Module 1:   Activity-Based Costing

[Slide Content]:

Activity-Based Costing

[Slide Content]:

Traditional Costing

"plantwide overhead rate applied on a single allocation base"
- *Overhead costs in a single pool*
- *Allocated on basis of single cost driver*

Commonly used – quick, easy, often inaccurate

[Jeanne H. Yamamura]:

Activity-based costing.

We briefly discussed cost allocation in the first week.   Overhead costs were accumulated in a single pool and then allocated to products based on a single cost driver.   Another way to describe this approach would be "the use of a plantwide overhead rate applied on a single allocation base."   This highly simplified technique is one that has been commonly used in the past – it's quick, it's easy, and it is often glaringly inaccurate.   The steady growth of overhead costs at the expense of direct labor and material costs has further increased the inaccuracy of the single overhead rate model.   As a result, efforts were made to come up with something better.

[Slide Content]:

Activity-Based Costing

Products require activities

Activities consume resources

[Diagram Shown]

[Jeanne H. Yamamura]:

Activity-based costing, or ABC, is a costing method based on activities that occur in the production process.   It is based on two key concepts: products require activities and activities consume resources. ABC is directed mainly toward indirect costs but it includes not only the indirect product costs found in overhead, but also the indirect costs incurred in marketing and in management.

[Slide Content]:

Two Stage ABC

[Flow Chart Diagram Shown]

[Jeanne H. Yamamura]:

Activity-based costing occurs in stages. For a two-stage ABC system: In Stage 1, costs will be assigned to the different activities. In this example we have three different activities: an order size activity, a customer order activity and a product design activity.   Assigning the cost to the different activities is also known as assigning the costs to activity cost pools.   In Stage 2, the activity costs will be assigned to the products or services by means of a single cost driver or perhaps multiple cost drivers for each cost pool.   So in this example we see the order size activity costs being allocated by means of machine hours, the customer order costs be allocated by means of the number of orders, and the product design costs being allocated by means of the number of designs.

[Slide Content]:

ABC Mechanics

1. Identify activities
2. Identify costs
3. Identify cost drivers
4. Calculate activity rate
5. Assign costs to cost object

[Jeanne H. Yamamura]:

The mechanics of ABC.

Number one: identify the activities that occur in providing a product or service.   Number two: identify the costs related to the activities.   Number three: identify the cost drivers associated with each activity.   Number four: calculate the activity rate meaning the cost rate per cost driver unit.   And then finally number five: assign costs to the product or service based on the units of cost driver used by the product or service.

[Slide Content]:

Activity Levels

Allocated to product or service:

1. Unit level
2. Batch level
3. Product level
4. Customer level

Not allocated:

5. Capacity-sustaining (facility level)

[Jeanne H. Yamamura]:

ABC utilizes five categories, or levels, of activities.   Unit level, batch level, product level, customer level, and capacity-sustaining (or facility) level.   Unit, batch, product and customer level costs are

allocated to products or services based on the identified cost drivers.   Capacity-sustaining costs, on the other hand, are not allocated to products or services.

[Slide Content]:

Unit-Level Activities

- *Occur when unites produced*
- *Proportional to production volume*
- *Example:*
    - *Assembly*
    - *Machining*

[Jeanne H. Yamamura]:

Unit-level activities occur whenever units are produced.   Unit-level costs, therefore, are proportional to production volume.   For example, assembly and machining.   The greater the production volume, the greater the assembly and machining times.

[Slide Content]:

Batch-Level Activities

- *Relate to a group (batch) of unites*
- *Performed for each group*
- *Example:*
    - *Machine setup*

[Jeanne H. Yamamura]:

Batch-level activities relate to a group, or batch, of units.   The activity is performed for each group, or batch, produced.   For example, machine set up.   Before running a batch of product, the machines must be set up for the run.

[Slide Content]:

- *Product-Level Activities*
- *Relate to a specific product*
- *Example:*
    - *Product design*
    - *Product management*

[Jeanne H. Yamamura]:

Product-level activities relate to a specific product.   For example, product design or product management.

[Slide Content];

Customer-Level Activities

- *Relate to a specific customer*
- *Example:*
  - *Sales calls*
  - *Special mailings*

[Jeanne H. Yamamura]:

Customer-level activities relate to a specific customer.   For example, sales calls or special mailings.

[Slide Content]:

Capacity-Sustaining
(Facility-Level) Activities

- *Sustain entire business*
- *Not related to other levels*
- *Example:*
  - *Security personnel*
  - *Building and grounds maintenance*

[Jeanne H. Yamamura]:

Capacity-sustaining activities, also known as facility-level activities, are activities that sustain the business as a whole and are not related to a particular unit, batch, product, or customer. For example, security personnel activities or building and grounds maintenance.

[Slide Content]:

Why Important

- *Actual number of activities very long*
- *Number must be reduced*
- *When combining:*
  - *Combine activities at same level*
  - *Combine highly correlated activities*

[Jeanne H. Yamamura]:

The levels are important because the initial identification of activities that occur in providing a product or service may result in too long a list of activities. It would be too costly and complicated to track each of the activities separately.   Similar activities are combined to reduce the number. When combining activities, only activities at the same level should be combined.   Also the combined activities should be highly correlated so they move together.   Remember that they will be allocated to products or services using the same cost driver.

[Slide Content]:

Example: Standard and Custom Cabinets

Standard

- *Large quantities*
- *Continuous automated process*
- *Little attention, no extra work*

Custom

- *Small quantities*
- *Additional design work*
- *More machine setups*

[Jeanne H. Yamamura]:

Let's look at an example. Assume we manufacture two types of cabinets, Standard and Custom. Standard cabinets are produced in large quantity on a continuous automated basis. They require little attention and no extra work. Custom cabinets are produced in small quantities and require a lot of extra work. The extra work comes in the form of additional design services and more machine setups. Under traditional costing, if overhead were assigned on the basis of machine hours, Custom cabinets would receive little overhead while Standard cabinets would be assigned a lot.

[Slide Content]:

Standard vs. Custom
Overhead under ABC

[Figure Shown]

Activity-based costing assigns costs to the activities – design services and machine setups as well as machine time. Custom cabinets will now be assigned costs related to its extra needs, the additional design services and machine setups. Standard cabinets will be assigned costs only for the very limited amount of machine setups used. If overhead is significant (and it often is), the cost basis for Standard and Custom cabinets will now be substantially different than under traditional costing.

[Slide Content]:

Activity Based Management

- *Manage activities*
    - *Eliminate waste*
    - *Reduce delays and defects*
- *Value added and nonvalue added*
    - *Outsourcing*

[Jeanne H. Yamamura]:

Activity-based management builds on ABC and seeks to manage activities in order to eliminate waste and reduce delays and defects. It divides the activities into value-added and non-value added activities and then seeks to maximize the value-added activities. The enhanced cost information

provided by ABC is used to improve strategic and other decision making that affects capacity and fixed costs.

[Slide Content]:

Limitations of ABC

1. More subjective cost allocations
- *Cost to cost pools, then cost pools to products/services*
- *Assumed direct relationship with cost drivers*

[Jeanne H. Yamamura]:

There is no perfect system! While ABC improves the ability to allocate costs to products, it also has limitations related to its use. Number one: More subjective cost allocations.   First, costs are allocated initially to cost pools and then from cost pools to the products or services.   So judgments must be made about both sets of allocations. Second, ABC adds more cost drivers.   Each cost driver is supposed to be directly related to the cost that it is used to allocate. Judgment is typically required to select the cost drivers. If these additional cost drivers do not enable accurate cost allocation, ABC will result in a more complicated but just as faulty a system as traditional cost allocation.

[Slide Content]:

Limitations of ABC

2. Linear relationship assumption
- *Activities and related costs*
- *Linear and known*
- *Costs not always linear*

[Jeanne H. Yamamura]:

Linear relationship assumption: ABC assumes that the relationship between activities and related costs is linear and known for certainty.   Following this through – more activities result in more cost and fewer activities result in less cost.   Costs, however, are not always linear. In fact, cost functions are frequently nonlinear.   This assumption can therefore lead to inaccurate assignment of costs.

[Slide Content]:

Limitations of ABC

3. Costly implementation and maintenance
- *Complicated, time-consuming, expensive*
- *Multiple activities*

[Jeanne H. Yamamura]:

Number three: Costly implementation and maintenance.   Implementing and maintaining an ABC system is complicated, takes a lot of time, and costs a lot of money.   Identifying multiple activities

and tracking and assigning costs to them is much more time intensive than using a single cost driver whose data are already collected.

[Slide Content]:

Limitations of ABC

4. Misinterpretation of ABC data
- *ALL costs allocated*
- *Not always relevant to decision*

[Jeanne H. Yamamura]:

Finally, number four: Misinterpretation of ABC data.   The reams of additional data produced by an ABC system can be easily misinterpreted.   Remember – all costs are being allocated.   Allocated costs are not always relevant to a decision.   As a result, extra care must be taken when using such data for decision-making purposes.