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Rethinking Activity-Based Costing

Activity-based accounting looks great in the classroom, but too often fails in the field. In this *Harvard Business Review* excerpt, HBS professor Robert S. Kaplan along with Steven R. Anderson suggest a way around the obstacles.

by Robert S. Kaplan and Steven R. Anderson

Editor's Note— Activity-based costing, ABC, would seem to be an accurate way for managers to assign costs to the customers and products that use a department's services. But real-world use has shown ABC loses power in large-scale operations, and can be difficult to implement and maintain. In their HBR article, excerpted here, authors Kaplan and Anderson suggest the process be simplified through an approach they call "time-driven ABC." Here's an overview.

The solution to the problems with ABC is not to abandon the concept. ABC after all has helped many companies identify important cost- and profit-enhancement opportunities through the repricing of unprofitable customer relationships, process improvements on the shop floor, lower-cost product designs, and rationalized product variety. Its potential on a larger scale

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represents a huge opportunity for companies. Fortunately, simplification is now possible through an approach that we call time-driven ABC, which we have successfully helped more than 100 client companies implement, including those described in this article. In the revised approach, managers directly estimate the resource demands imposed by each transaction, product, or customer rather than assign resource costs first to activities and then to products or customers. For each group of resources, estimates of only two parameters are required: the cost per time unit of supplying resource capacity and the unit times of consumption of resource capacity by products, services, and customers. At the same time, the new approach provides more accurate cost-driver rates by allowing unit times to be estimated even for complex, specialized transactions.



ROBERT S. KAPLAN

Robert S. Kaplan is Foundation Professor Emeritus at Harvard Business School.

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Estimating the cost per time unit of capacity. Instead of surveying employees on how they spend their time, managers first directly estimate the practical capacity of the resources supplied as a percentage of the theoretical capacity. There are various ways to do this. As a rule of thumb, you could simply assume that practical full capacity is 80 percent to 85 percent of theoretical full capacity. So if an employee or machine is available to work 40 hours per week, its practical full capacity is 32 to 35 hours per week. Typically, managers would allot a lower rate—say 80 percent—to people, allowing 20 percent of their time for breaks, arrival and departure, communication, and training. For machines, managers might allot a 15 percent differential between theoretical and practical capacity to allow for downtime due to maintenance, repair, and scheduling fluctuations. A more systematic approach, perhaps, is to review past activity levels and identify the month with the largest number of orders handled without excessive delays, poor quality, overtime, or stressed employees. Whichever approach you prefer, it's important not to be overly sensitive to small errors. The objective is to be approximately right, say within 5 percent to 10 percent of the actual number, rather than precise. If the estimate of practical capacity is grossly in error, the process of running the time-driven ABC system will reveal the error over time.

THE CAPACITY OF MOST RESOURCES IS MEASURED IN TERMS OF TIME AVAILABILITY.

Returning to our example, let's assume that the customer service department employs 28 reps to do the frontline work and that each puts in eight hours per day. In theory, therefore, each worker supplies about

10,560 minutes per month or 31,680 minutes per quarter. The practical capacity at about 80 percent of theoretical is therefore about 25,000 minutes per quarter per employee, or 700,000 minutes in total. Since we already know the cost of supplying capacity—the \$560,000 in overhead costs—we can now calculate the cost per minute of supplying capacity (\$0.80).

The capacity of most resources is measured in terms of time availability, but the new ABC approach can also recognize resources whose capacity is measured in other units. For example, the capacity of a warehouse or vehicle would be measured by space provided, while memory storage would be measured by megabytes supplied. In these situations, the manager would calculate the resource cost per unit based on the appropriate capacity measure, such as cost per cubic meter or cost per megabyte.

Estimating the unit times of activities. Having calculated the cost per time unit of supplying resources to the business's activities, managers next determine the time it takes to carry out one unit of each kind of activity. These numbers can be obtained through interviews with employees or by direct observation. There is no need to conduct surveys, although in large organizations, surveying employees may help. It is important to stress, though, that the question is not about the percentage of time an employee spends doing an activity (say, processing orders) but how long it takes to complete one unit of that activity (the time required to process one order). Once again, precision is not critical; rough accuracy is sufficient. In the case of our example, let's suppose that managers determine that it takes 8 minutes to process an order, 44 minutes to handle an inquiry, and 50 minutes to perform a credit check.

Deriving cost-driver rates. The cost-driver rates can now be calculated by multiplying the two input variables we have just estimated. For our customer service department, we obtain cost-driver rates of \$6.40 (8 multiplied by \$0.80) for processing customer orders, \$35.20 (44 by \$0.80) for handling inquiries, and \$40 (50 by \$0.80) for performing credit checks. Once you have calculated these standard rates, you can apply them in real time to assign costs to individual customers as transactions occur. The standard cost rates can also be used in discussions with customers about the pricing of new business.

Note that these rates are lower than those estimated using traditional ABC methods (see the exhibit "Doing ABC the Traditional Way").

Doing the ABC the Traditional Way

This table provides a traditional ABC analysis for a customer service department for its first fiscal quarter. The percentage of time spent on activities is determined from employee surveys. Once activity quantities are known or forecast, cost-driver rates are used to allocate the department's costs on customers' utilization of the department's activities.

Activity	% of Time Spent	Assigned Cost	Activity Quantity	Cost-Driver Rate
Process customers orders	70%	\$392,000	49,000	\$8 per order
Handle customer inquiries	10%	\$56,000	1,400	\$40 per quantity
Perform credit checks	20%	\$112,000	2,500	\$44.80 per credit check
Total	100%	\$560,000		

The reason for this difference becomes obvious when we recalculate the quarterly cost of performing the customer service activities. In the exhibit "The Impact of Practical Capacity," time-driven ABC analysis reveals that only 83 percent of the practical capacity (578,600 of the 700,000 minutes) of the resources supplied during the quarter has been used for productive work, and hence, only about 83 percent of the total expenses of \$560,000 were assigned to customers or products during this period. This takes care of the technical drawback of traditional ABC systems we mentioned earlier—the fact that surveyed employees respond as if their practical capacity were always fully utilized.

The Impact of Practical Capacity

This table shows the effect on cost assignment when we use rates based on practical capacity (700,000) minutes, assumed here at 80 percent of theoretical full capacity. We can see that only about 83 percent of the customer service department's practical capacity was actually put to productive use during the first fiscal quarter.

Activity	Unit Time (minutes)	Quantity	Total Minutes	Total Cost
Process customers orders	8	49,000	392,000	\$313,600
Handle customer inquiries	44	1,400	61,600	\$49,280
Perform credit checks	50	2,500	125,000	\$100,000

Total**578,600 \$462,880**

In the case of our customer service department, the traditional ABC survey produced a work distribution of 70 percent, 10 percent, and 20 percent of the employees' time performing the department's three activities. But while that distribution did reflect how workers spent their productive time, the fact that their total productive time was significantly less than their practical capacity of 32 hours per worker per week was completely ignored. The calculation of resource costs per time unit forces the company to incorporate estimates of the practical capacities of its resources, allowing the ABC cost drivers to provide more accurate signals about the cost and the underlying efficiency of its processes.

Analyzing and reporting costs. Time-driven ABC enables managers to report their costs on an ongoing basis in a way that reveals both the costs of a business's activities as well as the time spent on them. In our customer service department example, a time-driven ABC report would look like the exhibit "ABC, the Time-Driven Way."

ABC, the Time-Driven Way

This reporting template for time-driven ABC shows the customer service department's costs in the second quarter of operations. Here we assume that the department processes 51,000 customer orders, handles 1,150 inquiries, and performs 2,700 credit checks. The data reveal that the company supplied \$85,120 worth of unused resource capacity during this period, representing opportunities for savings or growth depending on the company's circumstances.

Activity	Quantity	Unit Time	Total Time Used (in minutes)	Cost-Driver Rate	Cost Assigned
Process customers orders	51,000	8	408,000	\$6.40	\$326,400
Handle customer inquiries	1,150	44	50,600	\$35.20	\$40,480
Perform credit checks	2,700	50	135,000	\$40.00	\$108,000
Total Used			593,600		\$474,880
Total Supplied			700,000		\$560,000
Unused Capacity			106,400		\$85,120

Note that the report highlights the difference between capacity supplied (both quantity and cost) and the capacity used. Managers can review the cost of the unused capacity and contemplate actions to determine whether and how to reduce the costs of supplying unused resources in subsequent periods; they can then monitor those actions over time. In some cases, the information can save companies that are considering expansion from making unnecessary new investments in capacity. For example, the vice president of operations at Lewis-Goetz, a hose and belt fabricator based in Pittsburgh, saw from his time-driven ABC model that one of his plants was operating at only 27 percent of capacity. Rather than attempt to downsize the plant, he decided to maintain the capacity for a large contract he expected to win later that year, for which he otherwise would have created new capacity.

Updating the model. Managers can easily update their time-driven ABC models to reflect changes in operating conditions. To add more activities for a department, they don't have to reinterview personnel; they can simply estimate the unit time required for each new activity.

Managers can also easily update the cost-driver rates. Two factors can cause these rates to change. First, changes in the prices of resources supplied affect the cost per time unit of supplying capacity. For example, if employees receive an 8 percent compensation increase, the resource cost rate in our example increases from \$0.80 per supplied minute to \$0.864 per minute. If new machines are substituted or added to a process, the resource cost rate is modified to reflect the change in operating expense associated with introducing the new equipment.

The second factor that can cause a change in the activity cost-driver rate is a shift in the efficiency of the activity. Quality programs, continuous improvement efforts, reengineering, or the introduction of new technology can enable the same activity to be done in less time or with fewer resources. When permanent, sustainable improvements in a process have been made, the ABC analyst recalculates the unit time estimates (and therefore the demands on resources) to reflect the process improvements. For example, if the customer service department gets a new database system, the reps may be able to perform a standard credit check in 20 minutes rather than 50 minutes. To accommodate the improvement, just change the unit time estimate to 20 minutes, and the new cost-driver rate automatically becomes \$16 per credit check (down from \$40). Of course, you then have to add back in the cost impact of purchasing the new

database system by updating the cost per time unit estimate, so the final figure may be somewhat higher than \$16.

By updating the ABC model on the basis of events rather than on the calendar (once a quarter or annually), you get a much more accurate reflection of current conditions. Any time analysts learn about a significant shift in the costs of resources supplied or the practical capacity of those resources, or about a change in the resources required to perform the activity, they update the resource cost per time unit, or resource cost rate, estimates. And any time they learn of a significant and permanent shift in the efficiency with which an activity is performed, they update the unit time estimate. [Wp](#)

ABOUT THE AUTHORS

Robert S. Kaplan is a professor at Harvard Business School.

Steven R. Anderson is the founder and chairman of Acorn Systems in Houston. (Kaplan serves on the board of Acorn systems.)

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