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DETERMINING THE COST OF IT SERVICES

PROVIDING
MANAGERIAL
INFORMATION TO
EXPLAIN COSTS IN
THE CONTEXT OF
PERSONNEL AND
EQUIPMENT
ACTIVITIES AND
PROCESSES.

INCREASINGLY, COST MANAGEMENT concepts are becoming more critical in evaluating IT. Technology-dependent firms are aware that IT costs need to be controlled to remain cost effective, yet most require expensive IT infrastructure

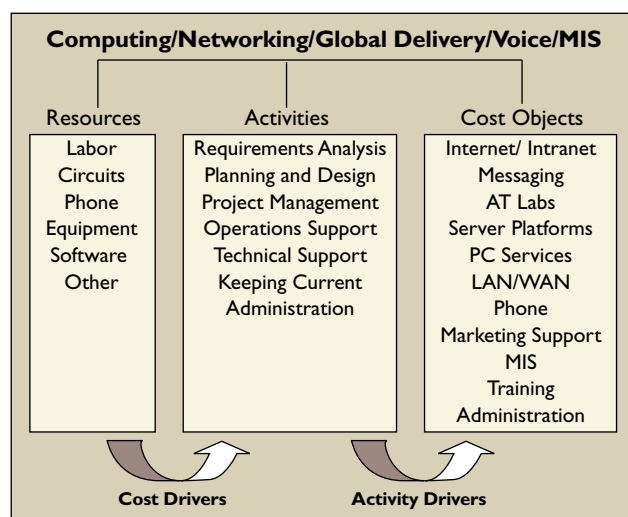
expansions to sustain their competitive edge. Traditionally, IT costs are treated as overhead rather than direct costs. Overhead costs are either inappropriately absorbed by IT departments or charged out equally to all business units regardless of individual consumption. Such indiscriminant cost-allocation schemes encourage the overutilization of underpriced services and the underutilization of overpriced services—both of which lead to suboptimal organizational performance. Finally, failure to include the cost of IT personnel exacerbates the problem. This increased overhead expenditure level has overloaded traditional cost accounting systems, which very likely misrepresent IT costs.

Not surprisingly, the situation is well documented. According to Liebmann's IT manager sur-

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vey [2], the majority of respondents claimed to have a comprehensive IT assets management program; however, the details suggest otherwise. Liebmann found that 75% of respondents performed only a basic physical inventory, while only 10% were tracking basic IT asset financial data, such as lease payments and depreciation information. Liebmann observed, "The idea of capturing life cycle activity costs...is unheard of" [2]. Two years later, Oleson's survey [3] indicated that IT managers have started using more meaningful cost accounting methods to measure, for example, "cost per transaction." Yet, despite such improvements, Oleson concludes chargeback for specialized IT services and communications is, for the most part, ineffective or inaccurate. Unfortunately, most organizations in today's increasingly IT-dependent economy are

Figure 1. ABC model for the IT division.



unable to use cost accounting systems to accurately determine "real-time" IT processes and activity costs. And, until corrective steps are taken, organizations will continue to under-recover their IT service delivery costs.

IT Chargeback

Today's organizations can choose one of four basic IT cost recovery approaches. The first, market-based pricing, is considered optimal but not useful for IT since many of its services are related to infrastructure and cannot be supplied externally. The second approach, negotiation between provider and consumer, often leads to non-optimal pricing and inefficiencies caused by organizational disruption. A third approach, whereby executive management simply sets prices, usually fails to promote efficient IT service delivery. The last approach, cost-based accounting, lets the provider recover the full cost of the service, and perhaps some profit. When left ungoverned, profit centers tend to drive costs up and efficiency down.

All of the four cost accounting approaches outlined here have flaws. However, previous research reveals the most effective chargeback methods are those easily understood by internal customers and were rationally developed [5]. Activity-Based Costing (ABC), one of the newest cost-based accounting methods, satisfies these criteria. Quite simply, ABC is based on costs and resource consumption. ABC communicates the "rates" at which activities consume resources as well as why the resources are used. It provides managerial information in a financial metric and communicates better information to non-financial managers since it explains costs in terms of activities and processes of people and equipment. Perhaps most importantly, ABC provides data that can stimulate change and serve as an enabler for continuous improvement.

Activity-Based Costing

This article illustrates how an ABC model can be applied to an IT division with a \$100-million annual budget in a successful global software development company (name withheld by request). This company's IT division develops and implements support services for its internal customers and provides support for training and marketing divisions.

Previously, the Subject Company used various methodologies to chargeback IT costs. Costs clearly connected with a user of the service or product were charged directly to that user's department (special software, dedicated servers, and long-distance telephone charges). The remainder of the common IT costs (voice, networking, PCs and soft-

Table 1. Resources.

Resource	Description
Labor	Includes salaries, commissions, bonuses, benefits on compensation, travel, and contract professional services.
Circuits	Includes network and data circuits, leases, and depreciation.
Phone	Includes telecom expenses, phone leases, and depreciation.
Equipment	Includes computer equipment, leases, depreciation, and related maintenance fees and supplies.
Software	Includes licenses for standard applications and operating systems.
Other	Includes offices supplies and equipment, administration, and physical space expenses.

ware, and training to business units) were charged out on a "per employee" or "per port" basis. These recharge rates were somewhat arbitrarily determined (negotiated) during the budgeting process and were based on future IT equipment cost estimates. Also, the company did not chargeback labor-related costs, which were steadily increasing. Since no labor-related costs were recovered in this company's somewhat arbitrary process of establishing chargeback rates, ABC was selected as a

new approach to costing IT services. Likewise, its potential to identify how company resources are consumed by the IT division's various support activities made it highly appealing.

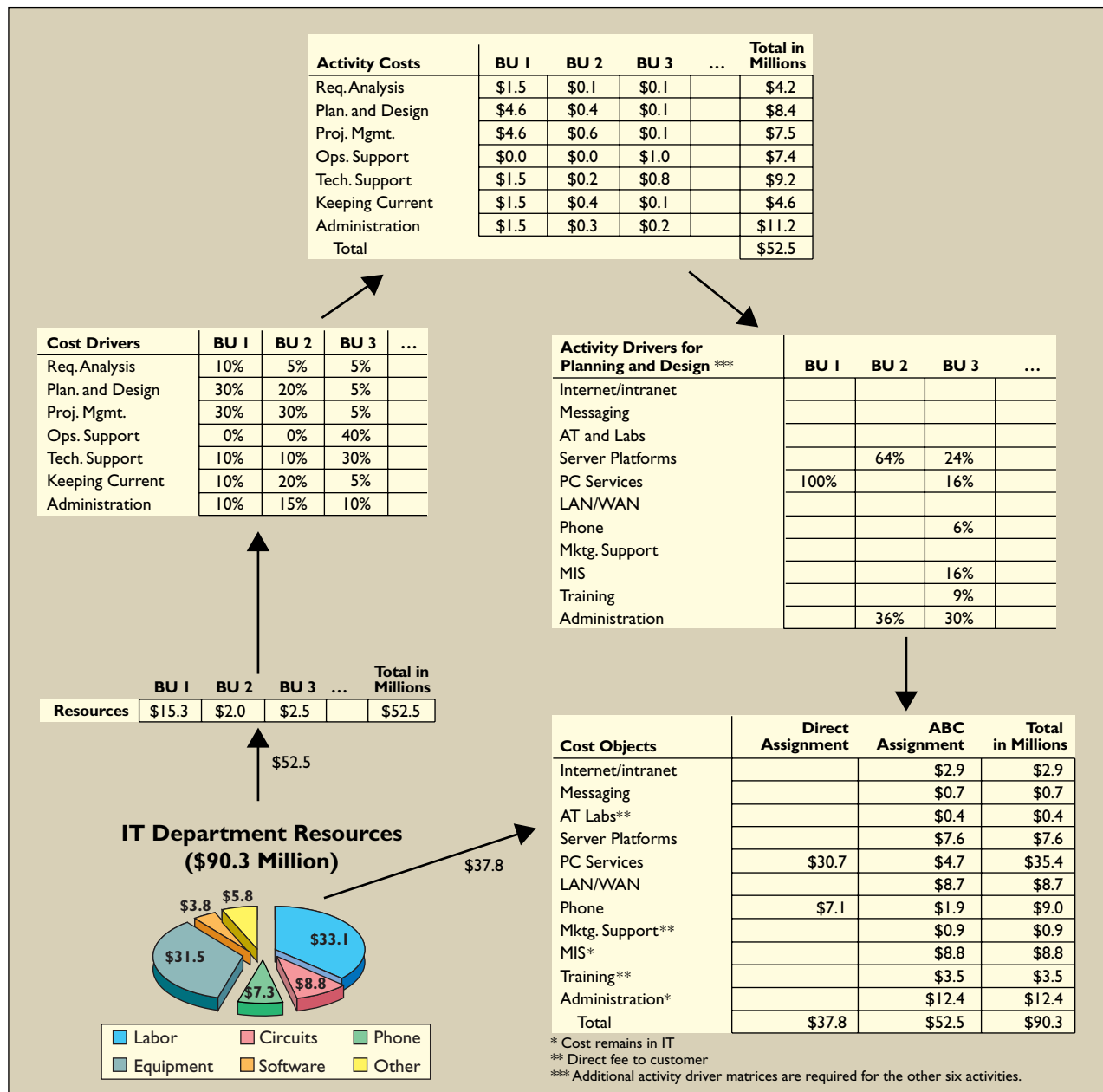
Within the Subject Company, the IT division has five major groups:

- Computing (provides desktop/laptop computing, application servers, demonstration systems, and training environments);
- Networking (provides network systems, data services, and Internet/intranet services);
- Voice (manages voice-related applications including telephone systems, voice messaging, cellular phones, and pagers);

- Global Delivery (provides end-user support for all IT services and training facilities); and
- Management Information Systems (supports internally developed business applications and the acquisition and integration of third-party solutions for managing the IT division).

These five major IT groups include approximately 150 business units. Generally, delivery of a single IT service involves participation by two or more groups and many business units. To understand an IT service cost, it is necessary to map the General Ledger costs through common activities that support IT services (see Figure 1). A hori-

Figure 2. ABC calculation for the IT division.



Activity	Description
Requirements Analysis	The pre-project engagement of a project life cycle. Specifically, developing user requirements, assessing alternative courses of action, estimating needed resources, and determining the optimal course of action.
Planning and Design	Relates to recurring IT tasks. Examples include capacity planning, performance tuning, lease/equipment replacement, and evaluating new equipment options.
Project Management	Accounts for non-recurrent, related tasks directed toward a major output. A project usually crosses organizational boundaries and has a timeline and budget.
Operations Support	The direct support of equipment, software, and/or computing environment to sustain normal operations; includes first-level troubleshooting.
Technical Support	Second- and third-level troubleshooting for correcting or repairing a problem.
Keeping Current	Informal and formal training, attendance at seminars, conferences and trade shows, and scanning of the business environment and new technology offerings.
Administration	Supervisory and administrative tasks not directly related to an activity defined above. Examples include preparing time sheets, tracking administrative expenditures, and preparing personnel evaluations.
Cost Driver	Description
Time	The percentage of time each business unit expends on each of the seven activities.

Cost Object	Description
Internet/intranet Services	Basic Internet/intranet connection.
Messaging Services	Internal and external mail services.
AT Labs	Laboratories for customer demonstrations.
Server Platforms	Application servers.
PC Services	Desktop and laptop computing.
LAN/WAN Services	Basic LAN/WAN connection and services.
Phone	Telephones, cellular phones, and pagers.
Marketing Support	Customized service to support marketing functions.
MIS Services	Business applications needed to run the IT division.
Training	Computer training labs.
Administrative Services	Ancillary costs not associated with one of the aforementioned cost objects.
Activity Driver	Description
Time	The percentage of time each business unit activity is directed toward each of the eleven cost objects.

zontal cost flow through activities to IT services accurately reveals the resources that are consumed by each IT service.

The first step in ABC is to assign the cost of resources (such as IT support personnel salaries, computing equipment, and other assets such as office space) to the various activities performed by the IT division (such as IT planning, design, and technical support). A cost driver mathematically models the rate at which an activity consumes resources. For example, the percentage of time IT support personnel spend on planning and design could be used when assigning labor costs to the planning and design activity. However, assignments are more complex. The planning and design activity consumes more than labor; it consumes physical assets, such as hardware and software for computer-aided design. Therefore, additional cost drivers are needed to specify the rate at which the

Table 2. Activities and cost drivers. planning and design activity consumes these resources.

The second cost distribution step in ABC assigns activity costs to cost objects. A cost object represents an IT service (either an Internet/intranet service or PC service). An activity driver mathematically measures the rate at which an activity contributes to a cost object. Again, "time" is used as a driver. For example, the percentage of time IT planning and design activities are used for developing Internet/intranet services can be used to apportion a percentage of planning and design's total costs to the Inter-

Table 3. Cost objects and activity drivers. net/intranet cost object. The end result—a cost object that represents an IT service—is based on the cost of performing those activities that ultimately produce the cost object. These cost objects are, in turn, used to calculate a recharge rate for recovering the cost of that service. A detailed description of each ABC component follows; Figure 2 depicts the ABC calculations.

Resources. The IT division budget incorporates all resources used to deliver IT services with

General Ledger cost data classified into six pools for tracking purposes (see Table 1). These six cost pools, totaling \$90.3M, are depicted in Figure 2. Of the \$90.3M, \$37.8M is first deducted as direct expenditures for either PC Services (\$30.7M) or Phone (\$7.1M). Such expenditures are allocated entirely to the corresponding cost object, thus bypassing the ABC calculations; from a cost accounting perspective, these direct charges are very accurate. The remaining \$52.5M expenditures support multiple IT services and are traced through the ABC system. Since the Subject Company wants to track IT costs through the 150 business units, six cost pools are calculated for each business unit.

Activities and Cost Drivers. A critical decision in the ABC model's design is the defining of activities at an appropriate level of detail. After all, the choice of activities greatly affects the accuracy and cost of devel-

oping and maintaining the model. Detailed activity modeling is usually needed for operations planning and process improvement, whereas more general activity models are sufficient for cost management.

Based on IT manager interviews, seven common activities were determined to describe the work performed by all 150 business units (see Table 2). Since the nature of IT tasks varied greatly across business units, defining activities at a greater level of detail posed the risk of creating tens, or even hundreds, of different activity categories. Furthermore, greater detail would substantially increase the time-tracking system's data requirements and concern was noted that time-reporting inaccuracy might increase if added options were available.

Each cost driver assigns a specific resource cost to the activity that consumes it. The essential links between resources and cost objects, they are often ignored in most

Table 4.
Recharge rates.

Service (Cost Object)	Recharge Rate Basis	ABC Recharge Rate (Monthly)	Recharge Rate without ABC Applied (Monthly)	Percent Under Recovered without ABC Applied
Internet/Intranet	Number of Employees	\$43	N/A	N/A
LAN/WAN Services	Number of Employees	\$129	N/A	N/A
Messaging	Number of Employees	\$10	N/A	N/A
Network Services Combined		\$182	\$159	15%
Server Platforms	Number of PCs	\$73	\$38	92%
PC Services	Number of PCs	\$339	\$274	24%
Phone	Number of Telephones	\$95	\$70	36%

IT cost accounting systems even if they drive significant organizational costs. Reasons for such omissions are usually difficulties in capturing and analyzing pertinent data with which drivers are developed. Rather than disregard the drivers, Liebmann suggests collecting source data to analyze time spent on IT support activities [2]. Drivers can then be based on time allocations.

The Subject Company followed Liebmann's recommendation. Cost drivers for labor were determined by each employee's monthly duties, based on the percentage of time each employee directs toward each of the seven activities, with the data gathered from the time-tracking system and employee interviews. However, developing drivers for the other resources proved more difficult since it was impractical to ascertain, in many cases, each activity's consumption of hardware, software, and physical space. Instead, these non-dedicated resources were assigned to the activities using labor's

activity drivers. This allocation assumes the IT division's general-purpose usage of computing and physical space is spread proportionately across cost objects, a reasonable assumption since most high-tech labor-intensive functions require higher levels of support.

Figure 2 shows the cost drivers for three of the 150 business units. Each column of the cost driver matrix lists the percentage of effort each business unit expends on any one activity. For example, Business Unit One spends 10% of its total effort on each of four activities: requirement analysis, technical support, keeping current, and administration. The remaining 60% of its total effort is distributed evenly across planning and design (30%) and project management (30%). The cost drivers for each business unit are applied to the corresponding resources to generate the activity costs for each business unit. The activity costs matrix depicted in Figure 2 shows these costs. For example, Business Unit One's planning and design activities cost \$4.6M (30% of \$15.3M). The IT division costs for each activity are computed by summing the activity costs across all business units. For example, the IT division spent \$9.2M on technical support.

Activity Drivers and Cost Objects. Typically, the cost of performing an activity is spread across several cost objects (see Table 3) via multiple activity drivers. Meaningful activity drivers are based on an understanding of what factors would cause activity costs to increase significantly. The driver should capture both the frequency of an activity and its intensity [6]. Drivers such as the number and complexity of pre-project engagement requests, number and cost of projects, and number of help desk requests and call duration were all considered. Again, data limitations prevented many inclusions.

Figure 2 shows the activity drivers for the planning and design activity, which are based on time allocations. The matrix shows that 100% of Business Unit One's planning and design activity supports PC services. Hence, Business Unit One's \$4.6M planning and design activity cost is allocated fully to PC services. For Business Unit Two, 64% of its \$0.4M planning and design activity cost is for server platforms; the other 36% is allocated for administration expenses. Additional activity driver matrices were developed for the other six activities but are not shown in Figure 2.

The ABC assignment for each cost object is calculated by applying each of the seven matrices of activity drivers to the activity costs. Finally, the direct assignment and the ABC assignment are summed to compute the total cost for each cost object. The cost object, representing the total cost of providing that service, is ultimately recovered by chargebacks or user fees. Since the IT division is the sole user of MIS services and

administration services, these costs are recovered internally through the division's budgetary allocations using the recharge rates.

Recharge Rates. Table 4 lists the Subject Company's recharge rates. In most cases the number of employees was the preferred basis. The fixed rate is justified since the service is based on infrastructure development and maintenance costs and is not affected by usage. However, where utilization was believed to be linked to the number of PCs a user has, then that number was used to form a variable rate. Dual pricing of variable and fixed costs directs clients' attention to fees that can be controlled. The AT (Advanced

Table 5. Cost percentage of PC services attributed to support activities.

Activity	PC Software	PC Equipment
Requirements Analysis	8%	1%
Planning and Design	14%	2%
Project Management	15%	2%
Operations Support	19%	4%
Technical Support	12%	19%
Keeping Current	5%	5%
Administration	8%	2%
Total	81%	35%

Technology) labs, training, and marketing support are fee-for-service products and are negotiated.

To measure the impact of ABC on recharge rates an analysis of the Subject Company was performed. The fourth column of Table 4 lists the recharge rate the Subject Company believed it would have recovered under its pre-ABC budgeting procedures. This analysis combines network services (Internet/intranet, LAN/WAN, and messaging) since it reflects the Subject Companies recharge practices prior to ABC. The last column lists the percentage that would have gone unrecovered under the previous budgeting process. The analysis shows a 15–92% improvement in cost recovery when ABC enabled the IT division to charge out salary, common systems, and other ancillary costs that would otherwise go unrecovered. Similarly, the ABC assignments for training, AT labs, and marketing support provide a cost basis for establishing fees that recover a service's full cost. Whereas training costs once went unrecovered, they are now being charged out.

Not surprisingly, fairness of charges is important to business unit managers who have no control over their rates [1]. ABC addresses this concern by explaining the cost of service delivery. For example, Table 5 lists the percentage each activity contributes to the cost object, PC Services. The data reveals 81% of PC software cost goes toward managerial and support activities, the most

expensive being operations support (19%), technical support (12%), project management (15%), and planning and design (14%). Only 19% of the software's cost pays for licenses. This analysis exemplifies and communicates the hidden costs. For PC equipment the situation is much different: 65% of the cost goes toward leases with the major hidden cost being technical support at 19%. This improved ability to explain IT charges can positively affect how managers view the IT division's competence [4].

Outcomes

Developing an ABC model is the first step toward company-wide implementation. It enables management to view its operations in terms of how resources are consumed in the delivery of IT service. Whereas previously financial allocations were arbitrarily determined, by using the model and new recharge rates, which mirror actual costs, management can track resources precisely, improve the budgeting process, and identify areas requiring cost containment. For the Subject Company, tracking cost objects back to their appropriate business units identified many inefficiencies in the IT division's design. A dramatic reorganization of the IT division followed, which eliminated one major group and approximately half of the 150 business units. Reductions were made by coalescing redundant business units and eliminating non-value-added work.

Lessons Learned. *Start with a basic ABC model that takes data constraints into consideration.* Data unavailability, inaccuracy, and unreliability are common, such as in the Subject Company's case wherein 50% of the time-tracking system data was miscoded. In cases where data is missing or suspect, estimations are often necessary. A lack of data also hampers efforts to define and measure drivers. Likewise, model enhancements generally require costly changes to existing enterprise systems and operational procedures. The cost-benefit of these changes needs to be weighed carefully. In this regard, sensitivity analysis is effective for assessing the impact of the change on recharge rates.

Be prepared for organizational change and manage cultural resistance. Being an asset-rich environment with limited debt, the Subject Company viewed itself as "too" profitable for ABC. More than one business unit manager revealed that budgets were not necessarily followed, simply because they didn't need to be. Communication, involvement, and education were successfully used to win over business unit managers.

Carefully develop a chargeback policy. Managers expressed several concerns openly. First, they were fearful of a "low-hanging fruit" approach to cost management that would attack large-ticket items. Concerns were raised that a cost reduction policy that deters

employees from using the help desk would create a non-optimal situation where business units try to provide their own support. Also, some business unit managers expressed a preference for usage-based charging despite fixed IT costs. Such factors can lead to unfavorable situations wherein one business unit's efforts to reduce use leads to a higher rate for other business units since the IT division seeks full cost recovery. Lastly, when ABC is tied directly to an enterprise system, real-time pricing is possible. However, since it creates a nightmare for the budget-minded manager it is better to establish stable chargeback prices and refine them only when they are obsolete or misleading.

Conclusion

Here, we have demonstrated the applicability of ABC to IT service delivery. The Subject Company that utilized this approach derived significant benefits from a better understanding of IT delivery costs and a rationale for explaining IT costs to department managers. Mutual understanding of IT costs is a necessary condition for shared responsibility of IT, which in turn leads to effective economic decision making that optimizes resource utilization and the alignment of IT with business strategy. At the very least, the managerial controls

facilitated by ABC should enable the IT division to continuously improve its operational costs. **C**

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