

ACTIVITY BASED COSTING

Concepts and Significance

16593

S.N. MAHESHWARI & SUNEEL MAHESHWARI

Costs are used in budgets for planning and control. They are also used for resource allocation and for evaluating profitability of products and services. The paper highlights the fact that though traditionally companies competed on the basis of cost, the emphasis now is on service, quality and flexibility as well. As a result accounting costs *per se* are not a source of competitive value. The authors, therefore, recommend Activity Based Costing as it offers better information for decision making, provides an inbuilt flexibility in the system, identifies causes of cost, sources of non-value added and thus serves as a superior tool for decision making by accounting for even non-financial information regarding quality, flexibility and value to customers.

I

Why Product Costing is Important

It is pure common sense that to sell a product, a manager/company needs to know the cost of the components which goes into the product. Every strategic decision like research for new product design, new product introduction, and amount of efforts expended on trying to market a given product line will be influenced by the anticipated cost and profitability of the product. Conversely, if product profitability appears to drop, the question of discontinuance will be raised. Product cost can also play an important role in setting prices, particularly for customized product with low sales volume and without readily available market prices.

II

Product Cost Guides Future Strategy

Availability of the distorted information can make the firm follow inappropriate and unprofitable strategy. For example, the low cost producer often achieves competitive advantage by servicing a broad range of customers. This strategy will be successful if the economies of scale exceed the additional costs, and diseconomies of the scope caused by producing and servicing more diverse product lines. If the cost system does not correctly attribute the additional costs to the products that cause them, then the firm might end up competing in the

Dr. S.N. Maheshwari is Reader, Deptt. of Commerce, Shri Ram College of Commerce, University of Delhi, Delhi.

Mr. Suneel Maheshwari is currently employed with Dalmia Cement (Bharat) Ltd., and is entrusted with the Costing, Budgeting and Fund Raising functions.

segment where the scope-related costs exceed the benefits from larger scale production.

III

Are The Present Costs Right?

The costs are right if the cost system is reflecting true cost on continuing basis, which is critical to good decision making. Today's costing systems are like the Cadillacs of the late 1950's. They clearly met the needs of customers of that era. Forty years later, however, there has been a major change in the competitive environment. This change has given us a new view of how to design, produce and market an automobile. Today the 1950's Cadillacs seem garish and excessive. When costing system becomes obsolete and is not flexible enough to change with the changing conditions, it may be possible, due to inadequate costing information, that the functional manager drops even those product lines which are in fact profitable.

A few indicators of an obsolete costing system are:

- i) Reliability on the central cost system appears to be low and departmental cost systems come into existence.
- ii) In a highly competitive market a firm is able to maintain high contribution/profit margins.
- iii) Special teams are visiting the department to estimate cost for special order. These are some of the indications that existing system is not right.

IV

Existing Costing System –What is Wrong

Costs are used in budgets for planning and control, and they also are used to evaluate both the profitability of the products and the effects on profit of resource allocation decisions. Relying on cost to evaluate the consequences of manager's decisions succeeds if cost is the primary determinant of profitability.

The limitations of the existing cost system can be elaborated as follows :

(i) *Full Costing v. Variable Costing*

In a full-cost system, fixed production costs are allocated to products so that reported product cost measures total manufacturing costs. In a variable cost system, the costs are not allocated and product cost reflects only the marginal cost of manufacturing. Academic accountants and economists have argued in favor of variable cost as they are relevant for decision making. However accountants in practice report full costs, as (they feel) variable costing definition assumes that product decisions have a short term horizon, typically a month or a quarter. Hence in practice the manager rejects this short term perspective, because the

decision to offer a product creates a long term commitment to manufacture, to market, and support that product. Given this perspective, short term variable cost is an inadequate measure of product cost.

(ii) *Two-Stage Allocation System*

A typical manufacturing organization follows a two stage allocation system. In the first stage costs are assigned to cost pools (cost centers); and in the second stage costs are allocated from the cost pools to the products. According to Cooper & Kaplan, "the companies use many different allocation bases in the first stage to allocate costs from plant overhead account to the cost centers. Despite variation in allocation basis in the first stage, however, all companies use direct labor hours in the second stage to allocate overhead from the cost-pools to the products." The use of direct labor to allocate the overhead even when automation is on increase, on the face of it, does not sound logical. Moreover labor works on different products, and so it becomes difficult to assign even that cost effectively. The impact of labor cost oriented accounting approach was that it appeared:

- i) direct labor is expensive and should be removed from the product
- ii) product redesign is costless
- iii) products made to specifications cost the same as high volume products.
- iv) option and accessories may be offered with little impact on cost.

The result was that profit margins shrank on high volume products and low volume products appeared, to be more profitable. Managers in companies, selling multiple products, started making wrong decisions based on distorted cost information. Most companies realised the problem only after their competitiveness and profitability had suffered.

(iii) *Multiple-Base Allocation*

With the realization that overhead allocation as a percentage of labor is erroneous, managers started using multiple allocation bases simultaneously: labor hours for those costs that vary with the number of labor hours worked, machine hours for those costs that vary with number of hours the machine is running, and material dollar for those costs that vary with the value of the material in the product (e.g. the higher the material in the product, the greater the material handling costs associated with the products are likely to be).

Multiple allocation base gave a better picture, but could not take into account many other costs that vary with the diversity and complexity of the products, and not by volume.

Complexity and Its Impact

Initially companies competed on the basis of cost. Today emphasis is on service, quality, flexibility and cost as well. Diversity in product was not such a dominant feature in the 50's as it is now. The cost which varies with the output can be traced to the product, but with diversity, some costs do not vary with volume but with the product-mix. A plant which has to produce one single product in one single run can allocate its costs to the product, but with increase in number of products, the number of runs, the purchase, receipts, material handling work-load will rise. Traditionally costing system tends to classify these long term costs as fixed. Allocation of these and many other non-volume related costs gave distorted cost figures, because the allocation of these costs were based on volume. These distortions became more prominent as the Japanese entered the US market and priced their products substantially below the prevailing market price. The Japanese were able to capture significant market share with limited products and were seen as a threat to the entire US automobile and electronics market. What was the secret? It was simply the elimination of non-value added activities.

Prior to the 1970's companies competed on the basis of cost. Today's companies must compete on quality, flexibility as well as cost. However management accounting fails to help companies achieve world class standards of quality, flexibility and cost, when it encourages them to manage cost. Accounting costs per se are not a source of competitive value. Only the activities that consume resources have the power to add value. Moreover, no activity necessarily adds 100 per cent value all the time. Cost accounts record results of non-value activity in categories such as scrap (a sign of excess), inventory (a sign of delay) and overtime for end-of-period production spurts (a sign of unevenness). But cost information about scrap, inventory and overtime does not pinpoint activity that adds no value. Eliminating delay, excess, and unevenness removes wastes and makes activities more competitive. Let us look at a familiar example of managing set-up cost. The traditional way to manage set-up cost is to produce in batch sizes that spread set up cost over as many units as possible, but not over so many units that the cost of storing output in excess of current consumption becomes prohibitive. Unfortunately the set up cost and storage cost of the 'optimal' batch size are taken for granted, even though they add little value to the customer. Thirty years ago Toyota set out to curtail set up time, and by reducing the set up time, reduced economic batch sizes and eliminated the need for inventory. Reducing batch sizes and eliminating inventory removed major causes of defective output and improved quality. Moreover by reducing economic batch sizes, Toyota reduced turnover time and became more flexible. In short, the company improved quality, flexibility, and most simultaneously by managing waste in activities and not by managing cost. This shows that virtually all the activities of a company are related, and exist to support the production and delivery of goods and services.

VI

The Concept of Activity Based Costing

In order to understand the concept of Activity Based Costing let us take an example of a bicycle manufacturer who gets many parts of a bicycle from other small ancillary units. XYZ Co. supplies pedals to this bicycle manufacturing co. When the pedals are received in the factory they are counted, and inspected for quality. They are then sent to stores, where the storekeeper counts them to ensure that he is accepting the correct quantity. When the pedals are issued to the production they are counted once again. Alongwith the consignment of pedals two copies of invoice are also received. One copy is sent to the accounts where it is checked. The quantity is confirmed to accounts by the inception department, which receives the other copy of invoice. Accounts department reconciles the quantity and amount with the Purchase Order. After taking into consideration any rejects, and verifying the quantity from purchase order, payment is made. In case there are more than one supplier, the same process would be repeated.

In the above example, even if the counting of pedals is done two more times it is not going to add any value to the final product, as far as a consumer is concerned. However, from the costing viewpoint although counting does not add any value to the product, it will involve cost in terms of use of labor and material handling equipment. Similarly, inspection of material and processing of invoice also involves cost. Activity Based Costing (ABC) will take into account costs involved in all activities which results in increases of cost. This implies costing will be done at the activity level, under the ABC approach.

In the above case, the number of orders placed with the different suppliers is one of the causes of increasing cost. The other cause can be the procedure adopted in the organization. Similarly, the number of production runs undertaken drives up production, scheduling, inspection, material handling and set up costs. Also other transactions like despatch of goods would drive up the cost of despatch department. These causes or reasons which have an impact on overhead costs, have been termed as cost drivers by Cooper & Kaplan. Understanding the nature of cost will help one to understand whether a particular activity is adding any value to the product or not. This will help us to identify non-value added activities.

In the bicycle manufacture example, counting of pedals does not add any value to the final product. This non-value added activity should be eliminated. With an objective of eliminating non-value added activities the management may decide that for a particular model of bicycle they will place order for pedals with one supplier only. Payment to that supplier will be made based upon the number of bicycles produced. Since two pedals are used for each bicycle, it would be easy to relate quantitative supply of pedals to the final model/product. This decision can eliminate the need of inspection on receipt, counting on receipt in factory, counting in stores and during issue of material for production.

Thus by identifying the activities and their causes it would be possible to

correctly account for the cost of product and also eliminate the non-value added activities. The elimination of non-value added activities would drive down the cost of product. This in essence is Activity Based Costing. ABC has been successfully adopted by many Japanese corporations and now many U.S. Corporations are following suit.

Objectives of the ABC Costing

- * Activity based costing provides a greater analytical cost information regarding the product in order to have better information for decision making.
- * Provides an inbuilt flexibility in the system so that it could adapt itself to the changing environment.

Use of Activity Based Information

- * Focus on where the cost originates, i.e. the causes of the cost.
- * Accurate product cost due to understanding the cost behaviour.
- * Identifies sources of non-value added activity or wasted efforts.
- * Strategic cost information on which long term profitability decision for a product can be taken.
- * Non-financial information regarding quality flexibility & value to the customer can be perceived.
- * Improved cost-basis available both at head office and plant level for better decision making.

VII

Implementation Of the ABC System

The end result desired is achievement of excellence in all the areas of company operations. The new system will require the following steps.

1. *General Awareness:* Everyone in the company is to be made knowledgeable regarding the drawbacks of the old system and the need of the new philosophy. The new philosophy will involve people who strive for continuous improvement, elimination of waste, inventory and unevenness. The old philosophy of report control is to be replaced by on-line visual control. All this is necessary to estimate the right cost and remain competitive.

2. *Understanding the Cost Behavior:* This can be done in the following steps:

- * Chart the flow of activities throughout the organization.
- * Estimate the time spent on each activity.
- * Identify activities that add value to the customer and non-value adding activities.

- * Identify causes of delay, excess & unevenness in all activities and eliminate those activities which do not add value.
- * Track the indicators of waste and eliminate them.
- * For machines log-book can be maintained and similarly for computer resources.

3. *Initial Time-Sheet:* The activities which have been mapped out are given to all departments and everyone is made aware of the total systems view and where each one fits. Departmentwise list of activities is prepared. Every individual is asked to give the estimated time he spends on each activity. Problems are bound to arise as some of the activities cannot be measured precisely. But after discussions probably a new code can be established for the activity. The process may take about a month.

4. *Standardization Phase:* After hit and trial new department weekly time is to be introduced. At this stage, complaints regarding the new procedure will be removed.

5. *Computerization Phase:* At this time external consultants or internal EDP group may be asked to design a customized software package. The package must allow for the flexibility of adding/deleting, impact of changes in activity and so on. Costing system, as a part of it should be flexible and capable of assessing the cost reasonably accurately. A very large data base is visualized and will build over a period of time. Once the time spent on product, project is available, the expenses which are not yet traceable to a product can be apportioned on the basis of time spent on it.

6. *Management of Excess Capacity:* Successful implementation of ABC system will invariably produce excess capacity. Managers must identify and marshal excess resources if they are to save the cost associated with capacity; profits will not improve unless these costs are removed or absorbed elsewhere.

7. *Organization Changes:* Turnover will take place, role of accountants will change significantly and they will be doing more than just valuing inventory. Activities like continuous process improvement, elimination of waste and unevenness, and visual control rather than remote report control, will become part of the organization culture.

VIII

Problems With the ABC Approach

- * Cost of change will be high as everything will have to be worked out from the scratch.
- * It would be difficult to correlate the marginal increase in cost with a particular cost driver.
- * Over a period of time, the ABC will tend to standardize the cost of activities related to a particular product or process. But in practice there will be differences in set up time, production run, and meeting a delivery order for the product or process, as well as for different products.

- * The ABC system will require a change due to changes associated with new products and new technology. This will put strain on the costing system and resources due to certain degree of inbuilt standardization.
- * There exists catch 22 situation in the implementation of the ABC. Measure of activity performance will change again and again. A trade-off will be required between the accuracy and time spent on replacing the existing system with the ABC.
- * The ABC is at the stage of evolution. Literature on the ABC concept at present is primarily restricted to the manufacturing environment.

IX

Conclusion

No industry standards have yet been developed but there is an emerging consensus among progressive companies that these new measures must be flexible, directly related to the manufacturing strategy, non-financial and easily understood and highly responsive to the daily production situation. The ABC is a good solution to be changing needs, but if one agrees with the limitations of ABC, than it would prove costly in the long run. The basis of the ABC is activity. In our opinion, a very fine point has been missed, that is, activity itself is a function of time. Thus in fact, the time spent will become the basis of cost. This is a very fine variation of the ABC costing. The implementation of the ABC or Time Based Costing will essentially be the same, but the implications may vary. Time Based Costing while retaining the advantages of the ABC, will take care of its limitations. For example, the time based costing will take into account the actual time taken on different runs for the same product and will not standardize the costs associated with it. Further complexity of any nature will not require overhauling the entire system; only some fine tuning will suffice.