APQC INTERNATIONAL BENCHMARKING CLEARINGHOUSE

Activity-Based Management II:

Best Practices for Dramatic Improvement

CONSORTIUM BENCHMARKING STUDY

BEST-PRACTICE REPORT

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STATEMENT OF PURPOSE

The purpose of publishing this study is to provide a reference point for and insight into the processes and practices associated with certain issues. It should be used as an educational learning tool and should not be used as a "recipe" or step-by-step procedure to be copied or duplicated in any way. This report may not represent current organizational processes, policies, or practices because changes may have occurred since the completion of the study.

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Sponsor Companies

XVIII Airborne

ABC Technologies, Inc.

Alcan, LTD

AlliedSignal

Casa Autrey

CASE Corporation

Central & Southwest Corporation

Coca-Cola Foods

Cockerill Sambre, SA

***Controller* Magazine**

Ed Tel

Educational Testing Service

KLM Catering Service

Lawson Software

MetLife

Mutual Life of Canada

Nationwide Insurance

Navistar

Public Service Company of Colorado

Public Service Gas & Electric

Reichhold Chemicals, Inc.

Societe D'Electrolyse & De Chemie

Solvay Polymers Inc.

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Partner Companies

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First Data Corporation

Hewlett-Packard (North American Distribution Organization)

Marmon Keystone

Northeast Utilities

Public Service Electric & Gas Company*

Ralston Purina Company

Tektronix, Inc.

**Did not host site visits*

Executive Summary

The level of business performance required today to compete globally and to meet demands from increasingly sophisticated customers is unprecedented. At world-class levels of performance, change is constant. Improvement is required just to stay even. The complex and unique demands placed on a company's products and services have rendered traditional cost management systems and methods inadequate to plan and manage the business.

Since 1986 companies have increasingly recognized the value of activity-based management (ABM) information systems to meet the needs and demands of management and operational people. ABM provides companies with better information to manage by process. It identifies the key and significant activities performed in an organization and provides an accurate measure of the associated costs. The benefits of an ABM system include enhancing revenue, encouraging growth, reducing costs, increasing productivity, and enabling fact-based decision making.

In 1994 the American Productivity & Quality Center (APQC) and its research partner, the Consortium for Advanced Manufacturing-International (CAM-I), collaborated to conduct and publish a broadly based study of best practices in the application, development, and use of ABM information systems and practices. This widely quoted study, with its related survey, was the most comprehensive piece of work ever undertaken in the emerging area of ABM.

Since 1994 the number of companies and organizations embracing these new activity-based management systems has grown significantly—from the 3,000-plus organizations known in 1994 to have undertaken ABM implementations to more than 10,000 today. Since 1994 several significant trends have been established:

- from pilot tests to full implementations,
- from manufacturing companies to all industries,
- from single applications of activity-based costing (ABC) to multiple applications of ABM cost and performance information,
- from single/select users to multiple users,
- from separate management initiatives to integrated management initiatives,
- from reducing cost to creating value,
- from financial measures to process measures, and
- from North American to worldwide application and use.

Recognizing a need to understand best practices and how they are changing in this emerging and expanding use of ABM information systems, APQC teamed with Arthur Andersen to conduct a more detailed study into specific aspects of ABM information systems. On September 25, 1996, 42 corporate executives, members of academia, and ABM practitioners met in Houston to select the three key areas that became the focal points of this study:

1. transfer of ownership,
2. systems development, and
3. reporting.

SCOPE

This study included a comprehensive survey of organizations known to have achieved success in their ABM implementations. It also included site visits to organizations identified as having best practices for each of the study areas. An integral part of this study was the development of a database of ABM implementations considered or expected to represent best practices in ABM. Input to this database was based on secondary research, discussions with commercial software companies and consulting firms, and the companies' reputations. It also included input from the ABM study sponsors.

Five hundred fifty organizations were invited to participate in this study and asked to complete a comprehensive and detailed survey designed to identify best practices in ABM. The survey questionnaire consisted of 48 questions and was designed to be completed in one hour. Many of the questions yielded multiple answers. In total, 112 discrete pieces of data were gathered from each of the companies that completed the survey.

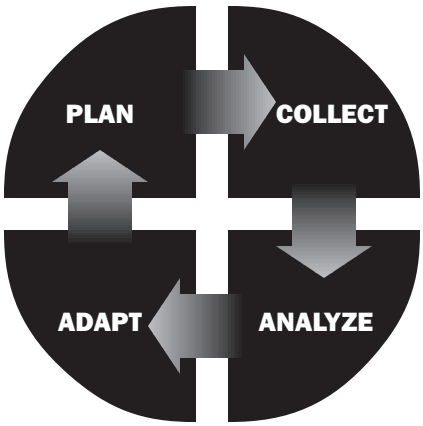
The survey was subdivided into eight areas: company information, site information, benefits of ABM, systems development, ABM reporting, ABM ownership by operating personnel, budgeting, and implementing ABM. The instructions with the survey stated that only those organizations that had achieved positive results from ABM efforts should complete and respond to the survey. We received 161 responses.

Based on the survey responses, 25 companies were identified as exhibiting best practices in ABM; 15 of them participated in the study as best-practice "partners." Criteria for selection of best-practice partners included maturity of installation, scale of coverage, scope of applications, results attained, and anticipated learning opportunities. Thirteen site visits were conducted to represent the organizations identified as best practice. Three of the site visits focused on transferring ownership of ABM information to operating personnel. The remainder focused on systems and reporting.

As this was a comprehensive and detailed study covering three specific aspects of ABM, the site visit questionnaires were custom designed to the specific agenda areas under study. Focused one-day site visits allowed the research team to gain insightful answers to interview questions and to experience the organization's culture. Subsets of sponsors also attended each site visit to participate in discussions with best-practice companies.

These three study areas were synergistic and designed to build on each other. The first area of study was how best-practice organizations achieve ownership of ABM information by operations personnel. The first area was completed and presented to the project sponsors in Houston on January 30 and 31, 1997. Also at that meeting, the results of the comprehensive survey were presented by Professor George Foster from Stanford University and Professor Dan Swenson from the University of Idaho.

Ten site visits for the second two areas of study, systems and reporting, were conducted during March/April 1997 and presented to the project sponsors on April 29 and 30. These two areas were particularly synergistic. Site visits of best practices for systems provided insight into best practices for reporting and vice versa.



METHODOLOGY

Benchmarking is the process of identifying, understanding, and adapting outstanding practices to help organizations improve their performance. This study was conducted using the four-phase benchmarking model of APQC's International Benchmarking Clearinghouse.

Phase 1: Planning

In planning this study, the study team and project sponsors established the scope, key measures, and definitions. Next, a database of potential benchmarking partners was developed. With this framework, the survey screening questionnaires and format for the detailed questionnaire were designed and conducted. The final step in planning was to identify contacts at potential partner companies.

Phase 2: Collecting Data

Surveys, questionnaires, and site visit discussion guides were used to collect data throughout the benchmarking process. These tools solicit quantitative as well as qualitative information.

The data collection tools used to collect information for this study included both questionnaires and site visit interviews. The two questionnaires were 1) a detailed survey questionnaire designed to collect objective and quantitative data, and 2) site visit questionnaires designed to collect qualitative information about the specific areas of study.

Phase 3: Analyzing

The analyzing phase included identifying practices that enable superior performance, identifying barriers to performance, and analyzing trends.

Phase 4: Adapting and Improving

In the adapting and improving phase, research reports were presented and sharing sessions on innovative practices were conducted.

SUBJECT MATTER EXPERTISE

As is standard with APQC's consortium benchmarking studies, subject matter experts (SMEs) were involved throughout this study. John A. Miller of Arthur Andersen LLP (AA) served as the study director and principal author. John was also the director and principal author of the first ABM study, completed and published in 1995.

George Foster of Stanford University and Dan Swenson of the University of Idaho, also SMEs in the first study, were responsible for designing and conducting the comprehensive survey used to identify organizations that had achieved success in their ABM implementations. Along with Steve Player and Randolf Holst, SMEs from Arthur Andersen, they participated in site visits and in the identification and presentation of best practices and overall findings.

KEY FINDINGS

This report contains a summary of the key finding and significant contributions of this ABM best-practice study. The key findings, covered in detail elsewhere in this report, for each study area are as follows:

Systems Best Practices

1. Companies are investing more in systems integration/systems linkages.
2. Data integrity is given high priority.
3. Access to information is viewed as a key issue in the successful use of ABM information systems.
4. Timing and its multiple dimensions are viewed as central in systems decisions.
5. The information systems resource commitments that best-practice companies make are appropriate to the decision applications.

Reporting Best Practices

6. Customization of reports is viewed as an ongoing part of systems development.
7. There is greater recognition of the benefits of reports comparing costs (and other variables) across multiple units.
8. Reports at best-practice companies give high priority to revenue enhancements and value creation.
9. Innovative data display/user interface is viewed as a high priority.

Transfer of Ownership Best Practices

10. Linking ABM information to operational goals/objectives and improvement initiatives is crucial for success.
11. Successful pilot tests/efforts prove the value of ABM initiatives through early wins.
12. ABM implementations should be operationally funded and operations driven.
13. Linking ABM information systems to compensation encourages operational and user ownership.

14. Operating personnel develop ownership of ABM information through periodic review and documentation of results.

SUMMARY

When this ABM best-practice study was initiated in July 1996, the intent was to conduct a significant and comprehensive study in three very specific and important areas for a successful ABM implementation. The goal was to create a landmark work that would provide value and long-term impact to those managers and organizations that elect to implement ABM in their organizations.

Study sponsorship by 24 leading companies, involvement of five subject matter authorities, and the willingness of 161 organizations to complete a detailed survey of ABM and of 15 best-practice companies to share their insights and knowledge would indicate that the goal was met.

The vision for the study included sharing knowledge gained, lessons learned, insights, methods, and practices of successful ABM initiatives with others. The mission was to lay a foundation for others to build upon and improve. This final report document is the fulfillment of that vision and mission.

Key Findings

Section One:

Systems Best Practices

Introduction

Developing an ongoing, reliable, and responsive system/model to report activity-based management information is a critical part of a successful ABM implementation. After all, what is the point of implementing ABM (other than to use its cost-tracing methodologies in a special project or one-time study) unless it is to report timely, accurate, and relevant ABM information on a continuing basis? Without continuous ABM reporting, the ABM implementation is a nonevent.

Best-practice companies—especially those that have approached implementation from an enterprisewide perspective—place significant emphasis on the selection and development of cost-effective data collection and reporting systems to collect and report ABM data. The levels of detail, accuracy, and frequency required by the users of the information are application specific.

The best-practice companies that hosted site visits have designed successful systems in which the primary applications are strategic, operational, or both. In general, ABM applications that were operational in nature (process and performance related) require more granular data, accuracy, and frequency of reporting than decision/strategic applications such as customer costing, product-line profitability analysis, and product/service costing. Strategic applications are updated as needed and require lower levels of detail and accuracy.

The types of ABM systems solutions vary considerably—from continuously updated mainframe systems running in a client/server environment to simple models run on commercial software and updated annually—within the best-practice companies and are dependent on the application. A key issue at each of the best-practice companies was whether to implement the ABM system off line through stand-alone or networked personal computers or to integrate the system online as part of the existing or planned financial and operations systems.

Organizational size and existing information systems capabilities and expertise are important factors in the type of ABM information system developed at best-practice companies. Large organizations that require frequent reporting of ABM information for operational purposes can overwhelm the capabilities of PC-based software prod-

ucts. Legacy systems capabilities and internal information systems capabilities and experience are also important factors in the selection of the ABM system solution.

In addition to the development of the ABM information system, significant emphasis is placed on the ongoing maintenance of the system. Even if fully integrated with existing financial and management systems in such a way that updates and reports are done automatically, the system still requires ongoing maintenance. Activities change over time, and the system must be updated accordingly. A lot of changes are a good sign; after all, if people aren't using ABM information to effect changes in the activities and processes performed, then the information is not providing the necessary value. Changes to activities and processes should be the rule, not the exception.

Finding 1:

Companies are investing more in systems integration/systems linkages.

Best-practice companies place significant emphasis on installing systems, procedures, and methods to collect and report activity-based information on an ongoing basis. Systems integration and linkages are emphasized for several reasons. The first reason is one of cost. ABM systems that are not integrated and linked to the existing financial and operations systems of the company can be difficult and expensive to update and maintain. Another reason is one of timeliness. Linkage to and integration with existing systems ensures that ABM reports are available at the same, or nearly the same, time as other financial and operating reports.

Systems integration can occur at different levels—across one organization (by functions, regions, processes, or the enterprise as a whole) or across multiple organizations. Efficient Customer Response (ECR) is a good example of systems integration across the value chain (suppliers, producers, distributors, retailers, etc.).

BellSouth Telecommunications:

The Activity-Based Information System (ABIS) at BellSouth is a large-scale, fully integrated system. The basic system architecture is a database (Oracle/Visual Basic application running in a client/server environment) linked to and integrated with source financial (cost) transactions and operation information and transactions from existing information and reporting systems.

Northeast Utilities:

Northeast Utilities (NU) has embedded ABM in the general ledger and budgeting system, which also integrates all source systems and accounting codes. Activities are budgeted and tracked by this fully integrated and multifaceted mainframe computer system. NU has used the basic system for more than five years. It is capable of tracking cost information by facility, project, task, resource type, cost control center, activity, and FERC (regulatory) reporting—both actual and budget.

Finding 2:

Data integrity is given a high priority.

Data integrity and accuracy are key systems design considerations at best-practice companies and vary by application. ABM systems that process polluted and contaminated data to produce inaccurate, or even misleading, information are useless.

Traditional financial cost data are often plagued by allocations, misapplied costs, assumptions, and incorrect coding that make the data unreliable; data from the other operating systems can be equally unreliable. Estimates (such as how people spend their time by activity) used to trace and allocate costs to activities, processes, products, services, and customers that are nothing more than guesses affect the data integrity and accuracy.

The requirement of data integrity and accuracy drives data input collection procedures by emphasizing upfront validation (quality inputs). Best-practice companies invest in labor-time reporting and validation including multipurpose use of bar coding on the manufacturing floor to ensure data integrity.

BellSouth Telecommunications:

One of the key implementation issues and critical success factors for the ABM implementation at BellSouth was to set forth the principles of the ABM project at the onset. One of the four principles identified was reconciling ABM data to the financial accounting system to ensure integrity.

City of Indianapolis:

Mayor Stephen Goldsmith's citywide competition strategy requires public employees to compete for their own jobs. City workers competed directly with private industry for contracts for city services, and activity-based cost information was used to formulate the bids. Because private industry and city residents were concerned that the city might submit bids below cost to win contracts, an independent auditor served as an unbiased third party to ensure that the city's bids were based on realistic cost estimates.

Finding 3:

Access to information is viewed as a key issue in the successful use of ABM information systems.

Access to ABM information is viewed as a key issue from three perspectives. One perspective is controlling access. As the use and application of ABM information systems have expanded, best-practice companies have become increasingly aware of the sensitivity of different information types. Supplier prices, customer profitability, payroll levels, executive compensation, and substandard areas are all examples of information that may be sensitive and to which organizations want to control access. Therefore, some best-practice companies restrict access to inputs, design of the ABM model (read-only capability), and content and detail of reports.

Another perspective is expanding access to ABM information. Best-practice partners understand that the value of ABM information is created when people use the information to improve organizational performance. Many people using ABM information can create lots of value. Therefore, focused efforts are undertaken to increase the base of people who access and use ABM information.

A third perspective is ease of access to ABM information. People who require ABM information expect fast and easy access to the data. ABM system design specifications must reflect the expectations, requirements, and standards of users.

The goal at best-practice companies is to expand the use of, and access to, ABM information, without losing control of sensitive or compromising information. ABM information systems that meet users' requirements for speed and ease of use contribute to expanding the base of users.

BellSouth Telecommunications:

There are three levels of users at BellSouth. Access to data is limited according to level. Level 1 users can see all of the available information. Level 2 can see information within a single business unit only. Level 3 can see limited information available in the databases.

Charles Schwab & Company:

Initially, customer profitability information was not shared with managers at Charles Schwab for fear that they would share that information with customers. Subsequently, the company has empowered its people in the field to use customer profitability information.

Public Service Electric & Gas Company:

Access to ABM information at Public Service Electric & Gas Company (PSE&G) is based on need and level of organizational responsibility. In general, access to ABM data carries a prerequisite that users have control and influence over the data and information available to them. Higher levels of organizational responsibility and authority are accorded broad access to ABM information. People at lower levels of responsibility and authority are accorded access only to the ABM information they need to do their jobs.

Finding 4:

Timing and its multiple dimensions are viewed as central in systems decisions.

Time, in its multiple dimensions, is a central theme for the systems implementation at best-practice companies. Time and effort spent on decision use of ABM information is more valuable than time and effort spent on assembling ABM information. ABM systems must enable decision use of ABM information by minimizing the effort required to reconcile data and balance reports and to update and maintain the system.

Time is also important in the sense of rapid response to inquiries. This includes not only the system response time but also response to users' inquiries on the application and use of the ABM system. Ease of off-loading data to other systems/tools is viewed as important as well.

Allied Signal:

At AlliedSignal, the focus of ABM efforts is to provide information that can be acted upon immediately. Providing timely and actionable information is also the basis for the company's long-term cost systems needs. Increasing the time available to act by reducing the time required to analyze is a cornerstone of AlliedSignal's ABM information.

Tektronix, Inc.:

Costing of new products at Tektronix had been time consuming, inefficient, and frustrating for new product introduction managers. In addition, new product cost estimates were generally unreliable. ABM information was used to increase the speed of new product introductions by reducing the time and effort required to estimate new product costs. ABM information also increased the accuracy of estimates.

Finding 5:

The information systems resource commitments that best-practice companies make are appropriate to the decision applications.

There are many alternatives to the design and installation of the ABM information system. Alternatives are driven by the purpose and use of the activity-based information and are application specific. The Information Services (IS) resource commitments necessary to support the ABM implementation are also application specific.

Operational applications of process improvement, cost reduction, and performance measurement that require a relational database (complete with automated interfaces between existing financial and operating systems to feed and update the database continuously) running in a client/server online environment with multiplatform access by Macintosh, DOS/Windows, and UNIX require significant IS resources. Annually updated PC-based models used for strategic applications such as product profitability require the commitment of fewer IS resources to implement.

Regardless of application, best-practice companies are involving their IS technical people early in ABM systems design and development stages. Dedicated resource commitments are being made beyond the initial implementation phase.

Public Service Electric & Gas Company:

At PSE&G, the ABM system is a delivery tool to provide and display profitability information, process and activity cost information, and nonfinancial measures of process and activity performance. The system concept was to provide an easy-to-use point-and-click desktop application, updated in a timely manner—rapid development, rapid response. Systems expertise was identified as one of the keys to the success of the ABM initiative, and Information Services was involved in and committed to the ABM implementation from the outset.

Ralston Purina Company:

Securing adequate Information Services resources and early involvement of IS personnel were critical to enterprisewide ABM implementation at Ralston Purina.

Support from top management was required to ensure that IS resources were available to provide the necessary feeder systems that allow the ABM system to interface with the general ledger for financial information and with the operating systems for operational data.

Summary

Many ABM implementations fail to place sufficient emphasis on installing the systems, procedures, and methods necessary to collect and report activity-based information on an ongoing basis. As a result, the systems, procedures, and methods that are installed are often unresponsive to the needs of users, difficult to maintain, and unreliable. We learned from the best-practice companies that the systems and software aspects of the ABM implementation cannot be ignored; in fact, they must be emphasized.

For an ABM system to be useful, its focus must be on the important aspects of the business, at a level relevant to improvement efforts and decision making. A cornerstone of an effective ABM information system is the avoidance of complexity whenever possible. The simpler a procedure is, the easier it is to implement and the greater support it provides to management. Designers of best-practice ABM systems have learned that complex designs lead to complex repair problems and difficult modifications. A basic rule followed by best-practice companies is if the users of the output are unable to understand the system's basic features and functions, the system is too complex. Instead of "user friendly," best-practice companies think "user tempting." This means that a system is not only easy to use but also tempting to use and drives increased usage.

Section Two:

Reporting Best Practices

Introduction

ABM information is communicated to the organization through reports, reporting capability, and access to information contained in databases. Organizations design and implement ABM reports and reporting capability to provide cost and performance information about key and significant activities: the cost of products, services, customers, distribution channels, and other company-specific cost objectives. They also design reports and reporting capability to track the resource and activity drivers used to trace, assign, and allocate costs. Reports and reporting capability highlight the costs for nonvalue-added activities and identify opportunities and cost drivers.

Like systems best practices, ABM reporting practices vary considerably among the best-practice companies and are application dependent. Reporting for operations applications is more frequent, more detailed, and more accurate. Strategic applications report information quarterly or annually and are updated only periodically. The capabilities of ABM reporting systems in terms of accuracy for intended use, ease of use, timeliness of information, access to information, and ad hoc reporting were identified as critical success factors by the best-practice partners.

At best-practice companies, reports are designed so that the users are able to view information from many different perspectives, in differing formats, and in relationship to other data. Many of the best-practice partners use flexible EIS systems to generate reports and information online to users. Graphical and other innovative report displays are used to illustrate important aspects of reports.

Use of the Internet and intranets to make reports and information available to users was a fairly common practice at the best-practice companies. Most of the partners either had, or were planning to have, Internet and intranet reporting capabilities.

Finding 6:

Customization of reports is viewed as an ongoing part of systems development.

No one can anticipate all of the needs of ABM information systems users and the kinds of reports they will require. The ability to provide users with the flexibility and capability to build customized reports is demonstrated throughout the best-practice organizations. At these companies, input from decision makers helps guide the timing, content, and format of reports.

Charles Schwab & Company:

ABM reporting at Charles Schwab covers six dimensions consisting of general ledger revenue/expense group, organization, project, distribution channel, and product and customer segment. Reports for managers are provided on demand and customized to the specific requirements of the users.

Chrysler Corporation:

At Chrysler's Windsor, Canada, assembly plant, ABM information supports performance measurement through the balanced scorecard. The balanced scorecard consists of five measurement categories—safety, quality, delivery, cost, and morale. While these same categories apply to all levels of management and workers, the measures themselves differ by level. At the line-worker level, the measures are narrow and tend to be nonfinancial. At the plant-manager level, the measures are broader in scope and financial. The ability to customize reports to meet individual user needs is mandatory and an ongoing part of systems and reporting development.

Hewlett-Packard North American Distribution Organization:

ABM reporting capabilities are the "slice-and-dice" cube that shows the relationship of costs among customer segments (major accounts, independents, suppliers, VARs, etc.), product lines, and activities. The slice-and-dice cube is a full set of information to drill down and facilitate the understanding of the relationships among products, customers, and the activities carried out to produce these products and provide services to customers.

Finding 7:

There is greater recognition of the benefits of reports comparing costs (and other variables) across multiple units.

Best-practice companies design ABM systems so that users can compare relevant internal costs and performance measures with externally driven targets. ABM systems anticipate and plan to compare internal costs and measurements with internal and external standards and requirements. Managers use comparative reports to set standards or highlight gaps for a particular activity or business process. System design specifications take into account such techniques as benchmarking, best practices, and target costing.

Best-practice companies emphasize consistency and comparability in report design. Collection and analysis of costs from multiple units are done systematically. Investments made in common definitions, common coding, and consistent application of cost assignment methods help to ensure comparability.

Boise Cascade Office Products:

ABM reports and reporting capability at Boise Cascade Office Products (BCOP) were designed to provide year-to-year and town-to-town comparisons of its distribution operations. ABM information also enabled the company to compare and understand key business measures and cost of quality, as well as analyze business issues. Using ABM data for comparative purposes was also cited as a best practice for achieving operational ownership of ABM information.

Caterpillar Inc.:

Caterpillar has a well-defined and documented Cost Information System (CIS) to ensure corporatewide consistency and comparability. Because of this consistency, Caterpillar enjoys significant advantages in using its cost information as a decision-making tool. Costs for similar parts from differing manufacturing locations can be compared in sourcing decisions, and best practices in manufacturing can be identified. Another benefit derived is having a common understanding around the corporate cost structure, which enables a greater focus on specific business decisions rather than on how the data were developed.

Cummins Engine Company:

Cummins Engine uses a standard activity dictionary with three levels for its manufacturing plants. At the highest level are 14 major business processes, such as direct material procurement, order management, and conversion. The next level, the activity level, includes approximately 250 activities that are common to all manufacturing plants. Standardization of business processes and activities for all manufacturing plants ensures comparability and consistency of reporting. The lowest level consists of any number of tasks that are customized to each location.

Marmon Keystone:

ABM reports at Marmon Keystone highlight the cost of transactions and transfers among its 15 branches.

Ralston Purina Company:

For its enterprisewide ABM initiative, Ralston Purina developed a common framework to use at each of its sites. This framework is contained in a dictionary of activities and drivers. At the activity level, the plants are fairly similar, and this framework provides reporting capability for plant-to-plant comparisons. In addition, the use of common activities and drivers helps leverage ABM knowledge among plants.

Finding 8:

Reports at best-practice companies give high priority to revenue enhancements and value creation.

In the final report for the first ABM best-practice study conducted in 1994, the project team stated its belief that most organizations that had implemented ABM were not thinking "total cost" and "total value." ABM was being applied mostly in those areas where a unit cost traditionally existed (i.e., unit product cost). ABM reporting was too focused on cost and cost reduction and not on value and value creation. This has changed considerably in the last three years.

The reporting of ABM cost information is more holistic now in that best-practice companies are reporting on customer profitability and including all of the resources consumed to design, produce, deliver, and support their products and services. Best-practice companies design reports to highlight revenue-producing enhancements such as profitable services, cost of low-volume products, and market niche profitability. There is a significant level of reporting of cost information as it relates to the entire value chain.

Boise Cascade Office Products:

BCOP undertook its ABM implementation with the objective of understanding the profitability of each of its customers. Reports focus on customers and customer profitability and are used to support the company's four-part growth strategy.

First Data Corporation:

First Data Corporation uses a unique approach to ABM called F.A.C.T. (Functional Administrative Control Technique). F.A.C.T. uses a two-phase job plan, conducted over a three-month period, based on an action-research model. Both phases are conducted throughout the value chain of each business unit and include innovation and development, sales and marketing, product service, delivery, and customer service.

Hewlett-Packard North American Distribution Organization:

At HP-NADO, features of the cost-to-serve profitability reports include profitability by product and product line. These reports highlight the customer value

proposition defined as net ship dollars, which includes quoted prices, discounts, price protection, CoOp/MDF (advertising and promotion costs attributable to a particular customer), and other terms and conditions of sale attributable to the specific customer. Net ship dollars after operating expenses attributable to specific customers and products (derived from ABM) is the cost to serve.

Marmon Keystone:

The focus of ABM at Marmon Keystone is customer profitability. Using ABM information, costs that were previously allocated only to products were able to be traced to both products and consumers. Reports highlighting customer profitability drove a strategic decision to eliminate a fairly large group of customers that were found to be unprofitable.

Finding 9:

Innovative data display/user interface is viewed as a high priority.

Not everyone, and especially not nonfinancial people, likes numbers. An 8 1/2-inch-by-11-inch piece of paper or a computer screen filled with columns and rows of data carried out to four decimal points is not a pretty sight—not even for an accountant. It is also difficult to analyze. If the key to company prosperity were buried in the data, only a gifted few would have the patience to find it.

From a user's point of view, reports are the deliverables of an ABM implementation and the communication vehicles to link users to ABM information. Given the state of the art in technology and users accustomed to friendly, intuitive, and visual software systems with graphical interface, standards and expectations for ABM reporting are high.

At most of the best-practice companies, ABM reports and ABM information are available online to users. Being online is synonymous with the use of visual displays (graphs, pie charts, etc.) to supplement and display column/row data-intensive reports. It is also synonymous with drill-down and -up capabilities to look at information and data at various levels and in varying accumulation points. In certain best-practice companies, drill-across capabilities—looking at costs as they are consumed across the entire organization—are possible online. Being available online to users is also synonymous with intuitive, user-friendly graphical interfaces and attention-grabbing formats using color and visual effects to highlight information that should be of interest to a user of the information.

Caterpillar Inc.:

The CIS reporting capability at Caterpillar provides both summarized reports of product cost by vehicle and drill-down capability to offer all the details of the components that make up the vehicle at the various inventoried levels. Roll-up reports of prime product cost with supporting detail are available down to the lowest nut-and-bolt level.

Hewlett-Packard North American Distribution Organization:

Reporting capability at HP-NADO includes reports and graphs that list activities and the percentage contribution of each activity to a list of products. A user can start with process contribution and select processes to drill down for more detailed analysis.

Northeast Utilities:

NU designed its ABM reports with extensive roll-up and drill-down capabilities. Resource and process costs are capable of being rolled up and summarized at higher levels within the company. Resource costs can be drilled down to show spending by individual accounts. Each budgeted activity line also can be broken down into more granular tasks, called tracers. Tracers show more precisely the work that is performed. Reporting capability includes the ability to drill up or down at the activity level.

Ralston Purina Company:

Ralston Purina graphs customer profitability by category—warehouse and clubs, wholesale, etc. Profitability runs across the vertical axis; services provided runs across the horizontal axis. This provides a clear visual picture of which customer groups should be emphasized.

Summary

ABM information is communicated to the organization through reports and reporting capability. As required by the application, reports of product/service cost and activity information are provided in a format and a time frame that are useful and relevant for decision making and for tracking operational performance. Reports and reporting capability are designed so that users are directed to meaningful and relevant activity data.

Section Three:

Transfer of Ownership

Introduction

The value and power of ABM come from the knowledge and information that lead to better decisions and improvement. If people in the organization don't use the information (for whatever reason), the only results are sunk costs of development and implementation and ongoing costs of maintaining the system until it is junked. Nothing may be more important to a successful ABM implementation than achieving ownership and accountability by the people who use ABM information to make decisions and effect changes in the organization. Likewise, nothing may be more difficult.

In the first ABM best-practice study, senior management commitment to ABM was one of the seven key findings identified as fundamental to the successful development, application, and use of ABM information systems. This study again highlights the importance of management commitment and priority as well as the importance of management involvement—as users of ABM information, in owning the information, and in being accountable for ABM results.

In achieving ownership of ABM information by operational personnel, several best practices are evident. Others are emerging. ABM information linkage to operation goals/objectives and ongoing improvement initiatives, pilot efforts for proving value, and operations-funded and/or -driven initiatives were universally identified as necessary to achieving ownership by operating personnel.

Linkage to compensation and periodic review and documentation of results were also identified as critical to achieving ownership by operating personnel. Nevertheless, best practices in these areas are still evolving and emerging. Examples of periodic review and ongoing cost-benefit justifications are rare. Although the best-practice companies, the study sponsors, and the ABM study team believe that compensation drives behavior and acceptance, best-practice organizations are just beginning to link ABM information to compensation.

Finding 10:

Linking ABM information to operational goals/objectives and improvement initiatives is crucial for success.

The value and benefit of ABM information to the organization is created when the information is used to make better decisions and improve processes. Operating people are more likely to embrace tools that help them achieve their goals. Therefore, best-practice companies recognize that linking ABM information to goals/objectives and improvement initiatives is vital. In best-practice companies, this is often a formal linkage to the strategic and operating goals of the organization.

Linkage to operations' goals/objectives and improvement initiatives includes the practice of leveraging the existing knowledge base. Written and documented procedures, job descriptions, policies, historical reports and studies, published financial reports for public companies, and internally prepared flowcharts are just part of the vast treasure chest of information that can be used to leverage the existing knowledge base.

BellSouth Telecommunications:

BellSouth is part of the telecommunications industry that is evolving from a regulated, technology-driven industry to a diversified and increasingly competitive marketplace driven by new lower-cost technologies. Executive management identified changing the BellSouth financial architecture to maintain alignment with the evolving environment as a key strategic objective.

Boise Cascade Office Products:

BCOP has long maintained a successful Total Quality Management (TQM) initiative. TQM taught the company to manage processes and activities. Through its quality efforts, BCOP had a good understanding of process costs, the baseline value chain, and cost of services. ABM was positioned as a tool to teach BCOP to manage its customers through sales policy and terms, profitable service offerings, and identification of customer cost improvement opportunities.

Chrysler Corporation:

The Chrysler Corporation assembly plant in Windsor, Canada, adopted the balanced scorecard as part of its formal Financial Management Excellence initiative. At this Chrysler site, ABM information supports performance measurement through that balanced scorecard.

Cummins Engine Company:

ABM was implemented to support the Cummins Production System (CPS), an umbrella that covers all manufacturing improvement initiatives. In fact, Cummins Engine identifies its decision to position ABM as a tool to support CPS improvement initiatives as a critical factor in the success of ABM.

First Data Corporation:

At First Data Corporation, ABM was positioned as a tool—part of a tool kit—to leverage the larger corporate JIT, quality, and design for manufacturing initiatives.

Ralston Purina Company:

At Ralston Purina, ABM was positioned as an enabler to achieve corporate goals of aggressive return on sales and market share growth targets.

Finding 11:

Successful pilot tests/efforts prove the value of ABM initiatives through early wins.

Until recently, few organizations initially undertook an implementation with the intent of covering the entire organization. Before committing to a longer-term course of action, bottom-line-driven managers want assurance that the resulting ABM information will be of value to them. Successful pilot efforts are required to demonstrate value with immediate wins and positive results. Proof of value is a prerequisite for operation ownership of ABM information.

Best-practice companies tend to embrace aggressive, focused pilot efforts to prove value. Certain best-practice companies were able to demonstrate value through the experience of others. Articles in trade, professional, technical, and business publications; attendance at ABM conferences and conventions; studies such as this one; and a growing body of experienced ABM implementations may be sufficient to establish proof of value.

The experience at best-practice companies is consistent with a trend toward larger and more comprehensive ABM implementations, where organizations are beginning to aggressively replace traditional information systems with activity-based systems. Pilot efforts are required less frequently, but when they are, the scope of effort is more aggressive. This trend is confirmed by ABM commercial software vendors who report increased demand for their advanced and integrated systems.

The key message is that each organization undertaking an ABM implementation must establish and prove the value of ABM information as a condition for ownership by operating personnel. Ultimately, proof of value must be demonstrated at the user level.

Boise Cascade Office Products:

BCOP did a "down-and-dirty" pilot test to get immediate use and results. Its initial pilot test was performed in the Boston operation over a three-week period. This pilot effort involved defining about 30 activities and related drivers to trace costs to 25 customers. Immediate lessons included the discovery that many customers

were not really as profitable as BCOP thought and that some deemed unprofitable were, in fact, profitable.

Chrysler Corporation:

An early win for Chrysler was the use of ABM data by a Chrysler platform team to quickly calculate the cost of nonconformance for the basis of a significant capital expenditure request. Typically, large projects require a lengthy approval process, but since the ABC data justified the cost of the changes proposed in this project, the plant received quick approval to move forward.

Cummins Engine Company:

The history of ABM at Cummins Engine begins at two manufacturing plants that started their own ABM initiatives. Based on the success of these early efforts, a corporate initiative commenced in early 1994. To date, Cummins has implemented ABM in 16 manufacturing plants, 12 distributors, and several support areas.

Marmon Keystone:

At the Marmon Group, Inc., corporate level, internal ABM consultants support its 60 operating units in evaluating the applicability and usefulness of an ABM information system to the particular unit. The same process applies to Marmon Keystone. Value established at this level is often based on the experience of other operating units that have previously implemented ABM. Further proof of value at the business-unit level is established by conducting an aggressive ABM pilot to demonstrate results.

Finding 12:

ABM implementations should be operationally funded and operations driven.

In most organizations, project funding and project responsibility are linked. Those responsible for the consumption of project resources are also responsible for project results. With responsibility and control come ownership and accountability. Operationally funded ABM implementation efforts, in essence, assign ownership to the users of ABM information. Operationally funded ABM implementations are the exception, not the rule.

Operations-driven is different from operations-funded. An ABM implementation can be funded by Finance/Accounting but driven by Operations through this function's involvement and participation in the ABM implementation. Involvement and participation from users of ABM information at the beginning of and throughout the implementation translates to operations ownership at the back end of the project. Involving operating personnel and users in the design, development, and installation of the ABM information system is an established practice at each of the best-practice organizations.

Chrysler Corporation:

Operating managers at Chrysler's Windsor assembly plant present the financial and operating results at weekly and monthly staff meetings. While the operating managers are not responsible for the recording and reporting of cost information and still receive ABM and financial information from the plant controller, the operating managers run the cost meetings. They present the financial results as well as action plans to improve performance.

Cummins Engine Company:

At Cummins Engine, ABM implementations are driven by Operations. Funding in the form of corporate ABM resources is the domain of Finance/Accounting. Funding in the form of internal business-unit resources comes from both operating and

support budgets at the business-unit level. ABM implementations at Cummins are highly systematic. Following a site assessment (also used to establish proof of value) performed by the corporate ABM team and the establishment of an ABM team (from the site), a contract for services and deliverables is developed between the business unit and the corporate ABM implementation team. The ABM implementation will not proceed until a signed contract is in place.

The corporate ABM team facilitates ABM implementations at the independently owned distributors of Cummins parts. Distributors pay a fee for this service.

Northeast Utilities:

Operational managers at NU who are ABM users are recruited to provide training to other operational managers. Operations managers have credibility and are well equipped to provide training in their functional areas.

Tektronix, Inc.:

Tektronix has been successful in using ABM information to support new product introductions (NPI). This ABM implementation effort was led by an NPI manager. Finance and Accounting provided tools, in the form of systems and support, not answers. The tools were user friendly and designed to be used with a minimum of financial expertise or support. The ability to use ABM information to control product cost in the design stage effectively transferred ownership of the ABM system to the NPI group.

Finding 13:

Linking ABM information systems to compensation encourages operational and user ownership.

Linkage to compensation is included as a best practice in this study primarily because of its perceived importance to achieving operational and user ownership of ABM information. The best-practice companies unanimously agree that compensation drives behavior in an organization and that linking ABM information to compensation is powerful. While most of the best-practice companies indicate this linkage as a priority for the future, few have linked ABM information to compensation in any kind of meaningful way.

When linked to compensation, ABM information systems are pay-for-performance models of compensation and reward. Activity cost and output, taken together, are a basic and fundamental measure of productivity and efficiency. Activity or process output (the result of the activity or process) divided by its cost (people, equipment, and facility resources consumed by the activity) results in a cost per unit of activity output. Productivity and efficiency improve, as measured by a reduction in cost per activity unit, by producing more at the same cost, producing the same at a reduced cost, or producing more at a reduced cost.

In many respects, compensation has always been linked to activities. Perhaps the most obvious link is with the employee's paycheck. Organizations hire people to perform the activities necessary to provide products and services to customers and to run and administer the business. Paychecks are compensation to employees for performing business activities. Another link is with the amount of the paycheck. Activities that require significant skill levels or specialized knowledge have always been compensated at higher levels than activities requiring minimal knowledge or skill.

Boise Cascade Office Products:

Sales commissions at BCOP were changed to reflect knowledge about the direct and indirect costs of processing orders. Salespeople are no longer paid commissions on orders that do not achieve a gross margin sufficient to cover the costs of recording, processing, and delivering the order.

City of Indianapolis:

ABM information at the City of Indianapolis is linked to performance- and incentive-based improvements. Of the cost savings achieved by the workers, 25 percent went to incentive pay in 1994 and 30 percent in 1995.

First Data Corporation:

At First Data Corporation, human resource people use ABM information for job descriptions and wage/salary determinations.

Marmon Keystone:

ABM customer profitability reporting drove a decision to change the structure of compensation and incentive pay for salespeople at Marmon Keystone. The company now rewards salespeople with commission based on gross profit and not sales revenue. Eventually, sales commissions will be based on adjusted gross profit (gross profit less customer attributable costs). Incentive pay for the regional managers is currently based on adjusted gross profit.

Finding 14:

Operating personnel develop ownership of ABM through periodic review and documentation of results.

Like linkage to compensation, periodic review and documentation of results is listed as a best-practice finding on the strength of its perceived contribution to achieving ownership of ABM information by operating personnel. Benefits, resources consumed, and the results of the ABM efforts must be periodically documented to determine value. Like pilot efforts and tests to demonstrate and prove value of ABM early in the project life cycle, periodic reviews and documentation of results are necessary to demonstrate and prove the value of ABM information on an ongoing basis.

Best practices for performing a meaningful ABM cost-benefit analysis are still emerging. Measuring and quantifying the value of information to an organization is difficult. Because ABM information drives and supports all improvement initiatives, regardless of acronym, it can be difficult to quantify its role in improvement and decision making. Furthermore, most organizations have no procedures, practices, or methods in place for measuring and quantifying benefits from their existing financial and operating systems. Knowledge and experience are low.

Boise Cascade Office Products:

BCOP used a "Passing Muster" test to compare the value of the ABM initiative with cost and effort expanded. The Passing Muster test, conducted at the end of the first year and before ABM was expanded, reinforced ABM as a priority at BCOP.

Summary

The only way to truly measure the results and benefits of an ABM system is through the value created by having improved tools that enable better decisions and operational improvements. If people don't use the tools, no value can be created. That's why ownership by the people who use the tools is so important. It's also one of the most difficult goals to achieve. Best practices in the area of ownership by operating personnel must continue to evolve and emerge.

Partner Company Profiles and Site Visit Learnings

BellSouth Telecommunications

BellSouth is the largest of the former Bell operating companies spun off in the 1984 breakup of AT&T. BellSouth serves 22.5 million access lines in the southeastern United States. The growth rate in access lines is among the fastest of the former Bell operating companies. Total operating revenues for 1996 were almost $15 billion. Net income from operations in that same year exceeded $2 billion.

BellSouth has four market-facing strategic business units and three shared service providers. The market-facing strategic business units include interconnection operator services, complex business services (more than six lines), small business services (fewer than six lines), and consumer services (residential). Shared service providers are network services (cables, switches, etc.); information technology services; and other shared services, such as tax, finance, and accounting. Network services account for about 60 percent of BellSouth's cost structure.

Telecommunications is evolving from a regulated industry that is technology driven to a diversified and increasingly competitive marketplace driven by new, lower-cost technologies. BellSouth, like all telecommunication companies, has faced dynamic changes in its business.

- There has been massive reengineering of systems and processes resulting in head count reductions of approximately 30 percent. From a high of 70,000–72,000, employment is targeted to be at 58,000–60,000 by the end of 1997.
- Demand for access lines (mostly driven by an increase in second lines) is at record growth rates, up 4.7 percent in 1996. Demand for access lines drives an annual capital program of $3 billion to support growth, enhanced technology, and new market opportunities.
- The discontinuance of regulatory accounting (SFAS 71) in June 1995 resulted in a $4.9 billion reduction in the recorded value of network assets. BellSouth prospectively has adopted an accounting model based on marketplace competition.

overview

Industry Group:	Telecommunications
Scope of Implementation:	Enterprisewide
Annual Costs:	Approximately $13 billion
Number of People:	60,000
Product/Service Diversity:	Similar
Customer Diversity:	Very diverse
Primary Applications:	Product costing
	Product profitability analysis
	Service profitability analysis
	Performance measurement
Results of ABM Efforts:	Extensive changes in performance measurement
	Significant changes in employee rewards/recognition
	Some improvement in product/service profitability and support function costs
ABM Reporting System:	Custom-designed, large-scale, mainframe-based systems (Oracle/Visual Basic applications) running in a client/server environment
	Fully integrated with internal financial reporting and product/service costing systems
	Features include ease of use, flexibility, timeliness, accessibility of cost data, accessibility of operational data, drill-down capabilities, quality of cost data, quality of operational data, and tracing/allocating costs to activities
	Updated monthly
	Online
	In use for two years
ABM Linkage to Business Environment:	Extensively linked to benchmarking
	ABM performance measures have been moderately accepted/embraced and perceived as fair
ABM Resources:	ABM competency center reporting to CFO
	Extensive use of meetings with ABM user groups
	Other resources include training materials, activity dictionary, ABM library, ABM resident expert, visits to other sites, basic training in finance/accounting, training in ABM applications, and training in ABM concepts
Barriers to Implementation:	Managers unwilling to change
	Other initiatives are more important
	A culture that inhibits innovation
	Lack of perceived benefits

Evolving the BellSouth financial architecture to maintain alignment with the changing business environment is a key strategic objective of BellSouth finance. Therefore, in early 1994, BellSouth Telecommunications executive management approved the construction of an ABM system as the key initiative to fully develop its management accounting architecture. Specific goals and benefits expected by executive management at BellSouth include:

- improve awareness of resource costs, capacities, and utilization;
- measure the cost and performance of resources, activities, products, and services;
- understand the causal relationships between cost drivers and activities;
- understand the financial impact of product life-cycle decisions, overall product/service, and Strategic Business Unit (SBU) profitability;
- support SBU decisions by developing operational performance measures and improvement agendas; and
- support process improvement and cost-reduction initiatives.

APPLICATION

The implementation of ABM at BellSouth covers the entire organization. ABM information is used primarily in the specific applications of product costing, product/service profitability analysis, and performance measurement. Secondary uses and applications include process improvement, cost estimation, cost control, benchmarking, and budgeting.

An enterprisewide ABM implementation for an organization the size of BellSouth is a major undertaking. The implementation team included almost 50 full-time equivalents responsible for 12 implementation phases conducted over a four-year time horizon beginning in early 1994.

The first four phases were completed in 1994 and included theory and concept development, initial business analysis, system requirements development, and vendor and package software screening. Phases five, six, and seven (detailed business analysis, detailed system design and construction, and acceptance testing), were completed in 1995. System and model implementation, validation and certification, education and training, and enhancement phases were completed in 1996.

The last phase, integration/simplification, is scheduled for completion in 1997. Integration/simplification includes refining the business models to balance ease of maintenance with strategic cost management needs, providing the basis for transfer pricing and activity-based budgeting initiatives, enabling benchmarking (baseline and tracking) and developing detailed corporate overhead business models.

KEY SUCCESS FACTORS

One of the key implementation issues and critical success factors at BellSouth was setting forth the principles of the ABM project at the outset. These principles included collecting and attributing costs at the level of control, not allocating costs that are not controllable, reconciling to the financial accounting system to ensure integrity, and taking a management perspective rather than a regulatory or financial perspective.

BellSouth also identified several key ABM implementation issues for project structure, skills, and construction and implementation:

- **Project structure.** Issues include ownership by business units; active executive sponsorship/support; strong project management structure; detailed project planning and weekly progress tracking; adequacy of dedicated (full-time) resources; clear understanding of vision, goals, and objectives; resolution of key issues in a timely manner; "scope creep" management; and a one-team concept that included business analysis and software development.
- **Skills.** Strong project management expertise, balance of strategic cost management and operational background/knowledge, and cutting-edge software developers are all critical to a successful ABM implementation.
- **Construction and implementation.** Two issues are important. First is the linkage to operational and formal performance measures. Second is selecting the appropriate levels of model complexity, training, and education.

SYSTEMS AND REPORTING

The Activity-Based Information System (ABIS) at BellSouth is a large-scale, in-house-developed, integrated system. The basic system architecture is a database (Oracle/Visual Basic application running in a client/server environment) linked to source financial (cost) transactions and operating information and transactions from existing information and reporting systems. The ABIS database includes 470 resource pools, 100 activity and resource drivers, 770 activities, and 2,000 cost objects.

ABIS is the basic ABC system—the engine that "crunches" data. This is the cost engine for tracing resource costs to activities and activity costs to cost objects. Fundamentally, ABIS is similar to the PC-based EasyABC commercial software package sold by ABC Technologies, Inc. The primary difference is one of scale. The ABIS engine feeds the Management Profitability Analysis and Tracking System (MPATS—profitability reporting by cost object) and its information warehouse and MDP tracking systems that are the sources of budget/actual tracking reports.

ABIS, MPATS, and IFD/DSS Agent are BellSouth cost management reporting tools. These three tools are linked and designed to meet the specific needs of different types of users. Reporting within ABIS includes resource utilization, bill of costs, and bill of activities.

MPATS is intended for management and executive-level users. Reports include business-unit profitability, product profitability, SBU expense revenue, and ledger collection and income. DSS Agent and DSS Web serve the front-line workers. Reports include resource utilization analysis, activity trend analysis, product trend analysis, model verification, and distributed access.

Currently there are 250 users of ABM information, including 30–40 modelers. Line managers, middle managers, and senior managers use ABM information in many different ways. Operationally, it is used to eliminate nonvalue-added activities, establish value-added activity cost trends, and control costs. Strategic uses include product-line management, capacity management, improvement agendas, and resource deployment.

CRITICAL SUCCESS FACTORS

Critical success factors identified by BellSouth relative to ABIS system development include:

- **Project organization and management.** Clearly defined scope, roles, responsibilities, and expected benefits are critical. The project proceeded with a focused analysis period followed by phased delivery with integrated scheduling and reporting. Project management involved a small core team throughout the project.
- **Change management.** Prioritized needs assessment and regularly scheduled releases are essential. Business needs drive updates and releases.
- **Use of off-the-shelf data analysis tools.**
- **Test platform/user acceptance phase.**
- **Security of data access.** There are three levels of users at BellSouth. Access to data is limited by level. Level 1 users can see all of the available information. Level 2 can see information within a single business unit only. Level 3 can see limited information available in the databases. Information is available to all three levels of users online.
- **Report prototyping.**

The number one priority for BellSouth is to drive increased usage of the ABM information system. In 1997 BellSouth is focusing on ownership by business units, active executive sponsorship/support, appropriate level of model complexity, linkage to profitability and performance, adequacy of resources, training/education, and skill set development.

Boise Cascade Office Products

Boise Cascade Office Products (BCOP) is one of the world's largest distributors of office supplies, furniture, and computer products. Operations (35 distribution centers) in the United States, Canada, Australia, and Europe distribute office supplies and products directly to large corporate accounts, small businesses, and government agencies. BCOP also plays a leading role in the contract stationery and direct marketing channels of the office products distribution business—a dynamic, fragmented, and rapidly consolidating industry.

Until April 1995, when it went public, BCOP was a division of Boise Cascade Corporation. BCOP now trades on the New York Stock Exchange. In 1996 net income was more than $45 million on a sales base of approximately $2 billion. In 1996 BCOP distributed more than 5,000 line items of supply to 5,000-plus customers.

BCOP undertook its ABM initiative for many reasons. The most significant and compelling are as follows:

- The corporate business environment was changing. Specifically, this involved industry consolidation—from mom-and-pop operations 10 years ago to six major office product distributors today. As a result of consolidation, competition is better and much tougher.
- Boise Cascade has long maintained a Total Quality Management (TQM) initiative. ABM brought data and measurements to enable TQM and process improvement.
- There was a need for greater awareness and understanding of costs.
- BCOP was pursuing new strategic growth initiatives and "outside-the-box" thinking.

APPLICATION

The primary application of ABM at Boise Cascade Office Products is customer profitability. Revenues increased from $682 million in 1993 to almost $2 billion in 1996. Profitable growth is the cornerstone of its four-part growth strategy to 1) broaden product lines and increase business with existing customers, 2) add new national accounts, 3) grow direct market sales to smaller companies, and 4) acquire other distributors.

overview

Industry Group:	Distribution
Scope of Implementation:	Multiple facilities/operations
Annual Costs:	$2 billion
Number of People:	5,000
Product/Service Diversity:	Average
Customer Diversity:	Very diverse
Primary Applications:	Cost estimation
	Product profitability analysis
	Service profitability analysis
	Customer profitability analysis
Results of ABM Efforts:	Extensive changes in customer support/mix
	Significant improvements in sourcing decisions
	Significant improvements in process including operating departments, support functions, and performance measures
ABM Reporting System:	PC-based commercial software
	No integration—all data are extracted and downloaded or manually input
	Features include flexibility, accessibility of cost data, drill-down capabilities, quality of cost data, and tracing/allocating costs to activities
	Reports are updated on an annual basis for use in strategic analysis
	In use three to four years
ABM Linkage to Business Environment:	Extensively linked to TQM/continuous improvement and benchmarking
	ABM is viewed as completely fair and has been moderately accepted/embraced
ABM Resources:	ABM competency center reporting to controller
	Good use of ABM applications and extensive use of ABM concepts
Barriers to Implementation:	Managers unwilling to change
	Systems or other technical issues
	Other initiatives are more important
	Limited resources

The purpose of ABM at BCOP was to understand the profitability of each of its customers. The goal was to identify cost improvement opportunities that would enhance customer profitability. The customer profitability application is also important at BCOP because of the fit with the company's quality and improvement initiatives. TQM taught BCOP to manage process/activities. Through BCOP's quality efforts, it had a good understanding of process costs, the baseline value chain, and cost of services. ABM taught BCOP to manage its customers through sales policy and terms, profitable service offerings, and identification of customer cost improvement opportunities.

The development and use of ABM information at BCOP began in 1993, when BCOP was still a division of Boise Cascade Corporation. Since it was introduced in 1993, the application has evolved considerably.

1993	ABC was introduced to the division, and managers were trained on the principles of ABC. The sales force "heard" about ABC.
1994	ABM signaled a change in strategic direction. The focus became margin contribution and requisition size. Compensation of sales personnel was reevaluated. The importance of requisition size was recognized.
1995	The new BCOP organization (now a public company) was thirsty for more. The sales force was introduced to the concepts. Sales training was conducted by the corporate ABM team, and a "what if" model was developed.
1996	ABM became part of daily life. The sales force introduced the concept of ABM to its customers via the SAVE marketing program.

OWNERSHIP OF ABM INFORMATION BY OPERATING PERSONNEL

BCOP was selected for a site visit primarily because of its success in achieving ownership of ABM information by operating personnel. A large part of that success is due to the results of the ABM initiative. Results included cost reductions on increasing revenues, quality improvements, external customer cost reductions, positive changes in customer behavior, salespeople's compensation gains, and BCOP profitability gains.

BCOP identified key success factors and best practices for the transfer of ownership to operating personnel in four specific areas. These areas are ownership by senior management, ownership by operating management, ownership through implementation, and ownership through expanding the program.

Ownership by Senior Management

Best practices in this area include the use of an outside consultant to sell the ABC/ABM concepts and to assist in securing top management buy-in. Benefits were stressed and importance established by learning from an authority. Outside consultants and authorities were able to link strategic decision making required by the industry consolidation to the ABM data. Linking the BCOP strategy of being the low-cost provider in the more competitive environment meant that there had to be a good understanding of costs in order to reduce them. Management was also interested in identifying the changes in the organization and in leveraging its process improvement initiatives. Outside consultants could paint a vision for management based on their experience.

A second best practice was to conduct a "down-and-dirty" pilot test to determine value. This initial pilot test was performed in the Boston operation over a period of three weeks. This pilot effort involved defining about 30 activities and related drivers to trace costs to 25 customers. Immediate lessons included the discovery that many customers were not really as profitable as thought, and some that were deemed unprofitable were, in fact, profitable. This study taught BCOP that its intuitive perceptions were not nearly so sharp as the company thought.

With value established through the pilot tests, the third best practice was the initial program development. Activity flow, drivers, surveys, and modeling techniques had to be developed for the entire operation. Involvement of Operations in the development of these surveys, flows, and drivers was deemed critical. Initial program development also included issues orientation and resolution of internal debates.

Ownership by Operating Management

As with ownership by top management, ABM concept buy-in was considered best practice in this area. At the operating management level, the benefits of strategic cost management and the identification of improvement opportunities were stressed. Concept buy-in included linkage to the key strategic goal of profitability by customer.

Using a nonfinancial implementation team was also considered best practice. Operational representation provided the credibility and integrity required to make ABM a success. Operating personnel also were the location liaisons that could prepare the local organization and to ensure use and understanding after the team had left.

Best practice for ownership by operating personnel also included a focus on early wins. As ABM is rolled out to operating locations, each Operations-driven implementation team (supported by the corporate ABM team) is focused on achieving immediate and measurable results for the efforts expended. Operations managers seek ownership of those initiatives and efforts that produce immediate benefits.

Ownership Through Implementation

Ownership through implementation was achieved through education and training, compensation impacts, and reports to senior management. Education and training included all operating managers and supervisors. More importantly, training and education of the sales force was deemed critical. Effective use of the ABM customer profitability reports was required to change sales behaviors. Training was developed to familiarize sales personnel with report output and interpretation and to link these reports to customers' strategies and tactics. The training was also designed to take away objections.

Ownership through implementation was also achieved through change in compensation. The ABM data clearly articulated profitability by order size, customer, customer group, and product type. Based on these data, management was able to develop a structure for sales commissions that would drive behavior toward and reward salespeople for profitable sales. At BCOP, salespeople are not paid commissions on orders

that do not achieve a gross margin sufficient to cover the costs of recording, processing, and delivering the order.

Best practice in this area also included the periodic publication of reports, findings, results achieved, and action plans to keep senior and operating management interested and apprised during the difficult period of ABM implementation and rollout to Operations.

Ownership Through Expanding the Program

BCOP identified several practices in expanding the program that contributed to ownership of ABM information by Operations personnel. The first was a "Passing Muster" test to compare the value of the ABM initiative with cost and effort expended. The Passing Muster test, conducted at the end of the first year and before ABM was expanded, reinforced ABM as a priority at BCOP.

Ownership by operating personnel was achieved by linking ABM information to benchmarking initiatives. ABM data gave the company the ability to make year-to-year and town-to-town comparisons. ABM information also enabled the company to make comparisons and to understand differences in key business measures, Cost of Quality (COQ), and business issue analysis.

The final best practice in this area was marketing and expanding ABC to the customer using SAVE, a PC-based software application that, in effect, applies the principles of ABM to the value chain. Activities associated with the purchase of office supplies are defined in the software. Customers enter internal data and estimates of the time and effort expended to order office supplies. The results of this analysis can be used to optimize order size and order frequency from the customers' perspectives.

SUMMARY

The successful implementation of ABM at BCOP required a top-down and bottom-up strategy and clear division of responsibilities. Senior management interest in and follow-up on customer profitability findings were key elements of the success of ABM at BCOP. Coordination among branches to ensure consistent utilization of information and involvement of operating personnel in the ABM implementation were two other key elements of success.

The corporate ABC team, management involvement in developing strategies to address findings, action plan development, making it happen, and training sales representatives to work with customers were also significant contributors to success.

BCOP intends to build on the momentum and success it has established. Goals and objectives for 1997 include:

- Integrate the product profitability model into the customer profitability model.
- Apply ABC to the retail stores, redistribution centers, central call centers, specialty products, and other aspects of the business.
- Seek better driver information to apply sustaining costs to the customer level.
- Incorporate new applications of customer profitability reports—specifically, expand the SAVE program.

Caterpillar Inc.

In 1996 Caterpillar had sales and revenues of $16.5 billion and a product line of more than 300 machines used in construction, mining, and agriculture. Caterpillar's products are manufactured in 32 plants in the United States and 29 plants in other countries. Its global dealership network consists of 65 dealers in the United States and 127 elsewhere. The company is organized into 16 profit centers responsible for return on assets and five service divisions.

Caterpillar's current managerial cost system got its start several decades ago when senior management concluded that allocating value-added cost using a single, plantwide rate based on planned labor manufacturing time was inadequate. The extreme variation in manufacturing processes throughout Caterpillar and the existence of many different cost drivers required that a more detailed costing method be developed. The Machine Burden Unit (MBU) was the initial costing method created. Its basic principles of separating costs between labor- and machine-related expenditures and identifying machine-driven costs by individual machine have evolved into today's version of the Caterpillar costing methodology and system.

In general, today's methodology isolates costs to their operational sources, identifies corresponding cost drivers at these sources, and uses this information to develop rates. These rates are then applied to individual cost drivers (such as production machine hours or weight) for each part to yield a cost for that part. An internally developed Cost Information System (CIS) was created to implement these methodologies into a cost reporting system. Over the years, the cost methodology and system have evolved to meet Caterpillar's changing needs; however, the basic principles are similar to those established in the MBU system originally devised.

This costing methodology and CIS operate independently of the standard cost system, which is used for GAAP inventory valuation. Its purpose is to support strategic and long-term decision making, unencumbered by legal or tax reporting requirements that could limit the meaningfulness of the data.

overview

Industry Group:	Fabrication and assembly
Scope of Implementation:	Enterprisewide
Annual Costs:	More than $15 billion
Number of People:	More than 35,000
Product/Service Diversity:	Similar
Customer Diversity:	Diverse
Primary Applications:	Product costing
	Cost estimation
	Product profitability analysis
	Cost control
Results of ABM Efforts:	Extensive changes in product mix, new product introductions, and sourcing decisions
	Extensive improvements in product/service profitability, product development costs, and manufacturing/operating costs
ABM Reporting System:	Internally developed, mainframe-based cost information system
	Fully integrated in product/service costing systems
	Features include flexibility, accessibility of cost and operational data, drill-down capabilities, and tracing/allocating costs to activities
	Updated monthly
	Online
ABM Linkage to Business Environment:	Generally linked to TQM/continuous improvement, just-in-time manufacturing, and benchmarking
	Mostly perceived as fair and mostly accepted
ABM Resources:	ABM competency center reports to controller
	Extensive use of ABM resident expert, basic training in finance/accounting, training in ABM concepts
	Other resources include visits to other sites and meetings with ABM user groups
Barriers to Implementation:	No significant barriers

COST METHODOLOGY AND SYSTEM APPLICATIONS

The core of the Caterpillar costing methodology involves the use of an adjusted, forward-looking view of costs. The annual budget is the basis for cost development to provide the forward-looking view of expenditures. This budget is then adjusted to lessen the impact of extreme volume fluctuations and to eliminate nonrecurring or unusual expenditures, thus providing a fair depiction of ongoing costs. Research and development, selling, and general and administrative costs are also isolated from the budget and excluded from unit product costs. The remaining costs initially are broken down into the categories of material, logistics, manufacturing, and general overhead.

Material cost (purchases from sources outside Caterpillar) is pulled from the corporate purchasing system by CIS using direct mainframe ties to this source system. Because of this direct tie, purchasing information is updated monthly. The remaining costs and rates are developed annually, with an optional mid-year update.

General overhead, which includes such costs as human resources and information systems, is applied as a percentage of material and value-added costs. This application method ensures equal weighting of these general support costs to parts of varying manufacturing integration. The remaining manufacturing and logistics value-added costs are further broken down into more discrete categories.

Manufacturing expenses are broken down into pools of variable (direct) labor, variable machining, and period machining. The expenses are identified to specific work centers (i.e., a machine, an assembly line, or a work area). Additionally, specific elements of costs, such as perishable tooling for variable machining and depreciation for period machining, are identified within these cost pools. This additional breakdown enables better identification of these expenses to product cost-reduction efforts.

The work centers appear on a production routing, which lists all work centers involved in the manufacturing process for each part number with the corresponding time to perform each operation. Cost rates are established by taking the adjusted business plan information isolated to its work center and dividing by the corresponding extended time for all parts that are run across the work center (based on planned quantities). These rates are then applied to specific production routing times for costing individual parts.

Logistics costs are also broken down into pools including freight, receiving, and movement. These costs are developed into rates using extended weight (based on planned quantities). These rates are then applied to the weight of individual parts to develop costs by part number.

The CIS system is typically used to apply the cost rates based on information from various source systems. It has a direct link to systems in disciplines such as engineering (weights), process engineering (production routing), purchasing (purchased material costs), and manufacturing (demand), allowing for updates of cost information monthly. CIS calculates value-added costs based on established rates described previously, adds in new purchase information based on most recent purchase orders, and applies general overhead cost, resulting in monthly updated product cost information.

RESULTS ACHIEVED

The previously described costing methodology is used by all of Caterpillar's facilities to ensure corporatewide consistency and comparability. Most facilities also use the CIS system, but some use other applications for various business reasons. A key is that these varying applications all must support the same costing methodologies to ensure consistency.

Because of this consistency, Caterpillar enjoys significant advantages in using its cost information as a decision-making tool. Costs for similar parts from differing manufacturing locations can be compared in sourcing decisions as well as the identification of best practices in manufacturing. Another benefit derived is a common understanding around the corporation of cost structure, which enables a greater focus on specific business decisions rather than on how the data were developed.

The CIS system also provides many advantages to its users. It provides both summarized reports of product cost by prime product vehicle as well as all the detail of the components that compose that vehicle at the various inventoried levels. It also has several modules outside the current month costing module that allow for the cost estimation of future and alternative products and enables process design cost analysis.

CRITICAL SUCCESS FACTORS

One key critical success factor of Caterpillar's costing practices is that it is not a one-time project or an "off-line" ABC/ABM system. The continued focus on costing routines and theory has created a special discipline within Accounting at Caterpillar that supports the cost methodology, adapting it as necessary to the changing organization.

Another critical success factor is the consistent application of costing methodology across the corporation. The comparability and organizational understanding that it affords helps maintain the credibility of the cost information generated from any facility. The fact that this methodology is disconnected from the requirements of standard costing also supports its success.

Key, too, is the integration of both cost methodology and CIS into other systems around the organization. The fact that various disciplines that use product cost data provide their information directly to CIS helps ensure organizational buy-in.

Training is also a key factor. Because of the highly developed nature of the Caterpillar costing methodology, detailed principles make up this methodology. For this reason, annual cost conferences are held at which cost issues are discussed and enhancements are communicated to worldwide representatives. Also, several formal training courses have been devised to educate both users and customers of cost methodology principles. Future plans are to use Caterpillar's intranet to more effectively deliver training and documentation on methodology and CIS.

ACHIEVING NONFINANCIAL OWNERSHIP

Caterpillar's cost management methodology and CIS system, which are activity-based, have evolved over the last four to five decades, and their tentacles run deep. While top management at Caterpillar initially spurred the development of an advanced

cost management system back in the 1940s and 1950s, the operating managers were responsible for refining the system. The needs of these operating managers as customers have driven much of the present-day methodology and systems capabilities.

Currently, this nonfinancial ownership is sustained by the use of other disciplines' source systems, directly hooked to CIS, which are used to generate product costs monthly. The systems tie, coupled with source budget information coming from the same supporting areas, helps to maintain nonfinancial ownership of product cost.

Also, product cost has migrated from being the sole responsibility of Accounting, with information not being readily shared with the organization, to today's environment in which the entire organization "owns" the cost information. Today's environment allows for ready sharing of information, facilitated by cost accounting personnel frequently being located with the product or operations team supported.

COST INFORMATION SYSTEM DEVELOPMENT

CIS, being a traditional mainframe system, has a character-based user interface. Recent meetings with system users, however, have confirmed that the business logic within CIS is still accurate and appropriate for meeting customer needs. Based on this, Caterpillar plans to redevelop the front end of CIS into an interactive, graphical interface using intranet and Java technologies.

Further, CIS training, documentation, and support forums will be integrated into the CIS interface to provide a complete package for the training and support of CIS users.

CIS REPORTING

In addition to its ability to adapt to Caterpillar's costing methodology, CIS has extensive reporting capabilities. Roll-up reports of prime product cost with supporting detail are available down to the lowest nut-and-bolt level. These costs can be even further broken down to identify specific elements of manufacturing cost mentioned previously, such as labor, perishable tooling, and depreciation. Also, data from CIS are used in other financial reports such as Product Line Profitability (PLP). New reports have also been developed that allow for comparison of cost changes from varying time periods for cost monitoring purposes.

Charles Schwab & Company

Charles Schwab's main business is discount brokerage: making trades for clients who make their own investment decisions regarding stocks, mutual funds, options, and bonds. Schwab is positioned between traditional brokers such as Merrill Lynch and deep discounters such as E*Trade. The firm sets itself apart from other discount brokerage houses in two ways: 1) it offers a greater level of information (providing materials that help clients decide the direction of their investment programs without giving specific recommendations), and 2) it uses technology such as touch-tone phone trading, software packages, and online trading. Schwab has more than 230 branches, four regional call centers in the United States, and a labor force of 10,400. Schwab's revenues were $1.9 billion in 1996.

The catalyst for ABC/ABM at Schwab was senior managers who needed to better understand the profitability of the growing proliferation of the firm's new products and customer segments. To address this need, a custom-designed, mainframe-based ABC application called Model for Understanding Schwab Economics (MUSE) was implemented in 1992.

Within two years, the increased complexity of the business was already taxing the original MUSE design. Senior management was once again concerned that the frequency of data updates was insufficient to keep up with the rapidly growing business's need for timely and accurate information. In response, the original ABC/ABM system was significantly redesigned and migrated from a mainframe to a client/server platform.

APPLICATIONS

The early focus of ABC/ABM in the firm was primarily on product costing. However, by 1993, Schwab began to realize that customer profitability was also critical to its success. As a result, the firm was reorganized into virtual enterprises centered around products and customers. Now, all Schwab products are viewed in the context of a service offering to a particular customer group.

Every month, Schwab's system takes all of the firm's revenues and expenses as reported in the general ledger and recasts these general ledger items into activity-based

overview

Industry Group:	Service
Scope of Implementation:	Enterprisewide
Annual Costs:	Approximately $1.5 billion
Number of People:	10,400
Product/Service Diversity:	Similar
Customer Diversity:	Very diverse
Applications:	Product costing
	Pricing models
	Service profitability analysis
	Customer profitability analysis
Results of ABM Efforts:	Significant change in customer support/mix
	Significant improvement in customer/channel profitability
ABM Reporting System:	Custom-designed, mainframe-based ABC application running in a client/server environment (MUSE II)
	Partly integrated with operating and financial systems
	Features include ease of use, flexibility, timeliness, accessibility of cost data, accessibility of operational data, drill-down capabilities, quality of cost data, quality of operational data, and tracing/allocating costs to activities
	Updated quarterly
	Online
	In use for more than five years
ABM Linkage to Business Environment:	Somewhat linked to TQM/continuous improvement
ABM Resources:	ABM competency center reporting to CFO
	Good use of activity dictionary and ABM resident expert
	Other resources include training manuals, ABM library, basic training in finance/accounting, training in ABM applications, and training in ABM concepts
Barriers to Implementation:	Lack of sponsorship
	Managers unwilling to change
	Systems or other technical issues
	Other initiatives are more important

costing terminology and allocates the revenues and expenses across four cost objects: product, distribution channel, customer segment, and project. The system tracks approximately 500 activities. Additional activities are added as new products, customer segments, channels, and projects are created. The level of detail of activities at Schwab is related to the amount of time managers are willing to spend tracking activities.

The system is more strategically focused, and Schwab uses ABC/ABM data for product pricing, segment profitability analysis, new product development, identification of target markets, and acquisition analysis. However, in time, Schwab anticipates that ABC/ABM data will be used increasingly to uncover processes that can be optimized as well as to provide a starting point for business process improvement initiatives.

Future ABC/ABM applications also include custom cubes for ad hoc analysis, intranet delivery of applications, overhead allocation of discretionary costs and corporate overhead, operations research costing models, activity-based budgeting, target costing, forecasting, employee performance measurement, and incentive compensation.

CRITICAL SUCCESS FACTORS

Key factors related to the successful implementation of ABC/ABM at Schwab were keeping key sponsors aware of all major developments during the system design and development stage, taking the time at the beginning of the project to prepare specifications, selecting the appropriate software tools, and ensuring that adequate time was made available for testing and fine-tuning the system.

Also critical was showing people how data from the system could help them make better decisions and attain their objectives. As the managers become more confident about the usefulness and accuracy of the ABC/ABM data, they became increasingly dependent on the system.

ACHIEVING NONFINANCIAL OWNERSHIP

Despite the fact that the main champion of ABC/ABM at Charles Schwab is the CFO, a lot of progress has been made toward achieving nonfinancial ownership. This has been largely due to the efforts of an internal consulting group composed of four financial analysts with MBA degrees and strong communication and analytical skills.

This group helps Schwab managers to effectively use the ABC/ABM data and is responsible for updating the model, creating costing schedules, and checking data. The firm considers the group to be the critical link between knowledge of the model and knowledge of the business.

SYSTEMS DEVELOPMENT

The original mainframe-based ABC/ABM system was updated semi-annually with a three-month lag between transaction occurrence and reporting. Reporting was batch and paper based. For strategic purposes this was acceptable. However, as management needed to analyze customer segments, distribution channels, and increasingly complex products, a redesign of MUSE was undertaken over a two-year period.

The new client/server-based MUSE II system updates the ABC/ABM data every quarter with only a one-month lag between transaction occurrence and reporting. Data input and reporting are much more decentralized than under the old system.

The new system runs on a UNIX server with an architecture that includes Power Builder GUI input screens, PeopleSoft general ledger, Oracle (PL/SQL), a data warehouse, and Pilot DSS. Maintaining MUSE II requires one staff member for Power Builder, two Oracle developers, and four contract system developers.

REPORTING

ABC/ABM reporting at Schwab covers six dimensions consisting of general ledger revenue/expense group, organization, project, distribution channel, and product and customer segment. Reports for managers are provided on demand; they are not printed and distributed on a regular basis.

Initially, customer profitability information was not shared with managers because it was feared that they would share the information with customers. Subsequently, Schwab has empowered its people in the field to look at customer profitability.

A major challenge in the reporting area is accommodating the changes and growth at Schwab. For example, every time new customer segments and products are created, the underlying reporting structure of MUSE II needs to be changed as well. It is often difficult to conduct accurate trend analysis since data are rolled up according to the reporting structure in effect at the time. If Schwab could choose its software again, it would select a reporting tool with a roll-up engine strong enough to conduct data roll-ups in any manner required.

Chrysler Corporation

Activity-based management has been embraced and used in the U.S. automobile industry for a number of years. The results and successes of ABM initiatives within Chrysler Corporation have been published and presented in various forums over the past several years. Our site visit included a meeting with corporate representatives at Chrysler's world headquarters in Detroit, where we were briefed on the overall application and use of ABM within the Chrysler Corporation. The actual site visit location and focal point of the write-up, however, were a Windsor, Canada, facility where minivans are assembled.

The emphasis for this site visit was achieving nonfinancial ownership of cost management systems in general, and not specifically ABM. The Windsor plant had implemented ABM within the last year. The plant had also adopted the balanced scorecard as part of its Financial Management Excellence initiative. Both ABM and the balanced scorecard were discussed during the site visit.

BACKGROUND

The Windsor plant had been assembling minivans in 10 colors. The color gold, however, was used on less than two percent of production. Due to the high setup costs that are caused by changing colors in the line, gold paint was significantly more expensive to use than the high-volume colors. In addition to batch-related costs, each color adds to inventory holding, quality, and administrative costs. Once marketing understood the costs associated with maintaining each color, it agreed to drop gold paint from its product line. Since the plant is a cost center, plant management had incentives to reduce operating, and thus unit, costs.

Chrysler manufactures both three- and four-door minivans. At equal production volumes, the four-door model is more expensive to build. At the time of the visit, however, more than 80 percent of customer purchases were for the four-door models. According to the ABC product cost calculations, the Windsor plant was approaching the point at which the four-door models were less expensive to produce than the three-door models. This is because of product-related costs that are fixed, even at very low production volumes.

overview

Industry Group:	Fabrication or assembly
Scope of Implementation:	Single facility/operation
Annual Costs:	$101 million–$250 million
Number of People:	More than 1,000
Product/Service Diversity:	Similar
Customer Diversity:	Very similar
Primary Applications:	Product costing Target costing Make-versus-buy analysis Cost estimation Pricing models Product profitability analysis
Results of ABM Efforts:	Some changes have been made in sourcing decisions. Some improved parts cost have occurred in manufacturing/operating costs
ABM Reporting System:	PC-based commercial ABM software; external Windows-based reporting tool Mostly integrated with product/service costing systems; moving toward full integration Updated semi-annually
ABM Linkage to Business Environment:	ABM is somewhat linked to benchmarking
ABM Resources:	ABM competency center reports to controller Adequate use of ABM resident expert; and adequate use of training in ABM application and concepts
Barriers to Implementation:	Scattered operational sponsorship Managers unwilling to change Systems or other technical issues Other initiatives are more important Lack of perceived benefits Limited resources

The activity cost information also supports performance measurement through the balanced scorecard. The balanced scorecard consists of five measurement categories, including measures of safety, quality, delivery, cost, and morale. These same categories apply to all levels of management and workers at the plant. At the level of the line worker, the measures are narrow and tend to be nonfinancial. At the level of the plant manger, however, the measures are broader in scope, and more are financial. To some degree, the results are cumulative, i.e., results at lower levels of the organization impact the results at the top of the organization.

BALANCED SCORECARD

The implementation team for the balanced scorecard is very systematic in its approach. Team members begin with an initial plant assessment, where they judge the willingness of plant employees to embrace the new initiative. The team also studies the plant to understand its operations and to develop a sense of the types of performance measures that might be needed. As part of the implementation process, a three-day training class is required for all employees who participate in the balanced scorecard.

The new performance measures allow operating people to measure and gauge their own performance results. Performance results are available in a variety of forms, but they must be visual and easy to use and interpret. For example, "near misses" is a safety measure that is tracked daily by shift. The number of near misses is recorded graphically on a five-sided board that is positioned in an area inside the plant that is highly visible to employees. Each side of the board highlights one of the measures of safety, quality, delivery, cost, and morale.

Periodically, meetings are held "around the board" for a particular zone within the plant. A production line is broken down into smaller zones, based on processes. These zone meetings are used to discuss performance results, unresolved problems, or action plans for improvement in one of the five key performance areas. Since the meetings are visible to other workers in the plant, they generate awareness and curiosity. As more and more employees learn about the balanced scorecard, it can be implemented in other zones more efficiently and effectively.

The board meetings are held with representatives from all functional areas—engineering, maintenance, quality control, and even a supplier if necessary. Management's role is that of facilitation and coaching. Management does not dictate measures to the supervisors and line workers.

During the site visit, the implementation team for the balanced scorecard described the project's success factors over three different time horizons. In the short term it requires buy-in, training, and coaching. For the medium term it must be consistently used for measurement purposes, actions must be taken, and broad training is necessary to obtain a critical mass of users. In the long term, it must be fairly easy to collect data, update the system, and track results. The plant must strive to spend less time collecting the data and more time interpreting the results.

At Chrysler's corporate level, metrics on the balanced scorecard are, for the most part, used as the basis for executive management reviews. In turn, the plant manager

uses the balanced scorecard to evaluate lower levels of management within the plant. These performance reviews affect management's compensation, but they do not have a direct effect on the unionized workers.

To some degree, the union workers wonder, "What's in it for me?" The results for them are more subtle and do not necessarily involve financial compensation. For example, the workers certainly want to avoid injuries, and by monitoring near misses, they have developed action plans to prevent future accidents from occurring. The balanced scorecard is also used to make their lives easier. One way is to show how preventative maintenance heads off work disruptions that are caused when machines break down.

The workers need to be involved in developing the performance metrics. But perhaps the best way in which management achieves buy-in from the workers is by acting on their suggestions. As the measures are tracked and problems identified, worker suggestions for improvement must be addressed by the supervisors. As the workers see results, they become more supportive of ABM and the balanced scorecard.

ACTIVITY-BASED MANAGEMENT

Initially, even though the plant manager understood how ABM information is important to the new product introduction process, he felt that ABM would have limited usefulness once products were ready for assembly at his plant. However, once he saw some early wins—such as cost comparisons of the three-door and four-door minivans and dropping the gold paint color—he embraced the ABM methodology at his plant.

The plant manager also feels a sense of empowerment by having the ABC data. Following a quality study, the plant manager wanted to spend several hundred thousand dollars to reconfigure the production line to improve the fit of parts that are added to the vans during the assembly process. Typically, projects of this magnitude require capital expenditure requests that have a lengthy approval process. For this proposal, however, Chrysler's platform team used the ABC data to quickly calculate the "cost of nonconformance." The cost of changes to the production line were justified, and the team quickly received approval to move forward with the project.

To achieve nonfinancial ownership of the cost management system, the finance function at Chrysler has become much more customer focused. Instead of being perceived as a value-adding member of a business team, Finance was considered to be a bottleneck to operations. And rather than being seen as a strategic partner that supports continuous improvement, Finance was perceived to be internally focused and control oriented.

Currently, operating managers are actively involved in cost management at the Windsor plant. Cost information is considered to be a tool that Finance provides to operations, and operations actually uses the information. Prior to this change in philosophy, the plant controller presented the plant's financial results at staff meetings. While the operating managers still receive financial information from the plant controller, the operating managers now run the cost meetings. They present the financial results as well as action plans to improve performance.

Evidence of nonfinancial ownership was also apparent during the consortium group's plant tour. The union workers demonstrated that they understood the performance measures displayed on the boards in their area. They were also knowledgeable about improvements that had been made in the past, as well as action plans for the future. What seemed to impress them most, however, was management's commitment to change. When the workers suggested changes, the changes were either made or management provided reasons why the changes were not implemented.

A manager commented that in the past they had 50 managers available to address problems. Now they have 5,000 workers trying to solve problems.

City of Indianapolis

With a population of more than 800,000, Indianapolis is one of the largest cities in the United States. Like many other large U.S. cities, Indianapolis was faced with declining city services and increasing costs. When Stephen Goldsmith, the current mayor of Indianapolis, ran for office, he campaigned on a platform to improve the efficiency of city services. One component of his long-term plan was to outsource (i.e., privatize) some of the city services.

Mayor Goldsmith's citywide competition strategy requires public employees to compete for their own jobs. By early 1996, the city had held 64 public-private competitions on more than $500 million of work in 27 separate service areas. Public workers had won 16 bids and split 13 with private contractors. One example of the success of Mayor Goldsmith's strategy is in the area of solid waste removal. The sanitation employees and their union outbid 12 private haulers for their routes, saved $13.9 million in two years, increased collections per crew from about 700 per day to about 1,200 per day, and saved 75 city jobs.

Activity-based cost management was critical to Mayor Goldsmith's strategic and operating initiatives. From an operational perspective, ABM served as a tool to identify the drivers of high-cost activities and to support cost reduction efforts. For strategic purposes, ABM served as the yardstick that measured the cost of services that were subject to outsourcing.

APPLICATIONS

Applications of ABM information at the City of Indianapolis include product/service costing, process improvement and reengineering, cost control, performance measurement, benchmarking, and budgeting. Each of these applications support management's strategy of competitive bidding for city services. These applications have been applied to the following city departments:

- **Street maintenance and traffic.** The concrete work was privatized, but most of the other activities within the department are still performed by the city.

overview

Industry Group:	City government
Scope of Implementation:	Multiple departments
Annual Costs:	$26 million–$100 million
Number of People:	100–250
Product/Service Diversity:	Very diverse
Customer Diversity:	Very diverse
Primary Applications:	Competitive bidding
	Process improvement
	Cost control
Results of ABM Efforts:	Moderate changes in performance measures and the annual budgeting process
	Significant improvement in customer/channel profitability
ABM Reporting System:	Fully developed activity models for each city department
	Partly integrated with financial and operating systems; some integration with product/service costing systems and budgeting systems
	Features include ease of use, flexibility, timeliness, accessibility of cost data, accessibility of operational data, quality of cost data, quality of operational data, tracing/allocating costs to activities, and drill-down capabilities
	Each model updated as necessary
	In use four to five years
ABM Linkage to Business Environment:	Moderately linked to TQM/continuous improvement, business process reengineering, and benchmarking
	ABM performance measures have been mostly accepted/embraced and perceived as fair
ABM Resources:	Good use of basic training in finance/accounting and training in ABM concepts
	Other resources include training manuals, activity dictionaries, ABM resident expert, meetings with user groups, and training in ABM applications
Barriers to Implementation:	Managers unwilling to change
	Systems or other technical issues
	Other initiatives are more important
	Lack of sponsorship
	Lack of perceived benefits

- **Solid waste removal.** This service is performed by a mix of city workers and private companies.
- **Sewer maintenance.** This service is privatized.

City workers competed directly with private industry for contracts for city services, and activity cost information was used to formulate the bids. Because private industry and city residents were concerned that the city might submit bids below cost to win contracts, an independent auditor served as an unbiased third party to ensure that the city's bids were based on realistic cost estimates. Generally, when the city workers lost bids, either the private firms had technology that was not available to the city or the technology could not be purchased cost-effectively by the city.

RESULTS ACHIEVED

With managed competition and competitive bidding, the city's taxpayers have seen the cost of city services decline substantially. For city services that have been privatized, outside contractors have passed on cost savings to the city. Through ABM, city workers have been able to reduce the cost of those services that they continue to provide.

For example, ABM was applied to solid waste removal. Inefficiencies were caused by poor truck utilization and poor scheduling. Truck use improved by requiring preventative maintenance, and when maintenance was performed, it was done at night.

Scheduling improved once the truck drivers participated in route scheduling. Through an interview process, management learned about problems with scheduling and decided to enlist the help of the truck drivers. Prior to ABM, the drivers were only productive on the routes approximately five hours per day. Once the drivers participated in the scheduling process and understood the high cost of being underutilized, productive hours increased to approximately six-and-a-half hours per day.

Management has also been willing to share the ABM results with employees. Employees saw, for the first time, the cost of the activities they performed. Thus, they could see how improvements (or lack of improvements) impacted cost. For example, at the beginning of each workday, workers in the solid waste department saw the cost per vehicle and the cost per crew reports. When costs spiked up, they investigated the reasons. For the solid waste department, absenteeism was one of the cost drivers. When workers didn't show up for work, schedule disruptions caused excessive overtime, and bonuses and incentive pay went down.

The city also negotiated more flexible work rules. This flexibility allowed more work to be done with fewer people. Currently, most workers are at the same pay scale and can work many different jobs. Even though the city could hire low-skilled workers to satisfy the primary responsibilities of some jobs, it often hires higher-skilled employees with the flexibility to perform multiple jobs. The strength of ABM is that it demonstrates the cost savings that result from a flexible work force.

For some parts of the city's trash collections, there was cross-subsidization—the residential services were actually subsidizing large apartment complexes. Through a better

understanding of costs, the city was able to develop a more accurate fee-for-service billing structure. Previously, the fees collected from the residential customers subsidized large apartment complexes.

In other areas, the city was acting as a middleman. Even though some city services were performed by independent contractors, the city collected money from the customers and paid the contractors independently. In some cases the city lost money. The city found it was more cost effective for customers to pay the contractors directly.

CHALLENGES/BARRIERS

Despite the successes achieved, the taxpayers of Indianapolis continue to demand improved services and lower costs. Challenges and barriers include:

- To some extent, the pressures for change have diminished in the city. Some city services have been outsourced completely; those that remain have been won consistently by city employees or are not subject to outsourcing.
- The city's work management system, the IMS system, experiences technological problems. The IMS system captures workers' time and the work they do. How people spend their time and what activities they are working on feeds the activity-based cost management system. The IMS reports are not received in a timely manner and are cumbersome to use.
- Many of the senior managers who have used the ABM information in the past have left the city. New managers need to understand the capabilities of the ABM system and how they can use the information to support decision making.

CRITICAL SUCCESS FACTORS

The mayor and city management had a clear vision of the information they needed to support decision making. They had many opportunities for improvement, and so the mayor rallied support, and changes were made. The city workers were also motivated—they wanted to keep their jobs. The ABM system and reports are adequate to support the information requirements for decision making and performance measurement.

The city linked ABM to performance measurement. Furthermore, incentive pay is based on ABM productivity improvements. Of the cost savings achieved by the workers, 25 percent went to incentive pay in 1994 and 30 percent in 1995. This was in lieu of pay raises. In fact, the incentive pay was higher than what the raises would have been had the incentive system not been in place.

NONFINANCIAL OWNERSHIP

While the ABM project was driven by the mayor's office, its concepts and applications appear to be embraced and understood by all levels of management, as well as the workers themselves. As part of the site visit, the study team met with a first-line supervisor and an hourly worker (who was also the union president). Both employees were conversant in ABM terminology and applications. They commented that for the first time they had cost information that was meaningful and could be used to support decision making.

Even though the public service workers for the city are unionized, many of the contractors (e.g., Browning Ferris Industries) that compete with the city for contracts are nonunion. The city and its union understood the importance of developing a partnership based on trust. If they did not establish good working relationships, city workers would not be competitive.

City management asked the union to participate in the bidding process. This strategy was important for two reasons. First, the union members understood the job requirements of each contract and could improve the accuracy of the bids. Second, by participating in and contributing to the bids, the union buys into and commits to the requirements laid out in the bid. Often that means agreement and commitment to productivity improvements required to complete the contract at the agreed-upon price.

By working with the unions, management has actually been more competitive in bids for contracts. When the unions participated in the budgeting process (about half the time), the city won 80 to 90 percent of the bids. When they didn't participate, the city won only 40 to 50 percent of the contracts.

SYSTEMS AND REPORTING

The basic ABM information system used to support the ABM applications at the City of Indianapolis is best described as a fully developed activity model for each department of the city where an activity analysis has been undertaken. The models are updated periodically, on an as-needed basis. Some reports are updated monthly, some quarterly, and some annually. The ABM models are only somewhat integrated with the other financial and operating systems of the city.

Activity information needed to update the models includes equipment usage, materials usage, vehicle usage, measures against plan, and labor usage. Information about labor usage is contained in the IMS work management system. Currently data are input to the IMS manually, and the hours in IMS do not always balance with the hours reported in the payroll system. Reporting of ABM information is fairly detailed (more than 100 activities and cost objects for the departments are covered by the models).

Users consider the system to be easy to use and flexible. All information is available online and in hard-copy reports. Users consider the quality of cost and operational data, timeliness, and accessibility relevant to their needs and requirements. ABM reports are used frequently, and the level of detail, complexity, and overall quality are deemed adequate.

Cummins Engine Company

Cummins Engine Company, based in Columbus, Indiana, is a Fortune 500 company (No. 272 in 1996) with annual sales of about $5 billion worldwide. Total employment is about 30,000 people. Cummins is the world's largest independent diesel engine manufacturer (35–40 percent market share) with 35 worldwide manufacturing locations typically employing 500-plus people.

The history of ABM at Cummins Engine Company begins at two plants that started their own ABM initiatives in 1990. Based on the success of these early efforts, a corporate initiative commenced in early 1994. A corporate ABM staff of five plays the trainer/facilitator role in manufacturing site implementations. To date, Cummins has implemented ABM in 16 manufacturing sites, 12 distributors, and several support areas. The focus for 1997 is follow-up work at existing implementations. No new implementations are planned for 1997.

At Cummins, the decision to implement ABM is made locally by each site. A corporate ABM team facilitates each implementation. The sites are not charged for services by the ABM team. The ABM team also facilitates ABM implementations at independently owned distributors of Cummins parts; however, the distributors pay a fee for this service. While the distributor organizations benefit from the initial activity analysis, few see the value in updated ABM information. Therefore, within the Cummins distributor organization, ABM may not be sustainable in the long term.

APPLICATIONS

The two primary applications for ABM at Cummins Engine are process improvement and customer profitability analysis. Local management consistently uses ABM data for process improvement, and ABM is consistently used for strategic decision making.

The activity information helps identify improvement opportunities. As part of the interviewing process, the interviewees offer recommendations for improvements after being asked, "What part of your job could be avoided?" (meaning what part is avoidable?) and, "If a reasonable number of resources were made available, how much of a particular task could be eliminated?"

overview

Industry Group:	Manufacturing
Scope of Implementation:	Multiple facilities/operations
Annual Costs:	More than $4 billion
Number of People:	30,000
Product/Service Diversity:	Diverse
Customer Diversity:	Average
Primary Applications:	Customer profitability analysis
	Process improvement
Results of ABM Efforts:	Significant changes in processes—Operating Department
	Moderate improvements in product/service profitability, make-versus-buy, and manufacturing/operating costs
ABM Reporting System:	Internally developed Microsoft Access database application; ABM model for each location Some integration and linkage to financial and operating systems
	Features include ease of use, flexibility, timeliness accessibility of cost data, accessibility of operational data, drill down capabilities, quality of cost data, quality of operational data, and tracing/allocating costs to activities
	Most models updated semi-annually
	In use for three to four years
ABM Linkage to Business Environment:	Generally linked to TQM/continuous improvement, and moderately linked to just-in-time manufacturing
	ABM performance measurement is somewhat accepted/embraced and mostly perceived as fair
ABM Resources:	ABM competency center reporting to controller Good use of activity dictionary
	Other resources include training manuals, ABM library, ABM resident expert, visits to other sites, meetings with ABM user groups, basic training in finance/accounting, training in ABM applications, and training in ABM concepts
Barriers to Implementation:	Passive sponsorship
	Managers unwilling to change
	Other initiatives are more important
	Limited resources
	Lack of perceived benefits

The interviews are conducted without management's presence. The employees are asked about any general problems that should be addressed, especially with regard to safety, tools, equipment, or general factory issues. The interviews are conducted individually and in groups. The interchange of individuals within a group often produces improvement suggestions.

ABM also supports strategic decisions, such as new product introductions and make-versus-buy decisions.

CHALLENGES

One of the challenges the company is addressing is how to make ABM sustainable, both at the distributors and at the Cummins plants. For example, former Cummins' employee Marlin Adams conducted a four-month ABM study that found that the activity analysis was successful—the objective of $6 million in savings was achieved—but the model was not being well sustained.

Currently ABM has limited applications for performance measurement or compensation and is a priority for the future.

CRITICAL SUCCESS FACTORS

To help ensure its continuity, ABM was positioned as a tool to support other initiatives; it is not a new improvement initiative. Through interviews and comments, ABM helps Cummins' employees articulate, in a systematic way, what their problems are and what it will take to fix the problems. This process is facilitated by having the employees work in group sessions. Management may have already been aware of the problems, but not their extent. In other cases, new problems are uncovered.

For 1997 the ABM team will focus more on improving current implementations, e.g., how to use the ABM information to support decision making, and less on developing new ABM applications or beginning new implementations. While some users "take the data and run with it," others are struggling with how to understand the data and how to take action. Therefore, training becomes an important issue.

Initially, Cummins implemented ABM at two pilot locations. Based on that success, implementations spread to other manufacturing and distribution locations. ABM was implemented to support the Cummins Production System (CPS), which is the umbrella over all manufacturing improvement initiatives. Within the CPS umbrella, ABM supports the Cummins approach to continuous improvement (CACI) and Kaizen.

The ABM system targets actionable improvements, which fall into three categories: quick fixes, minor CACI projects, and major CACI projects. The quick fixes provide early successes for the ABM project and help ensure its acceptance by the users.

The ABM implementations at Cummins are highly systematic. Following a site assessment and the establishment of an ABM team (from the site), a contract is developed. ABM does not proceed without a contract in place. A sample activity dictionary is provided to the plants prior to the interviews, along with a template to make

additions to the dictionary. The activity and task dictionary is developed before the interviews; once the interviews begin, the dictionary is rarely changed.

The activity dictionary for manufacturing plants contains three levels; distribution centers have a separate activity dictionary. The highest level consists of 14 major business processes, such as direct material procurement, order management, and conversion. The next level contains approximately 250 activities that are common to all manufacturing plants. The business processes and activities are common among all manufacturing sites. Each activity rolls up into one of the major business processes. The lowest level consists of any number of tasks, which are customized to each location. Fewer than 10 percent of the tasks at each plant are unique, however. Therefore, more than 90 percent of the tasks at each plant are common among multiple plants.

SYSTEMS DEVELOPMENT

The basic system used to capture and report ABM information is an internally developed Microsoft Access database called CAM-1. Activity profiles submitted by implementation teams, general ledger cost information, and operating systems (Manpower) feed the database. The ABM information included in the CAM-1 database provides data, information, and reports that are required for activity performance, cost-by-piece and -per-event calculations, customer profitability, and capacity modeling.

An updated ABM software system (CAM-2) includes business segment profitability, comments and improvement suggestions, subprocess capability, product costing, cost-driver analysis, flexible expense assignment mechanism, and task-level information. These internally developed ABM systems also capture employee suggestions and comments from interviews. These data can be sorted to support process improvements. Some of the models at the particular plants are updated every six months to a year; others are updated less frequently.

Cummins' ABM model maintains a table of comments, which includes improvement ideas that are produced from the interview process. The table includes comments that relate to the cost drivers, activities, tasks, etc. The table also includes business segments, business processes, and actionable recommendations. These data can be sorted by any of the above attributes.

REPORTING

Reports are available on the following topics: processes, activities, activity unit costs, tasks, cost drivers, business segments, customers, products, sub-products, comments, and audits. The data in the reports can be rolled up or drilled down for more detail. They can be run in a standard format or modified after being exported to Excel. For example, one report includes the 10 activities (and their associated cost drivers) that have the highest level of avoidable costs.

The ABM system has not replaced many of the other management accounting reports within the company, such as budget-versus-actual and variance analysis.

First Data Corporation

As the 82nd largest company in the United States in terms of market capitalization and with sales of more than $5 billion, First Data is the leading provider of credit card processing, payment systems, electronic commerce, and information-based services to businesses and consumers. Spanning 130-plus countries, more than 40,000 employees deliver service to institutions that in turn serve the consumer—financial institutions, manufacturers, utilities and government agencies, wholesalers, and hospitals. Through its Western Union operations, First Data serves the consumer directly.

Specifically, in 1996, First Data was behind the scenes maintaining data for 153 million credit and debit cards, authorizing approximately 2.3 billion credit and debit card transactions, issuing approximately 100 million credit and debit cards to consumers, processing 5.9 billion total card transactions for 500,000 merchants, authorizing 645 million checks, processing 35 million money transfers, selling 235 million money orders, issuing 865 million official checks, servicing 15 million investment accounts, answering 250 million interactive calls, administering 18 million healthcare claims, processing 60 million electronic document images, and mailing 1.2 billion documents.

First Data Corporation has a unique approach to ABM called F.A.C.T. (Functional Administrative Control Technique). F.A.C.T. is a variant of activity-based management developed in 1971. F.A.C.T. encompasses organizational development, strategic cost management, total quality management, process value analysis and reengineering, and activity-based cost management.

APPLICATION

The typical application of F.A.C.T. is at the business-unit level and takes about three months to complete. F.A.C.T. is undertaken by business-unit management to determine:

- what products/services really cost (complete with audit trail);
- which activities (costs) add value and which do not;
- what employees/customers think about work processes and activities; and

overview

Industry Group:	Service
Scope of Implementation:	Multiple facilities/operations
Annual Costs:	More than $4 billion
Number of People:	More than 40,000
Product/Service Diversity:	Diverse
Primary Applications:	Product costing
	Cost estimation
	Profitability analysis (product, service, customer)
	Process improvement
	Supply chain analysis
Results of ABM Efforts:	Significant changes in pricing strategies, customer support/mix, processes in the operating departments, processes in support functions, and the annual budgeting process
	Significant improvements in product/service and customer/channel profitability, manufacturing/operating costs, and support function costs
ABM Reporting System:	In-house developed F.A.C.T. database
	Mostly integrated with internal financial reporting, product/service costing systems, and budgeting systems
	Updated as required
	In use more than five years
ABM Linkage to Business Environment:	Extensively linked to business process reengineering and supply/value chain management; generally linked to TQM, employee empowerment, and reorganization by process
	ABM performance measures have been mostly perceived as fair and accepted
ABM Resources:	ABM competency center reporting to controller
	Extensive use of activity directory, ABM resident expert, visits to other sites, and meetings with ABM user groups
	Good use of training manuals, basic training in finance/accounting, and training in ABM concepts
Barriers to Implementation:	ABM is provided to the business units on a consulting basis; a larger staff of consultants would benefit and help support the implementation

- insights into overlap/duplication, misplaced and unnecessary effort/expense, non-mission-related work, and avoidable costs.

The results of a F.A.C.T. initiative include 1) change recommendations designed to improve operating performance; 2) an ongoing cost system that provides the building blocks for costing new products, determining fixed and variable costs, pricing and proposal development, and product/service life-cycle analysis; and 3) trained staff to maintain/enhance the cost management process. The ongoing cost system is linked to human resource and general ledger systems, thus permitting easy and frequent updates.

F.A.C.T. uses a two-phase job plan based upon an action-research model, involving planning, data collection, synthesis, analysis, and recommendations. Phase I, described as ABC, includes planning, data collection, and synthesis. Planning, which takes two weeks, includes understanding the organization, defining activities, planning data collection, and scheduling interviews. Data collection, which takes three weeks, includes conducting interviews, documenting interviews, and entering data. During synthesis, which takes one week, the interviews are completed, reports are run, and major issues are identified.

Phase II, described as ABM, includes analysis and recommendations. During analysis, which takes four weeks, opportunities are identified and prioritized. The recommendation stage of phase II takes two weeks. During this stage, recommendations are prepared in a final report, presented to management, and are followed by the preparation of an implementation plan. Both phase I and phase II are conducted throughout the value chain of each business unit, including Innovation and Development, Sales and Marketing, Product Service and Delivery, and Customer Service.

F.A.C.T. uses many analytical tools, such as process analysis, cost-driver analysis, and cost of quality. Unique to First Data are several additional analytical tools including value-added scoring, complexity analysis, nonlinearity analysis, attitudinal analysis, mission analysis, and fragmentation.

- **Value-added scoring.** Activities are scored and prioritized on the worth or value to each business unit. Two components are used to score activities: a value-added contribution component and a reliability component. Each component is scored on a zero to 10 scale. For contribution, zero means nonproductive and 10 means adds maximum value; for reliability, zero means terrible and 10 means perfect. These two scores are multiplied to determine a composite value score for each activity. The composite score has several purposes. For example, scores by those who perform the activity can be compared with those of the customers of the activity. When large differences exist, they can be discussed and resolved. Learning occurs for both the providers and the customers of the activity.
- **Complexity analysis.** As part of F.A.C.T., complexity is analyzed based on the growth in the number of departments or work units, increased number of organization levels, proliferation of policies and procedures, expanding product lines or product features, and product line proliferation.

- **Nonlinearity of activities and costs.** Examples include lack of available resources during peak times, excessive overtime during some periods, expenditures for labor that vary throughout the year, output demands that do not correspond with overtime schedules, advertising/promotions that are not uniform, and excessive resources during slack times.

  First Data also collects "attitudinal" information. While industrial engineers collect quantitative information, they leave out information about employee attitudes, which are more subjective and difficult to quantify. Attitudinal information relates to issues, concerns, opportunities, and roadblocks. Employee attitudes affect morale, and employee morale drives productivity.
- **Mission analysis.** The effectiveness of an activity is determined by whether it is mission- or nonmission-related. During interviews, employees are asked the extent to which they engage in mission-related and nonmission-related activities. For example, mission-related activities for a sales department might include making sales calls, configuring systems, developing pricing, writing proposals, and qualifying buyers. Nonmission-related activities might include completing paperwork, attending sales meetings, expediting shipments, resolving billings, and expediting collections. Based on this analysis, an effectiveness ratio can be calculated.
- **Fragmentation.** Fragmentation is defined as "the degree to which activities lose efficiency and effectiveness by being performed by too many people as compared to the total effort"—the sum of the parts is bigger than the whole. The number of full-time equivalents (FTEs) that perform an activity compared to the total number of people involved in the activity is a measure of fragmentation.

A successful implementation of F.A.C.T. generates significant opportunities in terms of profit improvement, quality improvement, customer satisfaction, employee effectiveness, competitive position, and process reengineering.

First Data applies direct costing, where costs are traced directly to cost objects. It tries to avoid "pooling," a two-step process where resource costs are traced to cost pools in the first step and then to cost objects in the second step. Directly tracing each cost element to each cost object eliminates distortions due to heterogeneous cost pools.

CHALLENGES/BARRIERS

Implementing ABM in a service environment is difficult. First, there are the difficulties associated with knowledge work, which tends to be a more nonstructured and self-directed work environment. Outputs of knowledge work can be intangible and difficult to measure. Often it is difficult to relate activity costs to value created. Determining what activities contribute to the mission of business units in the service sector is difficult as well.

An integral part of a F.A.C.T. initiative is providing detailed information about the cost drivers (both tangible and intangible) that generate unnecessary and avoidable costs. In the knowledge work force, intangible cost drivers (such as lack of information, inadequate planning, poor communication, and insufficient training) that generate unnec-

essary and avoidable cost are difficult to count and quantify. The same is true for tangible cost drivers such as overlap and duplication, wasted effort, and cost of quality. Interviews with the employees capture this information, but more importantly, the interviews also capture employee suggestions for improvements.

SYSTEMS DEVELOPMENT

The ongoing system supporting First Data's cost management initiative is a F.A.C.T. database. The database is fully integrated and linked to HRIS (Human Resource Information System) and the general ledger, thus permitting easy and frequent updates. The database provides the building blocks for costing new products, determining fixed and variable costs, pricing and proposal development, and product/service life-cycle analysis. It provides both financial and operational information.

The F.A.C.T. database concept is that of a cube in which costs are reported by organization (by departments and by employee type) and products and services and for the processes and activities themselves.

REPORTS

Internal users and recipients of F.A.C.T. information and reports include Marketing and Sales employees, who use the information for pricing and customer preferences; operating areas for cost improvement and process reengineering; Finance and Accounting for line of business costs and cost profitability models, and quality teams. Human Resource people use the information for job descriptions and for wage/salary determinations. Information Systems, a significant part of the cost structure, uses the information for system justifications.

The following is a sample of the types of reports and information provided:

- cost of each activity;
- reliable costs for each line of business;
- organizational information (span of control and number of organizational levels);
- cross-functional effort among departments, units, or groups;
- fragmentation of activities;
- activity-linked attitudinal information;
- skills, knowledge, and data used by top performers;
- value-added content of each activity; and
- nonmission-related effort.

Within its ABM system, First Data captures employee profiles, which represent the activities or work employees perform, how each employee's work integrates with that of other employees, and suggestions for improvement. Reports also include interview data from a large portion of the work force. The power of the system is demonstrated by sorting interview comments by process and using the suggestions to improve cross-functional processes across the organization.

Hewlett-Packard

North American Distribution Organization

Hewlett-Packard is a world leader in manufacturing PCs, computer systems, printers, scanners, and work stations. Hewlett-Packard has four product distribution centers worldwide. One of these distribution centers, Hewlett-Packard North American Distribution Organization (HP-NADO), is responsible for the distribution of 21 product lines (LaserJet, DeskJet, etc.) through six customer resale channels. In 1994, HP-NADO distributed nearly $7 billion in product through five depots to more than 300 principal resellers nationwide.

In January 1994, HP-NADO initiated an ABC effort to cover the entire operation—from front-end order taking to back-end assembly and distribution costs. The initiative was named SAM (Strategic Activity Management) and set out to determine the operating costs that contributed to product and customer profitability. The SAM model provided both strategic and operational information including segment, product, and simple process costing. It also included targeting of improvement opportunities.

The implementation of ABM at HP-NADO has been widely publicized and presented. It is covered as a case study in the book *Activity-Based Management: Arthur Andersen's Lessons from the ABM Battlefield*, edited by Steve Player and David Keys. The application at HP-NADO was also documented in the summer and fall 1995 issues of "As Easy As ABC," a quarterly newsletter published by ABC Technologies, Inc., a leading provider of commercial ABM software.

The ABM systems, methods, and practices at HP-NADO have continued to evolve since these case studies were published. This summary documents the changes.

APPLICATIONS

The basic ABM applications at HP-NADO have not changed. These applications are customer profitability analysis, process improvement, and supply chain analysis.

overview

Industry Group:	Distribution
Scope of Implementation:	Department/function only
Annual Costs:	N/A
Number of People:	Approximately 1,400
Product/Service Diversity:	Diverse
Customer Diversity:	Diverse
Primary Applications:	Customer profitability analysis Process improvement Pricing models Supply chain analysis
Results of ABM Efforts:	Extensive change in processes—both operating departments and support functions Significant change in customer support/mix Significant improvement in customer/channel profitability
ABM Reporting System:	Commercial, PC-based, stand-alone ABM system Features include tracing/allocating costs to activities, ease of use, flexibility, timeliness, accessibility of cost data, accessibility of operational data, drill-down capabilities, quality of cost data, and quality of operational data Updated quarterly In use three to four years
ABM Linkage to Business Environment:	Generally linked to supply/value chain management and moderately linked to TQM/continuous improvement ABM performance measures have been moderately accepted and mostly perceived as fair
ABM Resources:	ABM competency center reporting to controller Extensive use of ABM resident expert Other resources include training in ABM concepts, training in ABM applications, basic training in finance/accounting, and meetings with ABM user groups
Barriers to Implementation:	Other initiatives are more important Limited resources Systems or other technical issues Lack of perceived benefits

HP plants manufacture standardized versions of its products lines. At HP-NADO, these products are customized to specific geographic markets and for packaging and shipping. Potential customization steps number in the hundreds and differ by customer and product. Until ABM, HP-NADO was using a traditional allocation process to spread operating costs to products and customers. SAM was developed and designed to give management information on how operating costs influenced the company's profitability and how the costing process could be used to identify opportunities for improvement.

There are many variables to specialized products sold to individual customers, including colors, capabilities, packaging, delivery, and service. SAM focused on finding the real costs of these differences and the impact they had on earnings.

RESULTS

The original SAM model identified certain low-volume products that were losing money and being subsidized by higher volume products. Even more dramatic were differences in customer profitability. The ABM analysis that preceded building the model helped to identify more than $2 million in potential cost savings.

The model's strategic value is far-reaching. From the ABM data, management learned that 51 customers accounted for 85 percent of HP's orders. SAM proved a powerful tool for analyzing customer and channel profitability, analyzing costs of key services, determining the impact of outsourcing distribution functions and certain products, performing benchmarking of key areas, and justifying investment decisions.

Results for HP-NADO included the identification of a number of important operational uses for the SAM model:

- linkage to monthly cost allocation methodology,
- linkage to the budgeting process,
- support of operation improvement teams,
- use of attributes to identify under what time frames cost vary, and
- use in determining management performance related to cost efficiency.

CHALLENGES

Building a model to fully cost customers and products was a challenge. Most ABM models are directed at one or the other, but until HP did it, no one had built a model to accommodate costs shown both ways. One alternative was to analyze the profitability of both products and customers within a single model. The resulting design for tracing costs to these two distinct and different cost objects was complex. Using a single-model approach would have required more than 75,000 intramodule assignments, more than 37 hours to import structure, and more than three hours to run the model.

HP-NADO also considered using a bill of activities to roll up fully costed products and customers. Although this model could have generated both fully costed products and customers, it could not calculate the total costs or analyze the contributions

to those costs through all levels of assignment. These calculations can now be done with OROS Links and OROS Reports—ABC Technologies, Inc., software products—which were not available when the model was built in March 1994.

The rejection of these two alternatives left an obvious and simple alternative: create two models within EasyABC Plus, one for customer profitability and one for product profitability. Using the two-model approach, fewer than 14,000 intramodule assignments were required. The structure was imported in only 15 minutes, and the models were run in under two minutes.

The key to success was recognizing that once the first model was built, the second model would be relatively easy both to build and to maintain.

SYSTEMS DEVELOPMENT

SAM was built using a Microsoft Access database as a front-end preprocessor for the EasyABC Plus model and facilitates the collection and analysis of labor costs. Data are collected, consolidated, and formatted in Access for import into EasyABC Plus.

To keep the model small and agile while maintaining numerous details about activities and related costs, much of the detailed activity analysis is performed using Access. Aggregated data from Access is moved to the SAM model.

The SAM model statistics include the following:

KEY STATISTIC	QUANTIFICATION
Functional areas covered	51
Key activities identified	527
Head count included in model	1,410
Drivers used in model	27
Processes costed	118
Product families costed	75
Customers costed	58
Resource pools	42
Resource assignments	940
Process pools	152
Process pool assignments	3,000
Cost objects	410
Cost object assignments	13,000

The emphasis has changed since the SAM model was first introduced. Emphasis is now placed on customer costing and customer-compelled activities. The current (Release 3) ABM software has been simplified and now is more focused. The reason driving the change was the cost of updating, maintaining, and validating the model, because other costing tools were taking SAM's place and to match the model with

demand for information. By mid-1996 HP-NADO had migrated its model to a cost-to-serve tool.

Cost to serve is basically a profit/loss statement by customer. Major components of the cost to serve include accounts receivable carrying costs, price protection, CoOp/MDF costs (advertising and promotion costs attributable to a particular customer), returns devaluation, order management, returns management, outbound freight, and shipping. The model, using the OROS suite of tools and application software, includes multiple driver selection, attribute tagging in all three software modules, generic and custom reporting, querying capability and tools, and linking tools.

REPORTING

One of reporting capabilities of the SAM model is the "slice-and-dice" cube that shows the relationship of costs among customer segments (major accounts, independents, suppliers, VARs, etc.), product lines, and activities. The slice-and-dice cube is a full set of information to drill down and facilitate the understanding of the relationships among products, customers, and the activities carried out to produce these products and provide services to customers.

Reporting capability also includes reports and graphs that list activities and the percentage contribution of each activity to a list of products. A user can start with process contribution and select processes to drill down for more detailed analysis. Within the model it is possible to tag each of the quality-related activities with an attribute to pull all of them together in a report to analyze quality efforts. Reports breaking down the cost of quality into categories of prevention, appraisal, internal failure, and external failure are available.

Features of the cost-to-serve customer profitability reports include profitability by product and product line. The reports also highlight the customer value proposition defined as net ship dollars, which includes quoted prices, discounts, price protection, CoOp/MDF, and other terms and conditions of sale attributable to a specific customer. Net ship dollars after operating expenses attributable to customers (derived from SAM model) is the cost to serve.

Marmon Keystone

Marmon Keystone is part of the privately held Marmon Group, Inc. More than 60 member companies are included in the Marmon Group of companies. Total consolidated revenues are just less than $8 billion. Return on investment averages more than 20 percent.

The overall ABM effort at Marmon is spearheaded by a small corporate staff responsible for providing internal ABM consulting services (primarily training and facilitation) to the operating companies. On a companywide basis, Marmon has undertaken more than 100 ABM projects (initiated by line and operating personnel) in 45 of its operating companies.

ABM implementation efforts have included one-time studies, periodic trend analyses, turnaround situations, and systems (process) improvements. ABM implementation efforts also include installing fully integrated ABM information systems that feature monthly reporting and import/export/graphic report capabilities.

Marmon Keystone is a distributor of specialty steel products. Its customers are primarily contractors, and its products are primarily used in construction. Overall (United States and Canada combined), annual revenues are approximately $500 million. Implementation efforts have been undertaken in both the U.S. and Canadian operations. The ABM survey questionnaire completed by Marmon Keystone included the combined operations.

The site visit for Marmon Keystone was conducted at the Canadian division, Marmon Keystone Canada, Ltd., located in Toronto and included representatives from the U.S. division. The focal point of the site visit was transferring ownership to operating personnel.

APPLICATIONS

ABM at Marmon Keystone Canada is primarily being used for customer profitability analysis and process improvement. The application, as currently implemented, is best described as a project (strategic in nature), where an activity analysis

overview

Industry Group:	Distribution
Scope of Implementation:	Multiple facilities/operations
Annual Costs:	Less than $25 million
Number of People:	251–500
Product/Service Diversity:	Similar
Primary Applications:	Product costing
	Pricing models
	Product profitability analysis
	Customer profitability analysis
Results of ABM Efforts:	Significant changes in pricing strategies and customer support/mix
	Moderate changes in the annual budgeting process
	Moderate improvements in customer/channel profitability
ABM Reporting System:	Commercial, PC-based ABM system
	Minimal integration with existing systems
	Features include accessibility to cost data, quality of cost data, ease of use, flexibility, timeliness, accessibility of operational data, drill-down capabilities, quality of operational data, and tracing/allocating costs to activities
	Updated annually
	In use less than one year
ABM Linkage to Business Environment:	Moderately linked to benchmarking
	ABM performance measures have been mostly accepted/embraced and perceived as fair
ABM Resources:	ABM competency center reporting to CFO
	Extensive use of ABM resident expert
	Other resources include meetings with ABM user groups, basic training in finance/accounting, training in ABM applications, and training in ABM concepts
Barriers to Implementation:	Limited resources and systems or other technical issues

was undertaken to determine customer profitability and to identify opportunities for improvement.

Before ABM, costs were assigned to products based on weight. From the company's perspective, a ton was a ton. But allocating overhead based on weight alone caused distortions in product costs. For example, the cost of material handling for small orders of specialty products is sometimes higher than the cost of handling large, expensive orders of random-length pipe.

Using ABM information, costs that had been previously allocated to products could now be traced to products and customers. Drivers to trace costs to products and customers include:

- the number of orders,
- the number of lines on a customer order,
- the type of product ordered (some items are more expensive to pick than others), and
- the number of invoices processed.

The activity analysis also identified cost drivers for process improvement. Once prioritized, cost drivers became the focal point of improvement initiatives. Cost drivers include the methods of receiving from suppliers and for raw material storage, packaging, storage location, method of picking the order, cutting requirements, and shipping.

RESULTS ACHIEVED

The ABM implementation at Marmon Keystone Canada drove a strategic decision to eliminate a fairly large group of customers that was found to be unprofitable. Approximately 50 percent of these customers now buy from other suppliers. The other half agreed to change their behavior to buy less frequently and in larger quantities. The net effect is a smaller customer base, lower support expenses, but no loss in revenue due to minimum order quantities.

Results were also achieved through improved product mix decisions. Prior to ABM, the company felt that its aluminum pipe business produced a very low profit margin. In fact, it was planning to discontinue the product line. Through ABM, Marmon Keystone discovered that the profitability of aluminum pipes was quite acceptable. The pipes are sold in large quantities and at random lengths. The company also sells fasteners, fittings, and specialty products that come in smaller quantities and are sold as "eaches." The pipes are sold in large quantities and require minimum handling, no cutting, and no packaging.

ABM information drove decisions to adjust the customer mix. Prior to ABM implementation, all customers received similar levels of service, regardless of their value to the company. Through ABM, however, the company learned that its very large customers, which represent only 2 percent of its customer base, provide 20 percent of gross profit. Recognizing this fact, management now places a premium on providing a high level of support and service to these customers. Part of Marmon's strategy is to

maintain an ample supply of inventory to be very responsive to its customers. Executives at Marmon make it a point to know the executives at these customers. When problems arise, top executives quickly become involved in addressing the issues.

Marmon has also outsourced some of the cutting and grinding activities to its suppliers—ABM illustrated that the supplier could do certain activities more cost effectively that Marmon could. Pre-cutting pipes not only eliminates the cutting costs but also reduces material handling and bundling costs.

Results were also achieved in the value chain. Many of Marmon's customers are very small and don't have the expertise or the resources to implement ABM. Therefore, Marmon is helping some of its customers understand cost behavior. Marmon is showing them how their purchasing behavior affects Marmon's costs, as well as their own. Some of Marmon's customers are also distributors, and some have instituted minimum order quantities for their own customers.

Perhaps the most significant use of ABM was to change structure of compensation and incentive pay. The company now rewards salespeople with commissions based on gross profit (not sales revenue). Eventually, sales commissions are expected to be based on adjusted gross profit (gross profit, less overhead). Incentive pay for the regional managers is currently based on adjusted gross profit. Therefore, the regional managers may influence the shift to pay based on adjusted gross profit for the salespeople.

The cost of transactions among the 15 Marmon Keystone branches has also declined. The branches now understand that the cost of small shipments is very high, and they will be charged accordingly. Previously the credit for intracompany transfers was based on cost per ton.

CRITICAL SUCCESS FACTORS

Top managers understood that a significant number of customers were not profitable. The president of Marmon Keystone Canada commented that those in top management are "all salespeople at heart" and "never like to turn down an order." Using ABM to analyze Marmon's customer base, the company leaders discovered what they intuitively knew:

CUSTOMER RANK	A	B	C
Number of Accounts	15	25	60
Sales Revenue	65%	20%	15%

Marmon Keystone began ABM with a clear and concise objective—to develop relatively accurate product and customer costs to use for pricing and mix decisions. It developed uncomplicated ABM models that are fully understood by the user community. Furthermore, Marmon Keystone wanted to avoid elevating management expectations about the ABM system beyond a reasonable level. Therefore, it avoided pursuing too many opportunities at the same time.

SYSTEMS DEVELOPMENT AND REPORTING

The ABM system application at Marmon Keystone Canada uses commercial, PC-based software. It is off line and not integrated with other systems. The system does not feed other systems or use a data warehouse. Reports are kept simple and straightforward. The information is available to all levels of management and even to suppliers.

Marmon Keystone has also developed an online quotation model for pricing purposes. The model relies on activity-based costing data and considers sourcing, handling, and inventory holding costs. By using the online model, the salespeople can work with their customers to structure the sale to benefit the customer as well as Marmon Keystone. For example, the customer might receive a lower cost if it could accept a shipment from Marmon's supplier to the customer, thereby avoiding handling charges.

The model is not complex, and changes to the structure of activities and drivers can be made fairly easily. The model is updated annually. The entire process of interviewing the operating managers, collecting cost data, and refreshing the model takes fewer than three weeks per site.

The ongoing operating costs for the ABM system are minimal—one full-time person supports ABM. No additional data are collected on an ongoing basis. Minimal information systems support is provided to the ABM manager.

Northeast Utilities

Northeast Utilities (NU) is New England's largest electric utility. Operating subsidiaries include Connecticut Light and Power Company, Public Service of New Hampshire, Western Massachusetts Electric Company, and Holyoke Water Power Company. On a consolidated basis, annual revenues are about $3.7 billion, and the asset base is $10.5 billion. Approximately 9,500 employees serve a customer base of 1.7 million in New Hampshire, western Massachusetts, and Connecticut.

The history of ABM at NU began in 1990 with the development of budgets based on ABM information. In 1991 NU began using ABM to collect actual cost data. Before 1990 NU's general ledger was based on technology from the 1960s. The decision to implement a new general ledger coincided with the need for better cost management information.

As financial managers discussed system requirements with the operating managers, these operating managers described the need for process, not functional, information. During this same period, the chief financial officer learned about activity-based cost management, and this type of cost management system looked as though it would satisfy the company's needs. Therefore, the new accounting system that was developed for the mainframe was designed to accommodate ABM. Currently all of the general ledger feeder systems—payroll, accounts payable, purchasing, and journal entries—are directly linked to ABM.

APPLICATIONS

Northeast Utilities uses ABM information for process improvement and to support operational and strategic decision making. Applications include process improvement, cost control, performance measurement, benchmarking, budgeting, make-versus-buy analysis, and cost estimation.

NU is one of a very small and select group of companies that has implemented activity-based budgeting (ABB). Essentially it is a dual system—budgets are prepared by both activities and resource costs. To some extent, the budgeting process is still used

Industry Group:	Electric utility
Scope of Implementation:	Enterprisewide
Annual Costs:	More than $3 billion
Number of People:	9,500
Product/Service Diversity:	Very similar
Primary Applications:	Process improvement
	Cost control
	Budgeting
	Performance measurement
	Benchmarking
	Make-versus-buy analysis
	Cost estimation
Results of ABM Efforts:	Extensive changes in the annual budgeting process
	Significant changes in processes—support functions, processes—operating departments, performance measures, and employee rewards/recognition
	Extensive improvement in manufacturing/operating costs and support function costs
ABM Reporting System:	Large-scale, in-house developed, mainframe, activity-based general ledger and reporting system
	Fully integrated with all source systems and accounting code blocks
	Features include ease of use, flexibility, timeliness, accessibility of cost data, drill-down capabilities, quality of cost data, and tracing/allocating costs to activities
	Updated monthly
	Online
	In use more than five years
ABM Linkage to Business Environment:	Extensively linked to business process reengineering, reorganization by process, and benchmarking
	ABM performance measures are mostly accepted/embraced and perceived as fair
ABM Resources:	ABM competency center reporting to controller
	Extensive use of activity dictionary
	Other resources include training manuals, ABM library, ABM resident expert, visits to other sites, meetings with ABM user groups, basic training in finance/accounting, training in ABM applications, and training in ABM concepts
Barriers to Implementation:	Lack of sponsorship
	Managers unwilling to change
	A culture that inhibits innovation
	Other initiatives are more important
	Lack of perceived benefits
	Limited resources

to control resource spending by cost control centers. However, the system now has the capability of taking a process view of costs as well.

The budgeting process begins with the cost control centers. At this level, resource costs are budgeted vertically, and project costs are budgeted horizontally. Essentially a matrix is developed for each cost control center budget. The columns in the matrix represent resources such as salaries and wages, supplies, and depreciation. The rows in the matrix represent activities such as new hook-ups, tree trimming, and meter reading.

As a result of ABB, the budgeting process has become much more meaningful. Furthermore, since NU budgets by activity (the work people do), budget cuts are more surgical. For example, when budgets are cut, management actually sees which activities will no longer be performed. The implications of activity cuts on the business as a whole can also be discussed. Through the negotiation process, managers have the ammunition they need for budget negotiations. Through the cause-and-effect nature of cost drivers, they can discuss the implications of reducing the number of resources that are targeted to particular activities.

Management also uses ABM information to make outsourcing decisions, including those regarding administrative activities. Support activities might be outsourced, as well as the operating activities, such as tree trimming and meter reading. The level and quality of services provided must be carefully defined before the outsourcing decision is made.

Activity and process mapping helps define the level of service and the cost of these services. As part of process mapping, individual times are allocated to each of the activity areas. For cost control purposes, the level of activities provided becomes much more meaningful once dollars are assigned to each activity. This added visibility also requires the service providers to justify the cost they are charging for the service they provide. With competitive bidding for outside services, the service users will challenge the amounts they spend.

The requirements of strategic ABM applications are quite different from operational applications. The driver information that supports operational decisions must be gathered more frequently—and in a more granular form than required for strategic purposes. Furthermore, the selection of drivers for operational purposes might also be different from the drivers that support product costing. For example, the number of meters read may be an appropriate driver for customer costing or costing a type of service within a zone or geographical area.

For operational decisions, however, the number of meters may not provide enough information. Population density, an urban or rural environment, and the meter's location within a particular zone may be more important drivers. For example, the cost drivers for meter reading in an urban area are different from those in a rural area. Due to traffic congestion in an urban area, idle time and wear and tear on vehicles is quite different from that in the rural areas. In rural areas, driving time between meters is more significant. NU found that productivity improved when the workers specialized. Productivity enhancements were different based on the workers' zones.

Cost-driver information is also useful for cost control purposes. For example, preventative maintenance programs are designed differently for urban and rural vehicles. Likewise, automated meter reading equipment, which transmits readings back to the utility electronically, may be cost effective in a low-density, rural environment but not cost effective in densely populated urban areas. The most important driver to a particular area must be selected and managed aggressively.

Strategic cost information is particularly important in a deregulated environment, but it can also be useful in regulated environment. Activity cost information shows regulators the extent to which cross-subsidization occurs. For example, should large industrial customers bear part of the cost of widely dispersed rural customers? The problem of cross-subsidization will be exacerbated if pricing for the subsidized customers, e.g., rural customers, is regulated, yet the pricing for the industrial customers is left to the free market. A utility might be forced by the regulators to keep subsidized customers while it loses profitable industrial customers to the free market.

CHALLENGES

The activity-based budgeting process includes budgeting for cost control centers and projects and activities on the same screen. Yet, multiple cost control centers often have responsibility for the same project. Therefore, discrepancies occur when cost centers duplicate portions of the budget for a particular project. In some cases, project budgets are overstated through duplication. Alternatively, they could be understated if parts of the project are not budgeted for by any of the cost control centers. Differences in budgeting for resources and budgeting by project causes discrepancies in the budgeting process.

Utilities must separate regulated and competitive businesses. In a regulated environment, utilities are able to recover all of their costs. Therefore, they have limited risks in the businesses they operate. In a deregulated, competitive marketplace, the utilities can decide whether to participate. Therefore, accurate cost information is critical to their business strategies. Managing by activities must become a more disciplined process on which all level of management—especially senior management—constantly focus. Senior management needs to be able to speak comfortably to employee groups on ABM and its benefits.

Given that the primary ABM applications at NU are operationally focused, the financial managers felt it was critical to develop allies among the operational managers to move ABM forward. Operational managers who currently are ABM users have been recruited to provide training for other operational managers. Operational managers have credibility and are well equipped to provide training in their functional areas.

SYSTEMS DEVELOPMENT

NU has an activity-based general ledger and budgeting system. All source systems and accounting code blocks are integrated into this system. Activities are budgeted and tracked by this fully integrated and multifaceted mainframe computer

system. The basic system has been used at NU for more than five years. It is capable of tracking cost information by facility, project, task, resource type, cost control center, and activity, as well as for FERC reporting—both actual and budget.

Strengths of the ABM system include its flexibility and ease of use. As the ABM system evolved (it went through four major changes), it was flexible enough to accommodate change. The cost tables (activities and drivers) can be changed relatively easily. Another indication of the system's flexibility and ease of use is its ability to integrate the systems of companies that merged with NU.

NU has extensive roll-up and drill-down capabilities within its budgeting system. Resource and process costs are capable of being rolled up and summarized at higher levels within the company. Resource costs can be drilled down to show spending by individual accounts. Each budgeted activity line can also be broken down into more granular tasks or tracers. These tracers show more precisely the work that is performed. During the year the system will analyze spending either by resource (a cost control center view of the company) or spending by activity (a process view of the company). Similarly, the system is capable of drilling either up or down at the activity level.

To facilitate rolling up the activity costs, the parent of each activity in the cost control centers is also listed. Activity and cost drivers from cost tables in the work management system are still missing from the report, but they will be added at a future date. Once the drivers are added, driver rates will be able to be calculated based on the budgeted cost for each activity.

Ralston Purina Company

Ralston Purina is a Fortune 500 company with annual consolidated sales of about $2 billion. Principal business operations include Ralston Purina Pet Foods and Eveready Battery. This write-up covers the companywide ABM implementation for Ralston Purina Pet Foods.

Ralston Purina Pet Foods is responsible for the marketing, sale, production, and distribution of pet food products. There are 22 production facilities (11 domestic and 11 international) with a warehouse at each site. Ralston has 350 customers, 57 of which account for more than 95 percent of sales. Thirty products (out of 1,500) account for 85 percent of volume.

Several business issues led Ralston Purina to ABM:

- Ralston Purina had been experiencing limited sales growth and declining profits. Revenue for private-label sales was increasing at a growth rate of 8–15 percent; however, the rate for branded goods was only 2–3 percent.
- Ralston has been experiencing a proliferation of new products. Product diversity added a tremendous amount of complexity to its business, and management wanted to know the cost of this diversity. Furthermore, Ralston was offering deals and promotions without knowing whether or not it was growing sales for the right (profitable) customers.
- The company also experienced increasing complexity as its customers demanded many different delivery configurations, e.g., by truck or pallet or by partial trucks/partial pallets. This complexity had to be controlled—it was increasing costs at a time when higher profit margins and greater returns on investment were required.

At Ralston Purina, ABM is positioned as an enabler to achieve aggressive return on sales and market share targets by the year 2000.

overview

Industry Group:	Process manufacturing
Scope of Implementation:	Enterprisewide
Annual Costs:	More than $1 billion
Number of People:	Less than 5,000
Product/Service Diversity:	Similar
Primary Applications:	Product costing
	Product profitability analysis
	Service profitability analysis
	Customer profitability analysis
	Channel profitability
Results of ABM Efforts:	Significant changes in product mix and customer support/mix
	Extensive improvements in customer/channel profitability
	Significant improvements in product development costs, manufacturing/operating costs, and support function costs
ABM Reporting System:	Commercial, PC-based ABM system
	Some integration with internal financial reporting, product service costing, and operating systems
	Features include flexibility, timeliness, drill-down capabilities, quality of cost data, and tracking/allocating costs to activities
	Updated quarterly
	In use two years
ABM Linkage to Business Environment:	Extensively linked to supply/value chain management/benchmarking
	ABM performance measures have been moderately accepted/embraced and perceived as fair
ABM Resources:	ABM competency center reporting to CFO
	Extensive use of ABM resident experts
	Other resources include training manuals, activity dictionaries, ABM library, visits to other sites, meeting with ABM user group, and training in ABM concepts
Barriers to Implementation:	Limited resources

APPLICATIONS

After analyzing business needs, Ralston Purina selected customer and channel profitability as the first priority for its ABM initiative. There were several reasons for selecting this ABM application.

- First, the marketing emphasis of "what new product do we need to launch and what new promotion do we need to offer" needed to change. The business strategy at Ralston Purina is to move customers out of marginal, unprofitable products into ones that are profitable. Ralston had some understanding of brand profitability but only intuition when it came to customer and channel profitability. Effecting its strategy required Ralston Purina to have a good understanding of the existing profitability of its products and services.
- Ralston also wanted to either change customer behavior or adjust pricing, e.g., establish a fee for service. Customers are quite different with respect to the products selected, volumes ordered, packing requirements, and shipping requirements. Understanding the customer behaviors that drive cost and establishing a cost to serve were essential to these two goals. Once Ralston understood the cost of these differences, it could either influence customer behavior, adjust pricing, or adjust its mix of customers.

Eventually, Ralston will phase in additional ABM applications, particularly for operations. It would like to use the activity-based cost information to support process improvement and cost control. For strategic purposes, cost updates every three months are acceptable. For operational purposes, however, a three-month delay is not acceptable. Weekly, daily, and even hourly updates may be necessary to control costs.

NONFINANCIAL OWNERSHIP

Essential to achieving nonfinancial ownership and use of ABM information at Ralston Purina was defining and identifying the most critical business needs. Ownership of ABM information could only be achieved when the system provided the information that operations management needed to run the business. Operating people needed ABM information to answer the following questions:

- What is the cost of our processes and services?
- What are the high-cost activities?
- Which SKUs are profitable?
- Where we have pricing flexibility, are we pricing appropriately? Are we pricing according to the level of service we provide (service-level pricing)?
- Does our product mix make sense? Are we promoting our high-profit products/customers and eliminating, or at least de-emphasizing, our products/customers where we lose money?
- Do we tie performance measurement and compensation to accomplishing our goals and objectives?

Ownership of ABM by nonfinancial personnel was also achieved by involving the industrial engineers in process mapping and in developing activity and driver definitions. The industrial engineers already used this technique for project management. At Ralston, when this task was performed by the accounting function, process mapping mirrored accounting transactions in the general ledger and not the work that was actually performed. Once process mapping is complete, the accountants become more involved. Their role is to link financial data to the defined processes and activities.

SYSTEMS DEVELOPMENT AND REPORTING

For its enterprisewide system, a common architecture was developed as a framework for the ABM model to be used at each of the Ralston sites. This framework is contained in a dictionary of activities and drivers. At the activity level, the plants are all fairly similar, and this framework enables plant-to-plant comparisons. Each plant receives, manufactures, packs, and releases customer orders, as well as distributes products to customers. Therefore, the use of common drivers and a common activity dictionary is helpful for leveraging ABM knowledge between plants.

From an operational perspective, the plants have the flexibility to decompose each activity into a unique set of tasks. To support ad hoc reporting, the software is capable of drilling down from the activity level to the task level to monitor operational performance. The task lists are not required to be common among each plant.

Typically, Ralston updates driver rates on a quarterly basis based on costs from the general ledger and activity data from the operating systems. If, however, the costs or activities change enough to cause at least a 5 percent change in driver rates, the rates are updated to current levels. Ralston would like to enhance its system to streamline system updates and is looking at system interface tools that would automate this process.

Ralston uses approximately 40 drivers. Driver selection required compromise. The best driver was not always practical because it was difficult to capture and monitor its use. Furthermore, adding drivers increased the complexity of the ABM system by requiring additional data collection and analysis.

Ralston has four primary processes that it is modeling within ABM. The first two are linked to the product. The last two are linked to serving the customer or channel:

- purchasing and manufacturing,
- finished goods warehouse,
- order release management, and
- customer development group.

Securing adequate Information Services resources and early involvement by IS personnel was critical to the enterprisewide ABM implementation at Ralston Purina. Support from top management was required to ensure that IS resources were available to provide the operating systems for operational data and the feeder systems needed for the ABM system to interface with the general ledger for financial information.

Ralston has developed a simple but comprehensive technique to assign employee times to activities. An activity report lists each activity vertically—130 for the entire enterprise—as the column headings for a table. A column is provided for each individual. For each column, a percentage is recorded for the amount of time each individual spends on each activity. The columns all add up to 100 percent. Eventually, Ralston would like to link the payroll accounts from the general ledger to these percentages. The system could then, based on the percentages, automatically assign labor costs to activities in the ABM system.

Ralston graphs customer profitability by category—warehouse and clubs, wholesale, etc. Profitability runs across the vertical axis, and services provided runs across the horizontal axis. Visually, this provides a clear picture of which customers groups should be emphasized and which customer groups need to either change their behavior or have their prices increased.

SUMMARY

Critical success factors of the Ralston Purina ABM implementation initiative include the following:

- The company has a continuous improvement culture, which supports ABM.
- The organization developed a set of clear, systematic plans to implement a series of ABM applications in steps, prioritized by business need. Each ABM application has a set of specific deliverables.
- The company received demonstrated and not just verbal support from top management. When senior management buys in to ABM and understands how it supports business applications, powerful results are achieved.

Tektronix, Inc.

Tektronix, based in Beaverton, Oregon, manufactures and distributes measurement equipment and specialized computer peripherals. Annual sales are about $1.8 billion, half of which is in the Measurement Business Division, one of Tektronix's three divisions. The other two divisions are the Color Printing and Imaging Division and the Video and Networking Division. ABM has been implemented in multiple facilities/operations but not throughout the entire company.

Product costing is important at Tektronix because of the number and diversity of products offered. Within the measurement business division, Tektronix offers more than 6,000 end items (base and options). This product offering involves more than 40,000 individual parts (one-third of which are manufactured parts) and almost 200,000 bill-of-material links. Product volumes run from 100 to 40,000 annually and carry catalog prices from $1,000 to $50,000. Hours to manufacture vary from 15 minutes to 15 hours.

Tektronix products serve both the high- and low-end markets. While its low-end products are very price sensitive, its high-end products command relatively high selling prices. For the high-end products, having the latest technology and being the first to market provides a competitive advantage. Superior quality and the right mix of product features and options are also important to both product lines. Superior technology is demonstrated by Tektronix's ability to make a measurement that no one else is capable of doing.

Product costing issues are much more important for the low-end products than for the high-end products. Therefore, ABM receives more attention from the designers and manufacturers of the low-end products because of their need to compete based on price.

Historically, Tektronix maintained two separate cost systems—a financial/standard cost system and a management cost system. The management cost system was the focus of a frequently studied and quoted Harvard case study published in 1990. Over the last few years, Tektronix has gradually centralized its manufacturing and accounting

overview

Industry Group:	Fabrication and assembly
Scope of Implementation:	Multiple facilities/operations
Annual Costs:	$1.2 billion
Number of People:	Approximately 8,000
Product/Service Diversity:	Diverse
Customer Diversity:	Diverse
Primary Applications:	Product costing
	Cost estimation
	Inventory valuation
Results of ABM Efforts:	Significant changes in new product introductions
	Some improvement in product/service profitability, product development costs, make-versus-buy, and manufacturing/operating costs
ABM Reporting System:	Fully developed in-house ABM cost management system
	Fully integrated with financial and operating systems
	Features include ease of use, flexibility, timeliness, accessibility of cost data, accessibility of operational data, drill-down capabilities, quality of cost data, quality of operational data, and tracing/allocating costs to activities
	80% of reports on a quarterly basis and 20% on a daily basis
	Online
	In use for more than five years
ABM Linkage to Business Environment:	Somewhat linked to just-in-time manufacturing and supply/value chain management
	ABM performance measures have been somewhat accepted/embraced and perceived as moderately fair
ABM Resources:	ABM competency center reporting to the controller
	Good use of ABM resident expert, basic training, and training in ABM concepts
	Other resources include training in ABM applications and an ABM library
Barriers to Implementation:	Lack of sponsorship
	A culture that inhibits innovation
	Other initiatives are more important
	Lack of perceived benefits

operations. As part of this restructuring, and under the direction of the then-new CFO, Tektronix chose to consolidate its accounting into one common system. This system was internally developed and supports both financial reporting and management accounting. Activity-based management is part of this management accounting system.

APPLICATIONS

At Tektronix, the need is to understand product cost. Therefore the primary applications of activity-based information are for product costing, inventory valuation, cost estimation, target costing (in the area of new product development), and make-versus-buy decisions in manufacturing.

Using ABM to support new product introductions (NPI) is a successful application at Tektronix. ABM provides the design engineers with a "what if" tool to accurately predict the cost of new products. Prior to ABM, the engineers had little confidence in their cost projections. The NPI project has also pushed Tektronix closer to target costing, which is only possible if users can rely on cost estimates.

ABM also supports pricing, product mix, and make-versus-buy decisions, especially for its low-end products. Until recently, Tektronix was vertically integrated. ABM has helped Tektronix understand the cost-benefit trade-off associated with outsourcing components. For some parts, vendors achieve efficiencies through specialization. These specialized vendors are better equipped to keep up with technology, especially for capital-intensive processes. Accurate cost information enables Tektronix to cost-effectively buy the latest technology.

RESULTS ACHIEVED

Costing new products had been very inefficient and frustrating to the NPI managers. They were spending 10 percent of their time developing cost estimates for new products, and the cost estimates were still inaccurate. Prior to ABM, cost information from the manufacturing systems and the new product introduction systems were not integrated. Essentially, for product costing purposes, the NPI team built new products from scratch. The objective for new product costing (NPC) was to 1) use the Tektronix cost systems methodology (which included ABM), 2) provide what-if capabilities, and 3) be integrated with the systems currently used by manufacturing, e.g., bills of material and routings. The project team was composed of the key players involved with new product introduction—the NPI manager, design and manufacturing engineers, program managers, IS, and Finance.

Since product costing is a necessary part of the new product introduction process, the NPC project increased the speed of new product introductions by reducing the time and increasing the accuracy of new product costing. Generally, new products are introduced by modifying an existing platform. Eighty percent of the components used by the new products are already being manufactured. By integrating NPI with the manufacturing systems, these component parts no longer had to be recosted. For new components, the NPC system allows the user to modify existing

bills and routers for the new parts. The NPC system is also accessible to end users (the engineers).

ABM has influenced cost awareness and decreased the cost of new product introduction. One way in which cost savings have occurred is through the use of common components. In addition to cost savings, by encouraging the use of common components, the company brings new products to market more rapidly. The NPI team is aware that approximately 80 percent of a product's cost is determined at the design phase, and these costs are relatively fixed for the three to five years of the product's life.

CRITICAL SUCCESS FACTORS

Key to the success of the NPC system was making it user friendly, especially since the users are outside the finance and accounting function. Using the system is intuitive. The system was designed to require a minimum number of computer screens, making the mechanics of product costing easier.

Effective training and system documentation was also key to its success. The training program was developed by an engineer (manager of new product introductions). Documentation was excellent—similar to documentation for new projects. Reference materials and a tutorial are available to company employees on an intranet. Training classes, which are also provided, are hands on. Training is provided in a computer lab and, after some initial training on the model, attendees work on products currently in the design stage.

ACHIEVING NONFINANCIAL OWNERSHIP

In one sense, this ABM application was built from the ground up. The project was driven by NPI. NPI formed the team, which included Finance and Accounting to develop the ABM model. The team developed the model on its own time and secured funding for the project from Information Services and Materials Management. The feeder systems for the NPI model were already in place, and applications for the model were confined to the NPI team.

The project team was very focused—its only objective was to develop a new costing system for NPI. This ABM application is used continuously and is a critical step in the introduction of new products. Furthermore, the benefits from using the NPI system were immediately felt—new product costs were developed more quickly and more accurately.

Finance and Accounting wanted to avoid being the middlemen with regard to providing information to the NPI team. They wanted to provide tools, not answers. Once they had the tools, they were much more efficient using the system on their own. The tools were user friendly and designed to require a minimum amount of financial expertise or support for their use. Having the ability to use ABM to control the product cost effectively transfers ownership of the ABM system to the NPI group. Finally, the NPI manager is also more effective at selling the ABM concept to other operational managers. Because he currently works in Operations, he has credibility.

SYSTEMS DEVELOPMENT AND REPORTING

The ABM system was internally developed at Tektronix and is fully integrated with internal/external financial reporting, product/service, and operating systems. The cost system basics include multiple cost sets (updated quarterly), cost types (direct/indirect/material related/material/and noninventory), see-through costs, and error checking.

Dollar pools, driver selection criteria (labor hours, placements, inventory classification, vendor lead times), rate development (volume/no-volume/as is), and rate application (volume/no-volume/as is/material percent) are available online to users. The system is flexible and timely, and the quality of the cost data is good.

The system used for NPI taps into the existing product costing system. It can also access routers and bills of materials to make the necessary modifications. Once the changes are made, re-costing occurs instantaneously.