CIPS KNOWLEDGE

Activity Based Costing (ABC)

What the buyer needs to know

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01 CPD HOURS

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1. WHY ACTIVITY BASED COSTING?

Activity Based Costing (ABC) came to prominence largely through the realisation that traditional accounting information was of limited use in assessing the effectiveness of resource allocation decisions. Rather, this traditional information is geared towards satisfying auditors or other external bodies or functions which have a particular interest in financial accountability. ABC is especially appropriate in situations where:

- Competition is strong
- Product mix is diverse in terms of batch size,
- physical dimensions, level of complexity, and raw
- material characteristics
- Product life cycles are short (three years or less)

According to some writers, one of the key issues in addressing costing issues is the traditional process for the allocation of overheads. Over time, as production processes have become more and more complex, a greater proportion of total production costs are described as 'overhead' and are arbitrarily allocated to output. The suggestion is that many of these 'overhead' costs can in fact be allocated to individual products or product groups.

Certain activities and processes consume a disproportionate amount of these activities and it is arguable that the misallocation of overhead costs can generate severe distortions in any estimates of production cost. In particular, traditional costing strategies tend to attribute too high a level of overhead to less complex products, and to products produced in high volume. By the same token they seriously underestimate low-volume, complex products and services.

Under ABC on the other hand the production process is viewed as a set of activities. Once the relationship between an activity and a product or customer has been determined, indirect costs can be more appropriately assigned to these particular products or customers.

2. SOME DEFINITIONS

ABC is defined in the book 'Purchasing and Supply Chain Management 'by C K Lysons and B Farrington as: 'A cost attribution to cost units on the basis of benefit received from indirect activities, e.g. ordering, setting up, assuring quality.'

Additionally, and endorsing the above, ABC has been characterised as 'a management tool that facilitates the improved allocation of resources, relates total cost (i.e. resources consumed) to work accomplished (outputs produced), and as such can be used to good effect in drawing up accurate financial forecasts.' It needs to be emphasised that establishing clear connections between costs and outputs is of great assistance in producing an accurate financial picture; it is obvious that costs which are visible and transparent are an essential precondition for the optimum allocation of resources.

ABC is one aspect of ABM (Activity-Based Management) which may be defined as:

A discipline that focuses on the management of activities as a route to improving the value received by the customer and the profit achieved by providing this value.

There is a distinction to be made between ABC and absorption based costing, as follows:

- Within traditional absorption costing, overhead costs are assigned to products, services, jobs or other cost objects. Overhead costs are applied in proportion to production volume
- With ABC, an overhead is applied to cost objects according to the activities and resources consumed

'Total cost of ownership (TCO) is an assessment of all costs, both direct and Indirect, involved with an item over its whole useful life. Most frequently, TCO is used at the beginning of the purchase process to evaluate which is the most cost-effective choice. When TCO is calculated at the time the choice is being made, many of the costs included will be estimates'.

In order to assess costs more accurately, detailed understanding of how resources are used in different activities is required. This is the basis of Activity Based Costing.
Once costs, for example administration costs for different grades of personnel, can be accurately established, they can be assigned to different activities, within a function.

3. SOME TERMINOLOGY

The following terms are frequently encountered in ABC environments:

- Activity - in this context, is a repetitive action performed in fulfilment of business functions, such as designing, purchasing, production, quality control, packaging and shipping
- Resource - comprises costs which support activities. The purchasing activity, for example, incurs costs for salaries and benefits, office space, computer time, travelling, training, etc. Simply stated, activities consume resources, and products (or services) consume activities
- Cost object - this can be almost anything in respect of which costs are incurred. Examples include products, services, units, batches, jobs, customers, sales territories, etc
- Cost driver - is a factor that has a direct cause-effect relationship to cost activities creating cost. Cost drivers may be two types
  - (a) resource drivers,
  - (b) activity drivers
- An activity cost centre is a segment of the production or service process for which management wants separately to ascertain the costs of the activities performed
- Direct cost inputs as a traditional costing mechanism comprise direct labour and direct material costs

An example of an ABC environment is as follows:

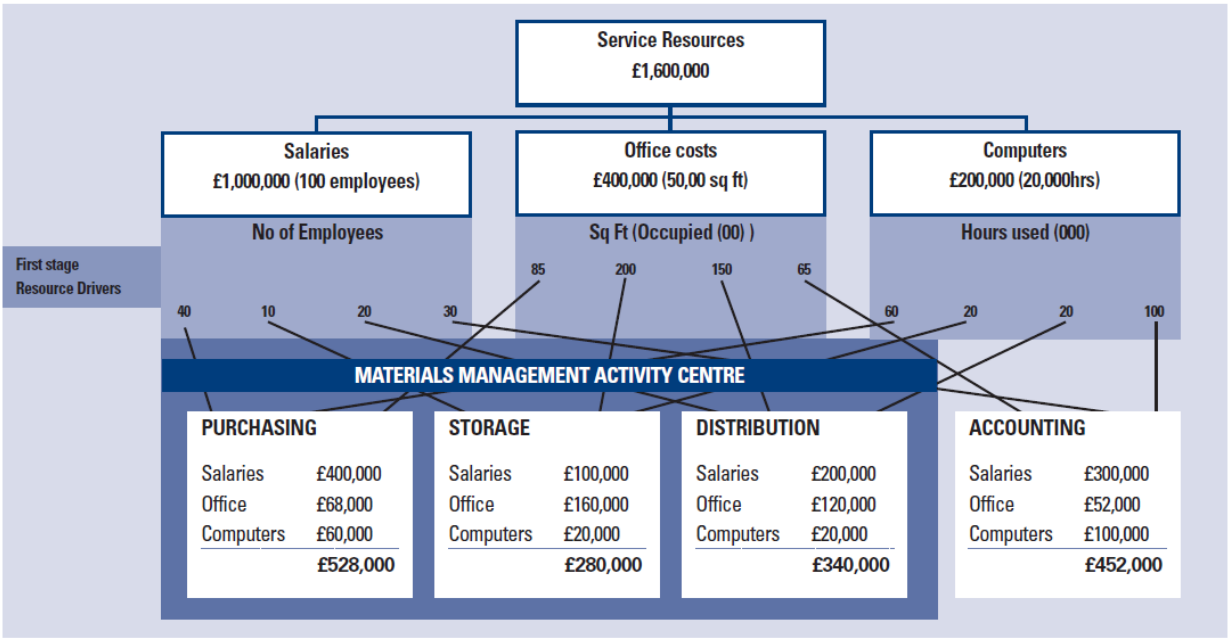

Fig1: Allocation of Service Resources to Cost Pools • Source: Adapted from Purchasing and Supply Chain Management. C K Lysons and B Farrington (Seventh Edition)

4. ACTIVITY BASED COSTING AND PURCHASING

It has been stated that purchasing is a 'key activity for using ABC' and that much of the literature uses the purchasing and supply function to illustrate the value of ABC. There are a number of ways in which it can be of value:

- The attribution of purchasing function costs to products
- The provision of information that can be utilised in relation to make or buy and resourcing decisions. At the US carmaker Chrysler for instance it is reported that the actual costs of some low volume parts were found to be as much as 30 times greater than the stated costs. This confirmed that the company would be much better outsourcing these particular parts and concentrating effort and energy on making more high volume parts
- Analysis of the TCO (total cost of ownership) of purchased items may give the buyer the information to prove what they have long suspected – 'paying more, often costs less'

  (A cross-department team at Jaguar Land Rover worked together on total cost of ownership of parts and saved €48m.)
- ABC is able to highlight procurement activities that do not add value to products, eg inspection and storage, and which activities should be cut
- ABC can assist in identifying ways in which savings in procurement costs can contribute to the competitive advantage of the enterprise, such as reducing the number of suppliers and transactions, eliminating unnecessary documentation, improving design with fewer and standardised parts
- ABC can help in monitoring the overall procurement function by regarding it as an activity centre in which all purchasing-activity-related cost pools are aggregated. This may provide data on drivers and rates which allows comparisons to be made across functions, as well as with potential external suppliers.

Additionally, ABC has the potential to make a significant contribution to TQM since costs are a key factor in any decision.

ABC and Purchasing performance

ABC is able to assist in improving purchasing performance by:

- Distinguishing between value adding and non-value adding activities. ABC management stresses that non-value adding activities must be reduced, or eliminated and replaced with those that add value. The familiar 'Just in Time' approach has similar aims in that both are focused on eliminating or reducing all wasteful activity.

- Analysing cost drivers (In ABC, a cost driver is an activity which creates a cost). ABC highlights the fact that complex products tend to engender enhanced negotiation expenses, more suppliers and purchase orders, and increased administrative costs and similar cost drivers. The following measures indicate the opportunities for cost savings through simplifying supplier driven activities:

$$\text{(a) Number of suppliers per product} = \frac{\textit{Number of suppliers}}{\textit{Number of products}}$$

Assuming 200 suppliers and 10 products this will be:

$$\frac{200}{100} = 20 \text{ suppliers per product}$$

$$\text{(b) Number of orders per product} = \frac{\textit{Purchase order}}{\textit{Number of products}}$$

Assuming 1000 purchase orders and 10 products this will be:

$$\frac{1000}{10} \text{ ie } 100 \text{ purchase orders per product}$$

Cost savings can be effected by:

- reducing the complexities of bought-out items, ie by standardisation
- reducing the amount of negotiation and the number of suppliers by the introduction of single sourcing or an approved list
- improved design using standard, simplified or fewer parts
- elimination of unprofitable products.

4. HOW IS ABC IMPLEMENTED?

A typical procedure is as follows:

- Total overhead costs for a given period are calculated either on a predictive basis from budgets, or retrospectively from departmental and general ledger records
- A project team is formed by senior management to plan and implement ABC systems. This team, normally led by the management accountant, may comprise design, production, supply chain, marketing and accounting functions

- The estimated or actual overheads will be divided into service and production categories. Functional managers will then be interviewed and questioned on such as the following:
    - What activity does your function undertake?
    - What activities are undertaken by each member of staff in the function?
    - What are the outputs of each activity?
    - What equipment and supplies are used for each activity?
    - What overtime is worked?
    - If idle time occurs, why?
      (This analysis describes what is done by the enterprise and each function within the enterprise, i.e. how resources including time and effort are spent and what inputs and outputs are involved)
- The team will then assign resource costs to activity cost centres and cost pools using first stage resources drivers as shown in fig 1 on page 4 (for the sake of simplicity, only three are shown)
- Second stage activity drivers such as number of purchase orders, deliveries made and number of items stored will be chosen. These will normally be outputs and are used to assign the cost pools to cost products
- A Bill of Activities will be prepared for each product; this enables the unit cost of each product, using ABC, to be ascertained

A similar suggested procedure is as follows:

1. Identify activities – this step requires an in-depth analysis of the operating processes of each responsibility segment. Each process may consist of one or more activities required by outputs
2. Assign resources to activities – the word 'tracing' is sometimes used for this process. Traceability is able to link costs to cost objects on order to determine why and where costs have been incurred. A suggested categorisation of costs is as follows:
    - direct – costs that can be traced directly to output; the materials used to manufacture an office desk for example
    - indirect – costs that cannot be allocated to an individual output; in other words they benefit two or more but not all outputs; in the case of the office desks they would include the maintenance costs for the machines that shape the frame, storage costs for the materials used in its construction, quality control routines etc.
    - general and administrative – costs which cannot be directly associated with any given product – these are commonly known as overheads and include for instance depreciation, security, purchasing staff salaries, etc.
3. Identify outputs – this step identifies all the outputs for which activities are performed and resources consumed by an activity or group of activities. These outputs can be products, services or customers
4. Assign activity costs to outputs – in this step, activity costs are assigned to outputs using activity drivers. These assign activity costs to outputs, based on individual outputs' consumption or demand for activities. For example, a driver may be the number of times an activity is performed (transaction driver) or the length of time an activity is performed (duration driver).

A suggested four-part categorisation of activities is as follows:

1. Facility-sustaining activities (buildings, utilities, plant management etc.)
2. Product sustaining activities (process engineering, product specifications, product enhancement)
3. Batch level activities (e.g. production equipment setups and material movements)
4. Unit level activities (direct labour, materials, machine costs, energy, etc.).

When carrying out an ABC analysis it is important to distinguish between the costs within each category and in particular to refrain from allocating facility, product sustaining and batch level costs to individual units or items.

It is important to remember that ABC is normally implemented in addition to traditional cost systems, which are required for accountability purposes. Once an organisation has taken the decision to implement ABC it must decide on the level of detail it wishes to collect, being aware that the greater the level of detail it decides to collect the higher the cost; at some point it is inevitable that the law of diminishing returns sets in.

5. HOW ARE OVERHEADS ALLOCATED TO PRODUCTS

If an ABC analysis shows that product X requires the purchase of items from twelve suppliers while product Y only involves purchasing from two suppliers it is clear that X will incur a considerable higher proportion of purchasing cost than Y. This should be reflected in the allocation of purchasing function costs to products which take place with ABC, but not with traditional costing methods.

Essentially, ABC revolves around a recognition that specific activities cause costs to rise, thus, if it is possible to isolate the activities that cause costs, it will be possible to absorb overheads much more fairly on the basis of those activities (instead of using the simple direct labour hour or machine hour method).

This key distinction has given rise to the use of the term ‘cost drivers’ discussed earlier to describe a measure of the activities performed. The Chartered Institute of Management Accountants (CIMA) simply defines a cost driver as ‘an activity which generates cost’. For example in order to manufacture certain products, a number of orders may have to be placed, the material may have to be handled several times, and the machines may need resetting. All these activities will have an effect on overheads, so it seems only fair to charge some products less for overheads than others.

For example if fewer orders are placed, materials are only handled once, and the machines do not have to be re-set. All of these activities can be described as cost drivers. In effect, instead of charging overheads to production by using one factor, ABC adopts a considerable number, depending upon how many activities can be isolated within a particular entity.

It is obviously a much more involved and costly system of achieving some control over overheads but it avoids over costing high volume products, and under costing low volume ones. This benefit arises because the cost drivers reflect the activity generated by particular products. In traditional overhead absorption, units are charged with a share of the total cost centre overheads (based on total direct labour hours or the total machine hours) worked in that cost centre. In an ABC system, if both products A and B require one set up, but A consists of one unit and B 1000, they will both be charged with the same amount of overhead.

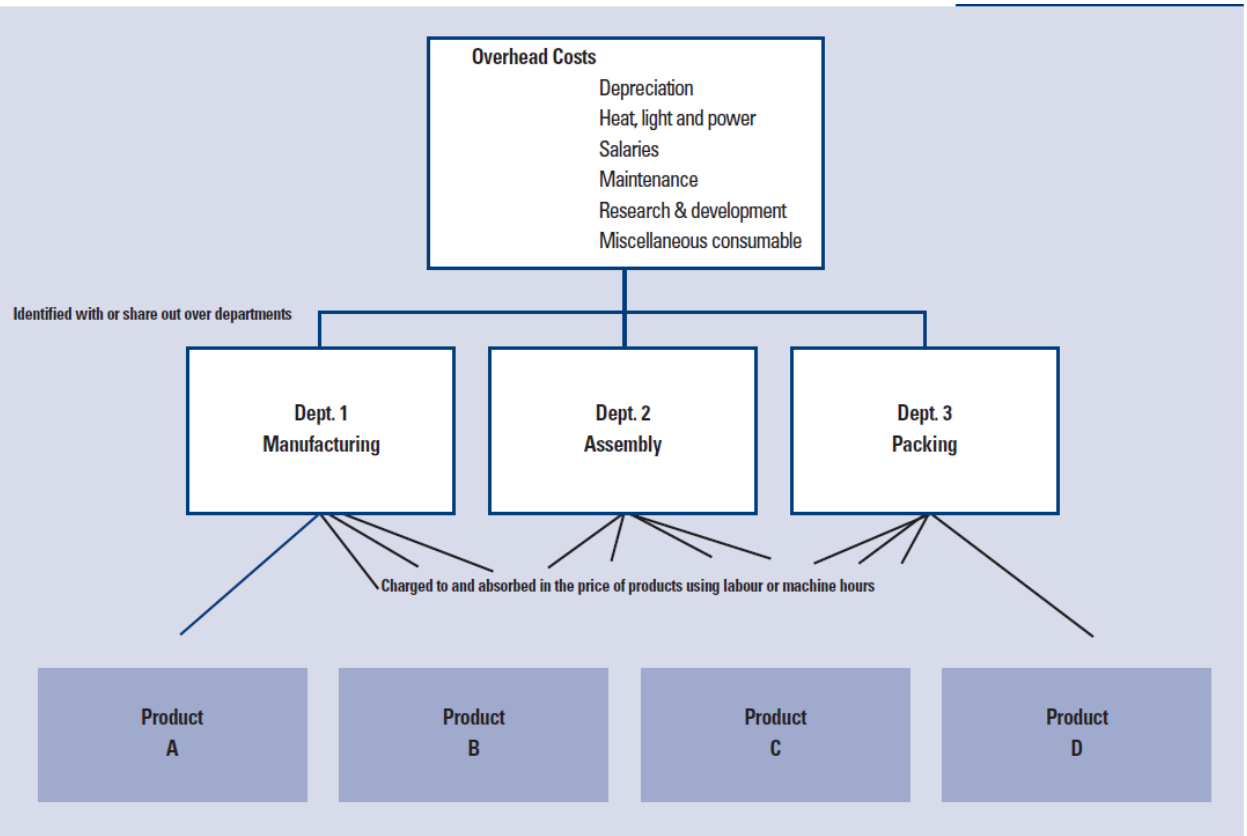

Fig 2: The principle of overhead cost recovery by absorption costing

6. ACTIVITY BASED BUDGETING (ABB)

Once an ABC system is operational it can be used in the budgeting process. ABB, which has been described as ABC in reverse, has come about through the realisation that traditional budgeting year on year pays insufficient attention to such issues as productivity and the efficient use of resources. With ABB on the other hand, managers are induced to consider what resources are actually needed.

The decision-making process involves drawing up an estimate of the production and sales volume for the next accounting period and determining the actual resource supply based on spending patterns and the activity capacity.

ABB encourages managers to think of fixed costs as variable in the medium to long run. Indeed some writers have come up with an alternative term – 'committed costs' since managers have committed the supply of resources in advance and will not alter their supply in the short run because of short-term demand fluctuations. In other words fixed costs are fixed because of management decisions and managers have the flexibility to redeploy those resources as and when conditions change.

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