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NORTHERN ILLINOIS UNIVERSITY

Managerial Uses of Activity-Based Costing

A Thesis Submitted to the
University Honors Program
In Partial Fulfillment of the
Requirements of the Baccalaureate Degree

With University Honors
Department Of Accountancy

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HONORS THESIS ABSTRACT

Product costs are a function of activities. Activity-based costing uses this theory to more accurately cost products. More companies are considering activity-based costing for their products. These companies have a lot of questions that need to be answered before switching their entire costing services.

There are four categories of costs that are used in determining the cost of a product. By grouping costs into these categories, companies are able to see what costs are unnecessary and should be eliminated. Activity-based costing provides for better decision-making. A manager faces many decisions about products including the “make or buy decision”. When using activity-based costing, the manager handles these decisions with ease.

After considering all factors, a traditional cost system is inferior to an activity-based costing system. Products are more accurately costed, decision-making is easier, and companies find it better to work with.

Managerial Uses of Activity-based Costing

Activity-based costing (ABC) is being adopted by more and more companies. The major reason for the growth of ABC is the benefits that ABC gives to a company. Before discussing the benefits, it is important to know what an activity-based costing system is and why it is needed.

Activity-based costing is a costing system that focuses on activities as cost objects. Managers first have to gather information about the activities performed in manufacturing a product. Managers then decide which of these activities are performed most frequently. After accomplishing this, managers assign an allocation base to each of the most frequent activities. The allocation bases that managers choose usually are cost drivers (any factor that affects costs).

Now that activity-based costing has been defined, a company's need for ABC will be addressed. Using an old, outdated costing system could lead to a lot of problems. Some systems tend to allocate manufacturing overhead by using only one base or by using an average. By only using one base, the costs of some products will be overstated and others will be understated. By using an average, the same costing problems will occur. One reason for this is that many products tend to use more of one resource than other products.

Using activity-based costing also leads to better decision-making processes because of the more accurate costing of products. For example, more accurate costing of products will lead to better cost reduction policies. The more accurate

costing will describe exactly what costs are adding value to the product and which costs should be eliminated.

We will now consider each of the above items separately to show the benefits of activity-based costing. The first is how ABC provides more accurate costing of products. The first step in the costing process is to identify the activities (cost drivers) and the costs that are associated with the activities. In the second step, the manager figures out how much of the resources each unit of product uses. For example, if the activity was set-up hours, the manager would figure out how many set-up hours each unit of a product takes. This number could be 3 hours per unit or even 10 hours per unit, if the product was complex. The manager would then budget how many units of each product would be produced in the next accounting period. Now the manager knows how many units are budgeted to be produced and how much of the resources the units will use. For example, the product takes 5 set-up hours per unit produced and there are 20 units budgeted to be produced. That means that there would be 100 budgeted set-up hours for the next period.

After determining the budgeted amount of each activity, the manager should figure out and budget the total costs associated with each activity. To do this, a manager could look at past costs compared to past units produced. After completing this step, the manager would have two numbers: the budgeted cost of each activity and the budgeted cost allocation base (for example, set-up hours). To get the cost per unit of the cost driver, the manager would divide the budgeted

cost for each period by the budgeted cost allocation base. After calculating the per unit cost of the cost driver, the next step is for the manager to determine the cost of each activity for each product. To do this, the manager would take the actual number of set-ups (or the allocation based used) and multiply it by the budgeted per unit cost of the cost driver. The manager would do this for all of the activities of the product used in the ABC system. Now the manager has determined all of the indirect unit costs. By adding the direct costs per unit to the indirect unit costs, the manager will have the per-unit product cost. This will help the manager accurately price the product.

There is another way to figure the cost of products using ABC. The manager would still use the budgeted rate for each allocation base. The difference would be that the manager would figure out the costs for a batch of a product and then divide by the total number of products in the batch, instead of dealing with everything on a per unit basis. (See Table on page 13)

The traditional system doesn't price products accurately. The traditional system does use the same costs for direct costs on a per unit basis. The change is in the way that traditional systems account for indirect costs. All of the indirect costs incurred during the period are put into an account called manufacturing overhead control, which contains all indirect manufacturing costs. The traditional system then assigns an allocation base to distribute the overhead costs to the different products. Some examples of such allocation bases are direct manufacturing labor hours or machine hours. Just like ABC, the traditional

system will budget manufacturing overhead costs for the next period. The manager of the traditional system will then divide the budgeted manufacturing overhead by the budgeted allocation base to determine the overhead costing rate used to cost products. The manager would then multiply the budgeted overhead rate times the machine hours (or their allocation base used for that period). After completing these steps, the manager would add the direct unit costs and the manufacturing overhead allocated per unit to get the total per unit cost.

There is also another way to figure the cost in a traditional system. It is very similar to the second way to figure costs in ABC. To figure the cost in a traditional system, the manager could also figure the costs of a batch and then divide by the number of products in a batch to get the per unit cost of each product. (See Table on page 13)

The main problem in the traditional costing system is that the cost of the products doesn't consider the resources that the products use. Some of the overhead resources that are used in production are allocated to products using one overhead allocation base. This causes the next problem, which is overcosting or undercosting of products. The allocated manufacturing overhead is based on an allocation base such as machine hours. Suppose there are two products, Product A and Product B. Product A uses only 1 machine hour because it is very complex and requires more manual work. Product B uses 20 machine hours and is highly automated. Most of the resources included in manufacturing overhead are caused by the production of Product A. When the overhead is allocated to the two

products, Product B will have more overhead allocated to its cost because it uses more of the allocation base. If this company then decided to change from this traditional system to an ABC system, the manager would notice a big difference in the costs of the products. Product A's cost under the traditional system would be much lower than the cost using ABC. This is due to the fact that more resources are used by Product A and allocated via the one overhead base to Product B. This is called undercosting of a product. The company probably sold a lot of Product A because it was priced cheaper than competitors from the inaccurate costing under the traditional system. Now consider Product B. Product B's price will be much higher under the traditional system than under ABC. This is because the product is highly automated and used fewer resources but used more of the allocation base. Product B would be overcosted. The company probably overcharged customers for this product and probably didn't have a large market share for Product B. Using ABC, the manager was able to see the costing errors and was able to more accurately price the two products.

Another reason that managers tend to use activity-based costing is that it usually allows managers to reduce costs more efficiently. One way in which this is accomplished is through the cost hierarchy that ABC uses. The cost hierarchy consists of four different cost types. The first cost type is unit-level costs. This includes any cost that is associated with each unit made such as direct materials and direct labor. The second cost type in this cost hierarchy is batch-level cost. Batch-level cost are costs to run an entire batch. This includes cost such as set-up

costs and material handling costs. Product-sustaining costs are the third type. These costs include product design and engineering change cost plus all other costs that deal with the product as a whole. The last cost in the cost hierarchy is facility-sustaining cost. These costs are costs associated with the manufacturing facility such as rent and insurance expenses.

Grouping costs into these four cost types makes it easier to figure out where to make the reductions. Most cost reductions take place in the batch-level and product-sustaining cost pools. This is because it is very hard to reduce unit-level costs such as direct materials. Most of the unit-level costs have been reduced as much as possible. However, batch-level costs have room for reduction. For example, a batch-level cost wouldn't change if you produced 1 unit or 10 units of a product. The manager then tries to figure out the maximum amount of units to produce at the lowest batch-level cost. Product-sustaining costs also have room for cost reduction. This includes costs such as design and number of parts. Trying to reduce the number of parts or finding a different material of the same quality at a cheaper price are some of the ways to reduce costs. Facility-sustaining costs often can't be reduced any further. These costs are usually fixed because they include costs such as rent expense, insurance expense, and salaries of the executives in the headquarters. In a traditional system, the manager first has to determine what costs are necessary and what costs are not necessary. After doing this, the manager would then have to find ways to reduce the costs that are not necessary.

Another way to reduce costs is to determine how the capacity is used. Activity-based costing provides managers with a measure of capacity use. By using this, the manager could figure out if there are any problems in the uses of capacity. There are two types of problems: bottlenecks (production is slow due to lack of capacity) and excess capacity. By grouping costs into activities and cost drivers, the manager could see what resources products use. The manager could also tell what resources are used the most, such as machinery, and if these resources tend to be used by just one product. The other problem is excess capacity. The cost pools could also show that some areas require fewer resources. These areas use less capacity than others, yet some have more capacity than they really need. Activity-based costing highlights such problems. By correcting these problems, the company can reduce costs associated with these areas.

Another reason why managers should use ABC is that better “make or buy” decisions can be made. Suppose, for example, that a main supplier of a certain company can’t make and ship the parts to that company. The manager of this company has two choices in his/her decision making. The first choice is to find another reliable supplier who could make and ship the required parts to the company in time for production needs. This could take time because the manager would have to find a reliable supplier and make sure that this supplier’s goods are of high quality. The second choice is for the company to make the product themselves. The manager would figure out the incremental costs of producing the parts. Using ABC would make this task much easier. The manager would only

include costs such as direct materials, direct labor, and other incremental costs. The manager would not include costs that are facility-sustaining because these costs are incurred whether or not the extra part is produced. After determining the incremental costs of producing the extra part, the manager would see which cost is cheaper. If the cost to buy is cheaper than the cost to make the part, then the manager should buy the part from another supplier. The opposite is also true. If the cost to make the part is cheaper than the cost to buy the product, the manager should make the part in the factory.

Another decision that can be made more easily using ABC is the “add or drop a line decision”. Most companies have more than one product. Sometimes these companies wonder how well their different products are doing. To determine if these different products or lines are profitable, companies can use the activity-based costing method. ABC shows the incremental costs and incremental revenues of each product. The traditional system often groups all products together. The manager of a company using the traditional system will not be able to tell if one product is doing extremely well and another product is doing poorly. On the other hand, a company using ABC will know that one product is profitable while another product is not doing so well. The manager of this company might then drop the product that is losing money. ABC could also be used to determine if a product will be successful and should be added to the company’s line of products.

After a company decides on an ABC system, employees must be trained. The accountants who analyze the cost structure need to be trained to understand the differences between a traditional costing system and an ABC system. The first step is to explain the procedural documentation. Analysts should be taught how to conduct interviews with the different department personnel to determine the appropriate activity and cost driver information. This step could be done with flowcharts or by observing the actual process.

The second step is the expense analysis. Here the analysts are taught to determine the valid activity costs and what costs really need to be reduced. Studies have shown that analysts without a cost accounting background learned quicker than those analysts with a cost accounting background. This is explained by the cost accounting analysts use and understanding of the traditional system.

To show that ABC is not just theory, the following paragraphs will give examples of companies that are currently using the ABC system. These companies have considered many factors in determining if activity-based costing is right for their company. The following examples illustrate why a company has chosen ABC and how ABC is working for them.

The first example is BT (a service organization in the UK). BT determined that the traditional costing system was very inaccurate. Most of BT's costs were sunk into a fixed network of permanent and temporary connections shared by many of their services. In the traditional system, these costs were allocated by the number of calls. This was inefficient because electrical expenses were incurred

whether or not the phone calls were made. BT determined that their fixed costs needed to be allocated by the basis of what caused them to be incurred. Special committees were set up to figure out a new costing system. These committees broke out all costs into pools with the most reasonable basis being used for the allocation. This process is the same as ABC. When BT came out with their costing system, ABC wasn't even known by many people, including BT. When determining their new costing system, BT thought of the most accurate system for their company that would also help in reducing costs.

Another example of an organization using ABC is the U.S. Department of Defense. The U.S. Department of Defense uses ABC to make business process re-engineering decisions. The first step in their process is to form a committee including representatives of all functions and levels of the business. The second step is to create a model of current processes. The committee then breaks the entire process into its various activities and calculates the cost of these activities. The next step is to focus on the activities where there is little or no value added to the process. The committee tries to eliminate as many of these costs as possible. The committee would also try to focus on ways to improve the costs and processes of other activities. The next step would be to determine possible alternatives and come up with the best recommendation. This process has been very beneficial to the Department of Defense. They already have gained approval for a medical videoconferencing application and a front-line client server system.

Valley View Hospital implemented ABC two and a half years ago. An ABC system is set up for each department of the hospital. To demonstrate how Valley View Hospital uses ABC, the costing of an operating room procedure will be presented. The overall cost of an operating room procedure includes direct supplies and direct labor along with equipment usage. The cost of a procedure would also include a portion of the overhead. Three reports are used at Valley View Hospital for documenting the cost of a procedure: the gross margin analysis activity – based costing report, the bill of activities, and specialty capital equipment (technology) costs. The gross margin analysis activity – based costing report utilizes the costing figures in conjunction with other decision-making information. The bill of activities shows the costing components that are used in the gross margin analysis report. The specialty capital equipment report presents the supporting line items for each item on the specialty capital equipment directly associated with a certain procedure. Management uses the three reports in four areas. The four areas are performance evaluation /measurement, strategic planning, managed care contract negotiations, and managed care contract management.

The U. S. Postal Service hired Coopers & Lybrand to conduct activity-based costing studies of its key revenue collection processes and market strategy. This action was taken in response to USPS's position in the marketplace. USPS competes with many companies such as Federal Express and United Parcel Service. USPS decided that some things need to change in order to keep up with

some of their competitors. They decided to create a credit/debit card service. Coopers identified the costs and grouped them into unit, batch, and product sustaining activities. They also conducted product pricing and profitability analyses of the new program. Coopers' study revealed hidden and indirect costs for each payment activity. Cooper recommended that USPS use a three-phase strategy to implement the new program. The program that USPS wanted to implement would not have been as successful if USPS didn't hire Coopers to conduct the activity-based costing survey. USPS would not have known about the hidden costs and probably would have thought that the cost of the system was greater than it actually was.

There are many benefits that ABC can give to a business. An activity-based costing system is not only beneficial but also needed by many companies. ABC provides better decision making and a more accurate cost of products. Without ABC, a company could overstate prices and lose customers. The company would also lose money from the undercosted products. If a business wants to make better business decisions, the company should switch to an activity-based system that gives the company more information. After weighing the benefits and costs of switching systems, most companies will switch to an activity-based costing system.

Activity Based Costing Approach

	Product X		Product Y	
Direct costs:				
Direct materials	\$ 9,700.00		\$ 59,900.00	
Direct labor				
\$30 x 25; 375	\$ 750.00	\$ 10,450.00	\$ 11,250.00	\$ 71,150.00
Indirect costs:				
Materials handling				
\$0.40 x 500; 2,000	\$ 200.00		\$ 800.00	
Lathe work				
\$0.20 x 20,000; 60,000	\$ 4,000.00		\$ 12,000.00	
Milling				
\$20.00 x 150; 1,050	\$ 3,000.00		\$ 21,000.00	
Grinding				
\$0.080 x 500; 2,000	\$ 400.00		\$ 1,600.00	
Testing				
\$15.00 x 10; 200	\$ 150.00	\$ 7,750.00	\$ 3,000.00	\$ 38,400.00
Total manufacturing costs		\$ 18,200.00		\$ 109,550.00
Number of units		10		200
Unit cost per product		\$ 1,820.00		\$ 547.75

Traditional System

	Product X		Product Y	
Direct manufacturing costs:				
Direct materials	\$ 9,700.00		\$ 59,900.00	
Direct manufacturing labor				
\$30 x 25; 375	\$ 750.00	\$ 10,450.00	\$ 11,250.00	\$ 71,150.00
Indirect manufacturing costs,				
\$115 x 25; 375		\$ 2,875.00		\$ 43,125.00
Total manufacturing costs		\$ 13,325.00		\$ 114,275.00
Number of units		10		200
Unit cost per product		\$ 1,332.50		\$ 571.38

*Taken from Cost Accounting: A Managerial Emphasis
problem 5-35

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