

*By revealing the links between activities and resource consumption, ABC points directly to profit opportunities.*

# Profit Priorities from Activity-Based Costing

by Robin Cooper and Robert S. Kaplan

In recent years, companies have reduced their dependency on traditional accounting systems by developing activity-based cost management systems. Initially, managers viewed the ABC approach as a more accurate way of calculating product costs. But ABC has emerged as a tremendously useful guide to management action that can translate directly into higher profits. Moreover, the ABC approach is broadly applicable across the spectrum of company functions and not just in the factory.

**A**BC is a powerful tool – but only if managers resist the instinct to view expenses at the unit level.

Because ABC reveals the links between performing particular activities and the demands those activities make on the organization's resources, it can give managers a clear picture of how products, brands, customers, facilities, regions, or distribution channels both generate revenues and consume resources. The profitability picture that emerges from

the ABC analysis helps managers focus their attention and energy on improving activities that will have the biggest impact on the bottom line.

Fully exploiting ABC as a guide to profitability, however, requires a conceptual break from traditional cost accounting systems and a willingness to act on the insights ABC analysis provides. Managers must refrain from allocating all expenses to individual units and instead separate the expenses and match them to the level of activity that consumes the resources. Very simply, managers should separate the expenses incurred to produce individual units of a particular product from the expenses needed to produce different products or to serve different customers, independent of how many units are produced or sold.

Then managers must be prepared to act. First, they should explore ways to reduce the resources required to perform various activities. Then to transform

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those reductions into profits, they must either reduce spending on those resources or increase the output those resources produce. The actions allow the insights from ABC to be translated into increased profits at the bottom line.

## The Search for Profits

Financial managers usually start a search for increased profits with the corporate income statement. Out come the spreadsheets, with their projections of gross revenues, cost of goods sold, and general, selling, and administrative expenses. This financial analysis is conducted at an aggregate level, relating revenues and expenses in broad functional categories. Suppose, for example, a company wants to increase its current 8% return on sales to something closer to 12%. A manager might project that with an expected sales growth of 6% a year, the company will achieve its target return in five years if it can hold expense growth to just 5% a year.

But managing by legislative fiat at the aggregate level of the income statement and balance sheet doesn't work. When managers look at the gross numbers and deem that the company will hold expense growth to 5% in the presence of 6% annual sales growth, they assume that they can control

ABC helps managers unravel the stories about how the company designed, produced, and delivered products.

blocks of expenses represented by broad categories such as cost of goods sold, or marketing, selling, and distribution expenses. In fact, as activity-based accounting has brought to light, management cannot control expenses at the macro level.

Different products, brands, customers, and distribution channels make tremendously different demands on a company's resources. The gross numbers on corporate financial statements reflect the decisions made and actions taken throughout the business. They represent the aggregation of thousands of small stories about how the company designed, produced, and delivered its products, served customers, and developed and maintained brands. But this kind of income report won't help managers decide what to do to improve the numbers

for next year's financial statement. To discover which actions will increase selling margins and reduce operating expenses, managers need to understand patterns of resource consumption at the micro level, where the action is really taking place.

ABC analysis enables managers to slice into the business many different ways – by product or group of similar products, by individual customer or client group, or by distribution channel – and gives them a close-up view of whatever slice they are considering. ABC analysis also illuminates exactly what activities are associated with that part of the business and how those activities are linked to the generation of revenues and the consumption of resources. By highlighting those relationships, ABC helps managers understand precisely where to take actions that will drive profits.

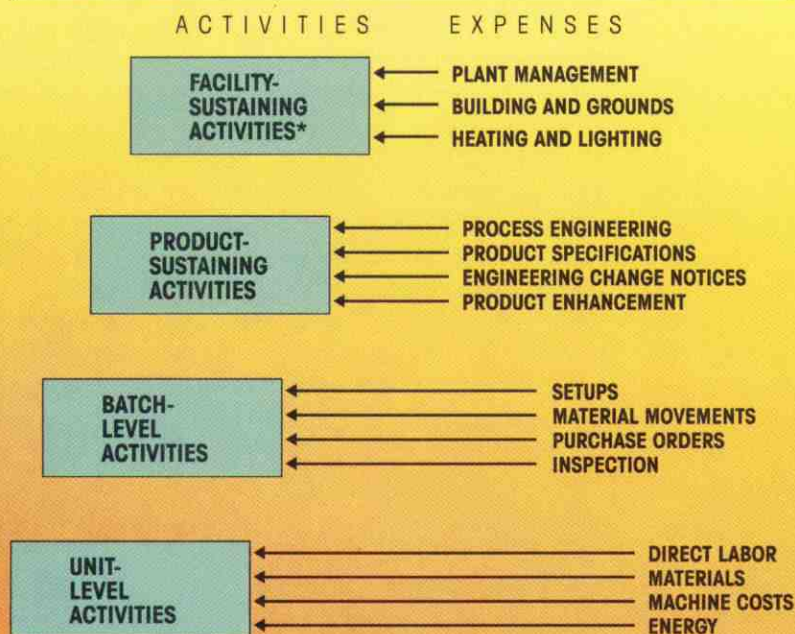
## The ABC Hierarchy

To demonstrate how ABC analysis exposes the relationships between activities and resource consumption and, ultimately, profits, let's start by focusing on products. Traditional cost accounting systems use bases like direct labor and machine hours to allocate to products the expenses of indirect and support activities, including engineering changes, setups, and parts maintenance. In contrast, activity-based costing segregates the expenses of indirect and support resources by activities. It then assigns those expenses based on the drivers of the activities.

When managers segregate activities in this way, a hierarchy emerges. Some activities, like drilling a hole or machining a surface, are performed on individual units. Others – setups, material movements, and first part inspections – allow batches of units to be processed. Still others – engineering product specifications, process engineering, product enhancements, and engineering change notices – provide the overall capability that enables the company to produce the product. And plant management, building and grounds maintenance, and heating and lighting sustain the manufacturing facility.

The hierarchy gives managers a structured way of thinking about the relationship between activities and the resources they consume. That is, managers need to distinguish the expenses of direct labor, direct materials, and electricity, which are consumed at the unit level, from the expenses of resources used to process batches or to support a product or a facility. (See "The Hierarchy of Factory Operating Expenses.")

## The Hierarchy of Factory Operating Expenses



\*If plant makes more than one product, this expense is allocated on the basis of value added.

Allocating expenses to individual units sends signals that managers can easily misinterpret. When batch- and product-level costs are divided by the number of units produced, the mistaken impression is that the costs vary with the number of units. But the resources consumed by batch and product-sustaining activities do not vary at the unit level, nor can they be controlled at the unit level. The quantity of resources consumed at the batch level goes up as the number of batches—not the number of units within the batches—rises. Similarly, product-sustaining activities depend on the number of different types of products—not on how many units or batches are manufactured. Batch- and product-level expenses can be controlled only by modifying batch- and product-level activities.

The example of a large equipment manufacturer with a machining shop containing dozens of numerically controlled machine tools shows the important distinction in emphasis between traditional cost systems and ABC analysis. The company's traditional standard cost system had employed three unit-level bases (direct materials dollars, direct labor dollars, and machine hours) to apply overhead costs. Underlying the cost system, therefore, was the assumption that all activities were performed at the unit level and varied with the materials dollars, direct labor dollars, or machine hours being consumed.

Managers of the machining shop were perplexed that their division kept winning business it was ill-

configured to manufacture and losing bids for products it could produce efficiently. Why was the facility uncompetitive when bidding for the complex, high-volume products it was optimally configured to produce and able to win bids only for simple, low-volume parts that made heavy demands on the factory's support resources?

A detailed ABC analysis revealed that more than 40% of the department's support resources were not used to produce individual product units. The company developed five new drivers of overhead resources: setup time, production runs, materials movements, active parts numbers maintenance, and facility management. The first three related to how many batches were produced, the fourth to the number of different types of products produced, and the fifth to the facility as a whole rather than to

individual products. This information gave managers a completely different picture of a product's profitability. The traditional system had failed to signal the widely different demands that individual products made on resources used to perform batch and product-sustaining activities.

For a simple drive shaft, for example, the traditional system had allocated \$13.38 of factory overhead to every 100 units. For the 8,000 units actually produced, the allocated overhead costs were \$1,070. In contrast, the ABC system signaled that production of the shaft consumed about \$1,700 of unit, batch, and product-sustaining support resources. (See the table "ABC Analysis of a Drive Shaft.") The much higher expenses under ABC spurred management to review pricing, product mix, and process improvement decisions.

It is possible to use ABC to report unit product costs by dividing total expenses by the units produced (yielding a figure in excess of \$30). But saying, "This product costs \$30-plus a unit" is less useful than saying, "Production of shaft A103 consumed \$2,453 worth of resources last year." The traditional unit-cost perspective is counterproductive because it tends to direct managers' attention to unit-level actions—to consider a price increase, for example, or to reduce direct labor, materials, or machine-time processing. Some unit-level actions might be beneficial, but in many instances, there is little room for improvement. Industrial engineering over the last 40

years got most of the easy savings from labor, materials, and machine-time efficiencies. Little fat remains to be trimmed from these unit-level resources.

Often, the greatest opportunities for improvement have to do with the large batch and product-sustaining activities that industrial engineers have only recently begun to address. These activities can constitute up to 50% of a facility's total costs.

Interestingly, ABC analysis often points managers in the direction of the advanced manufacturing and design philosophies some companies have begun to pursue. For those who have already adopted these philosophies, ABC explains how and why the changes can be so profitable. The targets for *kaizen*, or continuous improvement, include reduced setup times, better factory layouts and materials flows, and improved quality – all of which reduce the resources required to handle batches. The “focused factory” (a factory producing similar products) minimizes batch and product-related expenses. Product engineers’ design-for-manufacturability efforts, which aim to design products with fewer and more common parts, reduce the demands for product-sustaining resources. Advanced information and manufacturing technologies reduce the demands made on batch and product-sustaining resources in the production of customized, low-volume products. When successfully implemented, ABC helps managers justify their commitment to these approaches and quantify the financial benefits.

In addition to directing process improvements, ABC analysis can help managers reduce demands for resources by focusing the product line. The heavy equipment manufacturer in our example recognized that its low-volume products were a drag on profits. It estimated that by eliminating or outsourcing parts that ran less than 100 machine hours a year and replacing them with high-volume parts, it could keep direct labor and machines just as busy while consuming far fewer resources for batch and product-sustaining activities. The new product mix would require 77% fewer part numbers, 60% fewer setup hours, and 21% less support resources to produce the same output.

To avoid outsourcing all of the low-volume products, the division opened a special low-value-added job shop. It went from a single facility producing a broad mix of products to two focused facilities: one for high-volume products and the other for low-volume products.

While ABC can help managers modify existing product mixes, it can also help managers anticipate the effects of planned changes. ABC analysis prevented one pharmaceutical company, for example, from being unpleasantly surprised by a change in its

product mix. The company planned to replace one highly successful product, whose patent was expiring, with 300 new products per year for each of the next five years. The logic seemed sound: the new products would take advantage of the largely “fixed” costs of owning and running the plant, formerly used to make the single patent-protected product.

Omitted from the initial analysis, however, was how the new product mix would affect the so-called fixed costs. The ABC analysis showed that batch and product-sustaining operating expenses would soar as the company moved from making one product to making 1,500 different products. The company proceeded to expand the product mix, but it immediately initiated programs to reduce resource consumption at the batch and product levels.

An additional insight from the ABC hierarchy is that product-related activities do not impact facility-level costs. Only unit, batch, and product-sustaining expenses should be assigned to products. Therefore, in ABC, facility-level expenses are kept at the plant level and not allocated to products. Facility-sustaining expenses become part of another slice, such as a geographic slice, where the company is managing a number of facilities in an area.

## Beyond the Factory

Managers can use ABC to analyze many other aspects of their company's operations. They can compare the profits that various customers, product lines, brands, or regions generate. Then they can zero in on the dynamics of the more – or less – profitable ones. A brand analysis could look at all the expenses associated with sustaining a brand, such as “Snappy Cereals,” which includes a dozen different packages and flavors. Managers can judge the brand's profitability by matching the revenues earned from all Snappy products against the expenses associated with promoting, advertising, and maintaining the Snappy brand in the marketplace.

And the analysis can be continued beyond the brand level. Snappy is one of six brands in a company's cereal product line. Expenses such as general research, development, and advertising for all the cereal products should not be allocated to individual brands. Cereal profitability is determined by subtracting these product-line expenses from the profitability earned in all of the cereal brands.

Similarly, management may want to view the company's profitability by customer. To measure a customer's profitability, start by calculating the contribution margins (sales revenue less all product-

## ABC Analysis of a Drive Shaft

### Unit-Level Expenses

Materials		\$ 7.07
Direct Labor		2.36
Direct Labor Overhead	@ 111% per DLS	2.62
Machine Hour Overhead	@ \$16.71 per MHR	5.15
Total per unit		\$17.20

**Total Unit-Level Expenses for 80 parts @ \$17.20** **\$1,376**

### Batch-Level Expenses

2 setups @ 4.2 hours each	@ \$33.76/setup hour	\$284
2 production runs	@ \$114.27/run	228
4 material moves	@ \$19.42/move	78
Total per batch		\$590

**Total Batch-Level Expenses** **590**

### Product-Sustaining Expenses

1 part	@ \$487	\$487
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**Total Product-Sustaining Expenses** **487**

**Total Product Expenses** **\$2,453**

### Facility-Sustaining Expenses

(allocated to product @ 9.1% of value added) **172**

**Total Expenses Allocated to Product** **\$2,625**

related expenses) for all products sold to an individual customer and subtract the expenses of sustaining the customer. Customer-sustaining expenses are those that are traceable to individual customers but are independent of the volume and mix of purchases. These include the expenses of traveling to and calling on the customer and developing and maintaining background information on the customer's operations, markets, and credit rating.

Kanthal, a manufacturer of heating wire, analyzed its customer profitability and discovered that the well-known 80-20 rule (80% of sales generated by 20% of customers) had to be revised. A 20-225 rule was actually operating: 20% of customers were generating 225% of profits. The middle 70% of customers were hovering around the break-even point, and 10% of customers were losing 125% of profits.

The Kanthal customers generating the greatest losses were among those with the largest sales volume. Initially, this finding surprised managers, but

it soon began to make sense. You can't lose large amounts of money on a small customer. The large, unprofitable customers demanded lower prices, frequent deliveries of small lots, extensive sales and technical resources, and product changes. The newly revealed economics enabled management to change the way it did business with these customers—through price changes, minimum order sizes, and information technology—transforming the customers into strong profit contributors.

## From Improvement to Profit

ABC analysis highlights for managers where their action will likely have the greatest impact on profits. Managers should take two types of actions after an ABC analysis. First, they should attempt to reprice products: raise prices for products that make heavy

demands on support resources and lower prices to more competitive levels for the high-volume products that had been subsidizing the others. If the repricing strategy is successful, the company should arrive at a new product mix that either makes fewer demands on its resources or generates more revenues for the same consumption of resources.

Second, and more important, managers should search for ways to reduce resource consumption. This requires either decreasing the number of times activities are performed for the same output—such as by changing product and customer mix—or reducing the resources consumed to produce and serve the existing mix of products and customers. This might mean designing products with fewer and more common parts or customizing products at the last possible production stage. It could also mean implementing continuous-improvement programs to enhance quality, reduce setup times, and improve factory layouts, or adopting information technology to facilitate the processing of batches, products, and customer orders.

Analysis of a large and especially unprofitable customer might show that the customer demands low prices because of its large purchasing volume and also requires extensive technical development and marketing support. The company may decide to attempt the repricing route—maintaining the existing level of customer support but reducing discounts or charging the client for those extraordinary services. Alternatively, it may decide to provide fewer customer-sustaining services. Engineers might spend less time sharing technical knowledge, marketing people might put on fewer special trade shows for the customer, or salespeople might cut down on routine calls.

Steps to reduce resource consumption are, however, just the first round of action. Even the most ambitious improvement programs won't show up automatically in the bottom line unless the company follows through with a second round of action. When fewer of their resources are being demanded, managers must either get rid of the freed-up resources or redeploy them for additional output.

The important distinction here is between consumption and spending. Reducing resource consumption gives managers an *opportunity* to boost profits. Eliminating a part that consumes resources costing \$1,000 will not automatically lead to a reduction in spending of \$1,000. Even if the company reduces demands on parts-administration resources, it will experience an increase in profits only when it redeployes parts-administration resources or cuts spending on them. If it doesn't redeploy the resources or cut spending, the actions

to reduce part count will have merely created excess capacity, not increased profits.

When management recognizes that it has reached the point at which it can get the same output with fewer employees, machines, or factories, it can reduce spending on those resources. That is, management can eliminate or redeploy resources periodically to bring spending down to the new lower levels of resource consumption. Resource consumption can fall evenly across time, but spending lags in a staircase pattern. As the company generates the same revenues while spending less for support resources, profits rise.

Alternatively, management can use the freed-up resources to increase output, which in turn generates more revenues. While spending on the support resources remains constant, profits rise as a result of the additional revenues.

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**Expenses are fixed only when managers fail to do anything to reduce them.**

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Of course, managers can increase profits by simultaneously boosting revenues and reducing spending on resources. The point is that management must take some action to capture the benefits from the signals ABC analysis sends.

Activity-based cost management systems provide companies with management information—not traditional accounting information. ABC reveals often unexpected peaks of profitability and craters of losses in a company's operations. But managers should not use the information naively to close plants, drop customers, or eliminate products. They should use it as a guide to reprice products or customer transactions, to alter product and customer mix, or to perform activities more efficiently.

If managers fail to follow up any reductions in the demands on organizational resources, improvements will create excess capacity, not increased profits. Managers might then conclude erroneously that operating expenses were indeed fixed and not variable. The expenses were fixed, however, only because managers did not take the actions required to make them variable.

Costs are not intrinsically fixed or variable. ABC analysis permits managers to understand the sources of cost variability and reveals actions they can take to reduce demands on their organizational resources. Having reduced the demands, managers can then increase throughput or reduce spending to convert the savings into increased profits. 

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