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## Using Predictive Accounting to Improve Product Management

by James A. Brimson

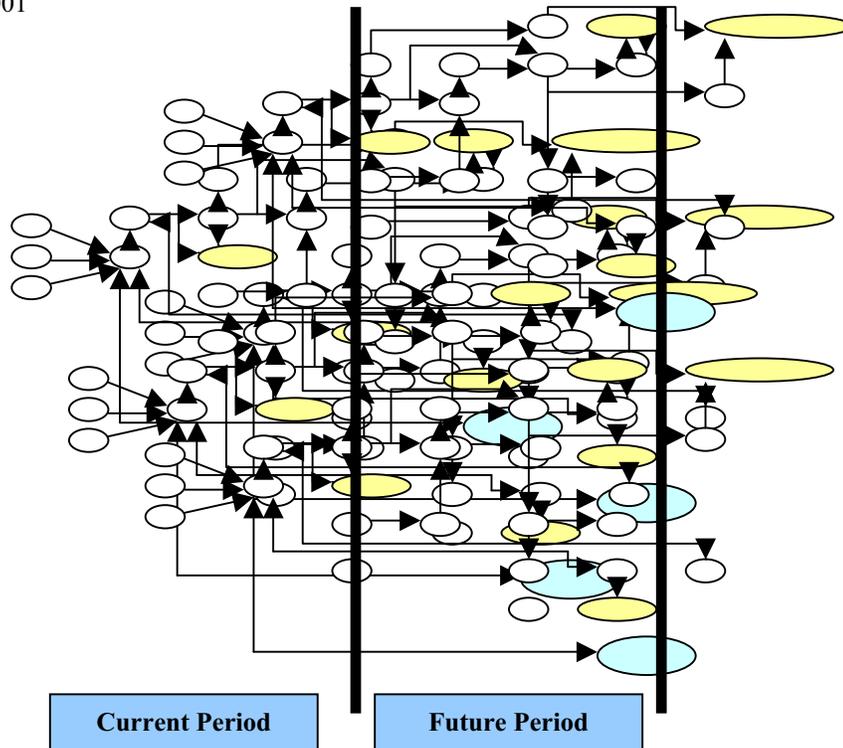
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A common objective of many organizations is to bring new products and services to market sooner than the competition, at a lower cost, and with superior quality. The role of the product management process is to plan and manage the value-creation potential and the value realization of products. To create value for customers, companies have to properly manage their product or service line. Product design must be synchronized with manufacturing to ensure that the proper capabilities and capacity are available. The sales process must sell the targeted product mix at the targeted sales price in the targeted quantity. Then, once products are in production, the production and delivery processes must be continuously modified to provide the capability and capacity necessary to meet product performance targets with minimal process variation from the target.

Predictive accounting, which is founded on process management, seeks to close the books for *next* month—that is, to focus management reports on what is *expected* to happen rather than on what happened last month. Organizations that have implemented activity-based costing (ABC) have laid a good foundation to support predictive accounting, but much work remains to convert many ABC systems to a predictive accounting system.

Predictive accounting is founded on the observation that events have a sequence—certain events precede and other events follow. At any point in time, certain events have already occurred that will largely dictate the upcoming short-term events. In other words, the seeds of the future have to a large degree already been sown. Products have a set the sequence of events. By placing several executions of a product production process on a time phased graph (see below), we can observe that much of the work to be accomplished during the upcoming period has already been set in motion by earlier events. Predictability does not depend first and foremost on forecasting—rather it depends on an understanding of the sequence of events and the statistical probability of the resulting financial impact.

This relationship of events has dramatic implications to accounting. Accountants want facts and “hard” numbers to report. Accountants do not like the subjectivity inherent in forecast and projections. Predictive accounting relies on hard facts about the relationships among events. It relies on the hard facts that underlie statistical analysis. Under predictive accounting, the accounting profession has a basis to take perhaps its most significant leap forward by increasing the relevance of reported



financial information—by managing upcoming events rather than reporting past history. But product management is essential factor in making this leap.

The process of delivering a product or service from concept to market is a key element in creating *value*—that is, the excess of what a customer pays for a product or service (cash inflow) above the cost of the processes necessary to deliver the product (cash outflow). The total value is determined by the competitive advantage the organization creates with its product offering. Competitive advantage can be created in many ways. Chief among these are superior product features, low cost, image differentiation, and first-class customer service.

The product management process begins with the setting of *target costs* to determine the features of the product or service, its performance attributes, and prices that best meet customer needs. The products or services must then be designed so that they provide the lowest life-cycle cost (as measured by ABC systems) while also satisfying the performance targets.

### **Product Management in the Product Introduction Phase**

Customers' perceptions of an organization depend largely on its product and service offering. Products help shape a company's image. Rolls Royce clearly has a different image than Toyota. What a customer is willing to pay for a product or service—and in what quantity (cash inflow)—depends on the standing of the product in its market niche.

The product introduction process also has a dramatic impact on the second element of value creation: the cost of the processes necessary to deliver the product

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(cash outflow). It has been widely observed that over 90 percent of a product's life-cycle costs (that is, the costs required to conceptualize, evaluate, market, design, prototype, test, produce, deploy, operate, support, evolve, retire, and manage a product or service) are locked in by decisions made during the product introduction phase. Therefore, front-end planning is required to capitalize on opportunities to create value.

The product management process must provide the information needed for the product introduction team to make sound decisions in light of the cost implications. The effectiveness of the product management process is measured by its ability to meet targets for cost, quality, and cycle time. Enter a multitude of tools and techniques, including ABC, design to cost, concurrent engineering, quality function deployment, target costing, the balanced scorecard, and others.

Each tool by itself should help the product management team improve its process for product introductions. Yet most product introductions continue to be plagued by missed schedules and cost overruns. So why do we continue to have problems in spite of these powerful tools? The answer is the lack of a unifying bond. The techniques are implemented independently of each other and managed by separate functions. Thus, for example, the engineering group implements a design-to-cost system. Where do they get the cost data? They build cost tables using parametric cost data. Yet ABC data is more powerful and easier to maintain. Ask an engineer about ABC, and he (or she) refers you to the accounting department

## **Target Costing**

Target costing determines the cost that can be incurred, yet still allow the company to earn the profit it requires from a product. What distinguishes target cost from other costing tools is that it bases product cost primarily on market factors and only secondarily on internal cost factors. Cost targets are established using the following procedures:

- ⚡ Set a market-driven price and anticipated sales volume.
- ⚡ Determine customer requirements, which involves agreeing on the product features and performance specifications.
- ⚡ Evaluate competitive offerings.
- ⚡ Establish a profit margin that is acceptable to the management team.
- ⚡ Determine a target cost by calculating the difference between the market-driven cost less the profit margin decreed by management. (Target cost considers product cost to be the independent variable rather than sales price or profit margin.)
- ⚡ Use ABC to determine the existing cost structures.

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- ⚡ Use process variation reduction, value management, and other cost reduction techniques to ensure that unnecessary costs are eliminated to achieve the target cost.

Note that target cost is derived from market factors, not from a company's own internal costs. An actual product cost is determined using ABC. The target cost and actual cost are then compared. Significant variations are resolved by evaluating cost and revenue trade-offs, then changing product features or performance specifications. Finally, the organization should work diligently to achieve the target cost as the product goes into production.

## **A New Vocabulary**

World-class organizations need to develop a new vocabulary that everyone in the organization shares. It should be a vocabulary based on processes, because every organization and function performs processes. The key process tools that form the basis of the new vocabulary include ABC, target cost, feature management, process variation, performance targeting, and perpetual planning.

Features will describe products and services. Performance targets will be set based on the features desired by customers. Accounting will provide up-to-date activity cost information on an enterprise-wide basis. ABC will provide activity cost by products, services, features, and customers. Process performance targets will be set and monitored. Process variation will be continually scrutinized. Improvement teams will reduce process variation and improve the process to meet performance targets. Yearly budgeting will be replaced with key event-driven planning. Value creation and realization will become a management centerpiece.

## **Determining Customer Requirements**

Several critical factors affect the ability of product-management processes to create value, but the most important one is undoubtedly determining customer requirements. Customer requirements should be stated in terms of product features and performance targets.

There is a hierarchy of product features and performance attributes that contribute to customer satisfaction. Customers expect basic features and performance targets. These include fundamental capabilities that must exist be present to meet the essential operational, safety, and reliability needs. Failure to meet these basic requirements leads to customer dissatisfaction. For example, coal must have a minimum level of BTUs to provide the heat required. If a product fails to satisfy a customer's basic expectations, dissatisfaction results.

The next higher level of features and performance attributes is optional but helps differentiate products among competitors. The success or failure of a product normally depends to a great extent on this bundle of features. Customers often make purchase decisions based on these differential features. By contrast, features that have minimal

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value to a customer merely drives up cost. Examples of differentiating features include the number of gears on a mountain bike or the type of tire on a racing bike.

“Excitement features” are innovations that, as far as most customers know, cannot even be achieved within the existing technology. This is important, because even seemingly minor innovations can represent major competitive advantages if customers perceive that they add superior value. (An example would be a new lightweight metal on something heavy.)

### **Activity-Based Costing**

ABC is a method for measuring an organization’s cost of activities and assigning them to products, services, or other cost objects—to anything, in other words, for which knowing the cost might prove useful. For example, who are the profitable customers? What channels of distribution are most profitable? ABC helps answer these questions.

ABC is based on the observation that *activities* trigger the consumption of resources recorded as costs in the accounting system by the various functions. Activities are performed in response to customer demands for products or services. Activities in an organization are first identified, and then the resources needed to perform those activities are assigned to calculate an average cost for each activity.

Activities, in turn, are assigned to products and other cost objects based on their usage. The total cost of a product is the sum of the costs of the activities required to bring forth, sustain, and retire the product. The cost of an activity for a product is defined as the average cost of the activity times the number of times the activity is required for that product.

ABC provides a far more accurate portrayal of cost than traditional cost methods. Given a better understanding of cost, management can make better decisions, thus gaining a competitive advantage. An improved understanding of cost can also be used to improve performance by eliminating activities that provide little value.

### **Voice of the Customer**

One of the first steps in the product management process is to determine the product features and performance attributes that satisfy customer needs. Marketing research starts by determining customer needs in an identified market segment. These customer requirements are often referred to as the “voice of the customer.”

Stating customer needs in terms of features avoids the common problem of general, vague terms, because it is difficult to develop a product design without a detailed definition of the requirements. For example, a customer requirement for a bicycle might be “good ride over mountains.” This requirement is stated in terms of product features: mountain bicycle and performance specifications for a good ride. These attributes might include the amount of human effort required per angle of grade and also ride smoothness.

## **Competitive Analysis**

Extend feature analysis to a competitive analysis, which considers the strengths and weaknesses of the product features to the competition. It uses customer and market-research surveys, customer meetings, or focus groups to compare product features against the competition. A competitive analysis does all the following:

- ≠# Identifies price points and market segments for product features under evaluation.
- ≠# Studies warranty, service, reliability, and customer-complaint activities to identify areas of improvement.
- ≠# Compares the product features of the best competitors on the basis of conformance to the targets and specifications previously established for each of the design requirements.

Competitive assessments should be used to refine customer needs. Where the product features of competitors rank high, even significant improvements in a company's own product features may offer little opportunity for differentiation, because they often only bring the product up to the level of the competition. In this case, imitation rather than innovation may be the best course. However, if competitors' product features seem vulnerable and the features in question are important to customers, technical innovation can differentiate a company's product from those of the competition and create an excitement feature. Feature management illustrates how to migrate the product management vocabulary to terms that are understood by everyone in an organization.

## **Features Management**

Feature management enables employees from different functions in an organization to understand and communicate the value-creation basis of their products (or services). Feature management defines a product by its features and relates those features to the operational processes needed to create the product and deliver it to market. The basic concept is relatively simple: Identify and group together related (or similar) features, and then assess their impact on manufacturing processes to take advantage of the existing process capability and capacity.

Feature management is a critical element in a predictive management system. A product (or service) feature is important to customers, because it determines the fit, function, use, or safety associated with the product. The future value-creation potential of a product is a function of its perceived value in the market relative to competitors, the degree of fit between the product design and the operational process capability or capacity, and the ability of sales to sell the appropriate features.

## ***Performance Specifications***

Performance specifications limit the range of components as well as the operational processes capable of producing a feature. Take, for example, the finish to be applied to a bicycle. A very rough finish, as measured in micro-inches, would be

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relatively inexpensive and have multiple possible processes available to provide the feature, including flame cut, shaper and planner, casting, mill-lathe, and saw.

However, when the finish must be very fine (32 micro-inches or less), the cost increases dramatically, and the process options become limited: The only possible processes are mill-lathe or grind. Each performance specification interacts with other performance specifications. In this example, the shape of the part would also have a significant impact on cost and potential processes. Flat surfaces would be the easiest to produce a fine surface; curved surfaces increase the cost and processing time.

The lesson to be learned from feature management is that product features, coupled with the performance specifications, are critical elements. They fix in place the perceived customer value while simultaneously limiting the potential production processes and locking in the cost. The goal of product management is to evaluate the trade-offs between (on the one hand) the customer-defined features and performance specifications and (on the other) the cost of delivering the feature.

### **Role of Requirements**

The role of requirements in creating value is a double-edged sword. A product's value-creation potential is directly related to how effectively an organization determines its customer requirements, including customers' unspoken needs. Value can be maximized only when the product introduction team properly assesses customer needs and competitive products. However, requirements also constrain the product management process. Requirements limit the design and processing options. Where there is a constraint on the system, there is an associated cost to the constraint.

Unfortunately, constraints come not only from the customer requirements but also from the management team that controls the product management process. Constraints imposed by management, whether explicitly or implicitly, have a far greater impact on competitive advantage than those imposed by customers. In the past, these constraints have largely been ignored. The challenge for the product management process is to recognize and model these constraints as they relate to competitive advantage.