what ERP can offer ABC

BY SIDNEY J. BAXENDALE, CMA, CFM, CPA, AND FARAH JAMA

One of the greatest stumbling blocks in implementing an activity-based costing (ABC) system is finding the right activity cost driver to use in attributing the cost of an activity to products or other cost objects. The nonfinancial measures that are typically used as activity cost drivers are rarely found in the accounting system. Measures such as number of sales orders, number of material moves, and number of engineering change notices per type of product are more likely found elsewhere.

Because the activity cost drivers aren't under the control of the accounting system, the activity cost-driver information isn't subject to the same process controls used to add reliability to the accounting numbers. In the early days of ABC-based costing, activity cost-driver information was often derived from a "back-of-an-envelope" information system.

ENTERPRISE RESOURCE PLANNING SYSTEMS

Enterprise resource planning (ERP) systems can significantly increase the availability and reliability of activity cost-driver information. ERP systems have become popular in recent years because they typically integrate financial accounting, managerial accounting, cost accounting, production planning, materials management, sales and distribution, human-resource management, quality management, and customer service using a relational database. The use of a relational database permits functional areas to share information without reentering the data or duplicating the data in databases throughout the organization.

One of the more dramatic ways that ERP systems provide reliable activity cost-driver information is by integrating production planning, materials management, and cost and management accounting. In cost and management accounting, activity-based costing is used to

increase the accuracy of the product-cost information and to develop activity-based budgets. Before ABC, the materials handling costs and other materials management costs were often allocated to products based on a percentage of the direct material costs associated with each product. The percentage amount used in the allocation was based on the relationship between budgeted materials management costs and the expected total cost of direct materials.

TURNING OVERHEAD COSTS INTO DIRECT COSTS

To simplify this presentation, we will focus on ABC support in the widely used R/3 System from SAP. It's important to note that ERP systems from other vendors typically include an ABC feature with degrees of integration that vary from company to company. Check your vendor's support team for specifics.

SAP's R/3 system links production planning's bill of materials with material movement information that is available in the materials management portion of the system. It permits the establishment of standards for material handling. In fact, in many respects, the use of the R/3 system results in material handling cost as a direct cost rather than as the traditional indirect (overhead) cost.

The R/3 system is capable of regarding materials handling as a process whose activity cost driver is the "number of pallet moves." The cost of the materials handling process is then attributed to a product based on the various direct materials that are moved in the manufacture of the product specified in a production order. The bill of materials (BOM) for the production order will reveal direct material part numbers that will be needed. Materials management personnel will have already entered into the R/3 system information about the number of units of each direct material part number that will fit on a pallet. One unit of direct material part number B123 might require 1/20th of a pallet (20 units per pallet), and one unit of direct material part number A456 might require 1/50th of a pallet (50 units per pallet).

If we assume that a unit of product PDQ requires one unit of direct material B123 and one unit of direct material A456, then the R/3 system can calculate a standard direct cost that includes material handling costs. Those material handling costs formerly would have been regarded as indirect (overhead) costs. Table 1 shows the direct

Table 1: Calculation of Standard Cost for a Production Order

Direct material B123 1,000 products X 1 unit X $10.00 per unit =		$10,000
Direct material A456 1,000 products X 1 unit X $25.00 per unit =		25,000
Materials handling:***		
1,000 products X 1 unit of B123 X 1/20 X $50*	=	2,500
1,000 products X 1 unit of A456 X 1/50 X $50*	=	1,000
Total Direct Product Cost **		$38,500
Direct Cost per Unit of Product		$38.50

* This $50 represents the activity cost-driver rate for the material handling process. This amount is calculated by dividing the annual budgeted costs of the materials handling process by the annual capacity of the process in terms of the number of pallet moves.
** This example has omitted other direct costs for simplicity purposes.
*** If a direct material required only a portion of a pallet, the number of pallets would be increased to the next whole number of pallets.

costs associated with a production order for 1,000 units of product PDQ. Those direct costs were calculated using an activity-based costing approach to product costing.

In costing the bill of materials for the production of 1,000 units of product PDQ, the R/3 system would link production planning's BOM for PDQ with material management's "bill of services," which specifies the portion of a pallet required by each unit of the various raw materials. That BOM would be related to the standard direct material costs maintained by the financial accounting portion of the R/3 system for inventory costing purposes. The associated bill of services would be related to the activity cost-driver charging rate for the materials handling process as determined by the ABC system. These relationships are possible because the data resides in the R/3 system's relational database. Using this relational database, each direct material part number on the BOM is converted to its related cost based on the standard direct material costs maintained by the financial accounting portion of R/3 for inventory valuation purposes. Further, the quantity of required direct materials is converted into required pallet moves, and the required pallet moves are costed using the activity cost-driver charging rate calculated by the ABC system.

R/3 SUPPORT FOR ACTIVITY-BASED BUDGETING

These same relationships between production planning, materials handling, and accounting, as represented in the R/3 system, are a tremendous benefit when the ABC system is used for budgeting purposes. Activity-based budgeting (ABB) attempts to anticipate the demands on a process, such as materials handling, given the estimated production of various products in standard batch sizes.

Table 2 shows the required number of pallet moves by the materials handling process given a budgeted annual production of 100,000 units of product PDQ in lot sizes of 1,000 units.

When the budgeted production of all products (product PDQ and others) is considered, the R/3 system will have estimated the quantity of the various direct materials and the number of pallet moves required to support the total budgeted production. The activity-based budget will already have an estimated budgeted cost and an estimated practical capacity in terms of pallet moves for the materials handling process. Let's assume that the budgeted annual cost for materials handling was $5 million and the budgeted annual capacity at that budgeted level was 100,000 pallet moves (resulting in the $50 activity cost-driver charging rate mentioned earlier). If the production budget estimated that 120,000 pallet moves would be required for the year, the activity-based budgeting system would reveal that the demands on material handling would be 20,000 pallet moves in excess of the budgeted capacity. This should certainly result in a reevaluation of the materials handling process and its budget.

This reevaluation could result in process improvements, including placing more units of raw material on each pallet or reducing the average length of each move. If no process improvements are possible, the manufacturer may have to increase the capacity of pallet moves by increasing the resources budgeted for the materials handling process. The final budget for materials handling cost and materials handling capacity will determine the activity cost-driver charging rate for each pallet move. Thus, the $50 activity cost-driver charging rate used in determining the direct cost for product PDQ could change as a result of a shift in the budgeted practical capacity and/or the budgeted cost.

OTHER PROCESSES

SAP's R/3 system collects a multitude of nonfinancial measures that are potential activity cost drivers for use in ABC systems. It can count and record the number of line items on a sales order, the number of sales orders for each type of product, the weight of each item on a shipping document, the number of shipping containers per sales order, and more.

This information is collected as part of a formal process that has built-in controls designed to ensure reliability. These controls include automatic counting of line items on a sales order. As the sales-order information is entered into the R/3 system, the system counts and records the number of different products that are included on the sales order. As the orders are processed, the system counts the number of sales orders for each product type. Another control includes the mandatory inclusion of information in the master record. For example, the master record for direct material B123 must include the maximum number of units of the direct material that will fit on a pallet (20 units for B123) before the master record will be incorporated into the ERP system.

Bar coding of product information is another control that adds integrity to the system. SAP's R/3 can record information directly into the system by reading bar-code information concerning direct materials input and product output. A feature of R/3 is the use of sensing devices on machines that will record data in the system without human intervention. With this feature, every time a punch press makes a "punch," the system automatically records the number of pieces created by the "punch."

SAP's R/3 system has an abundance of nonfinancial measures that may be used by activities as activity cost drivers. These measures have a high degree of integrity because of the way they are collected and recorded. Now, activity-based costing can move beyond the back-of-an-envelope information for determining the activity charging rates used to assign activity costs to products or other cost objects. Integrating the ERP information with the ABC process saves time and resources. ∎

Sidney J. Baxendale, CPA, CMA, CFM, Ph.D., is professor of accountancy at the University of Louisville, KY. You can reach him at (502) 852-4813 or baxendale@louisville.edu.

Farah Jama is a Solution Manager at SAP America, Inc., Chicago, Ill. You can reach him at (312) 279-2500 or farah.jama@sap.com.