INTEGRATING TARGET COSTING AND ABC

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Target costing is a technique that predetermines an ideal product cost to maximize profits across that product's life cycle. ABC is typically applied to products already in production; some of the ABC system data, however, is useful for target costing.

A new product's product design phase governs the majority of its life-long costs during the mature phase of its life-cycle cost management. The mature phase refers to the period in which the product is in the marketplace performing at its peak potential. Assurances are made using various techniques that the eventual product costs are economical after the product is released into production. An increasingly popular technique to achieve a profitable outcome is called target costing. Target costing occurs at the very beginning of a product's life cycle. Organizations cannot wait until a product has been launched and enters the production phase of its life cycle to reveal the cost impact of earlier design decisions. A nickname for target costing is "profit by design." It is only after the new product is in production that other cost management techniques, like continuous improvement, are applicable.

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EXECUTIVE SUMMARY

- *As product life cycles shorten and consumer demands for customization escalate, predetermining costs and profit margins across a product's life cycle becomes increasingly important.*
- *Ideal selling prices and expected profit margins determine a product's allowable cost. Often, supplier quotations exceed allowable cost, and the burden is placed on the supplier to close that gap.*
- *ABC data helps suppliers and product designers translate product features into future product costs.*

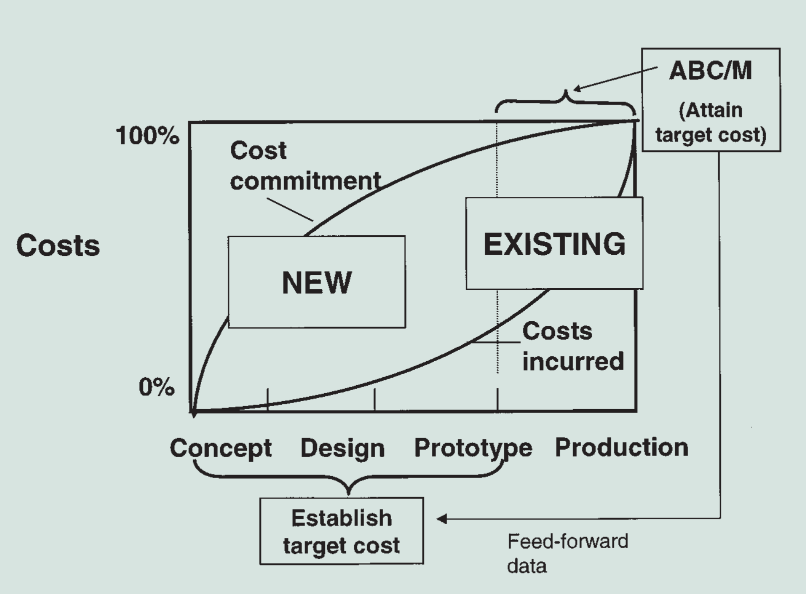
ABC has been popular for linking how products, channels, and customers affect the organization in terms of employee time and expenses. It is typically computed for ongoing operations where work is recurring in varying amounts. But ABC data has substantial input into target costing when equipment and machines are thought of as doing activities—just like people. By using time-equivalents based on the ways a product's unique features consume a machine, ABC provides cost rate tables. These tables were the foundation of target costing, a Japanese innovation.

Other techniques that support target costing, such as value engineering and quality function deployment (QFD), can also be linked to ABC data. This article, however, will focus mainly on target costing and ABC.

NEW VERSUS EXISTING PRODUCTS

The Internet has shifted the balance of power from suppliers to consumers, and firms that do not understand how to aggressively

EXHIBIT 1
Reducing the Costs of New and Existing Products



manage their costs to achieve acceptable profits will be at risk. To manage costs requires cost modeling techniques and relevant data. Expense recognition is accounting, whereas costing is modeling.

Exhibit 1 describes how the majority of a product's eventual costs are baked into its design, and highlights the divide between future and existing products.[1] The words "new" with "future" are used interchangeably with regard to products. Exhibit 1 also reveals that the ABC data—mainly perceived as a cost management tool only for existing products—also has feed-forward utility to assist in managing costs for future products.[2]

The following two sections clarify the divide between new products and existing ones.

New Products

As the pace of competition accelerates, new-product innovation must outpace product obsolescence. New products account for an increasing percentage of a company's near-term future sales and profits.

After the product is launched, the best that the operations people can do is to minimize unfavorable cost variances from the product's typically high standard cost and to apply process improvements. Accomplishing those results relies on cost management techniques used on the other side of the divide.

Existing Products

Managing the cost of existing products is actually code for being more efficient or clever with the processes that make the product or deliver the service. In some cases, unfortunately, managing these costs involves engineering and product design changes that are much more costly to effect after a product has been launched than in the preproduction phase of the product's life cycle.

Historical managerial accounting, with ABC being its most practical approach, provides data used not only to focus but also to provide trend feedback to see how well the organization is doing relative to prior changes to processes and policies. But the ABC data also provides feed-forward data for product designers during the product development phases that involve target costing.

After a new product or service line is launched, the potential to reduce costs from the product's perspective rapidly falls (see Exhibit 2). Costs can be eliminated from the production process, but there may be less opportunity for relative cost reduction opportunity in this stage.

As a result of the growing awareness of extended supply chains, it is no longer possible for companies to traditionally view themselves in isolation. That is, suppliers should no longer give their product designers free reign during product development, then take the resulting product's costs, and mark those costs up with some added profit margin. The company must work backward from the forces of the market and consumer preferences. They are the ultimate drivers of demand and revenues. With target costing, a supplier can work backward to determine the new product's most desirable cost, based on customer and competitor factors.

TARGET COSTING VERSUS ASSIGNMENT COSTING

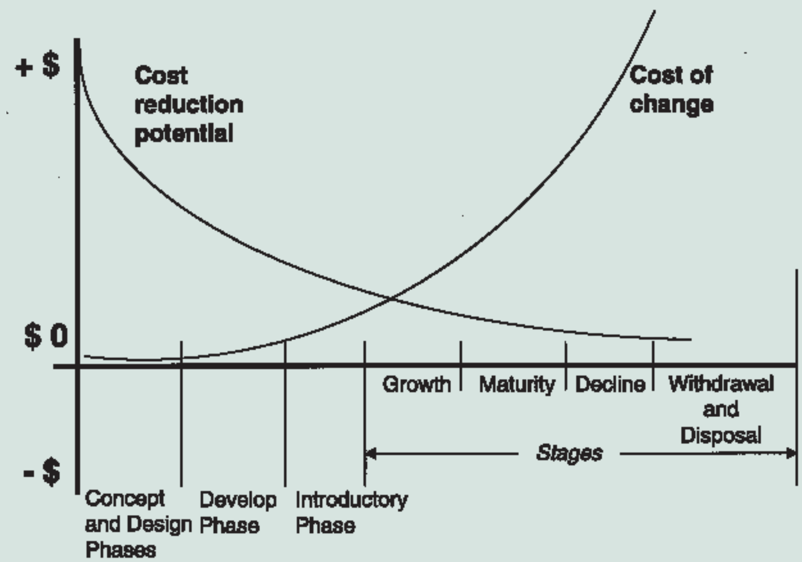
Ideally, prices should be linked to the sensitivities of customers and the market. Too often, marked-up costs are computed to ensure an adequate profit margin. Target costing begins, not ends, with what an appropriate price should be; that is, it is price-based, not cost-based and, therefore, offers a substantial improvement over cost-based pricing. Some of the best applications of target costing are by Japanese manufacturers.

In Japan, cost management is the responsibility of engineers, not accountants (which, ironically, is where the responsibility historically was located in North America, at the beginning of the Industrial Revolution). Japanese manufacturers treat costs as a symptom, not a cause or a solution. They embrace them as important clues for tackling problems or seeking opportunities.

Target costing begins with the assumption of the customer's ability to pay, and works backward from the customer's preferences. That is, target costing begins with market-based pricing, independent of cost, for desirable product features, functions, and quality. Because earning a profit is a given purpose for a company, a planned-for target cost becomes a calculated number that the operating costs cannot exceed once the product design is released. In contrast to this approach, manufacturers in most countries outside Japan usually first design and produce their products, then calculate a cost-plus markup to determine a selling price that assures an acceptable profit margin. Salespeople then hope that there is still a sufficient market for the product or service at that potentially high price. The per-unit profit margin may be assured but not the sales volume.

Target costing presumes that costs are best managed during the concept and design phase, when the design engineers can be restricted to stay within company means to develop a marketable product. By excelling in strong and stable designs, the engineers are effectively committing the product's ongoing costs up front in the product's life cycle. Costs are intrinsically created during the new product or service development phase. That is, target costing makes costs an input to the design process, not an outcome of it.

EXHIBIT 2
Cost Reduction Potential Versus Effort



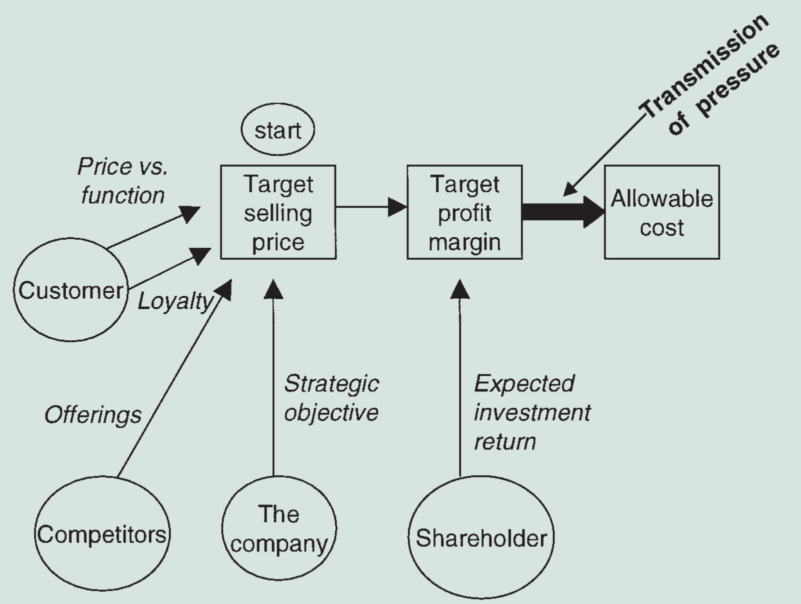
In effect, the majority of a product's recurring production costs are factored in prior to production. Experience has shown that it is easier to design costs out of a product than to figure out how to eliminate them after the product enters production. Product life cycles have become increasingly shorter as a result of rapid improvements in technology and competitive forces. Simply consider the short life of a laptop computer or semiconductor chip. Compared to previous decades, less room remains for on-the-factory-floor improvements in product cost and quality.

Time lag exists between designs about product design and their eventual impact on the recurring operating costs. Cost causes and cost occurrences are separated by time. Essentially, the operations people are dealt their cards from the product designers, and must make the best out of what may be a lousy hand. Sometimes, the production people can only, at best, try to minimize the unfavorable standard cost accounting variances that result from high product-design costs that were already baked into the product.

Additional unplanned costs are usually introduced prior to production. Without stable designs, the frequency and intensity of engineering design changes will generate excessive costs later in the product's life cycle. In Japan, cost management begins with target costing. Each supplier for components is also informed of the product's specifications and the price that it can charge. The supplier must creatively design its component in a way that both meets the product specifications and provides some return on profit and investment for the supplier's owners. After the product is in production—as an existing product—the Japanese rely on methods of kaizen as their form of continuous improvement to further drive costs down.

In contrast, other countries focus on managing the production personnel to reduce costs. Generally, production and operations face a

EXHIBIT 3
Market-Determined Allowable Costs for New Products



predicament: they can only slightly decrease costs, by introducing some level of efficiency; but they cannot substantially reduce costs outside the constraints of the predetermined product (and associated process) designs. The next place that production personnel look for lower costs is to extract a lower purchase price from their suppliers. Price pressure steamrolls back to the lowest tiers of suppliers.

In Exhibit 1, the ABC data is applicable without question during the mature phase of the product's life cycle, where the work is recurring. Some of the ABC data, however, is also useful during the design and development phases (see Sidebar).

Some examples follow:

- Cost rates that are effectively calibrated in historical ABC reporting can be used to extrapolate costs in the design of new products. This is the feed-forward link from ABC to new products, and is sometimes referred to as "same-as except-for."
- In some circles, applying ABC for costing the components that comprise products has been called feature-based costing. The product's design features govern the amount of cost usage. The future unit cost of a new printed circuit board, for example, might be estimated based on the number of holes punched, number of board levels, and so forth. The unit cost for each hole punched and for each board placement will likely have been derived in the historical ABC system. In effect, the time-dimension activity driver has been converted into an equivalent related to the product. This is sometimes referred to as cost rate tables.

In these ways, the ABC data, which is so powerful in the recurring phase of a product's life cycle, can also be leveraged in the up-front product design phase. In short, target costing is a technique to manage the future profits of a company. It achieves this by applying discipline in the product development phase of a product's life cycle.

DETERMINING A MAXIMUM ALLOWABLE PRODUCT COST

The allowable product cost that target costing will use to influence the designer's behavior consists of two factors: the selling price and an acceptable economic profit.[3] The first factor primarily considers customers and the second considers the financial returns expected by shareholders and investors. Exhibit 3 illustrates the elements and sequence of thinking that yields an allowable product cost.

DETERMINING THE TARGET SELLING PRICE

Setting a product's price is the critical initial step that drives the target costing process. The selling price takes into consideration three main players: customers, competitors, and a company's senior management. Senior management's important contribution is to define and adjust the strategies.

Customers

Understanding a customer's perceived value of a product or service as well as their attitude for purchasing things from you is key. Customers are usually unwilling to pay a higher price than in the past unless they perceive a change in the new product's function. In short, the objective is to design a product to sell at its target price and achieve the planned sales volume.

Competitors

Customers are shoppers, and as earlier described, the Internet is providing them with capabilities

Feature-Based Costing with ABC

THE PRESSURE IS ON THE PRODUCT

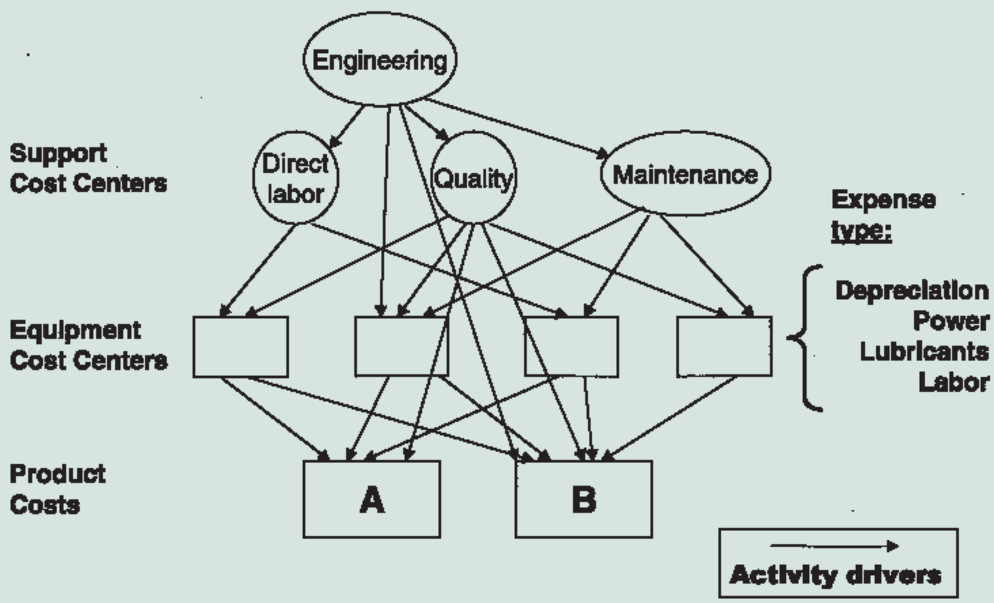
The power of target costing is its ability to apply pressure in a feed-forward mode in the design phase, as opposed to a feedback mode in the production phase. Feed-forward techniques concentrate on a more economical design, whereas feedback techniques are intended to achieve more effective and efficient make-and-deliver processes.

The demands of making existing products and service lines draws on people and machines. Within the context of the target costing framework, where the customer and market forces place pressure on product design, which places pressure on components, the component-level costing comes third—and last. The component-level target costs identify how much the producer or service provider is willing to pay for the components or services that it purchases.

COST INCLUSION: WHAT COSTS ARE ATTRIBUTABLE TO THE PRODUCT?

Feature-based costing focuses on work activities of equipment. Recall that people and machines perform activities. People operate equipment, and equipment makes products. A key term associated with marginal-costs analysis is relevant costs—include only those expenses that are affected by a change. In product cost analysis, there is always the issue of which costs to include as part of a product's cost. ABC is very inclusive, particularly in defining the cost center from which product-related costs will be traced. ABC not only captures the equipment's direct production costs, such as the laborer, electrical power, and lubricants; it can also include support expenses unique to each machine, such as maintenance, quality management, and material handling. Another product-related cost center, apart from equipment, is research and development.

To estimate the costs of new products, choices must be made as to how much, if any, of the indirect costs to include. What changes in expenses are attributable to different designs of a new product? The answer determines what costs to include or not. The exhibit illustrates the two aspects of costs that must be considered: which support functions and which types of expenses within each cost center (applicable to the support cost centers, too).



Feature-Based Costing with ABC—Continued

The rule for estimating product-related production costs is to minimize the number of indirect cost centers and categories to be included for costing, while at the same time carefully considering the planning horizon. In the end, the inclusion and exclusion of various expenses as costs is judgmental. Ideally, the complexity of the ABC model should be minimized such that the activity expenses share the same cost driver. Feature-based costing does not involve support work as much as it involves the intimate relationship between the product and the machine that produces it. Feature-based costing, however, draws on the same aforementioned principle about event-driven assignment of costs. This relationship is now addressed.

ACTIVITY-DRIVER SELECTION: FEATURE-BASED EQUIVALENT OF TIME

The same principles of activity-driver quantity measures used in ABC apply here, but with a twist. Instead of using machine hours as the activity driver to transmit components' usage or "rent" on the equipment costs, the driver assignment is now thought of as a feature equivalent rather than time based. It is a conversion of the time measure to "make" the component (e.g., number of seconds or number of minutes) into the types of features that require the time. The process step and the item of equipment remain the same, only the cost assignment basis changes with a substitution. Take a simple printed circuit board, for example. Assume that printed circuit board AAA requires 60 holes to be punched and three passes of the same board through a treatment device. The traditional costing method, which is based on a component's routing, is time based. This printed circuit board might have this cost:

Hole-punching Time = 6 Minutes
Board-treatment Time = 12 Minutes

For the month, the hole-punching machine may have cost $100,000 and processed 8,000 minutes worth of many diverse boards, or $12.50 per minute as the activity-driver rate. Similarly, the board-treatment machine may have incurred a cost of $400,000 and had 40,000 minutes of board work, computing to $10.00 per minute.

Given that board AAA component's hole-punching standard requires six minutes, the cost to make it computes to $75.00 (6 minutes x $12.50 per minute). Similarly, the board AAA component's board-treatment standard requires two minutes, computing to $120.00 (12 minutes x $10.00 per minute). If the unassembled product had only these two components, the product cost without any indirect support costs, would be the sum of $195.00 ($75.00 + $120.00).

DESIGNING NEW PRODUCT BBB

This is mindlessly simple. Assume that the product design engineers want to release a new design for the printed circuit board BBB that is a variation of AAA. BBB requires 30 holes punched and four passes of the board through the treatment device. What might be the cost of BBB for these items? It is a straightforward calculation, if we also know the activity quantities based in outputs, not just time.

Assume that we multiplied the unique number of holes punched for all of the product volumes for all of the printed circuit boards for the same month that experienced 8,000 minutes. Presume that number to be 80,000 holes. That equates to $1.25 per hole ($100,000 / 80,000 holes). Similarly, presume that there were 10,000 boards passed through the board-treatment machine for the 40,000 minutes. (Remember that different boards require a different number of passes.) That equates to $40.00 for each board-pass ($400,000 / 10,000 board-passes).

Now, board AAA can be recalculated based on feature quantities rather than time. The same answer of $195.00 will be reached:

Hole-punching = $75.00 (60 Holes x $1.25 per Hole)
Board-passes = $120.00 (3 Passes x $40.00 per Pass)

Feature-Based Costing with ABC—Continued

Now, however, the activity-driver rate is based on a component feature, not on time. The projected cost of the proposed new board BBB can be computed as $185.00, using the feature-based cost rates and the quantity of the feature driver:

Hole-punching = $25.00 (20 Holes x $1.25 per Hole)
Board-passes = $160.00 (4 Passes x $40.00 per Pass)

POTENTIAL FEATURE-RATE ADJUSTMENTS

It is best to not to treat these types of rate-based costing too simplistically. Average costs per component during a considerable time period—perhaps years—are assumed during the product's mature span of its life cycle. Capacity constraints and the step-fixed cost function that could impact the cost rate if the decisions made with this data required any idle capacity to be included are also ignored.

Periodically, a new design may involve a new process, which may entail purchasing new equipment with different speeds and different expenses. Then, it would be necessary to replicate the ABC cost assignments as if the new, not the existing, equipment were in place.

Also, if new processes and equipment are to be used with the new product design, the indirect costs will likely be affected. A manual inspection, for example, might be reduced or eliminated. These activity costs would need to be adjusted in the complete analysis of the total product cost.

ASSEMBLY AND INDIRECT COSTS

The costing exercise was restricted to only the components independent of the assembly and indirect costs. The same ABC principles, however, are applicable.

For assembly, similar cost rate concepts as for components can be applied.

and automated services to more effectively shop and compare. The selling prices and perceived value of competitor alternatives and even functional substitutes (e.g., plastic instead of glass) must, therefore, be considered.

Strategic Objectives

An individual product or service line should not be sold in isolation of other strategic objectives that a company is pursuing. The company may be attempting to gain market share, for example, in anticipation of a knockout future generation product. As another example, if the company desires to project a high image of its technologies and employees with its products and services, higher prices may strengthen that image.

In a new twist, companies are increasingly adding services to their products or base-service lines to differentiate themselves from competitors. As marketing approaches become more refined, ABC becomes an essential measurement tool to plan for and understand the cost and profit margin impact of the suppliers' value-added (or unbundled) service offerings. For our purposes, determining the target costing-derived maximum allowable cost and setting the selling price is one of the anchors from which we calculate backward.

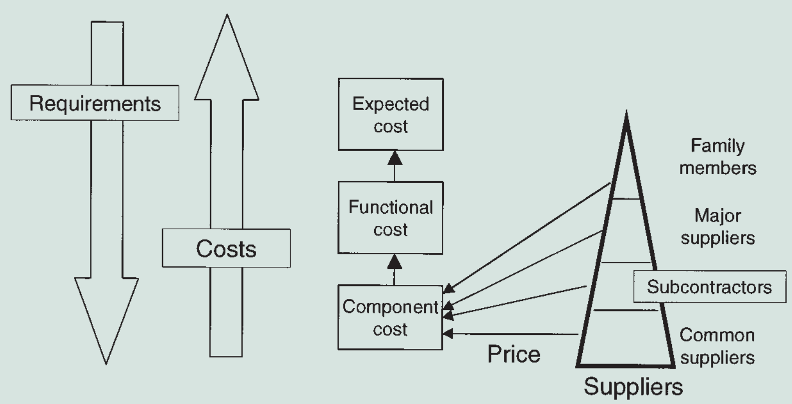
DETERMINING THE TARGET PROFIT MARGIN

The other key determinant to setting the target price is the target profit margin. Exhibit 3 shows this as the middle box required to determine the allowable cost. The idea here is to set profit margins to satisfy the profit expectations of both the company and its investors or owners.

Similar to the complexities involved in setting prices, no easy ways exist to translate the increasingly changing measures of shareholder return expectations into product profit margins. Advanced companies have moved beyond the financial metric of net operating profits after taxes to free cash flow. They use indicators that also include the cost of capital as a resource expense. There are two approaches to stipulate the desired investment return:

1. Baseline experiences.
2. Capital budgeting using life-cycle analysis.[4]

EXHIBIT 4
New Products—Costs Sum Up



Baseline Experiences

One approach to establishing profit margins for existing products relies on examining the actual profit margins of existing predecessor products and then making adjustments to those margins. This is analogous to evaluating the performance of an investment portfolio based on a composite average rate of return from the portfolio's high and low performing stocks.

Capital Budgeting Using Life-Cycle Analysis

Another approach that requires more analytical effort occurs when there is substantial up-front investment or if the selling prices and product costs are expected to significantly change during the life span of the product. When large capital investments are involved to release a new product, the target profit margin must be high enough to recover these costs over the life of the products that use the investment. Life cycle models should be constructed and tracked with plan-versus-actual data, to allow for midstream adjustments that could be severe enough to lead to a cut-your-future-losses decision to terminate the product. ABC calculates cost for each time period in a format that can be applied to inter-period life cycle cost reporting. The credibility and utility of life cycle reporting is reduced when tracking these expenses on a general ledger system–this is intraperiod reporting. Compounding this problem are complex accounting accruals, poor company memories, and classic misallocation of support expenses. ABC resolves these deficiencies.

CALCULATING THE ALLOWABLE PRODUCT COST—A CAUTION

At some point, using any of these approaches, or alternate ones, the target selling price and target profit margins are eventually established. After that job is done, the maximum allowable product cost can be calculated as the net difference as shown in Exhibit 3. Now the critical rule is to never tolerate expected costs—those that will actually result from building the design—to exceed the maximum allowable costs.[5]

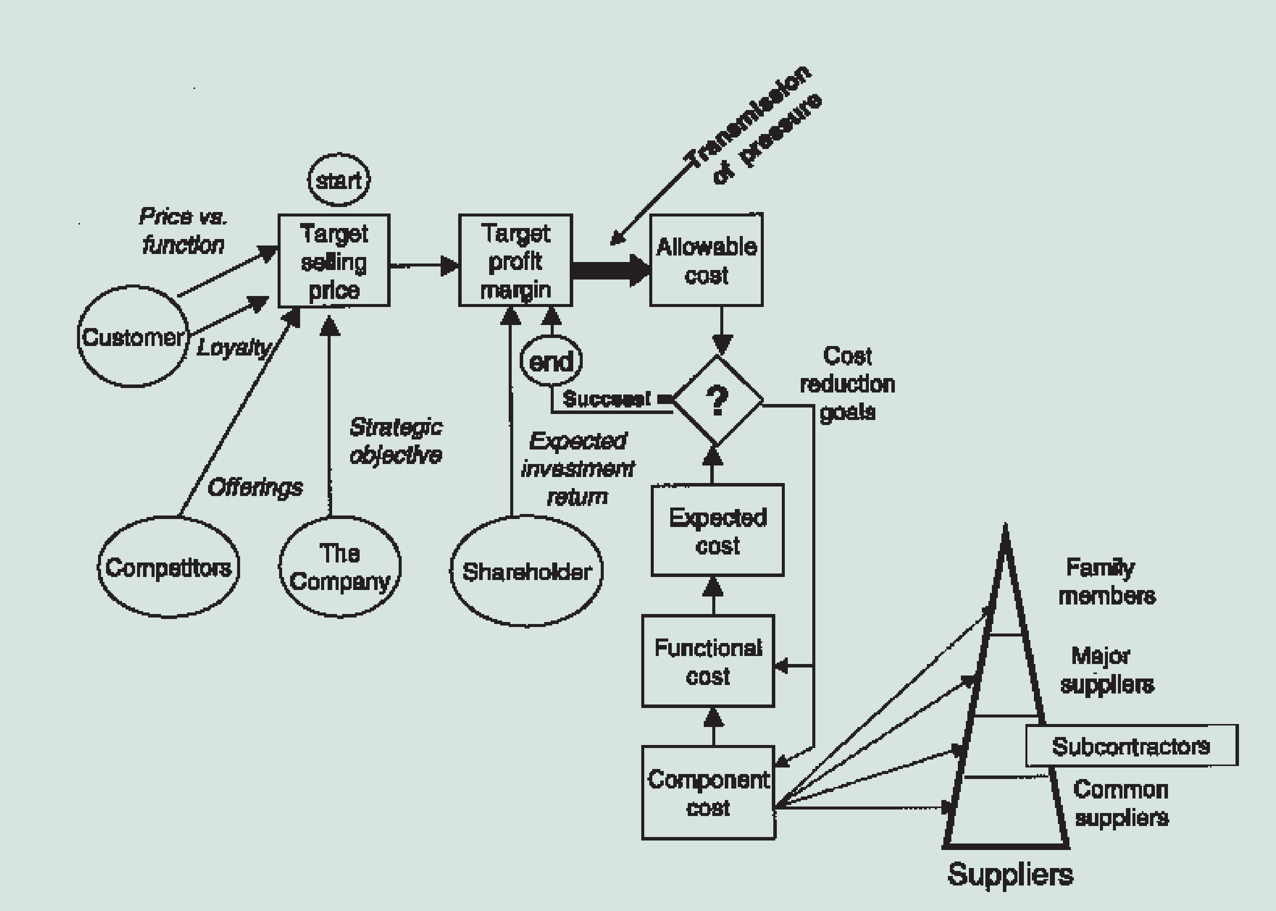
Note in Exhibit 3, the words "transmission of pressure." This is why maintaining a discipline of not having expected costs exceed maximum allowable costs is key. The consequences adversely affect both the future of the company and destroy the wealth of its investors. With any amount for which an unfavorable cost excess results, two undesirable outcomes will occur:

1. **An increase in price so that the profit margin can be maintained.** This step immediately erodes sales volume, because the optimal sales-price combination was predetermined in the target costing process. The sales volume decline drops to the bottom-line.
2. **Investor dissatisfaction.** Consideration for the investor's option to invest in risk-free financial instruments, such as money market funds, was already included when the target profit margin was set. Anything less is usually thought of as signal to divest.

In practice, however, expected costs will usually exceed the predetermined allowable cost. That is, the sum of the design efforts initially comes in overweight. The allowable cost does not usually reflect the capabilities of the company coupled with those of its component suppliers; therefore, attaining the target cost would initially be unachievable.

But the world does not end with that predictable outcome. In effect, the amount of cost reduction required to close the gap is identified and quantified. The real power of target costing then kicks into gear. Certain costs can be focused on and managed. In short, calculating the maximum allowable cost represents the cost that the

EXHIBIT 5
Target Costing Pressures on New Products



product or service line must produce or deliver if it is to achieve the target profit margin when sold at the target price. The maximum allowable cost is a critical measure, because it serves as a beacon and loudspeaker to employees and even to the company's suppliers (as we will see next) involved in the target costing process of the amount of cost reduction to be achieved. As an oversimplification, target costing is as much a technique for profit management as it is for cost management.

Let's now look at what determines, and is included in, the expected cost.

UNBRIDLED DESIGNERS AND SUPPLIERS

Left to their own devices, the product and service-line designers, often influenced by the marketing people, would likely come up with a product that is sure to be above the maximum allowable cost. A similar situation applies to the process designers, who must comply with the specifications handed down by the designers. The process people cannot afford to make the product with their existing assets and capabilities. This is why target costing has evolved. It is the harness to prevent runaway cost build up. Exhibit 4 illustrates the cost build-up, and is combined with the target costing illustration in Exhibit 3 that determined the allowable product cost.

In a loosely managed product or service-line development process, the product and service-line designers take their cue from the marketing research people. The marketing people presumably combine two areas of research:

1. Ascertaining the wants of their customers and prospects.
2. The company's strategic goals for specific additional types of customer and market segments desired in the future.

Like artists, the designers and process engineers brainstorm to create innovative ideas. Without restrictions, the enthusiasm to freely design cascades down to the component suppliers who are part of the company's extended supply chain. A company does not want to stifle this sometimes out-of-the-box thinking, but it must ensure that the designers' energy stays within the cost parameters determined by the requirements of the company's profit-minded investors.

Exhibit 5 combines Exhibits 4 and 3 so that the maximum allowable cost comes face-to-face with the expected cost. An unbridled design process will lead to expected costs that exceed the targeted costs. This outcome is not to be unexpected. After all, the allowable cost is derived from external factors (i.e., customers, investors, and competitors), and is computed independent of the internal design and production capabilities of the company.

The if-then diamond-shaped symbol in the flow chart in Exhibit 5 is where the cost reduction goal setting process kicks in. The dashed lines are the transmitted forces that cascade downward toward, and into, the component providers (i.e., internal or external suppliers), in the form of revised specifications and other information exchanges.[6] Ideally, as cost reductions are realized—whether they are product, component, or process-related—the gap narrows to zero. Then, the target cost is successfully, and finally, reached.

Going forward, the transmission of pressure from the buyer to the supplier will be an exciting area. Traditionally, the relationship between buyer and supplier has been adversarial, where the buyer, if in a position of power, demands price concessions, which can lead to financial trouble for the supplier and, hence, purchasing woes for the buyer. Today, a more preferred choice is collaboration—the key term in value chain management. Emerging software and information technology tools—many of them Internet based—that facilitate rapid and accurate exchanges about product designs among the participants in the value chain. This is sometimes referred to as collaborative product definition management (CPDM).

CPDM was preceded by product data management (PDM). PDM solved problems of computer-aided design file management. As technology evolved, the scope expanded beyond design engineering departments to include change control and configuration management. The Internet greatly facilitates real-time, synchronous collaborative work efforts involving teams of people widely dispersed across networked organizations. This broadened scope is simply an evolutionary step in the value chain's ability to deliver product features that have already been envisioned to consumers. But it greatly slashes the time-to-market for those who can do it well. Advances in supplier integration and communications as well as each enterprise's business management software (e.g., ERP) turns PDM into CPDM.

ABC provides key cost data to assure the 'target' in target costing is attained. Traditional cost allocation schemes have been excessively simplistic leading to flawed answers. As the margin for error gets slimmer, ABC becomes a crucial methodology for cost assignment. ■

Notes

1. Robin Cooper and Regine Slagmulder, *Target Costing and Value Engineering* (Portland, OR: Productivity Press, 1997), p. 49.
2. Cooper and Slagmulder, 59.
3. Cooper and Slagmulder, 104.
4. Cooper and Slagmulder, 100-101.
5. Cooper and Slagmulder, 122.
6. Cooper and Slagmulder, 140