
The Mysteries of Activity Based Costing in Oracle Applications Release 10.7SC

George L. Somogyi
John B. Augustin
Jason J. Balogh
Kelly L. Mohritz
Arthur Andersen

Introduction

As businesses face greater competition, demands to increase profitability, and the need to control costs, cost management can provide the tools, techniques, and mechanisms needed by companies to help achieve goals and strategies. This is done by optimizing the use of resources. Cost management is a vital tool for the whole business: its strategies, goals, processes, and performance measures.

As the need increases for higher value-added uses of information, the focus of management moves beyond information available in a traditional transaction processing system to more analytical applications, such as activity-based costing with performance management capabilities. Activity-based costing and performance management have become key tools for executives, operational, and financial management to manage the business.

Scope of Paper

In this paper, we focus on how to integrate activity-based costing into Oracle Applications. We present basic terminology, describe why businesses implement activity-based costing, review best practices, and review implementation considerations, provide an overview of the setup considerations, and finally discuss two real life business scenarios on how to implement activity-based costing in 10.7SC.

In the author's view, there were no Release 11 new features that influence activity-based costing in Oracle Applications that are within the context of this paper. This paper assumes the reader has basic knowledge of Oracle Applications setup, and a conceptual understanding of activity-based costing.

Applications within the scope of discussion include General Ledger, Cost Management, Bill of Materials, and Work in Process. Subject matters and features beyond the scope of this paper include:

- Project accounting and project costing;
- Project manufacturing;
- Average costing;
- Costing in a repetitive or flow manufacturing environment;
- Multiple organizations;
- Costing considerations in a multiple inventory organization environment;
- On-Line Analytical Processing (OLAP); and
- Activity-based costing bolt-on packages.

What is Activity-Based Costing?

According to Computer Aided Manufacturing International ("CAM-I"), "Activity-based costing is a methodology that measures the cost and performance of activities, resources, and cost objects. Resources are assigned to activities, then activities are assigned to cost objects based on their use. Activity-based costing recognizes the casual relationship of cost drivers to activities."

Activity-based costing (“ABC”) is a decision making tool. It allows organizations to improve business performance through increased efficiency and reduction of costs. ABC identifies the key activities performed in all stages of delivering the product or service to the customer. It is these activities that consume the resource and these same activities that create product. Recognizing this relationship is the cornerstone of ABC. It allocates cost (or resources) to activities based on consumption of resources (i.e., resource cost assignment).

ABC brings several different analysis tools into one type of process. This allows value analysis, process analysis, quality management, and costing to be combined. The combination of processes allows management to make better decisions, not only with regard to current processes, but also in forecasting of future events.

© 1999 Arthur Andersen. All Rights Reserved.

A goal of ABC is to increase value-added activities while minimizing the time and money spent on non-value added activities. It changes the focus of costing to manage activities, as opposed to dollars (see **Figure 1**).

Move From Managing Dollars To Managing Activities

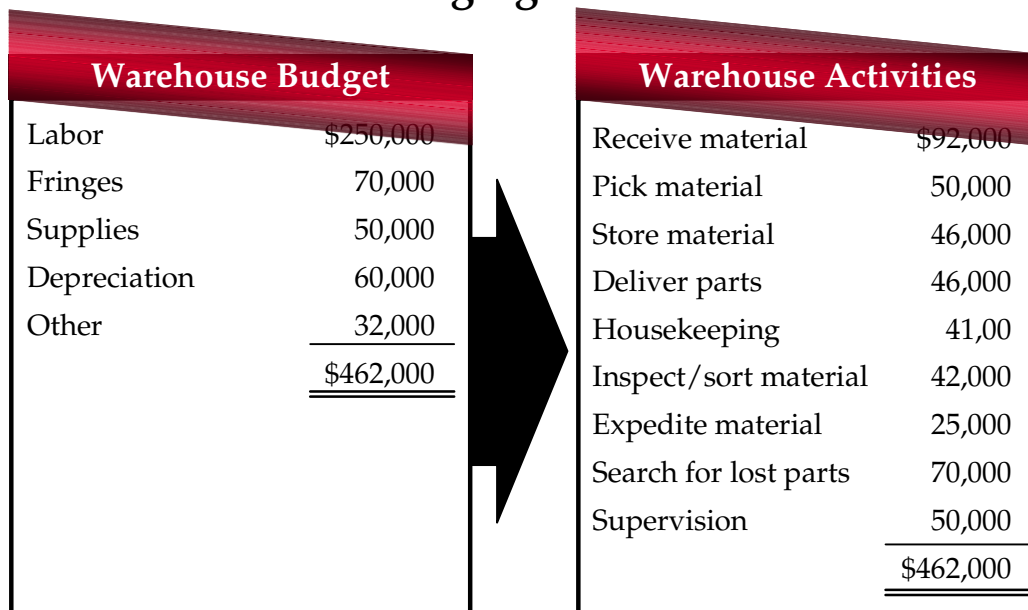


Figure 1: Managing Activities

It is important to note the basic difference between ABC and activity based management (“ABM”). ABC involves measuring the performance and cost of an activity. ABM focuses on managing the continuous improvement of the functions involved in producing and selling the product or service.

Activity-Based Costing Fundamental Elements

The following are key definitions used in ABC:

Activity: 1. Work performed within an organization. 2. The aggregations of actions performed within an organization that are useful for purposes of activity-based costing. *Example activity of processing an order over the telephone:* the actual process of taking the order.

Activity Driver: Associates activities with their respective cost object. Activity drivers measure the frequency and intensity of the demand placed on activities by cost objects. They are typically a one-to-one relationship with the activity. *Example activity driver in processing an order over the telephone:* number of minutes per telephone call.

Activity Measure: A measure of the workload involved in the activity. Can be similar to the activity driver. *Example activity measure in processing an order over the telephone:* number of orders taken.

Bill of Activities: A listing of the activities required (and optionally, the associated cost of the resources consumed) by a product or other cost object. *It should list each activity, activity drivers, number of units, unit cost per driver and extended cost that, taken together, compose the total for any particular cost object.*

Cost Drivers: Any element that would cause a change in the cost of an activity. *Example cost driver in processing an order over the telephone:* frequency.

Cost Element: An amount paid for a resource consumed by an activity and included in an activity cost pool. *Example cost element in processing an order over the telephone:* general ledger account containing wages of the telephone order clerk.

Cost Object: Any customer, product, service, contract, project, or other work unit for which a separate cost measurement is desired. *Example cost object in processing an order over the telephone:* the customer.

Performance Measures: Indicators of the work performed and the results achieved in an activity, process, or organizational unit. Performance measures may be financial or operational. *Examples performance measure in processing an order over the telephone:* sales revenue volume per unit of time.

Process: A series of activities that are linked to perform a specific objective. *Example process in processing an order over the telephone:* entering an order into the system and passing it onto production planning.

Resource: An economic element that is applied or used in the performance of activities. Salaries and materials are resources used in the performance of activities. They can also include any non-monetary assets that are essential for the completion of the item. *Example resources in processing an order over the telephone:* wages of the telephone order clerk, maintenance on telephones used, office supplies needed to complete the order.

Resource Driver: A measurement tool to associate costs with their respective activities or cost objects. Resource drivers measure the quantity of resources consumed by an activity, typically a one-to-one relationship with the resource. *Example resource driver in processing an order over the telephone:* amount of office supplies used per call or number of items sold per call.

Traditional Cost Management Systems

Traditional performance measures are based on financial results derived from the general ledger, budget, variance reports, and standard costing systems. The following are some common problems associated with traditional cost management systems:

- Traditional systems look backward; thus, organizations have trouble using this information to influence the future. With traditional systems, there are no answers to the question “what does it say about current or future processes and practices?”
- Traditional cost accounting techniques for capturing cost are flawed; hence, allocation methods do not reflect the true cost across the operations of a business. As a result, operational management tends to ignore cost accounting information.
- There is a lack of alignment as reporting of costs does not reflect the true flow of processes in the business.
- Traditional cost accounting systems encourage dysfunctional behavior by supporting the “ship at all costs” mentality.

- In a traditional cost accounting system, there is a lack of customer focus. There is no differentiation between activity costs and added value to customers.
- Standard costing does not identify key cost drivers, specifically for overhead costs. Therefore, the constant change and development of organizations is not examined.
- Standard costing does not point out how to improve current processes or leverage the learning curve.

The problem most relevant is that cost accounting is only an output measure, and it is only used at the organizational level. Traditional cost accounting focuses on gathering information for external reporting and upper management review. Consequently, there is a very high level of aggregation and little low-level of detail reported. Since reports are only produced on a monthly, quarterly, or even yearly basis, there is little focus placed on how to use the financial information to improve the organization and increase profits.

For management to have accurate information available for smart decision making, more customized reports are needed in a traditional standard costing system. Stephen R. Covey, author of *The Seven Habits of Highly Effective People* and *Principle-Centered Leadership* explains, “those who look deeply into the process of activity-based management will find that it is an area of management that will empower them with the solid information about their organization that *enables* them to exercise leadership and wisdom in decision making.”

Why Companies Implement ABC

Companies choose to implement activity-based cost management (“ABCM”) for a number of reasons ranging from strategic to operational in nature. They include:

Ability to Improve Customer / Product / Service Analysis

- **Customer/Product Profitability:** Identify how much is actually spent to service customers and provide products. Historically, customer and product profitability systems do not represent the true relationship of what drives the costs to be incurred.
- **Identify Hidden Costs:** Examples include small order quantities, low volume products, unique products, customer service demands, and considerable expediting.
- **Redesign of Unprofitable Products/Customers:** Redesign the processes used to make those products. Evaluate and set target costs.

Operations Performance Analysis

- **What-if Analysis:** Develop an ABC model to perform and demonstrate the direct linkage between tactical decisions and cost consequences.
- **Cost Management:** Provide market area managers with relevant cost information for activities over which they have control.
- **Cost of Capacity:** Identify the cost of capacity to support scheduling and investment decisions. Optimize activity capacity utilization.
- **Costs of Quality:** Identify and quantify manufacturing costs of quality.

Organization Reengineering

- **Business Diagnostic:** Indicate areas with high improvement potential, typically a focus of reengineering task groups. A process management initiative results from the knowledge of how much is spent on data gathering and manipulation as opposed to the value-added analysis.
- **Support Staff Rationalization:** Identify and quantify opportunities for support-cost reduction. Evaluate opportunities for consolidation.
- **Charge Intercompany Service Costs:** Identify costs associated with internal services and establish a basis for internal service charges.
- **Asset Management:** Classify and rank assets/properties in terms of cost and effort required. Assets can be assessed in terms of their fully loaded cost, which can be compared to their size and value to rank investments.
- **Interplant Benchmarking:** Establish cost targets for interplant benchmarking (i.e., best of breed and class).
- **Explore Outsourcing:** Evaluate the cost of outsourcing certain operations rather than producing in-house.

Some frequent benefits that were afforded by implementing ABC include the following:

- Provides more accurate product costing information by reducing arbitrary cost allocations.
- Improves the relevance and quality of information available for decision making by answer such questions as:
 - What activities and events are driving costs; and
 - Where should efforts be focused to control costs.
- Supports customer focus by helping a company identify and measure two types of activities: those that truly add value to the customer and those that do not.
- Eases the tracking process of allocating indirect costs to specific products.
- Allows more accurate reporting and analysis of overhead costs.
- Helps identify costs and activities that can be minimized or eliminated.
- Helps management better understand activities that drive / cause costs.
- Links decisions to subsequent costs (cause /effect / benefits relationship).

Finally, ABC supports the 80/20 rule. Typically 20% of the organization's customers are creating 80% of the profits and in the same rule, 20% of the organization's products cause 80% of costs. Utilizing ABC, these activities can be studied and analyzed, thus allowing more accurate and efficient decisions to be made regarding products and their related costs.

Three Views of Cost

While ABCM is a powerful toolkit, there still exists a great deal of confusion around it. When trying to implement a cost management system, one of the hardest questions to get management to articulate is which of the three views of cost they are concerned about. Many times managers confuse these three views, thereby dramatically, complicating the potential solution they seek. The three views of cost can be thought of as financial, operational, and strategic. As **Figure 2** shows, these three views of cost focus on different variables, including the time frame; the users and the uses of the cost information; the levels of aggregation; the reporting frequencies; and the types of measurements used. Understanding these multiple views is the key to harnessing the power of ABCM.

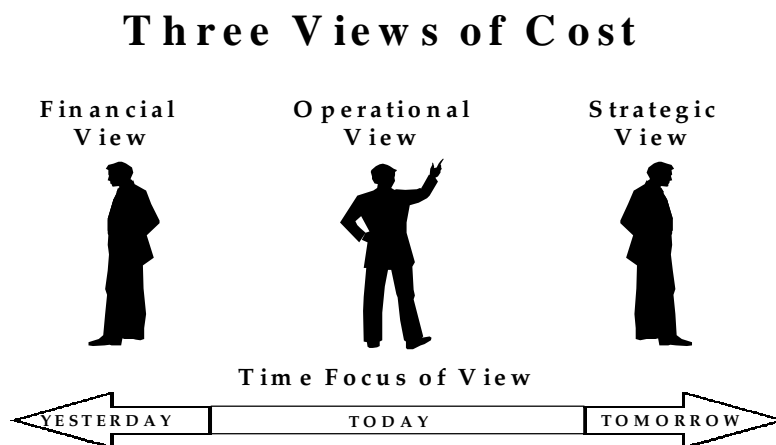


Figure 2: Three View of Cost

Financial: The financial view of cost can be compared to a man facing backwards, because of its adherence to the historical cost concept. The financial controller, tax manager, and treasury department use this type of cost information to value inventory and report to shareholders, lenders, and tax authorities. The level of information and aggregation required under this view of cost is high, and often company-wide. Auditors and accountants use the financial view to address periodic reporting requirements. The reporting frequency is often monthly, but can

be quarterly or annually. The type of measures used are almost exclusively financial. Although this view receives the most attention, it is usually ineffective for operational and strategic uses.

Operational: The operational view of cost is used for internal analysis. The operational view of cost focuses on the cost information needed to manage on a day-to-day basis. Line managers, process improvement teams, quality teams, and day-to-day managers use operational cost information as an indicator of performance and to determine if activities are adding value. Interestingly, operational managers are most comfortable with, and often use, physical measures rather than financial measures. Examples of physical measures include the number of units produced, the first pass quality, or temperature of each batch. These measures can easily be quantified in cost terms, but the operating manager really does not manage the dollars. Instead, he or she must manage physical activities. By understanding the root causes of problems, managers use this type of costing to identify where improvements can be made.

Strategic: The strategic view of cost differs from the financial and operational views in that it is the forward-looking view of cost. The users are concerned with improving tomorrow's results; yesterday and today are important only in how they help explain how to improve tomorrow. Investment justification, target costing, life cycle costing, and make/buy decisions benefit from the strategic view. The strategic planner, cost engineer, and people doing product sourcing use this view to determine how to change future costs and improve future profitability.

The level of aggregation in this view is solely dependent on the decision that management is trying to make. It could be a very short-term decision with a low-level of aggregation (e.g., such as whether to outsource a specific item) or a long-term, highly aggregated decision (e.g., whether to buy a business, open a new plant, or product line).

In the strategic view, both physical and financial measures play important (and interrelated) roles in planning for the future. Current information is reported to facilitate future decisions related to the organization. These decisions would include: product pricing, make/buy analysis, capacity utilization, product introduction/pruning decisions, investment justification, life cycle costing, and customer-focused direction. ABC is shared throughout the organization, mainly with strategic management. Strategic ABC answers the question, "what do things cost?"

The CAM-I Cross

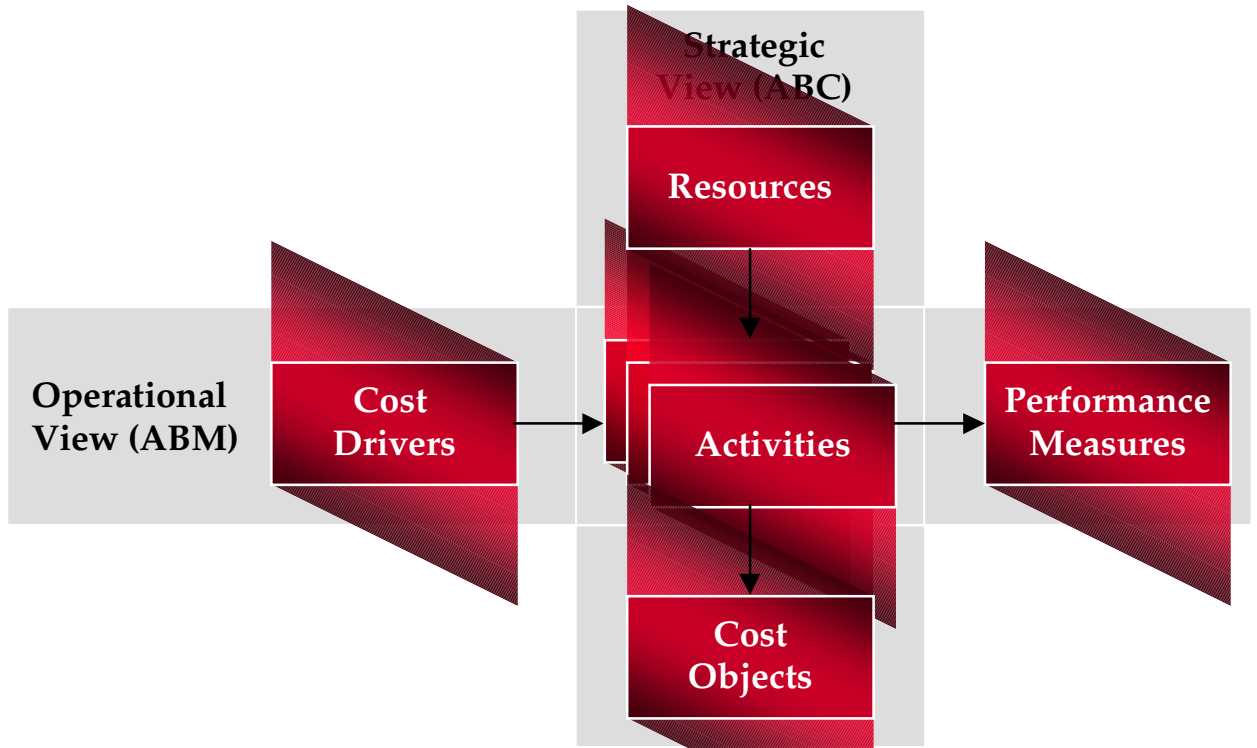


Figure 3: CAM-I Cross

The CAM-I Cross combines both ABC and ABM (see **Figure 3**). The vertical section includes the strategic view that measures the cost and performance of related activities and the products and service that uses those activities. The horizontal section is the operational view that focuses on managing the activities and their processes. While an activity-based approach is used for both strategic ABC and operational ABM, it is used in differing ways.

Strategic ABC

ABC focuses on the strategic view of cost. It has been called the cost assignment view. Strategic ABC provides information such as product costing, customer costing, and distribution channel costing. Strategic ABC answers the question, “what do things cost?” As noted in the vertical section, the assignment of costs is achieved by a two-stage driver model that goes first from resources to activities (i.e., stage 1) and then from activities to cost objects (i.e., stage 2).

Because of these assignments, an activity driver typically represents a line item on the bill of activities for a particular cost object (e.g., a product, customer, or distribution channel). A bill of activities lists each activity, activity drivers, number of units, unit cost per driver, and extended cost that, taken together, compose the total for any particular cost object. Resource drivers and activity drivers, as typically used, are single-factor methods of allocation (i.e., one resource driver per resource, one activity driver per activity).

Operational ABM

Operational ABM focuses on the operational view of cost, which is often called the process view. It provides information such as activity attributes for cost reduction opportunities, cost of quality statements, and performance improvement ideas. Operational ABM answers the question, “what causes cost to occur?” The CAM-I Cross illustrates operational ABM, which shifts to a focus on cost drivers instead of activity drivers.

A combination of these two views provides a conceptual linkage between the strategic ABC and operational ABM at the intersection of activities. While conceptually powerful, this depiction contributes to why people confuse strategic ABC and operational ABM.

While the two views do intersect at activities, the level of activity definition required is at a widely different level. Strategic ABC can use a very high-level activity definition. For example, work can be defined as the shipping activity, because the entire cost will be assigned based on the number of shipments. In addition to the level of activity definition, strategic ABC and operational ABM also differ in the way drivers are analyzed.

Activity Based Costing Best Practices

Best practices are the best ways to perform a process or activity within a process. Best practices are signposts for process improvement. Several best practices have been discovered to help improve the success rate for implementing activity-based costing systems. Results of best practice studies, sponsored by Arthur Andersen and the APQC, show that organizations of various kinds are implementing ABM in record numbers and that they are moving much more aggressively toward enterprise-wide implementations. Discussed here are some best practices related to implementing ABM.

Strategy: During an implementation, it is essential to have a plan. This plan should layout the entire current and future processes in detail. It is also very important to understand basic elements of the organization (e.g., customers, market channels, customer profitability, and product lines).

Business Processes: Focus on business processes and not functions. When developing new products, move towards cost planning, understand the capacity for cost of the business, and completely understand the administrative capabilities of your organization.

Technology: Get accurate operating information to key decision makers, instead of only financial reports. Provide access to operating data for analysis, continue to look forward when developing or analyzing the costing of a product. Definitely support the three views of cost and think permanent!

People: All levels of support are key for a successful and long lasting implementation. Educate all users of the activity-based costing system and related business operations. Use process teams from the entire organization and focus on analytical reporting.

Focus On: Continuing partnerships with customers and suppliers, efficient product development, and focus on new opportunities to improve current processes. Reduce the complexity of the business and use various performance measures for continuous improvement.

Generate Results: Identify hidden costs, locate and redesign unprofitable processes and identify the cost of capacity to support scheduling and investment decisions.

ABC Implementation Considerations

Implementing ABC is far different than converting from one general ledger or MRP package to another. The critical first steps are to define which businesses to be focused on and in what priority. While ABCM can meet many needs, the system design varies across the different views of costs and from use to use. Implementation teams must understand what is required to respond to management's key business needs. They have different requirements for accuracy, timeliness, and reporting. Therefore, it is extremely difficult to implement with the other. Trying to simultaneously implement both strategic ABC and operational ABM is often a prescription for disaster.

Thus, any effort to integrate ABC into an ERP package should be organized as a separate project with the support of executive management. Begin with a clear articulation of the business needs that management expects to meet

through implementation of ABC. This would include a clear case for the cost/benefit justification needed for implementation to proceed and a focus on one of the three views of cost: strategic, operational, or financial.

In many cases, the basic activity data has not yet been captured. The initial implementation is very detailed and may take a lot of time and resources. The effort to analyze, collect, assimilate data, and prepare it for setup in an ERP package is substantial. In addition, the continued upkeep of an ABC system also requires continued support to ensure accurate information is recorded. The benefits of ABC clearly will be realized only if current and accurate information is recorded. After project sponsorship is obtained, activity analysis should be performed to develop the ABC cost model.

The first step is to define your cost objects. Using management's key business needs and the view of cost being implemented, the definition of cost objects should proceed. The next step is to develop activities. Before improving a process, you must first understand the process. What activities are performed? Which activities add value and which do not? Identify the activity information needs and related data collection required supporting the use selected. An ABC model does not require detailed activities to provide meaningful information to management.

After activities are defined, you can identify cost drivers, identify resources that activities consume, and record the results of your activity analysis. Only after the ABC cost model has been defined, metrics established, and results from activity analysis are complete, should the setup of activity-based costing in Oracle Applications proceed.

Finally, the business objectives for an activity-based system should be compared to and synchronized with the existing Oracle technology infrastructure to assess whether such a project will be a success, or whether too many business risks exist.

Setup of Oracle Applications for Activity Based-Costing

General Ledger Set-Up

The general ledger by its nature supports the financial view of cost. It contains overall expense information allowing it to reconcile to the operational ABM system. It also receives feeds of cost object values from the strategic ABC system, as the base from which overall adjustments can be made for differences required by financial accounting.

Some of the major features and functionality contained in the General Ledger module have ABC implications. Those set-up steps to be concerned with during implementation include:

- Enter statistical currency journals via Journals Enter form or Journal Import (i.e., STAT);
- Allocate resource costs to activity costs (i.e., MassAllocations);
- Define budgets to accommodate budgeted and actual activity costs;
- Allocate actual incurred expenses to activity-based budgets (i.e., Budget MassAllocations); and
- Report on financial results using Financial Statement Generator ("FSG") or General Ledger Desktop Integrator ("GLDI").

The steps to define ABC in the General Ledger are as follows:

- Add resource accounts to chart of accounts;
- Add activity accounts to chart of accounts; and
- Define a general ledger budget for actual activity-based costs.

To correctly record and classify resource and activity costs, the design of the Accounting Flexfield and its segments is a critical step in the process to develop an activity-based cost model in Oracle Applications. If Oracle Applications are already installed and running in production, you may need to add a segment to your Accounting Flexfield to accommodate resource accounts that support activity costs. As the effort to expand an Accounting

Flexfield structure is a customization effort, careful analysis of business requirements to encompass a method to align resources with activities while maintaining an existing financial reporting hierarchy is paramount.

To capture activity-based costs, Accounting Flexfields store activity-based resource cost and budgeted actual accounts need to be established. Steps to calculate activity-based costs in the General Ledger include:

- Trace or allocate costs to resource accounts;
- Post activity performance totals to activity accounts;
- Allocate costs to activity accounts; and
- Report activity unit costs.

To store accounting information for activity-based costs, a budget should be defined. The budget could also be used to store activity-based costs generated in the manufacturing modules. To segregate these transactions, some companies have used a segment, one character in length, in the Accounting Flexfield to segregate activity based accounting transactions from Generally Accepted Accounting Principles (“GAAP”) accounting transactions. This will allow for comparative reporting of actual activity-based costs to actual incurred costs under a traditional accounting method. Typically, expenses will be directly posted to resource accounts, or redistributed across multiple Accounting Flexfields using the MassAllocations functionality.

Allocating resource costs to activities is a two-step process. First, resource costs need to be transferred to the activity-based cost budget. Mass Budgeting is an easy tool to move, copy, or allocate (i.e., reclassify) actual balances to budget balances. Once the actual activity-based costs are in the activity-based costing budget, costs can be allocated to the activity Accounting Flexfields. If there is a requirement to calculate activity unit costs using a statistic, such as shipped quantity, units produced, or purchase orders, these would then need to be entered into the General Ledger as a statistical journal entry. Using Mass Budgeting allocations and statistics, resource Accounting Flexfield balances are re-allocated from resource to activity-based accounts. The following example shows a comparison of actual to budget resource and activity accounts.

| Type of Information | Actual Resource | Activity-Based Costing Budget |
|---------------------|-----------------|-------------------------------|
| Inspection | \$15,000 | |
| Product A | | \$8,000 |
| Product B | | \$7,000 |
| Material Handling | \$10,000 | |
| Receiving | | \$6,000 |
| Warehouse | | \$4,000 |

Finally, comparative reporting of activity-based costs can be accomplished using one of these tools: FSG, GLDI, or an OLAP tool.

Some practical limitations to implement ABC in the General Ledger include the following:

- Statistics required to calculate activity unit costs are difficult to obtain; and
- Data for reporting are stored in different systems.

Based on the cost drivers and activities, statistics may be required from different Oracle sub-ledgers (i.e., Order Entry). For example, to capture the number of active customers by territory in the General Ledger there is no canned functionality to transfer the number of customers from Order Entry as a statistic into the General Ledger. A custom report from the AR Customer Master File showing these statistics would have to be developed and the results entered into the General Ledger as a Statistical Journal Entry.

If reporting requirements only need information from the General Ledger, the creation of reports to compare activity-based costs to actual costs is relatively simple. However, as the complexity of the reporting requirements

increases due to the number cost drivers, cost objects, resources and other sources of data, a more sophisticated reporting tool, such as an OLAP product, may be required. For reporting of activity-based costs stored in the General Ledger, Oracle offers Activa; a bolt-on activity based management application.

Manufacturing Set-Up

ABC is implemented in Oracle Manufacturing primarily through the Cost Management, Bill of Material, and Work-In-Process (WIP) modules. The steps to implement ABC in Oracle Manufacturing include:

- Define a cost type to hold activity-based cost information;
- Define activities and enter activity costs;
- Define cost sub-elements for each activity;
- Associate activities to products;
- Assign activities to routing;
- Roll-up costs by activity;
- Report and view costs by activity; and
- Compare standard with activity-based costs.

Cost Types

Cost types are essentially buckets to store costs. Oracle delivers a “Frozen” cost type used for standard costing inventory valuation and transaction costing. Using user-defined cost types, different views of cost can be established. User-defined cost types are effective tools for comparative analysis of product costs. When implementing ABC, the following are some sample user-defined cost types that should be considered:

| Activity-Based Cost View | Objective | Cost Type Name |
|--------------------------|---|----------------|
| Strategic View | To assign all organizational costs through activities | ABC-STRAT |
| Operational View | To assign costs associated with the purchasing function to allow activity costs to be monitored | ABC-PO |
| Operational View | To assign costs associated with the shipping function to allow activity costs to be monitored | ABC-SHIP |

Since the level of detail is often much greater for an operational ABM, separate functional cost types for operational areas such as purchasing (i.e., ABC-PO) should be established. This will provide operational management with meaningful information to monitor and evaluate costs.

A single cost type (i.e., ABC-STRAT) should be defined for costs captured under the strategic view of cost. In some cases, companies are beginning to use strategic ABC to provide inventory valuation. Most of these moves are driven by the desire to minimize accounting support costs. This is achieved by eliminating the duplicate costing system for financial reporting. In Oracle, this would require the “Frozen” cost type to be transformed to a strategic view for product costing and inventory valuation. However, care must be taken in this approach for various reasons. The method to charge cost to product would need to be evaluated to ensure only rate-based costs (i.e., item, lot, and activity) are used. From a financial view, some items that should be included in strategic ABC costs (i.e., distribution and selling costs) are not allowed as product costs under GAAP. Allocation of cost-of-capital charges is another example of cost that might be included in strategic ABC, but not under the financial view.

If the General Ledger is used to capture and report activity-based costs, the name of the cost type can and should match the budget name in the General Ledger. For each cost type, you can reference a default cost type. When you roll-up costs in a cost type, the default cost type is used for items that have no costs specified in the cost type being rolled-up. While it is suggested that the default cost type be set to “Frozen” for a strategic ABC analysis, this could produce misleading results. For example, if a Bill of Material for an assembly is structured so that the components differ between the “Frozen” and ABC strategic cost type, the “Frozen” cost type component will be included in the cost roll-up of the ABC strategic cost type. However, for an Operational ABM cost type, such as purchasing, the

default cost type should be left blank. This ensures operational costs reported meets the needs of operational management.

Cost elements such as resource, overhead, and activity costs are rolled-up and stored in a cost type. Within a cost type, different activities and activity-based costs can be assigned. Suggested settings for a cost type in connection with ABC include enabling Multi-Org, Allow Update, Available to Engineering, Roll-up Option of Component Yield, and all Previous Level Roll-up Options (i.e., Element, Sub-Element, Activity, and Operation). These should all be enabled to provide the capability to track and roll-up all previous level costs, and allow detail comparative reporting of activity-based costs to standard “Frozen” costs. (See **Figure 4.**)

The screenshot shows the Oracle Applications interface for configuring a cost type. The window title is "Oracle Applications - [Cost Types (M1)]". The menu bar includes Action, Edit, Query, Go, Folder, Special, Help, and Window. The toolbar contains various icons for navigation and editing. The main form area displays the following fields and options:

- Cost Type: **ABC-STRAT**
- Description: **ABC STRATEGIC ACTIVITY BASED COSTS**
- Default Cost Type: **Frozen**
- Inactive On: []
- Multi-Org
- Allow Updates
- Available To Engineering

There are two grouped sections of options:

- Rollup Options:**
 - Component Yield
 - Snapshot Bills
 - Alternate: []
- Previous Level Rollup Options:**
 - Element
 - Sub-Element
 - Activity
 - Operation

At the bottom left, it says "Count: 1" with a dropdown arrow.

Figure 4: Cost Types

Activities

As described above, an activity is a unit of work performed. This either can be a process or a procedure. Activities can directly relate to the build of a product, such as runtime or setup time. They can also be an indirect cost such as purchase order creation, inspection of a product, or release of a work-order. A primary consideration in the cost model is how will cost be charged to the product. The actual rate that costs are applied at is controlled by the basis type. The following summarizes the basis types:

- Activity: Cost per item = (activity occurrences / number of items) * cost per occurrence.
- Item: Cost per item = fixed rate per item.
- Lot: Cost per item = rate or amount / item's costing lot size.
- Resource value: Cost per item = overhead rate * resource value earned in routing operation.
- Resource unit: Cost per item = overhead rate * number of resource units earned in routing.
- Total value: Cost per item = total cost -- material overhead earned * material overhead rate.

Basis types should be assigned to activities with consideration as to how the resource is consumed by the activity. Typically, resource unit, resource value, and total value basis types should not be used, as these are basis types associated with a traditional standard costing approach. If an activity is assigned to the material overhead sub-element, the basis type from the activity will default to the item. For other cost elements, the basis type of the sub-element is used.

Since the activities for a strategic view differ from an operational view of cost, it would be preferable for each view to have its own activities with their own activity rates. To easily identify the purpose and usage of an activity, naming standards should be developed. For example, the activity name can be defined as a concatenation of the cost type and functional activity usage (e.g., OP-POISSUE). Typically, operational activities should only reference the associated operational activity cost type (i.e., purchasing function cost type such as “ABC-PO”). Strategic ABC can operate effectively using a system with relatively few activities. Some examples include:

- Taking a phone order;
- Inspection of raw goods;
- Packaging finished goods; and
- Customer service follow-up.

Activity information is defined on the Activities Window (see **Figure 5**). The Activity Measures field is a descriptive field available to store the name of your user-defined allocation basis for the activity. It can either represent the cost driver for an operational ABM analysis or activity driver for a strategic ABC analysis. Unfortunately, the data element is not used on any canned report that would be useful for activity-based analysis. Activity rates are defined in the Activity Costs window (see **Figure 6**). Activity rates are developed for each cost type. The cost per occurrence represents the total budgeted activity for the cost pool (i.e., Total Cost) divided by the Total Occurrences. As previously mentioned, the rates developed only are used for Material Overhead sub-elements.

Oracle Applications - [Activities (M1)]

Action Edit Query Go Folder Special Help Window

MultiOrg

| Activity | Description | | Default Basis | Inactive On | Activity Measure |
|------------|----------------------------|---|---------------|-------------|------------------|
| PO-POISSUE | ISSUE PURCHASE ORDER | ☒ | Lot | | NUMBER PURCHA |
| ST-RECEIPT | RECEIVE RAW MATERIALS | ☒ | Lot | | NUMBER OF RAW |
| ST-CLEANUP | PRESS CLEANUP | ☒ | Lot | | NUMBER OF CLEA |
| ST-SLIT | SLITTING OPERATION | ☒ | Item | | NUMBER OF OPEI |
| ST-COAT | COATING OPERATION | ☒ | Item | | NUMBER OF OPEI |
| ST-SETUP | PRESS SETUP | ☒ | Lot | | NUMBER OF SETU |
| ST-RUN | PRESS RUN | ☒ | Item | | NUMBER OF PRES |
| ST-REWIND | PRESS REWIND AND INSPECTIO | ☒ | Item | | NUMBER OF REW |
| ST-PACK | PACKAGING | ☒ | Item | | NUMBER OF PACI |
| ST-SHIP | SHIPMENTS | ☒ | Lot | | NUMBER OF SHIP |

Activity Costs

FRM-40100: At first record.
Count: *0

Figure 5: Activities Window

| Cost Type | Description | Total Cost | Total Occurrences | Cost Per Occurrence [] |
|-----------|---------------------------|------------|-------------------|-------------------------|
| ABC-STRAT | ABC STRATEGIC ACTIVITY BA | 240,000.00 | 12500 | 19.20000 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Count: *0 <List>

Figure 6: Activity Costs Window

Cost Sub-Elements

The five cost elements in Oracle Manufacturing are material, material overhead, resource, overhead, and outside processing. For each cost element, you can define sub-elements which are sub-classifications of a cost element. Only material overhead cost elements use activity rates to apply cost to a product. All other elements use the rate associated with its sub-element to apply cost to a product. For each sub-element, a rate for the applicable ABC cost type would need to be developed and assigned.

As part of the methodology to develop a cost model, the relationship between the activity and cost element (i.e., sub-element) should be defined in advance of the setup in Oracle. To allow for easy tracibility of cost for sub-elements used for a strategic view of cost, a one activity to many sub-element (i.e., activity driver) relationship is most efficient and more easily maintainable. For an operational ABM view, one activity needs to be defined for each sub-element. Examples of cost sub-elements for material overhead and resources with activities appear in the **Figures 7-8**, respectively.

Oracle Applications - [Overheads (M1)]

Action Edit Query Go Folder Special Help Window

Overhead: Purchasing

Cost Element: Material Overhead

Description: Purchasing

Absorption Account: 01-520-5360-0000-000

Default Basis: Activity

Default Activity: PO-POISSUE

Expenditure Type:

Inactive On:

Resources Rates

Count: 9 ^ v <List>

Figure 7: Overhead (Material Overhead) Window

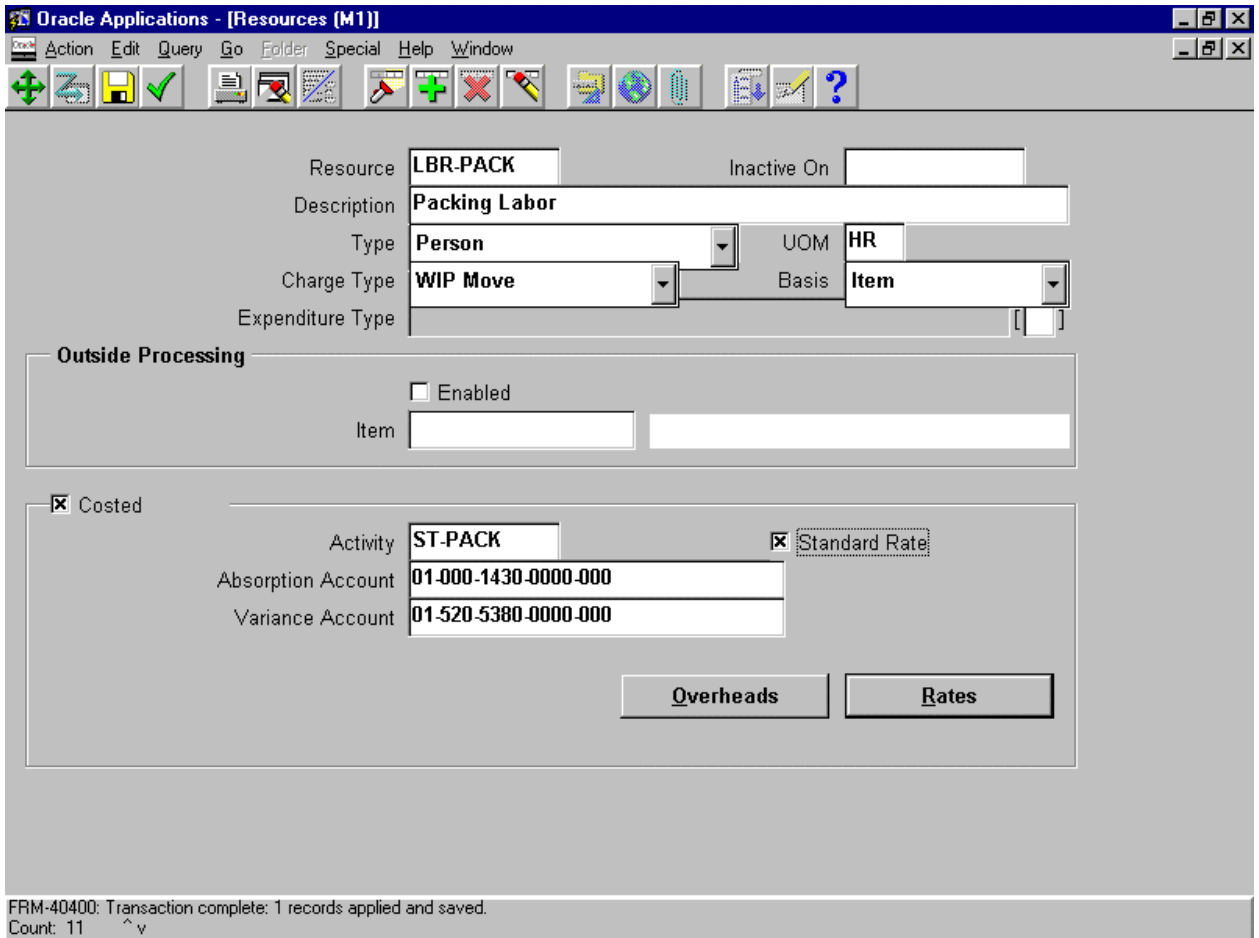


Figure 8: Resource Window

Activity / Product Association

After the cost structure for the activities and sub-elements have been defined, activities can be associated with products. As discussed above, only material overhead sub-element activity rates can be applied against an item. This association is created on the User Defined Item Costs Window. (See **Figure 9.**) For other sub-elements, activity costs are assigned on a routing via resources.

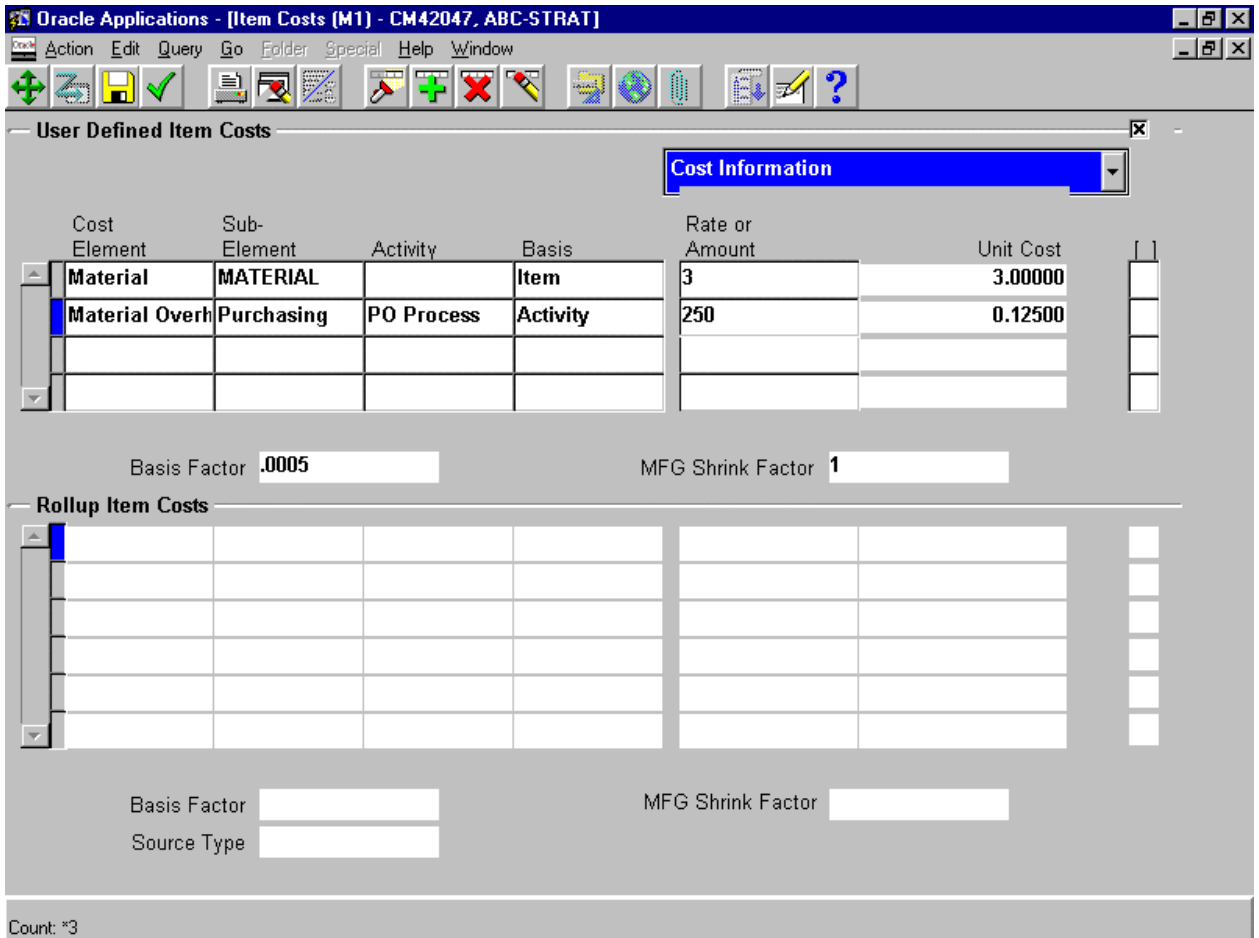


Figure 9: User Defined Item Costs Window

To create an association and assign a rate to an item, enter a material sub-element name and activity name. You can use a basis type of activity, item, or lot. Selection of the basis type should be based on an analysis of the types of activity costs that need to be applied using the following rules:

- To apply move-based costs, use item or lot basis to charge each item when moved in an operation; and
- To apply activity rates per item, use activity basis to charge each item upon completion of the assembly.

Costs applied under this method for material overhead are not earned in WIP. Material overhead charges are applied to the cost of an item whenever the quantity on-hand increases (i.e., it is earned when an item is received into inventory or an assembly is completed in WIP).

When defining item or lot basis type for material overheads, you only need to enter a unit cost per item. To assign an activity rate, enter the number of activity occurrences based on the number of times the activity is expected to occur for that item. The formula is:

$$\text{Activity unit cost} = (\text{activity occurrences} / \text{number of items}) * (\text{cost per occurrence}).$$

The cost per occurrence is derived from the Define Activity window. From a reporting or validation perspective, there are no cross validation edits to ensure the activity occurrences are not over-used.

In addition, when scrap is transacted, these costs are charged directly to a department / work-center accounting flexfield and not to an activity.

Routings

The next steps are to assign activities to routing operations. The activity name is assigned to a routing resource based on a previously defined relationship with a sub-element. If there is no relationship with a sub-element, an activity can be assigned directly to any routing resource (see **Figure 10**). To facilitate the assignment of activity-based resources to routing operations, standard operations could be defined to reflect the different types of activities or processes.

It is important to note that the activity rate associated with the resource is not used to apply costs to the assembly. The relationship between activity and the resource (i.e., activity driver) is only for reference purposes only. This means that when a sub-element is assigned to a bill or routing, the regular rate of the sub-element, not the activity rate, is charged to the cost of the item after cost roll-up. Therefore, it is important to assign the resource the appropriate rate to be applied to the product cost. To assign an activity rate as an example, a direct labor resource may have a rate of \$18.00, and an inspection activity rate of \$8.50. When cost is rolled-up, only the \$18.00 is included in the cost of the item, not the \$8.50.

| Seq | Resource | Activity | Standard Rate | Charge Type | [] |
|-----|----------|----------|-------------------------------------|-------------|-----|
| 10 | LBR-ASSY | ST-RUN | <input checked="" type="checkbox"/> | WIP Move | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | | |

Figure 10: Operation Resources Window

Cost Roll-Up

After all setups are complete and activity-based costs have been assigned to items (i.e., purchased parts, sub-assemblies, or assemblies), material overheads, and routings, costs can be rolled-up by activity. By selecting the parameter to roll-up costs by activity, you can retain activity detail at all levels, assuming parameters in the cost type were properly defined.

Reporting

After costs have been rolled-up activity-based costs can be reported. Various reporting tools are available. Comparative reporting of costs applied by cost type, comparing standard “Frozen” to strategic activity-based costs, can be generated. This provides management with a tool to compare standard with activity-based costs to help facilitate better decision making relative to product profitability and provides information to reduce costs.

The quality and value of data that is available through canned reports or on-lines inquires commiserates with the ability to efficiently implement either strategic or operational activity-based initiatives in Oracle. The following list of reports contains some of the more useful standard reports and cost views that provide valuable activity-based cost information:

- **Cost Type Comparison Reports:** This report is useful to compare differences in item cost elements between two different cost types.
- **Inventory Valuation Reports:** inventory valuation reports such as the All Inventories Value, Inventory Value, or Subinventory Account Value reports can be run using any cost type. These reports can be used to show how inventory would be valued using a strategic view of cost.
- **Item Cost Reports:** The Item Cost Report is an effective tool to analyze your unit costs for a selected item, item range, category, category range, or cost type. Several use variations of the report, referred to in the report parameters as a Report Name, are available. Those most useful for ABC analysis include Activity Summary, Element by Activity, Sub-Element by Activity, and Operation by Activity. These reports match the views available from the Item Cost View Window.

As a work-around to some of the reporting deficiencies in Oracle, an OLAP tool or Application Desktop Integrator – Request Center can be used for reporting. In addition, we have found the “Export” capability on the Item Cost View Window is a useful tool to export cost views for an item to Excel, albeit it is only one item. All methods can make information available for financial and operational analysis in a spreadsheet software package. A significant cost of implementing ABC is due to the effort required to develop custom reports to meet the needs of financial and operational management. To facilitate development of custom reporting, there are a number of cost views available in Smart Client 10.7 SC. These can help alleviate some of the deficiencies in reporting ABC information.

Limitations

There are several practical limitations a company can encounter when implementing activity-based costing in Oracle Manufacturing Applications. Business solutions to these limitations can be developed through custom programming or other procedural work-arounds. In Release 11, various tools such as Client Extensions, Account Generator, and Account Entry offer other ways to address these limitations. For example when using Client Extensions, if-then-else logic can be used to change a scrap account on a scrap transaction based on the component item or an absorption account can be changed on a WIP transaction based on the component item. The following are limitations that have been identified:

- The capability does not exist to automatically transfer activity-based costs from a non-frozen cost type to a General Ledger budget;
- Activity metrics and performance measures are not automatically integrated with a general ledger budget;
- Activity costs associated with material overhead may not match the timing of the actual business event that causes the expense to occur;
- No capability to perform “what-if analysis” for changes in costs of activities and the effect on unit costs, product profitability, and customer profitability;
- No canned report available to compare cost of used vs. idle capacity of resources;
- No canned report to show revenues generated per cost-object;
- Limited capability to support analysis of fixed vs. variable, avoidable vs. non-avoidable, inventoriable vs. non-inventoriable, incremental or marginal, controllable vs. non-controllable costs;
- Accounting transaction and costing reports cannot display information for any other cost type but “Frozen”;

- No controls or reports to compare activity measures against activity consumption exist;
- Limited reporting capabilities to show how an activity contributed to the cost of the product or service;
- Limited reporting and / or reporting structures to help summarize cost data by account, department, cost driver, or activity driver;
- Limited reporting that shows how a consumption account balances funded activities;
- Activity setup information, such as activity measures, quantity, usage, and rate information do not appear on canned Oracle Manufacturing reports; and
- There is no canned Bill of Activities Report.

Activity Based Costing Business Scenarios

Two business scenarios will be presented to help explain how strategic ABC and operational ABM use differing levels of detail. The following examples highlight differences in definition of activities and drivers.

The first business scenario involves the manufacturing process of producing pre-printed adhesive-backed labels. Some of the manufacturing activities involved with this process include:

- Receiving of raw materials (e.g., paper, ink, adhesive);
- Slitting the raw paper stock down to widths appropriate for finished label products;
- Coating the paper with adhesive;
- Move materials to the printing press location;
- Press set-up for the job to be run (e.g., number of colors, finished label width, perforations);
- Run printing press to produce labels;
- Rewind and inspect the finished label roll;
- Clean-up printing press machine;
- Package the labels for shipment;
- Ship the labels to customers; and
- Re-work any jobs necessary.

The above-defined activities represent work performed, either a process or a procedure. Hence, they should be setup in Oracle Cost Management to facilitate ABC analysis. These activities are performed by a person or machine resource. Using a resource cost element, various resource sub-elements should be defined. The activity rate is defined as the resource rate for each resource in the Resource Rates Window. See Figure 5 for the basis type defined for each activity.

Strategic ABC would assign the resource cost of producing a label to the above-discussed activities based on resource drivers. Resources would include wages of personnel to receive raw materials; set-up, operate, and clean the machines required to slit, coat, and press the labels; and package labels. Another resource to consider is the cost associated with running and maintaining the machines. A resource driver could be the number of hours worked by an employee or hours of machine time dedicated to the completion of a production label order. In Oracle, the resource driver information should be defined in the usage rate or resource rate fields. A user-defined cost type (i.e., “ABC-STRAT”) should also be defined for a strategic ABC analysis.

This approach of defining activities and associating the resource driver via the usage rate or resource rate is efficient in gathering activity driver data and reasonably accurate in associating those activity drivers with the cost objects (e.g., labels produced to fulfill an order). In this case an activity driver might be the size of the label order released to production. It would represent the link between the activity and cost object. It provides a reasonable answer to the question, “what do things cost?” However, if you change the question to “what causes cost to occur?” then the use of these resources and activity drivers are not detailed enough and in many cases inappropriate.

A production floor manager trying to understand what causes label production costs to occur finds that strategic ABC does not provide enough detail to answer his or her questions. If the strategic ABC system indicates that

smaller-sized label orders is a key activity cost driver, the production floor manager who uses this information may produce disastrous results. Often an operating manager will mistakenly begin to manage the activity cost driver instead of the activity; in this case managing the size of label production orders instead of label production department activities and the true cost drivers. Reducing the number of smaller order quantity jobs may result in efforts to run only jobs with higher quantities. While this reduces the number of jobs run to produce a given quantity of labels, it may have the opposite of the desired effect, resulting in the company possibly producing fewer small quantity jobs that could be highly profitable from a margin perspective.

For the production floor manager to understand what causes costs to occur, he or she must focus on a multitude of true cost drivers. The size of production orders could be one, but more likely cost drivers include:

- Number of colors involved in producing the finished label;
- Frequency of press changes (i.e., stopping and re-starting the printing press);
- Experience level of the machine operators; and
- Speed at which the job is being run through the printing press.

To potentially capture the operational ABM costs associated with the above listed cost drivers, different set-ups in Oracle would be required. The set-up requirements would vary in complexity. Typically a user-defined cost type (e.g., "ABC-LABELS") would be defined with the default cost type left blank. More specifically, the ink color could be setup as a material resource or material cost element. The cost associated with the frequency of press changes could be captured if a step was defined in the routing for non-scheduled breaks in production. Utilizing different pay grade rates, the different experience levels of machine operators could be costed in an operational ABM scenario. By varying the usage rate on the routing (i.e., speed of the job being processed through the printing press) the activity costs associated with the production label run could be operationally studied.

All these factors cause cost to occur in the production of labels. An understanding of each cost driver provides the basis for cost reduction and operating improvements. To measure the resulting affect of these potential cost drivers, performance metrics would need to be established (e.g., the number of labels produced per machine per shift). Any attempt to implement both a strategic ABC and operational ABM cost model using the same detailed level of activities would require substantial effort and is not recommended for simultaneous implementation. To apply the level of detail required for an operational analysis in a strategic ABC system would require significant computing capacity to process the detail for a single activity.

The second business scenario involves the receiving department for the above-described manufacturer of pre-printed adhesive-backed labels. The receiving department is involved with:

- Accepting delivery of raw material required for production;
- Moving the paper supply materials to a controlled environment for quality inspection to occur; and
- Stocking received / inspected materials into inventory.

The above-defined activities would also need to be setup in Oracle Cost Management to facilitate ABC. Resources involved in receiving the materials required for label production would include salaries, facility costs, computer system, and supplies. Utilizing a resource driver such as the percent of time spent on each activity, the resource costs could be assigned to the activities. The activity costs would then be assigned to the cost objects (e.g., products or customers) based on an activity driver such as the number of shipments received.

Once again, this type of cost management is helpful in answering the question, "what do things cost?" However, the pitfall is a strategic ABC analysis might lead a receiving department manager to conclude that the number of shipments received is a key activity cost driver. If he or she then began to manage the number of shipments received instead of receiving department activities, then shipments may be received in consolidated quantities. While this reduces the number of shipments received, it also may result in an increase in the company's overall costs.

The receiving department must also focus on a multitude of true cost drivers. While the number of shipments received could be one, more likely cost drivers include:

- Number of vendors used;
- Number of vendor audits or evaluations performed;
- Quality of each vendor;
- Number of operating locations supported;
- Type of goods purchased;
- Paperwork used to process receipts; and
- Complexity of the receiving process.

While the first four cost drivers listed are in fact valid drivers, Oracle Manufacturing Applications is not set-up to adequately handle these drivers. However, the General Ledger could be used to capture the costs associated with these drivers. The type of goods purchased driver could be set-up as a material overhead resource for operational analysis. The final two drivers could be captured if they were set-up on a routing as part of the activity to issue material to a work order.

Conclusion

While there are many challenges to implementing ABC in Oracle Applications, there are many strategic, operational, and financial benefits to an organization. Whether through strategic ABC or operational ABM analysis, solid cost management information can be obtained. Strategic ABC analysis is better supported in Oracle Applications than operational ABM by virtue of the ability to use higher level activities to study. While there are limitations in the ability of Oracle Applications to fully support an ABC environment, trends suggest that all ERP vendor are moving towards integrated performance management systems.

Other Reference Sources

Other reference sources and suggested readings include:

- Steve Player & David Keys, "Arthur Andersen's Lessons from the ABM Battlefield. (New York: MasterMedia, 1995).
- Shahid L. Ansari, Jan E. Bell, and the CAM-I Target Cost Core Group, "Target Costing – The Next Frontier in Strategic Cost Management". (Chicago: Irwin, 1997).
- Steve Player, Arthur Andersen Advanced Cost Management Team, "The Convergence of Enterprise Software into Analytical Applications and Activity-Based Cost Management"
- "CAM-I Glossary of Terms" edited by Norm Raffish and Peter BB Turney. (Arlington, TX: CAM-I, 1991).

Credits

We would like to thank Weber Marking Systems, Inc., especially Glen Gilly, John O'Leary, and Joe Fuchs for their assistance and support.

About the Authors

George L. Somogyi is a Manager in the Chicago office of Arthur Andersen's Business Consulting practice. He began working with Oracle Applications in 1989. He has experience implementing Oracle Financial Applications, Oracle Manufacturing Applications, Oracle Order Management, and Oracle technology solutions.

He is a Certified Public Accountant, and has been the OAUG Accounts Payable Enhancement Chair for the past 5 years.

John B. Augustin is a Manager in the Chicago office of Arthur Andersen's Business Consulting practice. He has experience in Oracle Financial applications and Oracle Manufacturing applications. John has focused on business process improvement projects in manufacturing, engineering, environmental, and government businesses.

Jason J. Balogh is a Manager in the Chicago office of Arthur Andersen's Business Consulting practice. He focuses on assisting manufacturing organizations as a member of the Arthur Andersen Advanced Cost Management Team.

Kelly L. Mohritz is a Consultant in the Chicago office of Arthur Andersen's Business Consulting practice. She has experience working with government and higher education clients. Kelly is trained in both the Oracle Financial Applications and Activity-Based Costing.