



UNIVERSITI PUTRA MALAYSIA

**A CASE STUDY OF
ACTIVITY BASED COSTING FOR
HOTLINE FURNITURE MANUFACTURERS SDN. BHD**

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ACTIVITY BASED COSTING FOR
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BY

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ABSTRACT

Activity Based Costing, a new costing method to compute costing for a product in a more appropriate way compared to Traditional Cost Accounting in this new manufacturing environment which is capital intensive. The significant different between Activity Based Costing and Traditional Cost Accounting is overhead absorption basis. Activity Based Costing charge out manufacturing overhead based on activity that related to the production whereas Traditional Cost Accounting charge out manufacturing overhead based on the production volume of the product. In this competitive market where consumer demand for high quality product with low price, Hotline Furniture Manufacturers Sdn Bhd has no other choice to implement more appropriate costing system to ensure that the factory price its product which can be compete in the market. However, at this initial stage, Activity Based Costing were only applied to one of the sales contract that going to be taken by the Company. As the Company has to decide whether to take up the sales contract, costing for the product under the sales contract was undergone a costing review. By implementing Activity based Costing method, the Company might decide to take up the sales contract worth USD2.0 million as the product price has been over-priced for the past.

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1.0. Introduction to Activity Based Costing

“Activity Based Costing is a technique to quantitatively measure the cost and performance of activities, resources and cost objects, including when appropriate, overhead. ABC captures overhead costs for the factors of production and administrative expenses, and applies them to the defined activity structure. ABC is a process of simplifying and clarifying decisions required by the process evaluators and senior management using activity costs rather than gross allocations.” (Gerald Boltin, ABC Guide Book, 1995)

Activity Based Costing (ABC) is a costing system that absorb indirect manufacturing overhead to a specific product based on the activity involved in producing the product. As far as indirect manufacturing overhead is concern, it was incurred not directly to produce a product. Indirect manufacturing overhead for a manufacturer may include depreciation of plant and machinery, indirect labor such as supervisor level and above, factory utilities such as water and electricity, factory maintenance, plant and machinery maintenance etc.

As all this indirect manufacturing overhead are not traceable to product, ABC is essential here to apply a proper basis of allocation to allocate all the indirect manufacturing cost based on information gathered regarding resources consumed during the production process.

ABC is also an essential part to improve a production process. ABC measures process and activity performance, determines the cost of business process outputs, and identifies opportunities to improve process efficiency and effectiveness.

2.0. The Objective of Implementing Activity Based Costing

The major objective of the ABC process is to objectively determine a better way of doing business. It help in various business function as follows:

Decision Making

For a manufacturer, it is very important that the factory produce “correct” product which is sellable at a “correct” pricing which is not under-priced as well as over-priced. ABC helps to determine a proper pricing method to price a product. Comparison can be obtained from external source to decide whether the company should produce the product or out source the product. Company might stop producing or increase the product price if a product were identified as under-priced using ABC. These are important because if the company keep on producing the product, the company will make a loss when all the indirect manufacturing overhead was charged out to the products.

On another hand, the company can effort to reduce the product price if a product has been identified as over-priced product using ABC. If the company has foregone to produce a product due to lower product price offered by the competitor, the company might have foregone the profit making opportunity. Hence, proper pricing is vital for a manufacturer to sustain its existence in the industry. Ultimately, proper costing is vital as it provides information for the management to make decision on the pricing for a product.

Planning and Controlling

In during a planning, ABC plays an important role whereby history records on a production circle were identified and recorded. The data and information serve as very useful information for management to do the planning for the coming year on what produce is going to be produced and produce at what level. Budget purchasing and manpower planning can be determined before a new calendar year.

The planning were later used as controlling tools to monitor and control the efficiency of a production process during the year by comparing the budget with the actual performance. Corrective actions can be taken such as increase product price whenever the increase in cost is identified rather than wait until end of the year when profit and loss accounts were generated.

Stock Valuation

Performance of a company is represented by its Financial Statement. As stock is part of the Balance Sheet items and it also effect the Profit and Loss accounts, it is very important that stock were valued properly. Generally, a manufacturing company tents to have high inventory level which include raw material, work-in-progress and finished goods.

As far as work-in-progress and finished goods are concerned, absorption of indirect manufacturing overhead is very important. The higher the absorption of the overhead, the higher is the profit of the company. By having a proper costing system for the stocks using ABC, the company Financial Statement will reflect more accurate performance of the company.

3.0. The Comparative Advantage Of ABC Over Traditional Accounting Methods

Most current established accounting systems normally capture and distribute resource costs by one of the following methods:

- Overhead element
- Budgetary account
- Traditional cost accounting with direct and indirect cost allocation

Each of these methodologies has advantages and disadvantages, which have met the past needs of the organization. Yet, every one of them fails to meet the full requirement for management information that occurs as the result of a redesign of the organization or any part of the organization. ABC is a more representative distribution of resource use since the cost allocations are based on the direct cost drivers inherent in each of the work activities that make up the organizational structure. ABC applies resource use directly to the output products and services based on the actual work activities of the process that produces the output with limited arbitrary allocations of indirect or overhead costs.

3.1. Organization Element Accounting

This accounting system identifies each of the organizational elements of the traditional bureaucratic structure and applies the identifiable costs of that element accordingly. Though overhead costs are sometimes applied, it is more common to find that these costs are ignored at the unit level. The indirect costs are usually captured with no attempt to subdivide further.

In many traditional organizations, the only costs that are identified to the organizational elements are the direct salary costs. This system was created to provide management with information on the costs of organizational elements, but was never intended to define the output costs either at the element or organizational level. This model is totally inadequate for making decisions on output variations. There is no application of costs to the ultimate output, activities or process flows of the organization.

3.2. Budgetary Accounting

The weakness of budgetary account is very similar to that of the organizational element. Historically, company has been most concerned with ensuring that their total expenditures not exceed the allocated budgetary resources. Consequently, accounting systems became a safeguard mechanism to capture expenditures, normally divided by organizational element to enable tracking of budget execution.

The major objective was to fully use the resources assigned rather than enhance productivity or to reduce expenses, because any attempt to conserve resources led to a reduction in the future budget resource level. Like organizational accounting systems, there was no attempt to cost output or in most cases to even define output.

3.3. Traditional Cost Accounting

Traditional Cost Accounting has been widely used by most of the manufacturers to allocate the indirect manufacturing overhead. It uses volume-related measures to allocate overhead. Volume measures include production volume, direct labor hours or machine hours. This cost

accounting can only accurately allocate resources that are consumed in proportion to volume such as direct material, direct labor and machine related costs.

However, it unable to allocate non-volume related costs like supporting activities which is unrelated to volume. Hence, indirect overheads were absorbed based on assumption that products consume resources in proportion to volumes. This has resulted in over-priced or under-priced of products.

3.4 Comparison of Traditional and ABC system

From the explanation on Traditional and ABC system, it was noted the following differences on the Traditional method and ABC:

Based For The Cost Center

When determine a cost center, traditional method will identified a cost center based on production volume. For ABC, cost center was identified based on the activity in the process.

Number of Cost Center

Traditional method has fewer cost center compared to ABC. Normally, labor hours and machine hours were being used as cost center for traditional method. For ABC, cost center was identified when cost is incurred at certain point of process. Normal allocation basis for ABC are cost driver such as number of set-up, number of purchase order, labor hours and machine hours.

Allocation Basis

Traditional method are volume based compared to activity based for ABC. Overhead has to be absorbed by all the product equally regardless the activity involved. Whereas ABC charge overhead to a product based on activity related to generate the product. Cost drivers used for allocation are those mentioned early in the cost center.

Overhead Cost Per Unit

As traditional method uses volume based of allocation basis, higher volume product will have to bear the same amount of overhead compared to low volume product. This problem will not exist if ABC method is used. For ABC, low volume product will have to absorb more overheads per unit than high volume product. This might due to lesser set-up cost per unit for high volume product compared to low volume product.

3.5 An Illustration Comparing ABC and Traditional Costing Systems

ABC Furniture produces two types of chairs i.e. Nikko Chair and Frisco Chair. Both are produced on the same equipment and use similar processes. The chairs differ by volume. Nikko Chair is a high-volume product while Frisco Chair is a low volume product. Details of production are as follows:-

| | Machine hours per unit | Direct labor hours per unit | Annual output (units) | Total Mac. Hours | Total direct labor hours | No. of purchase orders | No. of set-ups |
|--------|------------------------|-----------------------------|-----------------------|------------------|--------------------------|------------------------|----------------|
| Nikko | 2 | 4 | 1,000 | 2,000 | 4,000 | 80 | 40 |
| Frisco | 2 | 4 | 10,000 | 20,000 | 40,000 | 160 | 60 |
| | | | | 22,000 | 44,000 | 240 | 100 |

The overhead costs are RM440,000 but has been further analysed as follows:

| | |
|--------------------|---------|
| RM | |
| Volume-related | 110,000 |
| Purchasing-related | 120,000 |
| Set-up related | 210,000 |
| | 440,000 |

Traditional volume-based costing system

| | |
|-------------------------------------|------------------------------------|
| Total overhead costs | RM440,000 |
| Overhead rate per machine hour | RM440,000 / 22,000 hours = RM20 |
| Overhead rate per direct labor hour | RM440,000 / 44,000 hours = RM10 |
| Cost per unit Nikko | RM40 (2MH@RM20 or 4DLH@RM10) |
| Cost per unit Frisco | RM40 (2 MH@RM20 or 4DLH@RM10) |

Total cost allocated to products

| | |
|--------|-------------------------------|
| Nikko | 1,000 units X RM40 = RM40,000 |
| Frisco | 10,000 X RM40 = RM400,000 |

ABC System

| | Volume related | Purchasing related | Set-up related |
|--|----------------------|---------------------|--------------------|
| Cost traced to activities | RM110,000 | RM120,000 | RM210,000 |
| Consumption of activities (cost drivers) | 22,000 machine hours | 240 purchase orders | 100 set-ups |
| Cost per unit of consumption | RM5 per machine hour | RM500 per order | RM2,100 per set-up |

Cost traced to products:

| | | | |
|--------|-----------------------------|---------------------------|----------------------------|
| Nikko | 2,000 X RM5 = RM10,00 | 80 X RM500 = RM40,000 | 40 X RM2100 = RM84,000 |
| Frisco | 20,000 X RM5 = RM100,000 | 160 X RM500 = RM80,000 | 60 X RM2100 = RM126,000 |

Costs per unit:

| | |
|--------------------|---------|
| Nikko | RM |
| Volume-related | 10,000 |
| Purchasing-related | 40,000 |
| Set-up related | 84,000 |
| | 134,000 |

Cost per unit = RM134,000 / 1,000 units = **RM134**

Cost per unit :

| | |
|--------------------|---------|
| Frisco | RM |
| Volume-related | 100,000 |
| Purchasing-related | 80,000 |
| Set-up related | 126,000 |
| | 306,000 |

Cost per unit = RM306,000 / 10,000 units = **RM30.60**

| | <u>Traditional Costing</u> | <u>ABC costing</u> | |
|---------------|----------------------------|--------------------|-------------|
| Nikko | RM40 | RM134 | Undercosted |
| Frisco | RM40 | RM30.60 | Overcosted |

4.0 The Needs Of ABC

Traditional Cost System provides useful and simple way of overhead absorption when direct labor and material dominant factory cost. Further, the range of products manufactured is narrow.

Today, when global transportation become more convenience to transfer resources, global competition increased. Most of the production process has been automated with the purchase of high technology machinery to overcome the scarce resources problems. Moreover, customer nowadays demand for high quality of products where force the manufacturers to increase efficiency in manufacturing process.

All these improvement has caused factory overhead became higher. Relatively, indirect cost became substantial portion of a product cost rather than direct cost. The cost structure of a product has also been altered from labor intensive to capital intensive.

With the recent advent of activity accounting, it has been discovered that the traditional cost accounting methodology can create a significant difference in output cost because of the manner in which overhead costs are allocated to output rather than traced to output. This difference in distribution can skew the ultimate price of the output and lead to poor management decisions.

The ultimate decision will be probably some mixture of the two extremes into a blended action that minimizes cost and time while creating a better outcome, a better decision than that first proposed. This additional alternative is only possible because of the quantified data which is created from the analysis of

cost and activity information. The additional activity-based data improves the process and enhances the quality of the final decision.

5.0 The Steps To Implement ABC

ABC has a very definite procedural flow, a set of steps that define the performance process. It involves four stages in implementing ABC namely as follows:

- First stage : Analyse and identifying the major activities
- Second stage : Gathering and Assigning costs to activity cost center
- Third stage : Determining cost driver for each major activity
- Final stage : Assigning cost of activities according to consumption of activities.

5.1 Analyse And Identifying The Major Activities

The first major step "Analyse Activities" in the ABC process is preparatory. The name, "Activity-Based Accounting", implies that the managerial cost data cannot be applied until the activities are defined. The creation of the activity model is not traditionally considered as an integral part of the activity accounting structure, but cost allocation cannot take place without it, hence it is the first step, and therefore, necessary knowledge to the activity accountant.

In analysing activity, activity model will be identified for future reference in later stage. An activity model is a tool to assist in understanding and defining a process. The model is normally created by a project team which possesses subject area knowledge of the process

through interviews with other subject matter experts within the organization and from other available relevant materials, such as existing documents.

All the needed definitions, relationships and activity structures will be gathered from the fully documented model. This understanding becomes very critical in the later stages of ABC when costs and costs drivers are under development for each of the activities.

To analyse activity few actions can be taken to have full understanding of the activities involved. One of the actions will be examine physical plan of work place. By examine physical plan of work place, space occupied by respective machines can be identified. Workflow of the company will be identified to help identified the cost driver in later stage.

Payroll listings are also an important source to go through as it contains information about the indirect labor cost. Salary for respective department can be obtained through the payroll listing.

Finally, interview can be arranged with supporting staff to understand how a supporting department spent their time. This will be useful to determine the cost driver to absorb the cost for the supporting department.

In analysing the activity, activities which is same in nature can be merge to reduce complication. The other round, single activity can be again sub-divided into few activities if it is inappropriate to relate it to a single cost driver.

5.2. Gathering And Assigning Costs To Activity Cost Center

The second major activity of the ABC process is " Gathering and Assigning costs to activity cost center ." This means capturing all relevant expenses that pertain to the selected model and processes. It may mean capturing, constructing or synthesizing the correct cost figures to support the costing of the activities

The scope of the data required relates to the scope of the activity model and processes under review. If it is to be a full activity model of the organization, then all pertinent costs must be captured that pertain to the total structure. If it is to be a partial model, then it will be all direct costs for the selected activities plus some portion of the total overhead costs. Professional judgement will have to be applied when selecting the data and the source to be used.

Costs are usually allocated based on interviews with staff on the functions as explained earlier on. Estimates become more reliable when managers are closer to the actual work. If this cannot be accomplished, it will lead to more difficulty later in the process when costs are allocated in the activity model.

Overhead costs which were identified are divided within the organization structure and then assigned to the activities. This meshing and allocation procedure will require the full measure of analytical skill and experience. The resulting costs for each activity will represent resources used by that activity to convert inputs into outputs.

Costs which were identified for each department must now be allocated to the activity model. The process must identify the best representational costs and the most appropriate procedures for allocation. The entire flow can be broken into the following six phases:

Phase 1 - Identify organization costs

This entire phase was accomplished in the second activity step, "Gather Costs." All the overhead costs were identified and documented using various sources from within the organization.

Phase 2 - Distribute overhead costs to the organization structure

The identified costs were divided up into the existing organization structure. No attempt was made at this stage to move costs from one element to another or to individually allocate the overhead costs to the elements.

Phase 3 - Identify categories of organizational elements

Each organizational element serves one of three functions: managerial, support, or operational. It is possible to be in more than one, but this is an exception rather than a normal condition. Assignment or reassignment of costs depends on which category is selected. Not all organizational elements perform the "real" activities of the organization and would not translate into the activity model on a direct basis. By categorizing elements, it allows distribution rules to be applied and costs

reassigned to areas where ultimately they will be allocated in the activity model.

Phase 4 - Select the appropriate level of representative costs

Early in the allocation process, a critical decision must be made to select an appropriate tier of costs. This decision defines the level of effort which will be made to capture and identify the overhead costs. Each tier includes a progressively greater percentage of the total costs, but also increases the detail and complexity of the assignment and allocation process. There are advantages and disadvantages to each that need to be understood before a selection can be made.

Phase 5 - Redistribute organization costs to operational elements

The division of an existing cost to multiple organization elements does not have a simple book solution. Each type of organization, depending on its structure and mission, will face slightly different circumstances which will affect distribution decisions. Some rationale will have to be selected which represents the relationship between the cost and the elements where the work is performed. Then the selected factor will be used to divide the pertinent cost and distribute the parts to the remaining organizational elements.

Phase 6 - Allocate final distribution costs to the activity model.

The division of the final organization costs to the activity model is more of a subjective procedure, even though it is executed within rigorous controls. The procedure is substantially subjective because there is no direct objective relationship between the activity model and the

organization structure that can be observed or measured. The project team does not usually possess the knowledge and experience to decide which activities apply to which organizational elements. Therefore, the final distribution relies upon the judgement and knowledge of the operational element managers

5.3. Determining Cost Driver For Each Major Activity

The third step of the ABC process, " Determining cost driver for each major activity ", is the stage where involves a lot of judgement and creativity of a person doing the job.

Cost driver can be interpreted as the forces that are significant determinants of cost of activities. Here, cost incurred for the cost center will be allocates according to the activity related to the products. Hence, it is important that correct or proper cost driver were identified which can reflect the consumption of the cost incurred for a specific cost center.

To ensure proper cost driver were identified, few factors needed to be considered are as follows:

Valid reason to be selected.

Even judgement can be used to identify cost driver, cost driver selected must have its valid reason why it was selected. Reason given must be able to apply within general environment.

Easily Measurable

ABC is to ensure indirect manufacturing overhead allocate correctly. However, if cost driver selected is not practical to be applied or not cost

effective to be applied, then, the cost driver selected is not a good cost driver. Example of common cost driver must be easily measurable such as documents, hours etc.

Easily Obtained

Again, cost effectiveness come into picture when cost driver selected might take unreasonable time or cost to obtain its output. The best is to use the existing documents or report to determine the output of a cost driver. This will not incur additional workload or time to implement ABC.

Easily identifiable with products

This factor needs to be considered as the output of the cost driver ultimately needs to match with the respective products. For example, if the machine hours are the cost driver for depreciation, machine hours identified must be able to tell what product uses the machine. There must be a report to show the time frame for the products.

Cost of Measurement

This is a factor related to the easily measurable factor. If the result from a cost driver can be easily measurable, the cost incurred to obtain the result also low compare to cost driver that not easily measurable.

Can Capture Transactions.

As ABC is a quantitative technique to measure cost, it was proposed that the cost driver must be able to capture number of transactions generated by the activity.

Represent A Reasonably Homogenous Measure

To reduce the work load of getting results from all the cost driver, cost driver selected must have this homogenous measure. However, this compromise was done without tolerance with the accurately of the measure. Example of cost driver wish meet this criteria is number of set-up where it can be used as cost driver for maintenance cost and set-up cost by having only one measure.

5.4. Assigning Cost Of Activities According To Consumption Of Activities

This is a mathematical calculation. Using the amount of output measure that was selected in Stage 2 and the total cost of the activity that was calculated in previous parts of the ABC process.

This factor will be used to allocate the consumption of this activity to the output in a process flow based on the units of output produced or for a single cycle of the output production.

Normally, assignment of cost to product was done according to the demand for the activity. Number of cost driver consumed will be the best measurement to determine the cost absorbed by the product.

This can be done by the following formula:

$$\text{(Total overhead cost / Total no. of cost driver) x no. of cost driver consumed by the products.}$$

When total overhead cost was divided by total number of cost driver, unit overhead cost per cost driver were obtained. When it multiply by