchers have argued chargeback should make the IT unit more accountable for service cost and quality (Allen, 1987; Choudhury, Sricar and Venkata; 1986; Olson and Ives, 1982) but there is no empirical evidence of this outcome.

Similarly, IT chargeback, like other transfer prices, has been shown to impact attitudes related to performance evaluation. Hufnagel and Birnberg (1989; 1994) observed that practices associated with chargeback were related to perceived fairness. Nolan (1977a) notes that attempts to provide understandable cost information on IT to business managers can lead to frustration if business managers do not feel their actions can actually change their costs.

Thus we believe that Eccles' model is a good one for thinking about IT chargeback. However, we note that IT charges differ from most transfer prices in three important ways. Unlike a unit of raw material, a unit of IT is difficult to define. An IT unit may consist of a concrete transaction like one call to the help desk or one batch run, or the service may be more intangible, such as a month's worth of data security practices or 99% availability of the network. Thus, buyers of IT services are often not sure what they are purchasing. Second, even to the extent that the IT unit has parceled its services into meaningful units, charges do not always vary with usage and individual services typically cannot be traced to specific performance outcomes (e.g., revenues). Thus, managers may be unsure of the net effect of IT purchases on their financial performance. Finally, because chargeback at most firms covers shared infrastructure costs, business units may pay for services from which they cannot or do not fully benefit. This will happen, for example, if line managers have an inadequate understanding of the capabilities available to them, if IT management misunderstands their requirements, or if, for expediency, costs are allocated to business unit without regard to proportional benefit received. As a result of these characteristics of information technology, those responsible for paying IT charges often struggle with the question of whether they are receiving good value for their dollar.

As Eccles' model would suggest, researchers who have studied IT chargeback schemes have found that organizational policies and administrative processes influence its success. In particular, administrative processes for setting prices and who is involved in determining charges, as well as organizational policies mandating alternatives for sourcing IT services, can have an impact on economic decisions and perceived fairness.

The setting of rates for IT services. Researchers have argued that IT charges must be understandable and predictable in order for business managers to effectively use them as the basis for economic decisions (McKinnon and Kallman, 1987). Usually they recommend some

form of marginal cost pricing (Dewan, 1996; Mendelson, 1985; Smidt, 1968), which charges users of computing resources for the incremental costs that they cause. However, marginal costs, particularly for many IT services, tend to be confusing (Abdel-khalik and Lusk, 1974) and can discourage the use of new technologies (McKell et al., 1979). Consequently, a common practice in the IT domain is to apply standard rates to actual usage as a substitute for marginal cost pricing. Standard rates retain the concept of usage-based variable charges, but require simpler computations and provide more stable prices than marginal cost pricing (McKell et al, 1979; Rettus and Smith, 1972). Although a system of usage-related charges based on standard rates is expected to lead to optimal economic decisions, the evidence that it does so is limited. Bergeron (1986a) found that usage-based charging was related to increased self-reported use of chargeback information, but he did not examine the actual economic decisions that resulted from this use. If users feel they have no control over usage or that rates will increase to offset the impact of reduced usage (leaving total charges constant), usage-based charging may not lead to changes in the demand for IT services.

User involvement and knowledge of IT. IS researchers seem to agree that user knowledge about and experience with information technology are key to the success of IT chargeback schemes. More experienced users are more capable of predicting their IT charges and understanding their value, and better at planning, directing and controlling information resources (Nolan, 1977a; Bergeron, 1986). If IT is "strategic" or if the business is dependent on its IT services, business should be both more accountable for their IT expenditures and more knowledgeable about them (McFarlan, McKenney and Pyburn, 1983). Bergeron's (1986a) study revealed that users who were involved in the IT budget setting process were more frequent users of chargeback information. However, while involved, savvy users might be expected to make better economic decisions, they may also be more critical of IT service costs and quality (Olson and Ives, 1982).

Sourcing decisions. Historically, most firms have been reluctant to allow individual business units to purchase IT services outside the firm (Drury, 1982). Mandated internal sourcing limits business managers' sense of control over their IT expenditures, which is apparently tied to their perceptions of the fairness of a chargeback system (Hufnagel and Birnberg, 1989; 1994). In a laboratory environment, Hufnagel and Birnberg (1994) found that the lack of alternative sourcing choices led to perceptions of unfairness even when the prices charged were below market rates. They did not examine the impact of mandated internal sourcing on economic decisions.

In summary, existing literature on IT chargeback suggests that Eccles' (1985) transfer pricing model may be applicable to the IT context. The study described here is intended to examine how chargeback might contribute to fair and meaningful performance evaluation, wise IT investment and use, and positive attitudes towards information systems. To do so, we addressed two research questions: (1) How are firms addressing the need for greater clarity in chargeback systems in an increasingly complex environment? (2) What are the outcomes of changes they are making to their systems? We wanted to learn what objectives they targeted, what chargeback design decisions they made, and what benefits and problems they observed.

METHODOLOGY

In the first phase of this research (February to August 1995), we conducted telephone interviews in twenty-two firms with the person responsible for chargeback design and administration. The firms were known to the research team to have recently changed or evaluated their chargeback systems. The interviews lasted approximately one hour and the interviewer in each case wrote a detailed summary, often relying on a tape of the interview in addition to notes. The interviews solicited information on the objectives of the chargeback system as well as transfer pricing policy and related administrative practices. We also requested copies of supporting documentation, such as written chargeback policies, lists of service rates, sample bills, and so forth. We learned whether internal sourcing was mandated, how prices were determined, to whom the charges were sent, and how prices were communicated.

Ten of the participants in the first phase of the research were able to provide contact information for chargeback statement recipients.[2] In the follow-up phase (August 1995 to February 1996) we conducted hour-long telephone interviews with twenty-two chargeback statement recipients at these firms to learn how their charges influenced their economic decisions, performance evaluations, and attitudes toward IT services. We also asked their perceptions of the understandability, controllability, and fairness of their charges and the competence of the IT unit. In analyzing our data, we first resolved differences in the two interviews with follow up conversations. Next, we applied the Eccles framework to each case as a way of understanding each situation as a whole. Finally, we compared the cases to each other, looking for patterns that would help us understand the different outcomes across the firms.

FINDINGS

The sample companies, all headquartered in the U.S., included seven global manufacturing firms, a retail firm, a financial services firm, and a telecommunications firm. All firms were very large, multi-divisional businesses with annual revenues in excess of $5 billion. Three respondents described their IT units as highly centralized, and in their firms chargeback covered both applications development and infrastructure services. The other firms are best described as having federal IT structures, in which applications development is located within business units. In these firms chargeback included only charges from a central unit providing infrastructure services. Development costs were already associated with each business. In what follows, we use the term "core IT unit" to refer to the charging unit in all ten firms.

With the exception of two firms that had reevaluated their systems and made only incremental changes, respondents indicated that their firm had significantly revised its chargeback system within the last three years. Core IT owned responsibility for the design and implementation of the chargeback system at seven of the firms. At the other three firms, this responsibility was located in corporate finance. A description of the firms is provided in Table 1.

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[2] Because we wanted to understand the impacts of different chargeback systems on business units, this paper discusses only the ten firms that participated in both phases of the research. The chargeback systems at these firms did not differ noticeably from those of the twelve firms that participated in only the first phase, with the exception of two firms in the first phase that had elected not to charge business units for IT-related expenses.

Table 1 Description of Sample Firms

Firm #	Industry	IT Structure	Age of Chargeback System	Responsibility for Chargeback Design	Statement Recipient
1	Manufacturing	Centralized	2 Years	IT	100 Cost center business analysts
2	Manufacturing	Federal	3 Years	Finance	500 Cost center finance managers
3	Manufacturing	Federal	2 Years	Finance	Varies by division; 50+ finance managers
4	Telecommun-ications	Centralized	1 Year	IT	10+ Strategic business unit accounting managers
5	Retail	Centralized	3 Years	IT	11 Profit center accounting managers
6	Manufacturing	Federal	2 Years	IT	24 Strategic business unit IT directors
7	Manufacturing	Federal	1 Year	Finance	15–20 Strategic business unit IT directors
8	Finance	Federal	10 Years	IT	5 Strategic business unit IT directors
9	Manufacturing	Federal	6 Years	IT	8 Strategic business unit IT directors
10	Manufacturing	Federal	1 Year	IT	6 Strategic business unit IT directors

In the first phase of our study, individuals responsible for the design and administration of the firm's chargeback system provided information on chargeback system objectives, chargeback policies, and administrative processes. Their responses are summarized in Table 2 and described below.

Objectives of the Chargeback System

Respondents at the sample firms indicated that the objective of their chargeback systems, in addition to fulfilling corporate accounting requirements, was to influence economic decisions. All ten firms were interested in controlling IT costs. They were particularly concerned with limiting the demand for IT resources. Recent changes to their chargeback systems were intended to focus attention on IT costs in order to reduce resource consumption. For example, one manager noted that, on average, employees at his high-tech firm owned two computers and had tended to act as if access to computing capabilities was a "divine right." He credited chargeback with correcting that assumption. Another respondent observed:

> Print has been the most substantial reduction because it's the easiest. But another thing that happened, and this is on the telecommunications side, as soon as we started charging per logical unit, all of a sudden people got rid of all their logical units, or as many as they could. A lot of things like that happened. Once we attached a price tag to it, everyone started thinking, 'How much do we really need this? How much value is this really adding?'(Accountant, Firm 7)

Several managers emphasized that chargeback should help ensure effective use of resources by providing accurate, clear, and equitable data to guide user decision-making. Illustrative of this view was a statement in one firm's chargeback manual that chargeback should influence utilization of computing resources by differentiating cost of services. The manual listed four criteria for good chargeback: (1) charges closely represent actual cost; (2) fair in its distribution of charges; (3) repeatable in its calculation; (4) encourages cost effective use of resources.

Table 2 Chargeback Practices

Co.	Objectives of chargeback system	Sourcing Policy	Level of Accountability	Calculation of charges	Communication of Charges	Supporting Processes
1	Reduce consumption; track performance of systems	Mandated internal	Large cost centers	Some standard rates; some allocations	Report 1 line item; detail available on-line; IT account managers help with interpreting charges	Some service choice; rate-setting committee
2	Equitably, accurately, and simply distribute costs to reduce consumption	Mandated internal	Cost centers	standard rates for resources used	Report 100+ line items; IT's customer interface staff resolve concerns	Written service contracts (non-negotiable); local finance staff prepare report cards on corporate finance
3	Behavior modification focused on using company resources effectively	Mandated internal	Varies by charge	Standard rates for requested capacity; some strategic pricing	Report 100+ line items, prices communicated via e-mail	Some service choice
4	Expose and reduce costs; present cost causative prices; identify opportunities to cut costs	Mandated internal	Strategic business unit	Standard rates for services used	Report cost to run each system with more detail on-line; IT account teams address conflicts	Activity-based costing (just starting); implementing written contracts
5	Make charges equitable; help with assessment of IT spending	Mandated internal	Major business	Standard rates applied to prior year actual usage; 1/12 billed monthly	Report 1 line item; charges based on prime business units	Some service level agreements; IT customer representatives
6	Recognize that IT charges are mostly fixed; keep charges simple; focus management attention on business issues; help top management identify where IT can be leveraged	Implicit choice	Strategic business unit	Standard rates for estimated usage of selected services; 1/12 billed monthly	Report 1 line item, detail available; corporate IT persons responsible for each service meet as a group with local IT people to explain charges	Some service choice; rate-setting committee
7	Provide useful, accurate data to operating companies to help them manage IT resources; reduce cost	Implicit choice	Strategic business unit	Standard rates	Report on major resources, about 12 line items; corporate finance explains charges and resolve conflicts	Some service choice
8	Differentiate costs of services; encourage effective use of IT; find appropriate tradeoff between fairness and usefulness	Mandated internal	Strategic business unit	Standard rates for resources used, some strategic pricing	Report 1 line item with much detail available; local IT staff have dual reporting relationship; extensive explanation of charges in manual	Activity-based costing; detailed service level agreements (negotiated); external and internal benchmarking
9	Get costs into the product to support effective IT decision making	Implicit choice	Strategic business unit	Standard rates for resources used	Report 10 line items; local IT staff have dual reporting relationship	Activity-based costing; external benchmarking; informal service level agreements
10	Help manage IT costs	Mandated internal	Strategic business unit	Standard rates for resources used; allocations of fixed costs; some strategic pricing	Report fewer than 10 line items, much detail available; corporate IT managers discuss charges with local IT staff	External benchmarking; committee of business unit IT managers debate what services should be provided centrally and how they should be billed

Whereas Eccles (1985) observed that transfer pricing should influence economic decisions on both the demand and supply sides, most firms in this study did not indicate a direct role for chargeback in managing the supply of IT services. Clearly, respondents felt that reduced demand would limit the need for supply, but only three firms stated explicit expectations for direct impacts on supply decisions. The chargeback manager at one of these firms (Firm 9) commented that chargeback should expose IT costs, which would lead to better resource allocation within IT. He credited interactions around the IT budget and chargeback with identifying how IT could cut $9 million out of the data center budget in one year. The IT controller at another firm noted that chargeback provided a tool for IT and business managers to better understand one another:

> I don't believe you'll find anybody in the centralized group that thinks we could do what we do cheaper. But if we were to ask the customer, we might find that we are providing services that the customer doesn't need. We need to work through the customer to really understand what it takes to run the business. (IT controller, Firm 10)

Chargeback Policy

The objectives of the chargeback system in conjunction with organizational strategies guided three key policy decisions at our sample firms: (1) cost recovery decisions, (2) sourcing decisions, and (3) level of accountability decisions.

Cost Recovery

All the firms in the study were attempting to charge out to the business units their total IT costs. None were attempting to generate a profit and none had reserved any overhead charges that were to be absorbed by corporate or the firm as a whole (for example, space costs, executive salaries, or IT's own share of corporate overhead). One firm (Firm 10), responding to business unit complaints, had recently eliminated a markup on its costs to provide funding for research on new information technologies. This type of research activity had become a separate IT expense that had to be negotiated with the business units.

Sourcing Alternatives

Although one firm had outsourced infrastructure management on a large scale and the other nine had outsourced individual services, such as data center management and some network monitoring, infrastructure outsourcing decisions at the sample firms were expected to be made by core IT. Thus, all ten respondents described their policies as mandating internal sourcing. Three noted, however, that their distributed IT units were large enough and the businesses were autonomous enough that it would be feasible to provide or contract for most infrastructure services themselves if they objected to the price or quality offered by the core IT unit. Business unit respondents at these firms agreed that they could choose to provide any service themselves—even to the point of externally contracting some services, so we regard these three as having a policy of implicit choice.

Level of Accountability

Seven of the ten firms distributed charges (either electronically or on written statements) to only the highest organizational levels, such as major business units or profit centers. Respondents

noted that high-level charging promoted more strategic analysis of total IT costs and located accountability for costs at a level where managers could make decisions that affected total IT costs. As one manager explained: "With high level charging, senior management can better identify where IT can be better leveraged." High-level charging also had the advantage of significantly reducing complaints about charges. IT staff no longer had to explain hundred dollar charges to managers of small cost centers. The three firms that charged at lower organizational levels intended to push cost consciousness down to the individual level. Two respondents from firms that charge at lower levels noted that they were complying with firm-wide policies that specified cost center allocations for all corporate services. In both these cases the chargeback managers were concerned that their chargeback systems were too granular to provide useful decision-making information.

Administrative Processes

Eccles (1985) noted that administrative processes are as important to achieving the objectives of transfer pricing as the policies. We found two kinds of administrative processes integral to the chargeback system: (1) the setting of prices for services; and (2) communication processes.

Setting Prices

Consistent with their objectives of influencing demand decisions, the firms in this study had implemented usage based charging for at least some IT resources. To do this, they developed standard rates for individual services. To recover mainframe costs, they multiplied the rate by consumption units such as CPU time, pages printed, and disk space. For telecommunications and distributed processing they more often created rates for access to (rather than consumption of) services such as the network, help desk support staff, and e-mail support. For these services they established rates on the basis of units such as head count, the number of "logical" units (i.e., computers, telephones, fax machines) attached to a network, or the number of servers or applications supported by core IT.

Most respondents observed that a large percentage of the costs they were attempting to recover were fixed—one firm estimated fixed costs as high as eighty percent of total costs. In most cases they were concerned about the accuracy, fairness, and simplicity of their rates, although several observed that simplicity tended to compromise both accuracy and fairness. Their efforts to balance these tradeoffs resulted in two different approaches to recovering fixed overhead costs. Most firms fully loaded these overhead costs into their standard rates. Three firms, however, isolated some fixed costs from their variable costs and allocated those as fixed monthly charges to business units (that is, separate from usage or unit charges). The decision to isolate some fixed costs resulted from the sense that usage charges should be controllable by those incurring them and that business unit managers should recognize that many IT costs are fixed.

Chargeback rates at most firms were intended to reflect IT costs, although several IT respondents noted that their understanding of the costs of their services was sketchy:

> Our [chargeback] system was built on sketchy information, so there has been a lot of churn in the underlying data. (IT manager, Firm 4)

Three firms indicated that they sometimes engaged in *strategic pricing*, which involved pricing some services above or below cost in order to motivate specific behaviors. Most commonly they would reflect lower-than-actual prices for new technologies to which the firm wanted to migrate, and higher-than-actual prices for older technologies that the firm was phasing out.

Two respondents said that they had undertaken activity based costing, and a third respondent reported that his IT unit regularly engaged in identifying the drivers of its costs. Understanding cost drivers helped these firms better understand the variability of supposed fixed costs. This helped maximize flexibility by identifying when to staff services with contractors, consultants and dynamic team assignments rather than with permanent positions, and when to negotiate short-term leases and outsourcing contracts rather than make long-term investments. It also helped them price services more accurately so that a reduction in usage would lead to a real reduction in firm costs. Without this understanding of cost drivers, reduced consumption could lead to a reshuffling of costs rather than actual savings:

> Data from chargeback sometimes has an adverse effect on managerial decisions. For example, all desktop procurement should be done by corporate IT, except for laboratory equipment. If the businesses buy through corporate IT, they will have an infrastructure allocation charge. So, of course, many people call their desktop equipment, "laboratory equipment." Then it appears cheaper to them because they only have annual depreciation and maintenance charges. This reduces their charges, but it doesn't save the company anything. (Corporate IT finance director, Firm 2)

At most firms, corporate IT or finance determined chargeback rates and the bases on which they would be charged. At three firms, however, committees of business unit managers assisted in establishing chargeback rates. These committees debated the bases for calculating both usage-based and allocated resources. They provided insights on how individuals might try to subvert chargeback processes and on the bases for usage decisions.

Seven firms had either formal or informal arrangements for allowing business units some choice as to the services received. At most of these firms, the choice was simply an opportunity to opt out of one or more of the set of services provided by corporate IT (such as centralized support for servers or desktop units). Firm 5 had instituted a few service level alternatives for business units that had unique needs for premium service in areas like systems availability or response time. Firm 2 developed service contracts that provided business units with detailed explanations of what levels of service they could expect. Local finance managers at this firm also completed report cards on how well corporate IT delivered to those expectations. Only Firm 8 negotiated detailed service level agreements (SLA) specifying service choice options and alternative service levels with corresponding performance measures and charges. Firm 9 had informally instituted an SLA process for growing numbers of services, but did not have formal SLAs. These last two firms used the SLA process to better understand business unit needs.

Communication Processes

Because the relationship between IT inputs and business unit outputs is generally unclear both to the IT manager and to the business unit manager, communication about IT services and the charges for them is crucial to IT chargeback. In most firms, chargeback information is communicated not only through the rates and charges themselves but also through a variety of formal and informal interactions between corporate IT and business units.

The firms varied in how much detail they reported in monthly statements. Most firms reported fewer than ten line items, but provided significant backup detail on-line. The detail usually indicated costs by resource (disk space, network usage, pages printed) and by system (payroll, production scheduling, invoicing). Two firms with low level accountability provided in excess of 100 line items on the monthly statements. The detail most likely reflected attempts to provide significant information to statement recipients through charges alone. Firms that did high-level charging communicated directly with business unit managers to explain their charges. Thus, they did not rely as heavily on the charges themselves to communicate how the business units were consuming IT resources.

Processes for explaining rates and charges varied considerably by firm. One firm communicated annual rates by e-mail and sent charges through monthly electronic statements with little other communication. The other nine firms had developed mechanisms for explaining annual rates to business unit managers and resolving concerns. One centralized firm appointed customer representatives to each of the divisions. These representatives worked with divisional finance staff to help them understand and control their charges. In the federal firms, divisional IT directors usually had primary responsibility for managing IT costs and they were the recipients of communications from core IT about chargeback. Core IT provided these divisional IT directors with manuals explaining charges, and one provided training on chargeback processes to new directors.

Three of the firms engaged in regular external benchmarking of their services and communicated the results of the benchmarks to their internal customers as part of the process of explaining IT costs. They felt this was useful in representing their cost effectiveness to business units who had no better measure for assessing IT costs. One of the firms benchmarked its rates each year to its own prior year rates to show decreasing costs in the department and communicate its continuous improvement.

Chargeback Outcomes

We interviewed two chargeback statement recipients at each of seven of the firms. The other three firms were represented by one, three, or four respondents. At five of the six firms with a federal structure, the participants were the divisional directors of IT. These individuals indicated that they were responsible for the effective use of information technology in their business units. As members of business teams, these individuals had strong business orientations. At the other five firms we interviewed controllers or financial analysts. These individuals did not have technical backgrounds but had learned about IT services through their roles as negotiators/analysts in chargeback discussions. The respondents provided data on the outcomes of the chargeback system, which are categorized as (1) economic decisions; (2) performance measurement of the business unit; and (3) user attitudes towards core IT. Their responses are summarized in Table 3.

Table 3 Outcomes of Chargeback Practices

Co.	No. of respond-ents	Reaction to charges	Economic decisions	Performance evaluation	User attitude toward IT unit
1	4	fair, mostly reasonable, question value received from overhead allocation; control only by not running systems	avoid unnecessary equipment purchases, changes to off-shift processing; eliminate unneeded data on disk; download files for analysis rather than do on-line; chose to spend more for on-site help desk; choose platforms	subtle impact on performance evaluation; people cut cost to help firm survive	expensive, high quality, spend money on things nobody wants
2	2	fair, understandable, but maybe not reasonable; want service level agreements; can control requests for new systems	switch to off-peak processing; eliminate some reports; reduce amount of stored data; influences number and kind of workstation purchases; reduce development support; negotiate costs and/or services	affect business unit performance; affects top execs' bonuses	good support; unit is good at what it does, but not focused on business needs
3	1	fair, probably too high, need usage-based pricing; no control	rewrite inefficient systems; consider need for new workstations; switch platforms	need to meet target and high IT is built in	not sure they offer good value
4	3	charges seem high; charges could be bundled more meaningfully; fair; want input into determination of charges; some control, like processing times	eliminate systems; eliminate duplicate data; eliminate some reports; switch to off-peak processing; disclaim ownership of systems; choose platforms; improve program code	affects business unit performance but has no real impact on compensation	produces 'limousine' solutions; high quality, expensive
5	2	understandable charges; fair; may be high; no control	affect platform choice; disclaim ownership of systems; rewrite inefficient systems; purge files; move analysis to workstations; negotiate development	minimal impact; small part of total expenses	differs by respondent—development is slow; support is excellent
6	2	understandable, seem reasonable; fair; like simplified system; some control, if willing to bring service within strategic business units	eliminate development projects; take on services that are provided centrally; negotiate service levels; identify need for user training; fix system inefficiencies; change workstation replacement cycle	minimal at a high level	*Information Week* says they're good; currently underspending on new technology; talented people
7	2	understandable, fair, may be high; total control—can stop buying and service at strategic business unit level	request fewer reports; rewrite inefficient systems; switch platforms; take on some central IS responsibilities; disconnect logical units	affects bottom line and bonuses, but minimal	hard to assess; provide needed services
8	2	fair but rather complex; rates are competitive (external benchmarks confirm), exercise control mostly when systems designed & support costs analyzed	identify software improvements; identify inefficiencies in equipment choices; chooses service levels; eliminate unnecessary processing	minimal, try to control total business unit costs	sense they get good value; exceptional people; focused on business needs
9	2	fair, clear, high cost, limited control	switch to off-peak processing; negotiate with IT; rethink service requested; switch platforms; move data to local servers; delay new equipment purchases	yes, but IT costs are a small part of total expenses	getting more aligned with business needs, but need more skin in the game
10	2	reasonable, rationally developed; well communicated; fair; R&D costs too high; business units have input and some control over infrastructure spending	eliminate systems that do not generate sufficient value; rewrite inefficient systems; avoid expensive querying habits; take advantage of strategic pricing to move platforms	bonus system rewards wise investment	high quality; external benchmarking looks good; increasingly addressing business unit needs

Economic Decisions

All respondents indicated that their review of their IT charges resulted in actions intended to reduce charges. Some of the actions they took resulted in lower firm IT costs through immediate savings or deferred capital investment. These included switching batch processing to off-peak times, fixing bugs in software that caused processing inefficiencies, changing querying patterns to do more analysis off-line, reducing print requests, deinstalling systems, deleting redundant data, and reducing the number of workstations purchased. Other decisions more likely reduced their charges while increasing or maintaining total firm costs. These included subverting the procurement process for personal computers, disconnecting unneeded logical units, and moving systems from mainframes to local servers. Most respondents noted that while they expected that efforts to reduce IT consumption would lower total IT costs, they sometimes might instead result in reshuffling of costs.

Performance Measurement

IT charges were reflected in business unit financial performance in all sample firms. However, respondents claimed that their efforts to manage IT costs had no significant impact on assessment of their personal performance. This was because total IT costs represented between 2–11% of their business unit expenses, of which half tended to be charges from core IT, and most of that was considered nondiscretionary support of critical systems.

User Attitudes towards IT

The respondents characterized their charges as fair, which they defined as paying the same rates as other business units and being charged only for the systems and services they used. They were concerned about accuracy, because if they were paying for another business unit's systems, the charges were unfair. A number of respondents had approached corporate IT with such concerns and all said they were corrected. They did not identify the internal sourcing mandate as an unfair restriction, noting that they preferred not to be responsible for making infrastructure decisions.

Respondents indicated that they found their charges understandable, but they understood less well whether the firm or their business unit, in particular, was getting good value for its IT expenditures. Many respondents said they had "no idea" whether they were getting good value for their spending on IT, but they sensed that "costs are too high," and they wanted assurance that the IT unit's costs were competitive:

> I expect them to be world class. I expect them to benchmark themselves against the outside and guarantee that they're providing the kind of service that is second to none. If they don't provide that, I feel the ability to provide my own support in that area if I have to, but I don't want to. (Business unit IT director, Firm 9)

The sense that charges were high extended to respondents' attitudes toward the IT unit. Respondents rated their core IT staff as being highly competent—often referring to them as "excellent" or "high quality"—but they felt that the core unit was not cost-conscious:

> IT does not understand the concept of tradeoffs. As a businessman I know I can't have everything I want, so I make choices. IT doesn't think that way. They think I should have the best of everything. (Business unit IT director, Firm 10).

CATEGORIZING CHARGEBACK APPROACHES

In analyzing the data, we observed that the sample firms fit into three categories according to the focus of their chargeback systems: (1) low-level cost awareness; (2) high-level cost cutting; and (3) high-level management of IT supply and demand. The differences between the categories are fairly subtle in that no single variable determined categorization. But descriptions of each firm's chargeback objectives, policies, and processes provided a picture of firms taking three very different approaches to IT chargeback and realizing different outcomes. Table 4 lists the categories, their determining characteristics, and some generalized outcomes of their chargeback systems.

Table 4 Summary of Chargeback Types

Firms	Category	Objective	Sourcing Policy	Level of Accountability	Nature of Communication
1, 2, 3	1 Low level cost awareness	Reduce resource consumption	Mandated internal	Low	Detailed information to thoroughly explain charges
4, 5, 6, 7	2 High level cost cutting	Reduce resource consumption	Mandated internal or implicit choice	High	IT educates about costs, offers some service choices
8, 9, 10	3 High level management of IT supply and demand	Effective decision making	Mandated internal or implicit choice	High	Two-way negotiation and learning about services and prices; support processes to foster communication

Category One—Low Level Cost Awareness. The distinguishing characteristics of Category One firms are the emphasis on cost reduction as an objective of the chargeback system, the low level of accountability for IT charges within the firm, the mandated internal sourcing policies, and communications processes that relied primarily on formal exchange of information from IT to the business units about charges. The outcomes of these practices included heightened cost awareness throughout the firm, a vulnerability to behaviors that maximized business unit performance but suboptimized firm performance, and a sense of frustration on the part of both business managers, who felt their charges were high, and IT managers, who handled significant numbers of complaints about charges of relatively small dollar amounts.

A particular concern of business unit managers at Category One firms was that the core IT unit did not appear to take responsibility for understanding business unit needs or for reducing its own expenditures:

> What we need is a service level agreement where it is clear that the customer—my business unit—is responsible specifically for managing its appetite, while IS is responsible for managing its costs. (Business unit director of finance, Firm 1)

IT managers at these firms felt that chargeback was successful in reducing consumption of IT resources. For example, one IT manager noted that his internal customers had started to reduce their requests for "fully loaded" computers. But communication about chargeback at these firms tended to be limited to IT dispensing fairly formal communication about charges and business managers registering occasional complaints. Business unit managers noted that they were occasionally able to negotiate service levels or service choice but these negotiations were very limited

in scope and the amounts involved were insignificant. Both sides expressed frustration with the process:

> The problem is that IS prepares a price list and then my department chooses what it wants. There are huge discussions among local IT staff that [the core IT unit] is inefficient. Nobody is asking what should be cut. In fact, the CIO believes we can't cut costs if people continue to demand the levels of functionality and service that [core] IS currently provides. (Business unit director of finance, Firm 3)

Category Two Firms—High Level Cost Cutting. Category Two firms differ from Category One firms in two ways: they assign high level accountability for IT charges and they allow more choice of services through either an implicit policy of alternative sourcing or alternative service levels or selected services. Like Category One firms, the four firms in this category emphasized cost reduction as an objective of IT chargeback. Their communication about IT charges, while conducted on a more personalized level, focused on educating their business partners about the charges. The outcomes of these practices included cost reduction efforts within the business units, a sense within both IT and the business units of improved understanding of IT costs, and a frustration within the business units with their lack of control over costs and their inability to understand whether they received good value for their IT dollar.

All four respondents from *Category Two* firms noted that high level charging was having the desired outcome of helping business managers optimize IT spending within the business unit. They noted that regular communication with core IT staff had provided them with a good understanding of their charges. This understanding, however, did not necessarily lead to the sense that charges represented a good value:

> I'm frustrated that they don't have the same priorities as me. For instance, if I want a new system, I'll give them an amount I'm prepared to spend, but instead of giving me the best system they can for the price I can pay, they insist that I need to spend more for the system they think I need. (Business unit controller, Firm 4)

The emphasis on understanding IT charges led to several specific initiatives. For example, Firm 4 was undertaking activity based costing analyses in order to better understand cost causation, which was expected to lead to charging algorithms that provided business units with more control over their costs. At the time of the study, however, respondents indicated that they had little control over their costs except to turn off systems critical to running the business.

At Firm 6, the core IT unit believed its costs to be predominantly fixed in nature and one of the goals of the chargeback system was to help business unit managers understand that IT costs were fixed:

> We want businesses to focus on managing the business, not on managing staff units. We want them to recognize that IS costs are essentially fixed year to year, not variable by usage. The idea is to stop people from doing variance analysis

each month on their usage versus budget. This is a worthless activity. Instead they should be focused on winning in the marketplace. (IT manager, Firm 6)

The infrastructure services unit at Firm 6 was able to offer service choices and, in some cases, varying service level agreements, to its business units, but it viewed its costs as primarily fixed. Consequently, its monthly charges were one-twelfth of each business unit's total estimated annual bill, which was based on standard rates multiplied by estimated usage (and corrected for gross underestimates of usage in the prior year). Regular communication between core IT and the business units, including a committee that helped to establish rates, ensured that divisional IT heads understood their charges. However, despite external benchmarking that indicated their costs were reasonable, senior management at Firm 6 felt that IT costs were high and they did not understand what they were getting for their investment. Soon after this study was completed, the unit was outsourced. According to one business manager:

> We got tired of paying for something we didn't understand. (Business unit manager, Firm 6)

Category Three—High Level Management of Supply and Demand. Category Three firms were unique in that the objectives of their chargeback systems were to increase the effectiveness of both supply and demand decisions. This led to communication patterns that differed noticeably from those in the other firms. Category Three firms engaged in more two-way discussions of IT services and charges with the intention of modifying service offerings to meet business needs. They did high level charging so that these discussions could take place at a relatively high level in the firm.

None of the three Category Three firms had yet accomplished the supply side outcomes that they had targeted in their chargeback objectives. They had, however, observed changes in both business unit usage and IT provisioning of services which had resulted in lower total IT costs at both the business unit and the firm levels. An even more noticeable difference at these firms was a confidence within the business units that the IT unit was delivering good value.

All three firms used benchmarking to measure their effectiveness and communicate strengths, weaknesses, and continuous improvement to their business partners. All three also offered service choice and service level options to their business units. Firm 10 did so after coming to an agreement with business unit IT heads, guided by an executive steering committee, as to what services should be provided centrally and which of those services should be mandated and which optional. This led to a greater sense of control than that observed at other firms:

> I have almost no control over the half of my IS charges that are an allocation, except to the extent that a committee I'm on helps to establish the allocations. Through that committee I can influence how much the company invests in infrastructure and that has a lot to do with my allocation. (Firm 10 business unit IT director)

Respondents at Firm 8 felt that, except for discussions around a small set of service level agreements, they had no control over their rates and little control over their usage, but they trusted that they received excellent value from their IT charges. This trust was attributed, in part, to the fact that new systems development efforts involved extensive negotiation during the design stage between the business unit and core IT about the level of support required for a system and the cost of that support under alternative designs. In addition, core IT would recommend migrating old systems to new platforms when it appeared effective to do so. For example, a business unit IT director at Firm 8 noted that when he found his dial-up costs skyrocketing, he had worked with the core unit to identify changes that both he and they could make to get that cost under control. Business unit respondents from Firm 8 described the core IT unit as focused on reducing its costs:

> IT has been, and is required to, lower costs by 5% each year. So we don't feel bad about our charges. They're coming down without a discernible loss in service. (Firm 8 business unit IT director)

Firm 9 had performed activity based costing analyses to identify cost drivers and ways to lower its costs. Business unit managers recognized the potential benefits:

> We have to be very specific in what services we want from them, and if we want less, I expect the bill goes down, as close to an activity-based arrangement as possible, and they should always be reducing their fixed overhead, to get that to be as small as possible. (Firm 9 business unit IT director)

The business unit respondents at the Category Three firms all had IT backgrounds but reported to business unit management. This made them savvy, demanding IT customers. A respondent at Firm 9 noted the need to work cooperatively with core IT staff to improve services and lower costs. He described the value of constructive tension in establishing mutual responsibility for successful deployment of IT:

> The thing you really need to do is, as best you can, get joint measures, where you both have some skin in the game. And so we've done some things to try to make sure we understand what the other is doing, and so we're getting much closer over time, rather than getting farther apart. (Firm 9 business unit IT director)

DISCUSSION

Our findings support earlier research that indicated that usage-based IT charges will lead to business unit efforts to reduce charges by reducing the consumption of resources for which they must pay (Bergeron, 1986). It appears that most of these efforts will benefit the firm, although some reduce a given business unit's charges without reducing total IT expenditures. Business unit managers will attempt to reduce their consumption of resources *even though most respondents believe that this will have little or no impact on their individual and business unit performance.* These managers expected that changes in their behaviors should lead to changes in charges.

Prior studies argued that prices that were understandable, usage-based, and presented to accountable individuals could simulate a market environment which would control the supply and demand for IT services (Allen, 1987; Bergeron, 1986b; Nolan, 1977b). This study revealed that even when business unit managers understand their charges and how to reduce those charges, they feel unable to influence the supply of IT services.

Consistent with earlier findings (Nolan; 1977; Olson and Ives, 1982), we observed that by exposing IT costs, chargeback can lead to user frustration. The frustration appeared to stem primarily from business managers' beliefs that they could not control the level of core IT spending, which directly affected the rates they were charged, and hence their IT charges. This frustration was reflected in users' attitudes towards the core IT unit.

Like earlier studies (Drury, 1982; Hufnagel and Birnberg, 1989), this study found that most firms had corporate policies mandating internal sourcing of IT. This policy did not appear to be associated with concerns about fairness at these firms. Prior studies had examined user attitudes immediately after a major policy change and in a lab environment (Hufnagel and Birnberg, 1989; 1994), and had concluded that mandated internal sourcing created concerns about fairness. In this study, the respondents were apparently committed to the concept of obtaining shared services from their core IT units. They were experiencing the growing importance and complexity of the IT infrastructure, and they recognized the economies offered by a shared infrastructure. In the three firms that might have been willing to waive the mandated sourcing rules, business unit managers noted that they were reluctant to reject core services. Even managers with IT backgrounds lacked confidence that they would make good infrastructure choices.

In this study fairness did not emerge as an explicit issue for recipients of chargeback statements. When asked about the fairness of their charges, our respondents talked about the distribution of charges among business units, and they were satisfied that the design of their systems allocated charges "fairly" in that sense. On the other hand, many business unit respondents believed that the IT unit spent money on services they did not need and perhaps did not want. The sense that they had to control their demand but that IT was not required to manage the supply of services could be seen as an issue of the "fairness" of rates: if IT does not control its costs, they are passed along to the business in the form of rates that are too high. This concept of fairness is similar to Eccles' (1985) use of the term, in which he refers to the relative fairness of the transfer pricing outcomes with regard to their impacts on the buying and selling units.

This study contradicts assumptions that IT chargeback schemes, if well-conceived, can by themselves lead to effective economic decisions with regard to the deployment of IT in a firm. Most of the firms we studied were using chargeback primarily to educate business managers on IT costs rather than to promote mutual understanding of IT costs and capabilities and business unit information needs. In effect, the chargeback systems offloaded responsibility for learning and saving to business units. This approach resulted in missed opportunities to use negotiations and communications about chargeback to educate IT on business needs and on opportunities for cost reductions within the IT domain. Consequently, many of our respondents concluded that IT costs were too high, even though the business units believed they were carefully managing those things they could control.

We found Eccles' (1985) transfer pricing model a useful starting point for understanding the inputs and outcomes of chargeback systems. To some extent policies and administrative practices influenced economic decisions and performance evaluations. For the most part, the economic decisions amounted to the curbing of demand, not supply. These were tactical, not strategic decisions, and these decisions would almost certainly influence firm financial performance, although we did not directly observe the impact. The performance evaluation effects of IT charges on the business units were less evident than the effects of raw material purchases, but the impact of IT chargeback on business unit evaluation of the IT unit and managerial attitudes toward IT were pronounced.

Our proposed IT chargeback model is shown in Figure 2. The key difference between this model and Eccles' transfer pricing model is that attitudes towards the IT unit emerge as a direct outcome of chargeback practices. Although these attitudes were evident whether or not chargeback was perceived to influence a manager's performance evaluation, we anticipate (but did not explicitly observe) that performance evaluation impacts may influence user attitudes. We also anticipate that user attitudes will ultimately have an impact on the effectiveness of the economic decisions being made about the use of IT. As shown in the model, the impact of chargeback on business manager attitudes may have very significant implications for how strategically IT is deployed in a firm.

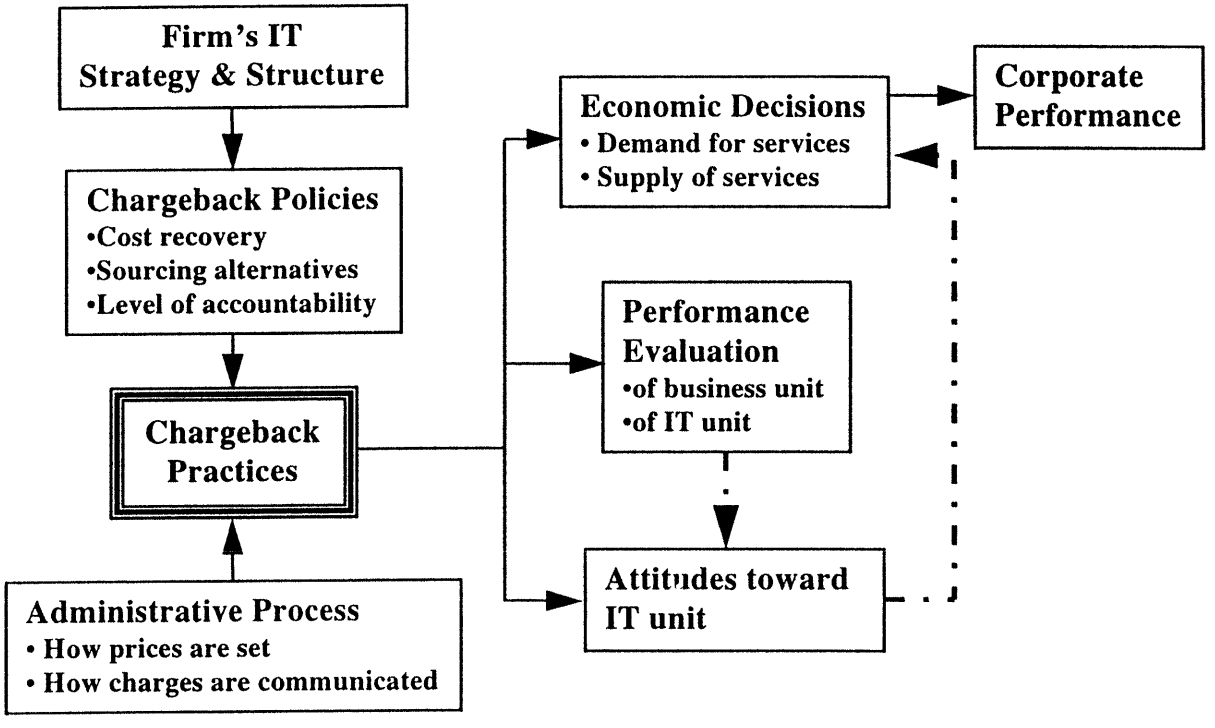
Additional research is needed to validate this model. The study reported here is based on an analysis of chargeback at a small sample of very large firms and the insights of an average of three people in each of those firms. It would be difficult to conduct a large-scale study to test this model, but a series of in-depth case studies would be very revealing. In particular, research is needed to understand the interactions of the policies and processes identified here and key contextual characteristics that contribute to effective performance.

Implications for Practice

Research on the effective use of IT in organizations consistently echoes the following:

> ...higher levels of IT use require the *synergistic combining* of IT-related and business-related knowledge (Boynton, Zmud, and Jacobs, 1994, page 314).

Figure 2. A Model of IT Chargeback



Dotted lines represent expected relationships that were not explicitly observed in this study.

Boynton *et al.* recommend that future research should provide "a rich understanding of mechanisms for accomplishing such intertwining" (page 314). This paper proposes that chargeback is one such mechanism.

Many IT managers view discussions with business unit management about chargeback to be an annual rite of justification. The findings reported here indicate that chargeback offers an opportunity for *learning* and *listening*, not just *telling* and *notifying*. The opportunity presented by a chargeback system is its ability to focus both IT and business managers on identifying and deploying IT services that offer real value to the firm.

The three categories that distinguished the sample firms' approaches to chargeback reflect both different perspectives on the role of chargeback in organizational learning about IT and different IT-business unit relationships. Category One firms use chargeback to simply charge out the costs of services in a transaction-oriented relationship. The primary benefit of the approach is a general increase in cost consciousness throughout the firm. Category Two firms use chargeback to teach business units about IT costs, with the expectation that increased understanding of costs will lead to better assessment of IT value within the business. The approach of IT to the business units in these firms is that of a long-term service provider. This approach is useful for helping IT to better understand (and control) its own costs. Category Three firms use chargeback to educate both IT and the business units on IT costs and business unit needs. The relationship is a partnership in which both parties recognize their mutual interest in successfully deploying IT strategically.

These categories may be viewed as stages in the development of IT chargeback and the IT-business unit relationship. It is worth noting that partnership is a resource intensive process (Henderson, 1990). All three Category Three firms had evolved from Category Two firms and some of the Category Two had previously charged at a lower level. Consequently, at most firms, high level accountability for IT charges will be a prerequisite to meaningful negotiations. IT units will not be able to effectively negotiate services with large numbers of business units. But a Category One approach is valuable in raising cost consciousness, which is a useful and perhaps necessary foundation for Category Two or Three approaches. Category Two focuses the IT unit on managing its costs, which is critical to its playing an effective role in a partnership. Some firms might not move beyond this category, at least with some business units, because business unit management may not see value in partnering with the IT unit. While a Category Three (learning) approach both fosters and demands a partnership between IT and the business units, all of the business unit respondents in the Category Three firms demonstrated a willingness to partner and a sophisticated knowledge about the role of IT in their businesses. Business unit managers interested only in cost reduction and unwilling to recognize firm-wide needs would undermine a Category Three approach.

These findings help explain why the IT unit as a profit center idea, which crops up regularly, is inappropriate for most organizations (Venkatraman, 1997). Enthusiasts claim that a profit center arrangement can boost IT efficiency and enhance IT and business communication about services and costs (Allen, 1987). The profit center, however, is not a partnership tool, in that it makes the IT unit's primary concern its bottom line results. This makes the business units customers rather than partners of the IT unit. In addition, it allows business units to reject services that might be desirable as firm-wide infrastructure. If implemented carefully, the profit center may be useful in

a Category Two approach, but it would not appear to be the desired state for the IT-business relationship.

This model suggests that IT managers who want to use chargeback as a managerial tool to increase IT effectiveness should do four things:

1. *Understand cost drivers.* Because charges lead to changes in behavior and those changes are often intended to decrease a firm's IT expenses, it is imperative that chargeback systems be guided by a clear understanding of what causes IT costs to increase and decrease. Prices need not mirror cost—two of the three Category Three firms pointed out the value of strategically pricing old technologies above cost and newer technologies below cost in order to encourage users to switch platforms. However, without a detailed understanding of its cost structure and a plan for reducing costs if resource consumption drops, an IT unit risks finding itself locked into a 'death spiral' of increasing costs and decreasing utilization.

2. *Pursue continuous improvement in cost performance and document results.* Demonstrating continuous improvement and cost effectiveness through standard rates that are stable or decreasing increases the credibility of the IT unit, establishes trust between IT and business partners, and facilitates partnership (Henderson, 1990). IT units that were attempting to establish themselves as partners in the process to effectively manage the supply and demand of IT services were benchmarking their quality and costs and sharing the results of those benchmarks with business units. In the process they were accepting joint responsibility with business units for reducing costs and meeting business needs for IT services. Given the very dynamic nature of most businesses, improving cost performance will increasingly involve converting fixed costs into variable costs, so that costs can be more closely associated with the business needs that cause them.

3. *Create structures for communicating with internal customers about costs.* Firms are establishing a variety of roles, structures, and processes to accomplish ongoing communication between the core IT unit and distributed IT managers (Brown and Ross, 1996). These include business unit account managers, executive steering committees, joint application development processes, and human resource practices that transfer IT staff into business unit roles. Mechanisms specific to IT chargeback might include rates tied to cost drivers that are under the control of the business units, negotiation of service level agreements, and training for new business unit IT liaisons on the chargeback process. This study suggests that a particularly valuable organizational structure is a federal IT structure, which locates IT managers in business units (Rockart, Earl, and Ross, 1996). In a federal IT structure distributed IT managers report to business management, and thus can be counted on to represent business unit interests at the same time their IT expertise contributes to a comfort in negotiating with core IT.

4. *Negotiate service levels and establish meaningful service level agreements.* Attitudes toward the IT unit were related to the sense of control that business unit managers felt they exercised over IT supply. Providing external sourcing alternatives (Hufnagel and Birnberg, 1994) is one way to give business unit managers a greater sense of control, but it can undermine attempts to leverage a corporate infrastructure and integrate processes. Service level agreements are another alternative for increasing business unit control over IT costs (Singleton, McLean and Altman, 1988). But while SLAs provide an opportunity for negotiation between IT and business units, some firms use SLAs and service choice initiatives as just another way to hold business units accountable for IT spending.

Viewing chargeback as a partnership mechanism rather than an accounting or economic tool shifts the emphasis from the calculation of rates and charges to the communication of alternative services and their accompanying costs. It will also require a mind shift for many IT units—one that recognizes the many competing demands for business unit resources. IT units can use feedback from chargeback to help identify business unit concerns about their services and to demonstrate their cost effectiveness. Thus, chargeback has the potential to increase IT effectiveness in organizations—a potential that apparently few firms have exploited.

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