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The Implementation of an Enhanced Activity-Based Costing Model at the Defense Supply Center Columbus

James A. Neice Jr.

Vernon L. Scribner

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THESIS

James A. Neice, Jr., Captain, USAF
Vernon L. Scribner, Captain, USAF

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THE DEFENSE SUPPLY CENTER COLUMBUS

THESIS

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James A. Neice Jr., B.S.   Vernon L. Scribner, B.P.S.

Captain, USAF   Captain, USAF

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Preface

The purpose of this thesis is to provide a case study analysis of the implementation of an Activity-Based Cost (ABC) System in a government organization. The Chief Financial Officers Act of 1990 and the Government Performance and Results Act of 1993, require better cost management within the Public Sector. Traditional Government accounting systems have operated on a budget basis. With this increased emphasis on better cost management, the cost accounting systems in the Department of Defense must reflect a cost basis orientation. The use of Activity-Based Costing in private organizations has been well documented in the past. However, there are few well documented examples of the application of ABC in the Department of Defense. This research explores the process of ABC implementation at the Defense Supply Center Columbus in order to add to the database of ABC applications in the Department of Defense.

We would like to thank our advisors, Major Pohlen and Dr. Christensen for their guidance. Without this guidance the quality of this document would have been far less that what it is. We would also like to thank our wives Linda and Alisa, as well as our children, Rachel, Derek, Emily, and Claire, and Reah, Vernon Jr., and Jenna. We ask their forgiveness, and thank them for their patience and support during this often trying time.

James A. Neice, Jr.

Vernon L. Scribner

Table of Contents

List of Figures

List of Tables

AFIT/GIM/LAL/96S-1

Abstract

This research explored the problems with ABC implementation at a government service organization. ABC implementation efforts within other government organizations were examined to determine what caused different organizations to implement ABC. Next a case study analysis was performed, following the implementation of an expanded ABC model within a government service organization. The research used unstructured open-ended interviews, on-site visits, and archival analysis to conduct the case study. The study examined how the organization developed its initial model and subsequently introduced an enhanced model.

The enhanced ABC Model had not been implemented at DSCC as of the conclusion of this case study. The research concluded that managers at all levels must be educated about ABC in order to understand what the information has to offer them in cost visibility over their processes. By failing to educate the end users of the ABC information in addition to the implementation team, the case study organization was not able to use even the limited information that the initial model did provide. Also, top management should not limit the flexibility of the implementation effort to tailor the ABC model to the needs of the organization.

THE IMPLEMENTATION OF AN ENHANCED ACTIVITY-BASED COSTING MODEL AT THE DEFENSE SUPPLY CENTER COLUMBUS

I. Introduction

Overview

Few well documented examples of the application of Activity-Based Costing (ABC) exist in the Department of Defense. Even fewer examples exist of organizations that implemented an ABC model, then found the need to review and revise their model to meet management decision making needs, thus keeping the model from becoming just another passing management fad. This research explores the problems with the initial ABC model, implemented at the Defense Supply Center Columbus (DSCC) and describes how they reviewed, and revised their model to develop an enhanced model to meet management decision making needs.

ABC is an "Approach to costing that focuses on activities as the fundamental cost objects. It uses the cost of these activities as the basis for assigning costs to other cost objects such as products, services, or customers" (Horngren, Foster and Datar, 1994:939). As an example, consider that an organization, be it manufacturing or service oriented, produces an output. It doesn't matter whether the output is tangible like a fax machine or intangible like a transportation service. These outputs cause some activity to be performed by the organization and it is performing these activities that cause organizational resources to be consumed. ABC uses multiple cost drivers to trace

resource costs to activities consuming them and then to the outputs that are using these activities.

This chapter presents the background why DSCC embarked on its journey towards implementation of an ABC accounting system, how they went about implementing the initial ABC model, and where they are now in the implementation process. The problem statement and research objectives, discuss shortfalls in the original model and highlight the goals of this research. The investigative questions, scope and limitations of the research, and assumptions, provide guides and parameters for the research to be covered in this study. The research methodology outlines the case study approach used in this research effort, and the management implications discuss some of the benefits that will be provided to managers at DSCC from this expanded ABC model.

Background

In his message from the director, Vice Admiral Edward M. Straw, Director of the Defense Logistics Agency (DLA), stated "We are redefining the benchmark for logistics services for the Department of Defense (DOD) and the Federal Government. As the first Department of Defense pilot agency for the Government Performance and Results Act of 1993, we are shaping performance planning and budgeting policy for the Department as well as the rest of the Federal Government" (DLA Corporate Plan: 1). To guide their efforts, DLA produced a Corporate Plan as a strategic road map to the 21st century. The second goal of this plan was to improve the process of delivering logistics support. To achieve this, the agency established the following major strategic initiative: "Activity-Based Costing (ABC) - Use activity-based costing to focus on process improvement

opportunities. The goal is to employ ABC at field activities by April 1994 and at Headquarters by July 1994, and to follow deployment until ABC is institutionalized" (DLA Corporate Plan: 8). Responding to this initiative, Major General Lawrence P. Farrell, Jr., the Principal Deputy Director for the Defense Logistics Agency, issued a directive to all six inventory control points (ICP) within DLA, ordering the expedient implementation of ABC (Farrell, 1993). In response to this order on 4 October 1993, the Defense Supply Center Columbus (DSCC) located at Columbus, Ohio, initiated an ABC project. Their goal for this project was to provide DSCC managers with a useful working tool to assess the costs involved in their processes so they might make better management decisions (DCSC, 1994:A).

The Defense Supply Center Columbus (DSCC) is an inventory control point operating under the Defense Logistics Agency (DLA). From 1918 to 1962, DSCC was assigned to the Army to fulfill a variety of missions in the supply, construction, and maintenance areas. It was assigned to DLA in 1962 (DCSC: 10). As a vital member of the nation's defense team, DSCC provides spare and repair parts that maintain the military's state of response readiness.

As an inventory control point, DSCC purchases materiel, monitors inventory levels, maintains technical data and assures quality conformance (DCSC: 3). It purchases construction material and equipment, vehicle repair parts, and weapon systems parts for US military and North Atlantic Treaty Organization (NATO) members around the world (Robinson, 1993: 108). These items are shipped directly from contractor facilities or stored at distribution depots until requisitioned by customers.

The majority of DSCC's workforce is divided into four application groups. Three of the groups specialize in air, land or sea weapons systems support, respectively. The fourth group manages commodities that are not unique to a particular weapons systems group. The remainder of the workforce provides administrative and maintenance functions as necessary to operate such a large organization (DCSC: 3).

In today's environment of downsizing and maintaining a competitive edge, DSCC needs accurate cost information. Betty Baker, team leader of DSCC's ABC Design Team, states that "today's business climate dictates that we in the government concern ourselves with our financial health and focus more intently on where our dollars are being spent. If we are to be competitive and prepared for outsourcing issues, we must not only know and thoroughly understand our costs, but begin to address how we can redesign our processes to produce more for less" (Baker, 1996: 2). DSCC needs to be able to answer questions such as: are there items that should not be managed, are there processes that could be outsourced, is workload evenly distributed, are customers charged correctly, and how will DLA lower cost to the military customer? To answer these questions, detailed financial information is required, especially since DSCC manages approximately one million items, employs 3,300 people and has $1.7 billion in sales (Baker, 1996: 1). From DSCC's 1995 General Ledger, the magnitude of DSCC's operations is shown in Figure 1.1:

1995 DSCC Operations (Millions)

Revenues	
Net sales	989.300
Other income	.145
Reimbursables	32.286
Total Revenue	**1,021.731**
Expenses	
COGS: Materiel Exp	818.100
Net PDO Transfers	156.800
Transportation	1.441
Other Mat'l Related Exp	1.218
Operations Expense	273.409
Total Cost of Sales	**1,250.968**
Net Operating Result	**<229.237>**

Figure 1.1 1995 DSCC Operations

Major General Farrell provided the following explanation in 1993 for implementation of ABC at DSCC:

> Our customers pay us for the goods and services we provide to them. In order to better support our customers and be the supplier of choice, we must continually look for ways to improve our processes in terms of cost, quality and timeliness. Although DSCC has been continually pursuing improvement, ABC as a tool is unique in that it will provide us with a guide to identify and focus our attention on process improvement opportunities, while measuring the impact of those cost improvements. Specifically, we need to reduce our operating costs at DSCC...If we are interested in lowering costs, we need to know the relative value of activities and understand what drives them. Through ABC, cost drivers are defined and examined in order to reduce or eliminate them, thus reducing the cost of performing those activities. ABC

> allows our decisions on cost reductions to be based on really
> knowing how the reductions will affect the mission and our
> customers. It will provide information to managers over which
> they have control and can affect change. (Farrell, 1993)

The ABC model being developed at DSCC is a pilot project and will be exported to the other supply centers when development and installation is completed in Columbus. After costs are developed for FY95, an automated time and workload system will be reviewed and tested to accumulate time and cost data automatically (Baker, 1996: 2).

The initial phase of implementation involved defining organizational activities using the Defense Logistics Agency (DLA) Business Process Improvement Model developed by DLA personnel, and a Defense Industrial Supply Center (DISC) prototype model (DCSC, 1994:A). These two models provided the ABC team with a framework they could add to or change to reflect DSCC unique activities.

After defining the organizational activities, the ABC team interviewed people from each functional area to determine the amount of time spent on the defined activities. They used this information to assign labor costs and to develop costs per activity.

Utilizing cost data from the existing organizational structure, the ABC team developed eight major business processes including: establish item of supply, maintain logistics data, distribute materiel from stock, provide acquisition support, perform post award management, market the business, manage the business, and manage resources. Spreadsheets were developed which included all direct and indirect costs for each activity making up the eight processes.

Table 1.1 shows the eight major business processes identified by the ABC team and the associated process cost of each. Note that approximately $90.6 million or 40 percent of the DSCC total budget is included in these eight processes. This cost

information can be used to measure business process improvement efforts and to

benchmark against other similar organizations.

TABLE 1.1 Process Costs. (DCSC, 1994:B)

Process	Process Cost
Establish Item of Supply	$4,807,936
Maintain Logistics Data	8,134,108
Distribute Materiel from Stock	6,129,877
Provide Acquisition Support	35,760,907
Perform Post Award Management	17,430,730
Market the Business	1,064,034
Manage the Business	6,525,727
Manage Resources	10,747,122
Total Cost of DSCC Processes	$90,600,440

TABLE 1-2 Costs Not Included in Initial DSCC Model. (DCSC, 1994:B)

Costs Not Included in Initial DSCC Model	
DLA Cost Items:	$14,068,621
Depreciation:	1,883,703
Real Property Maintenance Reserve:	3,000,000
Depots:	116,160,407
Total:	$135,112,731

However, Table 1.2 shows that approximately $135.1 million or just under 60

percent of the total budget was excluded from the ABC model. Defense Logistics Agency

cost items, depreciation, real property maintenance reserve, and depot charges were left

out of this original cost model. The ABC team's rationale for not including these costs

was:

> ABC is a tool to be used for business process improvement and cost
> reduction. In order to use this tool with a degree of confidence,
> management must deal with activities, processes, and costs which it can

control. By fully allocating all costs, we do nothing to promote the use of ABC as a tool for business process improvement at the activity/process level. At a future date it may be necessary to allocate these costs to activities if ABC is used to develop surcharges to various commodities. (DCSC, 1994:A)

Another category of costs not introduced into the original model was the industrial stock fund cost of goods sold which consisted of about $818.1 million according to DSCC's 1995 General Ledger. The decision by the ABC team to exclude cost of goods sold resulted in a model that gives only a useful picture of the internal activities in DSCC and their associated costs. However, as indicated in the rationale, in order to develop surcharges to various commodities and to determine how these internal activities consume or drive these costs, the excluded costs must be introduced. The introduction of these costs into the model will also enable management to determine how their actions affect stock fund obligations or inventory levels, how DSCC actions drive depot activity levels or reimbursements, and the cost of supporting specific customers or commodity groups

Problem Statement

This research seeks to determine how the Defense Construction Supply Center can expand their existing ABC model to account for external resource costs and how the model can be adapted to cost customers and commodity groups. The current DSCC model has not included such resources as stock fund procurement, inventory carrying costs, and depot reimbursable charges. According to FY 93 information, the amount of costs not captured in the existing model is about $135.1 million or almost 150% of the captured costs. The model also left out industrial stock fund cost of goods sold dollars from the model which in FY 95 amounted to about $818.1 million according to DSCC's

8

1995 General Ledger. Without this information, DSCC management cannot determine how their actions consume these resources or affect the costs of customer or commodity support. Also, the addition of these costs will facilitate the accurate pricing of DSCC services. DSCC is a stock funded organization therefore they must be able to accurately price there services so they will fully recover their costs with the surcharge attached to products.

Research Objectives

The goal of the research was to first, document the problems that DSCC encountered with the implementation of the first ABC model and reasons that the first model was not being used by management, and second, to document the implementation of the enhanced ABC model. The first objective was to discover and document the reasons driving the need for development and implementation of an enhanced ABC model in order to highlight these reasons so that other organizations implementing an ABC might avoid the pitfalls encountered in the first DSCC ABC model. The second objective was to develop a documented case study of the implementation of the enhanced model at DSCC that might serve as a road map for other government organizations to follow as they implement ABC, documenting problems encountered as well as "lessons learned" during implementation. The final objective was to identify areas for possible future research.

Investigative Questions

In order to focus this research on the research objectives, the following investigative questions were developed:

1. Why did DSCC management feel that it necessary to implement an enhanced ABC model?

>   This question will aid in the discovery of possible problems or inadequacies with the initial model to develop lessons learned for future use.

2. What modifications were made to the initial model to provide DSCC managers with relevant cost information?

>   This question will highlight the areas that must be included in an ABC model in order to provide managers with cost information that can be used to make informed management decisions.

3. How did management accept the cost information provided by the enhanced ABC model?

>   This question focused the research on the usefulness of the enhanced model in order to discover whether management will use the model with the revisions provided by the enhanced ABC model to make informed management decisions.

4. How was the enhanced ABC model implemented, and what problems/lessons learned were encountered during the ABC implementation process at DSCC?

>   This question will aid in the discovery of possible problems or inadequacies with the entire ABC model implementation process to develop lessons learned for other organizations. Other organizations may find this information useful to avoid some of the pitfalls encountered at DSCC.

Scope and Limitations of the Research

The research applied a case study approach to document the development and implementation of an ABC model within a government service organization. The study examined the development of both an initial and enhanced ABC model within a government service organization. The focus of the research was limited to a single inventory control point within the Defense Logistics Agency. The Defense Supply Center Columbus (DSCC), Columbus, Ohio served as this focus due to its close proximity which enabled on-site visits and the fact that it was the pilot organization for development of an

enhanced ABC model for the Defense Logistics Agency. DSCC provides spare and repair parts that maintain the military's state of response readiness.

The research performed a case study to document both the problems and lessons learned during the development and implementation of an ABC model within a government service organization. Conclusions drawn from the results of the case study pertain to the implementation time frame of the ABC model, from January 1993 to August 1996. The research findings specific to the case study organization are limited in their extension to organizations with similar organizational structure, such as other inventory control points within DLA. General findings however, may well have a broader application.

Research Methodology

The research performed an in-depth analysis of a government organization that was revising and expanding an activity-based model that had previously been implemented and was not meeting the needs of management. The research utilized participant-observation, unstructured open-ended interviews with key personnel, and archival analysis to document the problems as "lessons learned" from the original implementation of ABC at DSCC. To focus on the implementation of the enhanced model, the research utilized a case study research design.

In his book *Case Study Research: Designs and Methods* Dr. Robert K. Yin states "In general, case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on

a contemporary phenomenon within some real-life context"(Yin, 1984:13). This research fits all three of these statements.

Management Implications

By introducing a large portion of the over $131 million of external costs that were left out of the current ABC model and the $818 million of industrial stock fund cost of goods sold into the model, DSCC managers should gain a better understanding of the costs of activities under their control. The managers can then use the expanded model to demonstrate how management decisions and improvements in their ICP processes will affect changes in stock fund procurements, inventory levels, and depot costs.

The results should provide a much clearer relationship between activity performance and resource consumption. The expanded model can be used to develop a preliminary understanding of how greater cost visibility will impact management behavior within the DLA supply chain. The results have potential implications for developing tiered stock fund charges, vendor selection ,direct vendor deliveries, use of third party logistics firms, inventory levels, delivery charges, packaging , stock positioning, and other related material management decisions.

The results will have an impact throughout the entire DLA organizational structure as other DLA organizations adopt the lessons learned from implementing an enhanced ABC model and implement ABC models of their own DLA will have a much greater cost picture of their entire supply chain and how each component interacts. This knowledge will allow DLA to manage itself on a total system basis ensuring that no one portion of the chain is sub-optimizing the system.

The results may also be applicable to other similar DOD or government organizations ABC implementation efforts by allowing them to avoid some of the pitfalls that DSCC experienced, and capitalize on some of the methods used by DSCC to surmount problems that they encounter during implementation.

Organization of the Research

This chapter discussed why the DSCC embarked on its journey towards implementation of an ABC accounting system, how they went about implementing the initial ABC model, and where they are now in the implementation process. The problem statement and research objectives discuss shortfalls in the original model and where this research effort proposes to make improvements to that model. The investigative questions, scope and limitations of the research, and assumptions provide guides and parameters for the research to be covered in this study. The research methodology outlines the case study approach used in this research effort, and the management implications discuss some of the benefits that will be provided to managers at DSCC from this expanded ABC model.

Chapter Two presents a review of current ABC literature in order to educate the researchers on current ABC techniques. It provides a definition of ABC, discusses the design of an ABC system, presents some examples of other government organizations that have implemented applications of ABC, and finally discusses the application of ABC within DLA.

Chapter Three details the methodology used during the research. It delineates the research design and describes the reasons for this design choice. It defines the research

objectives and presents the purpose for selecting these objectives. It also presents the research propositions and proposes the predicted results and the rationale for choosing this prediction. The chapter then describes the research instruments selected and the rationale for these selection and finally details the implementation of the research design.

Chapter Four presents the findings relative to the methodology set forth in Chapter Three. The chapter is made up of two main sections. The first section reports findings relative to the research propositions. Findings relating to the relevance of cost information provided by an ABC system are presented first. Then the section considers management acceptance of an enhanced ABC model. The second section presents other findings relative to the implementation of an enhanced ABC model within a government service organization that are not directly related to the research propositions.

Chapter Five summarizes the results of this research. The chapter first provides the research objectives, investigative questions, research propositions, findings and conclusions, and then presents other findings not addressed in the research propositions. Information is presented in the following form: 1) a summary of the research proposition, 2) a summary of the findings for the proposition, 3) conclusions drawn, and 4) recommendations. The chapter closes with a recommendation to extend this research.

II. Literature Review

Overview

Chapter Two provides a conceptual foundation for the research by reviewing the applicable ABC literature, including both concept and examples of implementation. The first half of the chapter reviews current ABC literature in order to develop a conceptual foundation for this research. Section One defines ABC to develop an understanding of the concept. Section Two is a discussion of the need for more accurate accounting information. Section Three is a comparative example between traditional accounting and ABC.

The second half of the literature review examines the design of an ABC system, and then examines the implementation of ABC within government organizations. Section Four describes the steps necessary to design an ABC system. Section Five discusses recent government applications of ABC. Section Six describes problems that have been encountered in the implementation of ABC systems. Section Seven describes possible reasons why Activity Based Management has also encountered problems in implementation. Finally, Section Eight examines the implementation of an ABC model within the Defense Logistics Agency.

Definitions

ABC is defined as an "Approach to costing that focuses on activities as the fundamental cost objects" in the book, *Cost Accounting: A Managerial Emphasis* by Charles T. Horngren, George Foster and Srikant M. Datar. It uses the cost of these activities as the basis for assigning costs to other cost objects such as products, services,

or customers" (Horngren, 1994:939). The *Computer Aided Manufacturing-International (CAM-I) Glossary of Activity Based Management* defines ABC as "a methodology that measures the cost and performance of activities, resources, and cost objects. Resources are assigned to activities, then activities are assigned to cost objects based on their use. Activity Based Costing recognizes the causal relationships of cost drivers to activities" (Romano, 1989:65).

From the *Activity-Based Costing Guidebook,* ABC serves to capture quantified cost and time data and translate it into decision information. It measures process and activity performance, determines the cost of business process outputs, and identifies opportunities to improve process efficiency and effectiveness. ABC is a technique to quantitatively measure the cost and performance of activities, resources and cost objects, including when appropriate, overhead. ABC captures organization costs for the factors of production and administrative expenses and applies them to the defined activity structure. ABC is a process of simplifying and clarifying the decisions required by the process evaluators and senior management using activity costs rather than gross allocations.

Consider this example. In an organization, be it manufacturing or service oriented, there is an output, for instance the production of a fax machine or providing transportation services to a shipper. It doesn't matter whether the output is tangible like the fax or intangible like a transportation service. These outputs cause some activity to be performed by the organization and it is these activities that cause organizational resources to be consumed.

The Problem with Traditional Cost Accounting

Traditional cost accounting systems were developed to provide outside sources such as the Internal Revenue Service and shareholders with the value of inventory. To do this, a firm would add the cost of materials to the number of direct labor hours. Then they would add up all indirect costs such as administrative costs, research and development costs, and rent or depreciation on the facility and allocate the costs to an output based on direct labor hours. To get a per unit cost for a product, they would divide the total by the number of items made during the period under consideration (Kelly, 1991: 42).

Traditional systems typically focus on areas that have little to do with real causes of production costs. This becomes critical when management is seeking relevant information to control the production process and must use a system designed primarily to bill the customer and to report to shareholders. The over reliance on the direct labor base as a system for allocating overhead costs compounds the situation. Increasing factory automation will make direct labor decrease even more, with current methods of cost allocation becoming even less relevant (Haedicke & Feil, 1991: 29).

Traditional cost accounting operations use the classic model of cost distribution which was designed around the major factors of production; direct labor, direct materials and overhead. This distribution is represented by the diagram at Figure 2.1 from the *Activity Based Costing Guidebook* chapter one. Businesses have relied upon the historical model of cost accounting for over 100 years.

TRADITIONAL COST ACCOUNTING

Direct Labor	Direct Labor	Direct Labor	Direct Labor	OVERHEAD

Activity → Activity → Activity → Activity → **OUTPUT $$**

DIRECT MATERIALS   DIRECT MATERIALS   DIRECT MATERIALS   DIRECT MATERIALS
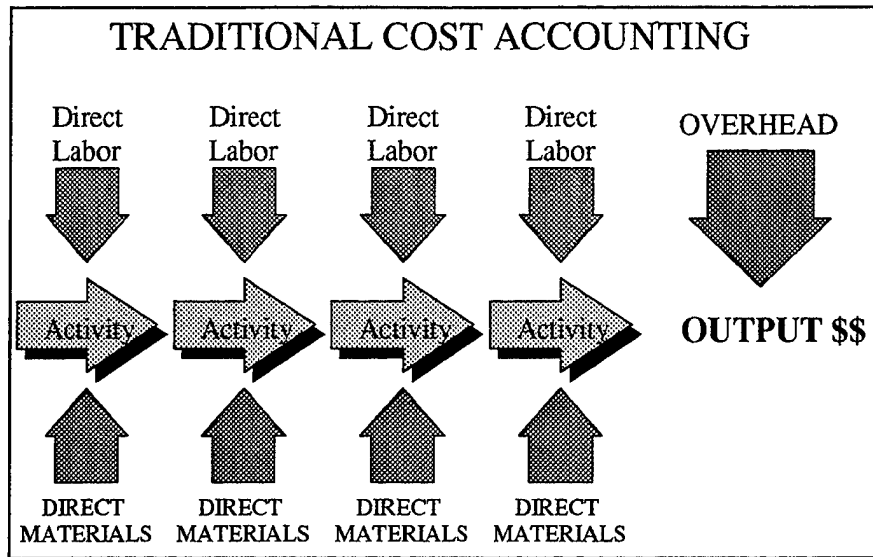
Figure 2.1 Traditional Cost Accounting

According to Terence P. Pare in his article "A New Tool For Managing Costs," published in the 14 June 1993 issue of *Fortune* magazine, the traditional accounting method worked fine in the past when the outputs of most companies costs were accounted for by direct labor and they produced just a few products. For example Earl Landsman, a principal with Chicago consultants A.T. Kearney is quoted as saying "Once labor was the major cost component in the manufacture of products. Nowadays overhead may be as much as 70%." However, Pare points out that today's environment is quite different, "Business has been steadily replacing people with machines, and in some high-tech companies direct labor may account for as little as 5% of the cost. Faced with such a huge structural change, even the most energetic accountant using the traditional methods can do little more than estimate and hope for the best" (Pare, 1993:125). Harvard Business School Professor Robert S. Kaplan states "It's better to have no cost system than a standard cost system because it is so inaccurate" (Pare, 1993:126).

Professor Kaplan and his associate, Robin Cooper, state, concerning managers

using the traditional accounting methods, "Managing by legislative fiat at the aggregate

level of the income statement and balance sheet doesn't work" (Cooper, Kaplan,

1991:131). They also contrast the traditional cost accounting system with its volume

driven bases, like direct labor and machine hours to allocate the expenses of indirect and

support activities such as setups, maintenance and engineering changes. The ABC system,

however, segregates the expenses of these support functions by activities and then assigns

these expenses based on the drivers that cause these activities to be performed (Cooper,

Kaplan, 1991:131). Figure 2.2 1 from chapter one of the *Activity Based Costing*

Guidebook, represents the activity-based allocation of overhead costs.
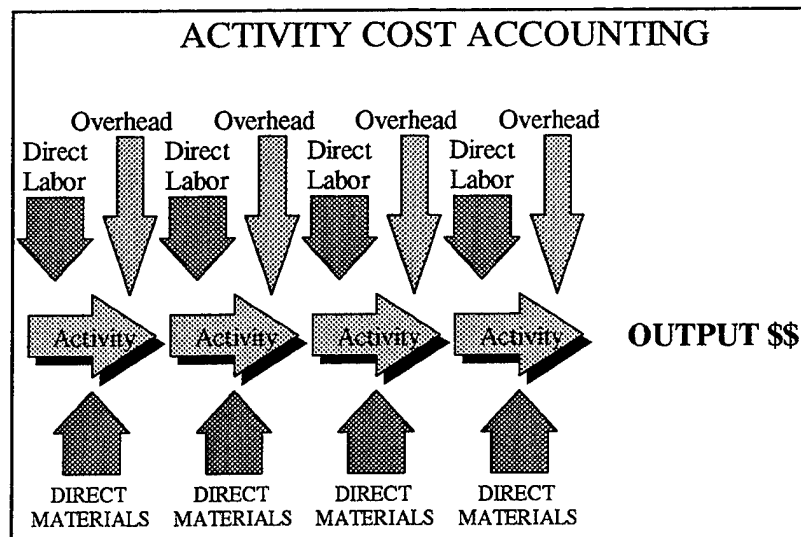
Figure 2.2 Activity Cost Accounting

A Comparative Costing Example

From the *Activity-Based Costing Guidebook,* pages 4-6, the following, is an

example of the difference between traditional cost accounting and an ABC approach. Site

JKJ produces two products, Output A and Output B. The production, market price and JKJ cost are shown below.

Operation Output and Pricing

Operation	Production	Average Market Price	JKJ Cost
Output A	200 units	$125	$110
Output B	800 units	$ 18	$ 20

Management has been concerned that of the cost of Output B, which is above the average market price, makes it noncompetitive, and it should be eliminated from the product line. A managerial analysis has concluded that Output A is very competitive and is carrying the operation. Output B is costing too much and should be eliminated from production. Before the final decision is made, a request was made to provide more analysis using the new activity-based costing methodology as a comparison to the current traditional system. The following information was gathered.

Additional Information:
Direct Costs

Output A	$100 per unit
Output B	$ 10 per unit

Overhead costs:

Purchasing Department

Annual workload	10,000 purchase orders
Annual cost	$10,000

Purchase orders required per unit of Output A	30
Purchase orders required per unit of Output B	5

Cost Distribution Table:

Traditional Cost Accounting

Total Overhead / Total Output = Amount per Unit of Output
1000 / $10,000 = $10

Activity-Based Accounting

Activity Cost / Activity Workload = Amount per Unit of Activity
$10,000 / 10,000 = $1

Activity Units * Amount per Unit = Total Output Cost per Unit of Output
Output A: 30 * $1 = $30
Output B: 5 * $1 = $ 5

Total Cost per Unit Output

Traditional Cost

	Direct Cost	+	Overhead	=	Total Cost
Output A	$100	+	$10	=	$100
Output B	$ 10	+	$10	=	$ 20

Activity-Based Cost

	Direct Cost	+	Overhead	=	Total Cost
Output A	$100	+	$30	=	$130
Output B	$ 10	+	$ 5	=	$ 15

When a comparison of the two sets of information were presented to management, it resulted in turmoil. The activity-based analysis yielded results which were entirely different from that of their internal system. Using the ABC analysis, when costs are traced to the amount of the activity actually used, rather than as a straight distribution based on output allocation, Output A is actually more expensive than originally thought and is not competitive in the market. Output B is competitive and should be retained. Management became skeptical of both systems and complained about "voodoo" accounting practices. It was decided to ignore the new analysis and implement the decision to eliminate Output B.

This decision produced interesting results. With Output B eliminated along with all the associated costs, the output price for A immediately reverted to the remaining costs. Purchasing was unable to eliminate the costs as anticipated by management and the price for Output A rose to $130 per unit. This new price made Output A impossible to sell. The information below shows how the costs remaining after the elimination of Output B were allocated to the only remaining product.

Direct Material + Overhead = Total Cost / Production = Price

$20,000 + $6,000 = $26,000 / 200 = $130

If management has chosen to select their decision based on the new analysis that was available from the activity-based accounting review, then Output A would have been eliminated. If Output A had been eliminated and all associated cost had been eliminated, then the output price for B would have been:

Direct Material + Overhead = Total Cost / Production = Price

$8,000   + $4,000 = $12,000 / 800   = $ 15

The elimination of Output A had no effect on the organization since the remaining costs were those associated with Output B and Output B was always competitive within the market.

This simplified example demonstrates that the traditional method of applying overhead directly to the output can overstate or understate the true cost when a full internal review is done of how the costs are incurred. Even though the example was simplified for demonstration purposes, it nonetheless is an accurate representation of how

the activity-based methodology more fairly distributes costs with less of the arbitrary distributions normally associated with traditional cost accounting procedures. Activity-based costing gives a more accurate picture of output cost by tracing overhead cost through the activities that are actually used to produce the output rather than straight allocation.

Figure 2.1 graphically represented the traditional cost allocation process and showed that the overhead was allocated directly to the output based on the amount or share of total output production rather than through the activity utilization. As was shown in the comparative example, this can overstate or understate the actual amounts of overhead that is actually used by each of the outputs. An analysis of the comparative differences between the current methods of accounting and that proposed as activity-based accounting indicates that the new applications are more representative and, therefore, more useful to the managerial decision-making process. Because of hidden, or less than apparent, internal process flow differences and actual resource uses, the traditional distribution does not align the amount of activity that is consumed individual by each output directly to the appropriate output. This difference between the traditional and activity cost accounting is graphically represented when the components of Figure 1 are compared in Figure 2.2 with a model that represents the activity-based allocation of overhead costs (*ABC Guidebook*, 1996: 6).

Designing an ABC System.

In his article "Five Steps to ABC design," Professor Robin Cooper poses and answers a natural question "What do activity based systems look like?" (Cooper, 1989:

39). His answer is that most organizations have implemented ABC in a two stage approach as he portrays in the following figure:
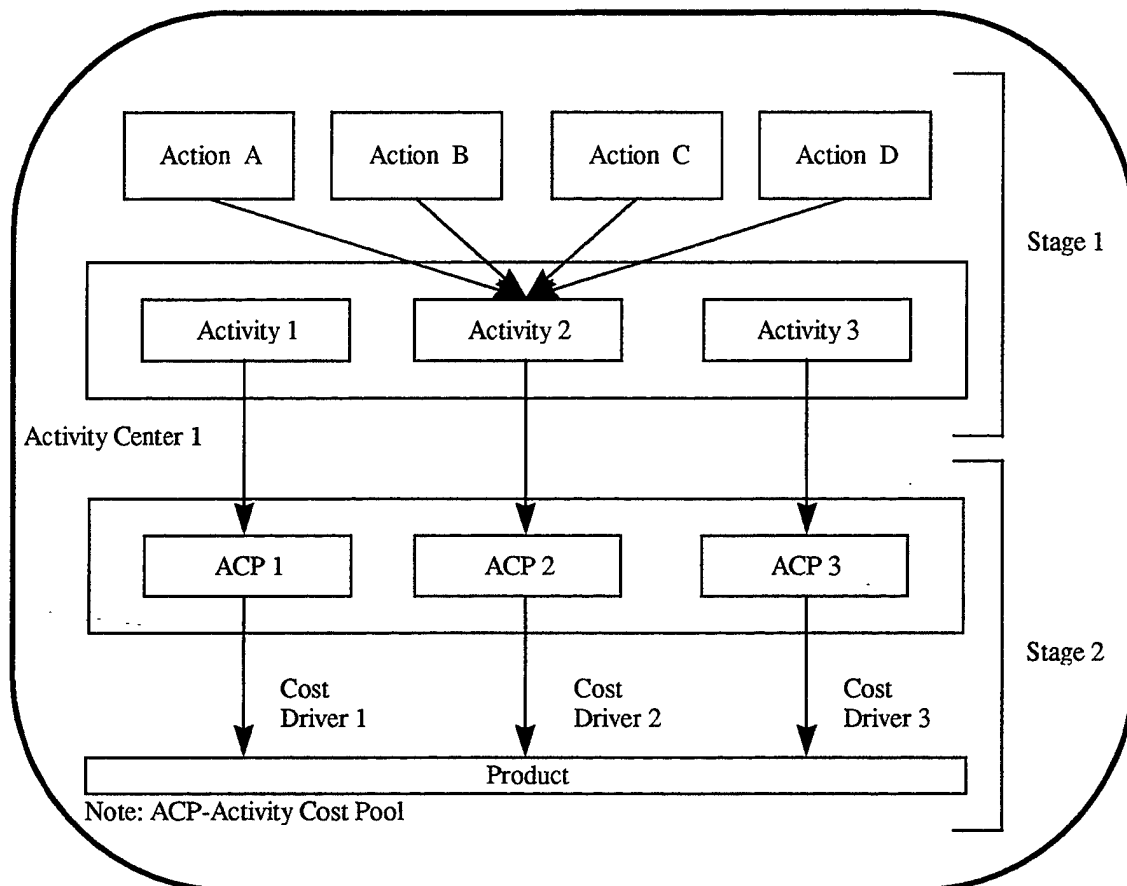
Figure 2.3 Activity Based Cost Systems as a Two Stage Allocation Procedure (Cooper, 1989:39)

The first stage takes resources such as direct labor and supervision and splits them up into sections, each related to a segment of the production process. These segments can be machines,...collections of machines, or even entire departments...These costs are then traced, in the second stage, from the cost pool to the product using a measure of the quantity of resources consumed by the product (Cooper, 1987: 44).

"The objective that designers of an ABC system should set for themselves is to provide the most benefit possible at the lowest overall cost" (Cooper, 1990:78). To achieve these objectives, Cooper gives five design steps that should be followed:

1. Aggregate actions into activities. 2. Report the cost of activities. 3. Identify activity centers. 4. Select first stage cost drivers. 5. Select second stage cost drivers.

Aggregating activities allows the vast number of actions typically performed by an organization to be combined into a smaller and more manageable number of like activities removing the need and the associated costs of measuring and tracking the performance of each action. "Unfortunately, as more and more actions are aggregated into an activity, the ability of a cost driver to accurately trace the resources consumed by products decreases" (Cooper, 1990:78). In designing an ABC system, you must balance the cost savings of aggregation with the resulting loss of specific information available to managers.

In the second design step, reporting the cost of activities, the same choices are faced of what level to aggregate the costs of activities as in aggregating the activities themselves. The resources can be reported as consumed by an action alone, or as a part of an aggregated activity depending upon the level of detail required by management in order to make an informed decision. For example, a system could report set-up costs for a certain product at $10, inclusive of both set-up and material movement. Or it could break the cost down to machine set-up of $7 and material movement of $3 (Cooper, 1990:78). If management were trying to improve machine set-up costs, the latter approach would be appropriate.

Cooper placed identifying activity centers as his third step in ABC design. He states "An activity center is a segment of the production process for which management wants to report the cost of the activities performed separately." Reporting the cost of activity centers by activity center allows management to manage the activities better.

25

Selecting the first stage cost drivers or allocation bases is the way the cost system traces the cost of inputs into cost pools in each activity center in the organization. Each cost pool is representative of a performed activity within the activity center. The same cost drivers that trace costs into the cost pools determine the dollar amounts traced to each pool and thus the accuracy of reported costs (Cooper, 1990:78). These drivers are typically either volume related or number related, such as inspection hours spent or number of inspections.

The final step in Cooper's design process consists of selecting the second stage cost drivers. These drivers are the essential link to the actual product or service produced and as with the first stage drivers can be either volume related or number related. It is the value of these drivers such as how much does it cost to do a purchase order or to apply a special type of packing that allows you to trace the amount of an activity center consumed by an output then up through first stage drivers to the amount of resources consumed by this output to give you a total cost picture of the output (Cooper, 1990:78).

Government Applications of ABC

An expanding workload during a time of decreasing resources has forced many government organizations to step back and take a closer look at how they do business. Government managers work in mazes of rules, practices, and procedures that prevent them from doing what is best for their country, state, or community. New approaches, such as activity-based costing and management, can create a new set of standards for creating and managing cost-effective, high-quality government service (Kehoe, 1995:3).

These two approaches are a way to break down the mazes and enable government

employees to take charge of improving their operations.

The National Performance Review has an initiative to reform federal cost

accounting standards and has circulated a comment that agencies strongly consider

adopting ABC:

> The Federal Accounting Standards Advisory Board notes in
> particular that activity-based costing has gained broad acceptance
> by manufacturing and service industries as an effective managerial
> tool. The Board encourages government entities to study it
> potential within their own operations. (Kehoe, 1995: 6)

ABC is an important tool as it serves to capture quantified cost and time data and

translate it into decision information. It measures process and activity performance,

determines the cost of business process outputs, and identifies opportunities to improve

process efficiency and effectiveness. ABC quantitatively measures the cost and

performance of activities, resources and cost objects, including when appropriate,

overhead. It is a process of simplifying and clarifying the decisions required by the

process evaluators and senior management using activity costs rather than gross

allocations. As described below, some government and government related organizations

are switching to ABC systems.

Hughes Aircraft, a defense contractor, has developed an ABC project, helping to

usher in a new era of contractor and government cooperation. Recent changes in

Department of defense procurement policies include second sourcing and leader/follower

arrangements that have served to increase competition. Due to this current competitive

environment of the aerospace industry, those contractors who win future procurements

will be the ones with the lowest costs and highest quality (Haedicke and Feil, 1991:29).

Hughes initiated a successful ABC program over a period of five years. The reason for success is that the system evolved slowly, allowing the government and Hughes staff to grow and learn as equal partners. Hughes recognized that today, activities rather than products absorb costs. Activity costs must then, be assigned to the product based on drivers that can be determined instead of a single allocation base like direct labor. Their goal is to have accurate cost information, without which Hughes will not be able support management's task of making operational and strategic decisions (Haedicke and Feil, 1991:30).

Haedicke and Feil, employees of Hughes Aircraft, explain that their approach was a gradual one, for many reasons. Possibly the most important reason was education. Hughes attempted to create a system to meet the needs of all parties instead of having one forced on them by government regulation. For that reason, the effort must start at the bottom and work its way up, gaining the consensus of each level of management as it proceeds. A hurried approach will rarely gain that type of consensus required to support such a system (Haedicke and Feil, 1991:32).

The Naval Supply Systems Command (NAVSUP), headquartered in Washington, D.C., provides logistics services to Navy ships, aircraft, and shore installations from a network of field activities throughout the United States. The Jacksonville Center of NAVSUP used to have an ADP-based job order cost accounting system involving over 200 accounts for budgeting and financial reporting to headquarters. Headquarters staff monitored financial performance on a monthly basis. Despite a meticulous level of detail, the financial reports did not provide the information or incentives needed to improve the Center's financial position (Harr, 1990:37). Because costs were not tied in with activities,

the reported costs could not be readily related to operating performance. Another shortcoming was that as long as operating objectives were met and the budget was not exceeded, no incentives existed to further reduce costs.

The Center switched to an activity-based approach in 1986 (Harr, 1990:37), and its overall financial operating performance has been very favorable. The ABC system provides better information to both headquarters and field activities. What management has learned from this approach and determination of cost behavior has resulted in a constant refinement of processes.

Long-term success of this ABC depends on continual process improvements. Significant work flow and job design changes in an organization inevitably cause fluctuations in operating performance. The Center achieved significant cost reductions with early use of the ABC approach without a decline in service delivery, timeliness, or quality. More recent cost reductions have caused declines in some areas of performance. The ABC approach however, has clearly given NAVSUP and its Centers the needed tools to effectively manage costs in a dynamic operating environment (Harr, 1990:39).

An ABC pilot project was conducted at the Directorate of Engineering and Housing (DEH) at Fort Eustis, VA in 1991 to test the feasibility of applying ABC concepts within a small government function. Its success spawned a second phase test upon an entire directorate, the Fort Sill Department of Public Works (DPW). The Fort Sill DPW differs from its predecessor, DEH, in that it is intended to operate on a fee for service basis similar to the private sector. In order to be competitive, DPW must understand its business process costs to improve in a cost effective manner. The Fort Sill project analyzed all DPW business functions as well as the Directorate of Contracting

(DOC), including primary and supporting activities at the branch level of the organization. In addition, the project was to provide a framework to analyze costs in a similar way across all corresponding DOD installations (Appleton, 1993: 111).

The results of the project were generally positive and pointed out several lessons learned. First, the set of models used in the Fort Eustis project were used instead of as-is models at Fort Sill, and they had to be modified to better fit the Fort Sill project. Standard models generally need to be tailored to fit the organization. Second, an overly comprehensive set of interviews were used that, while local management felt gained valuable insights, consumed more effort and time than would normally be required in a typical project. Third, in order to establish credibility for the cost transformation step, all costs were included and accounted for when a lower percentage would have limited complexity of the analysis. Using 100% coverage increased accuracy only slightly (Appleton, 1993: 115). The overall summary of the project states that ABC, when using IDEF procedures, effectively identifies and analyzes an organization's activities, thereby providing functional users the capability to determine the value of or need for each activity.

Activity-Based Management

Activity-Based Management (ABM) is defined as "Business management in which process owners have the responsibility and authority to control and improve operations, and that uses ABC methods" (Kehoe, 1995:6). ABM can also be defined as "a process-based approach to planning the ongoing activities and business processes of an organization to ensure it meets strategic objectives" (Brimson, 1994:297). Activity-Based

Management is not a tool to cut costs although its use may very well result in cost reductions. Whereas Activity-Based Costing is a tool to measure the cost and performance of activities, resources, and cost objects, Activity-Based Management is an overall operating philosophy that guides the use of tools such as Activity-Based Costing to produce valuable information for management decisions.

Kehoe, Dodson, Reeve and Plato describe the business practices, in addition to Activity-Based Costing, that are included in Activity-Based Management:

- Management structure built around core business processes

- Top-down and bottom-up emphasis on improvement

- Activity budgeting

- "Sizing" capacity to match work load

- The principles and practices of quality management

In ABM, management structure built around core business processes is concerned with those business operations that are critical to an organization's success. In Activity-Based Management, process or activity owners manage the different operations of business processes. These owners may be line managers in charge of a particular product or program or they may be department heads who are most concerned with a certain process, not fully under their control. Process owners are in charge of the operation, control and improvement of their assigned process. They have authority to command resources from functions and departments and it is clear and enforced that process owners are the customers of departments (Kehoe, 1995:39).

The second business practice, top-down and bottom-up emphasis on improvement is an step up from the bottom-up improvement that is often associated with new process

31

improvement. This gives all levels of the organization the opportunity to improve what they think is important. ABM, in fact encourages the continual improvement of activity performance (Brimson, 1994:20). While top management still sets the strategic course of the organization, middle managers and employees are allowed to make improvements at lower levels.

Activity budgeting is different than the typical line-item budgets often used to plan and control expenditures. Line items are usually presented by department with headings such as direct labor, direct materials, or overhead. Most government organizations use line-item budgets as their tool to manage spending. While this budget structure is acceptable for external reporting, Activity-Based Management utilizes activity-based budgets for internal planning. An activity-based budget assigns cost based on expected volume of output and allows managers discretion in how they spend their money (Kehoe, 1995:40).

Kehoe cites sizing capacity to match workload as the next business practice of Activity-Based Management. ABC's ability to break down resources by processes allows an organization to adjust capacity to meet variable production demand. This is often done by guesswork especially in overhead departments. ABM enables treatment of capacity as a strategic variable rather than a fixed asset.

Kehoe also notes that organizations using Activity-Based Management usually adhere to quality management principles and practices such as customer focus and employee empowerment. These quality practices must be integrated with the above practices in order to be set apart from normal quality procedures.

Activity-Based Management enables managers to understand how their organization operates and consumes resources. While Activity-Based Costing breaks out costs of processes and shows interrelationships of activities, Activity-Based Management is the force by which ABC and other techniques can be utilized to work towards improvement.

Lesson From the ABM Battlefield

Many companies are trying to use ABM, with varying results. Although numerous success stories have come to light, little has been written about why ABM projects sometimes fall short of their intended goals. Player and Keys have described three different stages of Activity-Based Management implementation during which problems can arise. Each phase examines pitfalls that organizations have fallen into when implementing Activity-Based Management. The pitfalls of ABC and ABM that Player and Keys discuss were identified through some 50 interviews Those interviewed included practitioners who were implementing ABM, users of ABM, and managers who had rejected ABM. The objective of their research was not to argue against ABM but to expose and better understand the problems so that they can be avoided or minimized. This first phase deals with ten pitfalls in getting off to the right start in ABM implementation. They are:

1. Lack of top management buy-in.
2. Failure to understand the three views of costs.
3. Lack of clear objectives.
4. A financial person heads the ABM project.

5. Lack of employee involvement.

6. Lack of monetary support.

7. Lack of training.

8. "The outside consultants did it to us."

9. Lack of cost management expertise.

10. No link between ABM and JIT, TQM, BPR, or other management initiatives.

Any one of these ten pitfalls can cause ABM to fail, but if these pitfalls are recognized and dealt with, ABM has a good chance of getting off the ground and succeeding (Player and Keys, 1995: 33).

The second phase includes pitfalls encountered in developing a pilot ABM system. Many of the pitfalls are technical in nature, while the pitfalls in the first phase and third phase are behavioral. The technical pitfalls can cause serious problems in the implementation of ABM. Once they are fully understood, however, they tend to be easier to solve than the behavioral issues. The ten pitfalls in developing the pilot are:

1. Failure to begin with a pilot.

2. Activities are defined in too much detail.

3. Activities are defined in too little detail.

4. Problems in collecting activity data.

5. Inaccurate assignment of costs to activities and to cost objects.

6. Unavailability of detailed data.

7. Costs may not be assigned to the right year.

8. Software problems.

9. Poor project management.

10. People do not have enough time.

Player and Keys state that once the problems are understood by management they are easier to correct than behavioral problems because the problem dealt with is an actual mistake instead of someone's attitude. They also point out potential pitfalls in the implementation process so that others who are considering or are in the process of initiating an ABM project might be forewarned and thus forearmed to avoid these pitfalls (Player and Keys, 1995: 35).

The third phase focuses on why activity-based management (ABM) has been less successful than people originally expected. In particular, the focus is on the pitfalls encountered in moving from a pilot project to a mainstream ABM system. The ten pitfalls are:

1. Individual resistance due to fear.

2. Departmental resistance to change.

3. People's resistance to changing their beliefs and value systems.

4. Environmental barriers to change.

5. Failure to formalize plans to act on the data provided by the ABM system.

6. Lack of clear, concise, and easily understandable reports.

7. Problems with reporting frequency.

8. ABM is not implemented in a profit center.

9. Company is too profitable.

10. System is too costly to maintain.

The first five pitfalls have to do with change management. Pitfalls 6 and 7 are concerned with reporting issues. Pitfalls 8 and 9 deal with two aspects of profitability, and Pitfall 10 discusses ABM systems that may be too costly to maintain. The pitfalls in phase three, like those discussed in phase one, tend to be more behavioral than the technical issues of phase two, developing the pilot. No one doubts the importance of the technical issues, but everyone interviewed for this study, including accountants with experience in implementing ABM and also users of ABM information, identified and emphasized the behavioral pitfalls. The first companies to adopt ABM, however, did not expect these problems, and the pitfalls discussed here have never been well understood (Player and Keys, 1995: 41).

Problems With Activity-Based Costing Implementation

Activity-based costing has become popular among today's financial and operational managers, who hope to get a better understanding of their production costs and ultimately, reduce them. An ABC analysis at Hewlett-Packard's Roseville Networks Division caused the redesign of one product, resulting in an estimated savings of $1 million, a payback of less than one month (Roberts and Silvester, 1996:23). However, Roberts and Silvester state that recent field evidence indicates that as few as one of three ABC implementations actually yields meaningful results.

There is no way to tell for sure how many failures of ABC have occurred, but it is certain that not all ABC implementation efforts succeed. One recent survey reported that 25 percent of respondents indicated they had not received a financial benefit from ABC (Shields and McEwen, 1996:15). In addition, a survey by the Institute of Management

Accountants performed on companies upgrading their cost management systems, shows that 81 percent of the companies surveyed had not yet realized an improvement in net profit from implementation of ABC.

Roberts and Silvester argue that the problem can be attributed to neither a flaw in the theoretical basis of ABC nor to the way ABC has been applied. Instead, the failure to implement profit-enhancing change seems more fundamentally related to the many structural barriers to change, internal and external, that managers encounter when attempting to implement ABC. An example from the early 1980's is the Schrader Bellows Automation Group, who performed an activity analysis that identified 250 unprofitable products that could have been safely dropped. This action would have decreased sales $1,178,000 but would have increased net income by $750,000. A follow up study showed, however, that despite the many hours of analysis and planning, little action was ultimately taken. By 1984, only about 20 products had actually been dropped (Roberts and Silvester, 1996:23).

Roberts and Silvester conclude that to ensure the success of an ABC improvement program managers must analyze the types of changes likely to be required to improve activities and processes before the program begins. With this understanding, managers can begin to assess the structural barriers to change and develop plans to remove or circumvent these barriers, which is evidently the key to realizing benefits (Roberts and Silvester, 1996:23).

Activity-Based Costing Within the Defense Logistics Agency

DLA has been phasing in ABC since 1993 with an eye towards cost reduction, and better service to customers (Farrell, 1993). "Activity-Based Costing is a valid and important management technique used to focus business process improvement efforts in those areas which will produce the most improvement" (Elliot, 1994).

The Defense Supply Center, Columbus (DSCC) has been in the middle of this push towards ABC, establishing an initial system in 1994 and working towards a second echelon system in 1996. The ABC effort at DSCC is a pilot project that will be exported to other DLA support centers once the model is complete. Per Betty Baker, team leader of the ABC Design team, "The development of an Activity-Based Costing model will insure that we have the capability to identify process reengineering opportunities that will enhance our customer service and reduce cost."

To be a world class provider, DLA must have meaningful and useful cost visibility to provide increased accuracy in the pricing of services. To answer such crucial questions as: are there items DLA should not manage, are there processes that can be outsourced, is workload evenly distributed, are customers charged correctly.... DLA must have complete and detailed information on what actually consumes the resources DSCC has available (Baker, 2:1996).

Summary

This literature review demonstrated the problems with traditional accounting systems in today's competitive environment. These traditional systems do not provide the resource information needed to effectively manage production. While private companies

have adopted ABC on a larger scale, government organizations have also realized the benefits of switching to an ABC system as well. In today's climate, managers find they need information with which they can manage and improve activities and processes. Activity based costing provides the ability to examine processes, allocate resources and manage activities.

III. Methodology

Introduction

This study performed an in-depth analysis of the implementation of an expanded ABC model at DSCC. The study examined how the center expanded the existing ABC model to account for external resource costs and how the model was adapted to cost customers and commodity groups. The current DSCC model did not include such resources as stock fund procurement, inventory carrying costs, and depot reimbursable charges. According to FY 93 information, the amount of costs not captured in the existing model is about $135.1 million or almost 150% of the captured costs (DCSC, 1994:B). The model also excluded industrial stock fund cost of goods sold dollars from the model which in FY 95 amounted to about $818.1 million according to DSCC's 1995 General Ledger. Without this information, DSCC management cannot determine how their decisions consume available resources or affect the costs of customer or commodity support.

This chapter presents the methodology employed to carry out the research. The chapter begins by presenting the research design and showing why this design was chosen over other available methods. The research design is followed by the objectives of the research as well as a list of the research questions that require answering in order to meet these objectives and a list of the research variables identified. These questions are followed by the research propositions that will be used to test the answers to the research questions. The chapter concludes by presenting the research instruments chosen to gather

data, a discussion of research design implementation, and how the data obtained will be coded and analyzed.

Research Design

The research performed an in-depth analysis of a government organization that was revising and enhancing an activity-based model that had previously been implemented and was not meeting management needs. The research employed, used unstructured open-ended interviews with key personnel, on-site visits, and archival analysis to document the problems as "lessons learned" from the original implementation of ABC at DSCC. To focus on the implementation of the enhanced model the research used a case study research design.

The exploratory and descriptive nature of this research justified the use of qualitative research. The application of ABC in government is still largely unexplored, and limited data exists to support quantitative research approaches. The researchers will be highly involved in obtaining new data, the relevance of which will be highly subjective, lending itself to the application of qualitative methods. N. W. Schmitt and R. J. Klimoski provide four reasons for adopting a qualitative approach: (1) To gain familiarity or insights. (2) Description. (3) Frequency. (4) Causal relationships (Schmitt and Klimoski, 1991:121,122). This study clearly fits into the first two reasons.

Dr. Robert K. Yin states "In general, case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life

context"(Yin, 1984:13). As shown below this research fits into all three of these statements.

First, of the five types of research questions presented by Yin: "who," "what," "where," "how," and "why" (Yin, 1984:17), the research questions in this study consist of the "how," "why," and "what" variety. The following research questions are of the "how" and "why" type that Dr. Yin says suggest a case study design: Why did DSCC find it necessary to implement an enhanced ABC model?, How was the enhanced ABC model implemented? and How did management accept the cost information provided by the enhanced ABC model?

The remaining question is exploratory in nature: What problems/lessons learned were encountered during the initial implementation process at DSCC? Dr. Yin suggests that "this type of question is a justifiable rationale for conducting an exploratory study" (Yin, 1984: 17). The case study research strategy was the methodology chosen to answer these questions because the answers to the research questions cannot be found through archival or historical analysis due to their focus on contemporary as opposed to historical events.

The additional criterion posed by Yin, "the control an investigator has over actual behavioral events, and degree of focus on contemporary as opposed to historical events" further supports the choice of using a case study in this research. Yin states "The case study is preferred in examining contemporary events ... it adds two sources of evidence not usually included in the historian's repertoire: direct observation and systematic interviewing. ... the case study's unique strength is its ability to deal with a variety of evidence—documents, artifacts, interviews, and observations. Moreover in some

situations, such as participant-observation, informal manipulation can occur" (Yin, 1984: 17).

The research applied three research techniques: Unstructured open-ended interviews with key personnel, participant observation, and on-site visits. Unstructured open-ended interviews with key personnel and archival analysis were used to document the problems as "lessons learned" from the original implementation of ABC at DSCC. Schmitt and Klimoski state that "Interviews have been characterized as conversations with a purpose. As a technique for qualitative research, they are used to gain insights regarding how individuals attend to, perceive, or otherwise deal with some phenomenon of interest" (Schmitt and Klimoski, 1991, 139).

The research utilized a special form of interviewing called the "tandem interview" which simply refers to interviews performed by two individuals. Schmitt and Klimoski suggest that "it is easy to see how having two researchers involved might be quite functional. While one person is primarily responsible for asking questions, the other is taking notes or listening carefully to responses. The latter can be brought into a more active role from time to time to pose questions that seem to have been overlooked or are important and deserve elaboration" (Schmitt and Klimoski, 1991, 139). Two other benefits pointed out by Schmitt and Klimoski are that a post interview discussion can take place with the two interviewers to summarize and clear up what was learned and recorded and that the technical knowledge brought by each of the interviewers can have a synergistic effect on the subject of interest (Schmitt and Klimoski, 1991, 139).

To supplement these interviews the research conducted an archival analysis of existing documentation on the subject, reviewing past briefing slides, memorandums, the

first ABC model, and other documentation describing the first model. In addition, the research includes information gathered from attendance at various DSCC ABC planning committee and workgroup meetings.

Participant-observation as well as unstructured open-ended interviews with key personnel were used to document the implementation of the enhanced ABC model focusing on the model design, implementation, and lessons learned. Archival analysis was not appropriate due to the current nature of the implementation as there was no historical data to research. The researchers attended DSCC ABC planning committee and workgroup meetings in order to observe and participate in the implementation process.

Yin describes participant observation as "a special mode of observation in which the investigator is not merely a passive observer. Instead, the investigator may take a variety of roles within a case study situation and may actually participate in the events being studied" (Yin, 1984: 92). Schmitt and Klimoski state that "One of the strengths of participant observation is that the researcher, once immersed in the context of interest, can detect and process enormous quantities of information" (Schmitt and Klimoski, 1991, 139).

The application of ABC in a government setting is still largely unexplored, especially in cases where ABC implementation has been attempted and is subsequently being revised to meet specific management needs. This research attempts to identify why the initial model did not fulfill management's expectations. And by adapting the model, DSCC can satisfy their requirements for more accurate cost information. Emory and Cooper suggest that when this kind of in-depth information is necessary, a case study methodology is appropriate. "Case studies place more emphasis on a full contextual

analysis of fewer events or conditions and their interrelations. ... An emphasis on detail provides valuable insight for problem solving, evaluation, and strategy" (Emory and Cooper, 1995: 116,119).

Research Objectives

The goal of the research was to first, document the reasons that the first model was not being used by management, and second, to document the implementation of an enhanced ABC model. The first objective concentrated on identifying the reasons driving the need for development of an enhanced ABC model. The attainment of this objective may assist other organizations implementing ABC to avoid the pitfalls encountered in the first DSCC ABC model. The second objective was to develop a documented case study of the implementation of the enhanced model at DSCC. The case study will serve as a road map for other government organizations to follow as they implement ABC. The case study documents problems encountered as well as "lessons learned" during implementation. The final objective was to identify areas for possible future research.

Investigative Questions

1. Why did DSCC management feel that it necessary to implement an enhanced ABC model?

2. What modifications were made to the initial model to provide DSCC managers with relevant cost information?

3. How did management accept the cost information provided by the enhanced ABC model?

4. How was the enhanced ABC model implemented, and what problems/lessons learned were encountered during the ABC implementation process at DSCC?

Research Variables

Relevant Cost Information for Management: Relevant cost information is defined as: cost information that will enable managers to make informed decisions on their business processes by providing the true cost of doing business. The research used two research variables to code on the category relevance.

Variable 1. Meaningful. The variable "meaningful" is defined as: cost information that provides a complete understanding of the total cost of an activity or output. The range covered by this variable runs from providing no cost information to a complete picture of the cost of the activity or output.

Variable 2. Actionable. The variable "actionable" is defined as cost information that managers can use to base a decision on about the process under their control. The range covered by this variable runs from, the information being of no use to the manager to providing information in a form that decisions can readily be made on this information.

Management Acceptance: Management acceptance is defined as: the tendency for management to use the ABC information in making decisions. The single dimension variable "use" was selected to code on the category "Management Acceptance." The range of the variable extended from, the model not being used, (taking up space in the credenza) to the cost information being used to support day to day management decisions.

Research Propositions

The research employed research propositions to examine and analyze the research objectives and questions. A proposition is a "statement concerned with the relationships among concepts (Callahan & Marion, 1994:56; Zikmund, 1989:89). The research used a proposition and prediction format. The predicted results reflect anticipated results to be observed during the research. The propositions were stated in the null case to identify specific relationships examined by the case study (Pohlen. 1993: 149).

Proposition 1 - Relevance of the Initial ABC model to DSCC.

Proposition 1.a: The initial model provided management with relevant cost information to meet their information needs to facilitate sound management decisions.

Predicted: The initial ABC model did not provide relevant cost information to meet the needs of DSCC managers.

Rationale:

The initial model was not being used by management for making decisions on how they managed their processes. The model was too detailed and complicated and much of the information provided by the model was not usable. Management appeared unsatisfied with the model as it could not answer the questions they considered relevant. In addition, the model excluded $135 million or about 60 percent of the DSCC operating budget from the DSCC initial model (DCSC, 1994: A). Additionally, the model did not introduce the industrial stock fund cost of goods sold which, according to the DSCC 1995 General Ledger, amounted to about $818.1 million.

Proposition 2 - Relevant Cost Information Provided by the Enhanced ABC

Model

Proposition 2.a: Introducing additional resources into the enhanced ABC model will not give DSCC managers more relevant cost information to make managerial decisions.

Predicted: The additional resources introduced into the enhanced ABC model will give DSCC managers better information to make decisions.

Rationale:

With the introduction of industrial stock fund dollars and a large portion of DSCC's budget that was omitted from the first model, managers may be able to use the cost information from the enhanced ABC model to make informed management decisions that will improve cost management. This is especially relevant in the industrial stock fund area where decisions made by item managers can greatly impact the amount of money spent. With a more complete picture of the cost of doing an activity, managers may be able to make more informed decisions on whether to privatize a process or do it in house.

Proposition 3 - Management Acceptance of the Enhanced ABC Model

Proposition 3.a: DSCC management will not accept the cost information provided by the enhanced ABC model.

Predicted: DSCC management will accept the cost information provided by the enhanced ABC model.

Rationale:

With the improved cost picture provided by the enhanced model, managers will know the cost of the processes they are responsible for and will be able to see areas where process improvements can save dollars from the budget by making better informed

decisions on the material that they control. Managers have a natural tendency to view programs that focus on labor cost savings as a threat to their people. However, with the increased cost visibility provided by the enhanced ABC model managers will be able to find cost savings in non-labor areas through better management of non-labor resources such as the amount of materials purchased or the length of time materials are stored at the depots. This will lead to managers being more likely to accept a model that does not primarily focus on identifying non-value added labor as a cost savings.

With the cost savings incurred by knowing the "true cost of doing business" managers will also be able to make more informed decisions on whether to privatize certain activities.

Implementation of Research Design

The research performed an in-depth analysis of a government organization that was revising and enhancing an activity-based model that had previously been implemented. The research consisted of two phases. In order to achieve the first research objective, which was to discover and document the reasons driving the need for development and implementation of an enhanced ABC model, the first phase of the research consisted of on-site visits and archival analysis to document the problems as "lessons learned" from the original implementation of ABC at DSCC.

The second phase consisted of participant observation, unstructured open-ended interviews with key personnel, and document analysis in order to achieve the remaining objectives. These objectives were: 1. To develop a documented case study of the implementation of the enhanced model at DSCC that might serve as a road map for other

government organizations to follow as they implement ABC. 2. To Document problems encountered as well as "lessons learned" during implementation, to identify key issues involved in implementing ABC in government organizations. 3. To identify areas for possible future research.

In order to analyze and interpret the data obtained through in-depth interviews, document analysis, and participant observation, the research broke the observations down to two main categories, Relevant Cost Information for Management and Management Acceptance.

To code observations on the category "Relevant Cost Information for Management" the research compared two research variables:

Variable 1. Meaningful. For this research, the variable "meaningful" is defined as: Cost information that provides managers with a complete understanding of the total cost of an activity or output. The range covered by this variable runs from, providing no cost information to a complete picture of the cost of the activity or output.

Variable 2. Actionable. For this research, the variable "actionable" is defined as cost information provided, that a manager can use to base a decision on about the process under his control. The range covered by this variable runs from, the information being of no use to the manager to providing information in a form that decisions can be made on this information.

The single dimension variable "use" was selected to code on the category "Management Acceptance." The range of the variable extended from, the model not being used at all (taking up space in the credenza) to the cost information being used to make management decisions in day to day operations.

Summary

Chapter Three outlined the research methodology used to document the lessons learned from the original ABC model implementation and to provide an in-depth analysis of the implementation of the enhanced ABC model. The chapter begins by presenting the research design and showing why this design was chosen over other available methods. The research design is followed by the objectives of the research as well as a list of the research questions that require answering in order to meet these objectives. A list of categories and research variables was identified and their definitions were also presented. These questions are followed by the research propositions that will be used to test the answers to the research questions. The chapter ends by presenting the research instruments chosen to gather data, a discussion of how the research design will be implemented, and how the data obtained will be coded and analyzed.

IV. Results of the Study

Introduction

This chapter presents the findings relative to the methodology set forth in Chapter Three. The chapter is made up of two main sections. The first section reports findings relative to the research propositions. Findings relating to the relevance of cost information provided by an ABC system are presented first. Then the section considers management acceptance of an enhanced ABC model. The second section presents other findings relative to the implementation of an enhanced ABC model within a government service organization that are not directly related to the research propositions.

Findings Relative to the Research Propositions

Proposition 1 - Relevance of the Initial ABC model to DSCC.

Proposition 1.a: The initial model provided management with relevant cost information to meet their information needs to facilitate sound management decisions.

Results: Proposition Rejected

Predicted: The initial ABC model did not provide relevant cost information to meet the needs of DSCC managers.

Results: Prediction Supported

Findings:

The initial model was not being used by management for making decisions on how they managed their processes. The largest portion of the DSCC operating budget was excluded from the DSCC initial model. Also, industrial stock fund cost of goods sold, which, according to the DSCC 1995 General Ledger, amounted to about $818.1 million

was not introduced. Without these costs, the model did not provide managers with relevant cost information to help them make decisions on their respective processes. Additionally, the information that was provided by the initial model was too detailed and was available to managers from other sources.

Below is a compilation of reasons given that the cost information provided by the initial ABC model was considered inadequate for managers use. The information was obtained through unstructured-open-ended interviews, document analysis, and on-site observations. The observations were subjectively placed on Figure 4.1 by the researchers according to how they fit the scale of the research variables. The variable "meaningful" is defined as: Cost information that provides managers with a complete understanding of the total cost of an activity or output. The range covered by this variable runs from, providing no cost information to a complete picture of the cost of the activity or output. The variable "actionable" is defined as cost information provided, that a manager can use to base a decision on about the process under his control. The range covered by this variable runs from, the information being of no use to the manager to providing information in a form that decisions can be made on this information. The number placed on the chart correspond to the number of the observation following Figure 4.1.
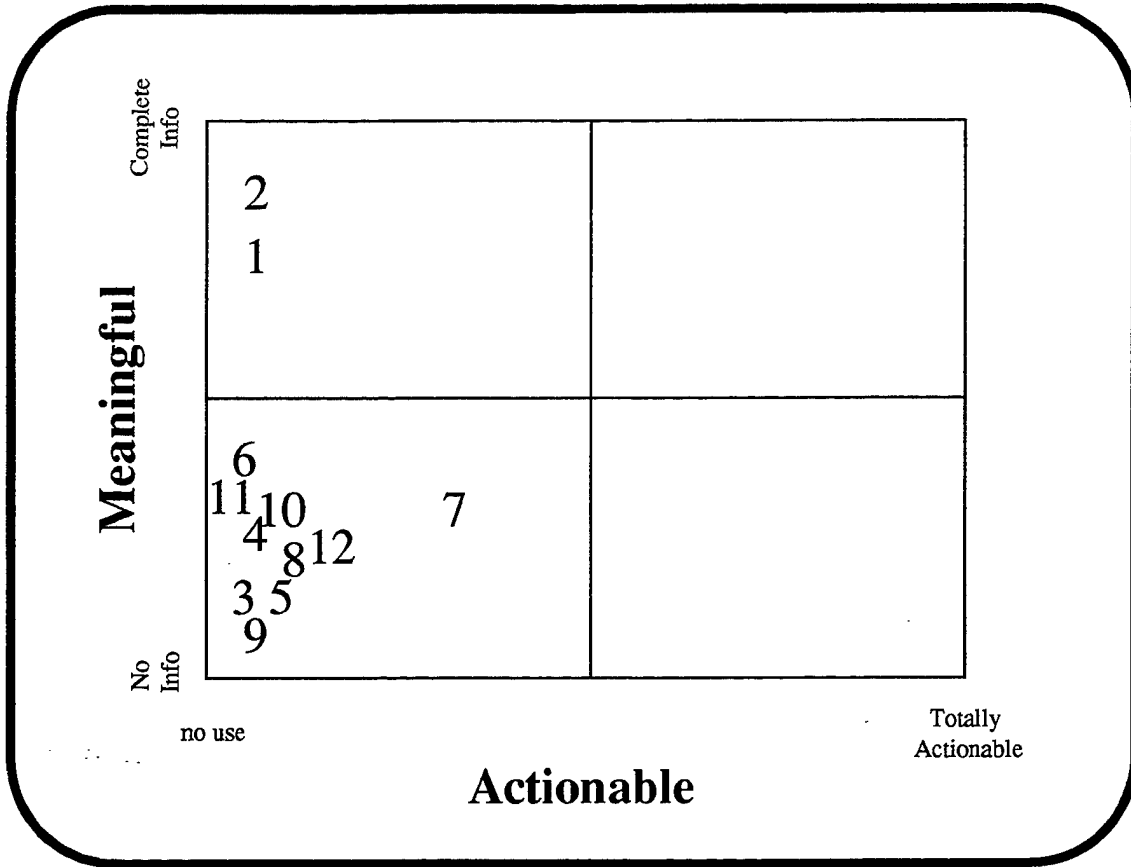
Figure 4.1 Actionable versus Meaningful Grid

1. The model was too detailed. Too much of the information in the model was not usable.

2. Costs at the branch/section/division could have been found in other financial reports. Managers did not need an ABC model to get to those numbers.

3. The model did not answer the questions the managers needed to know. (How much does it cost me to do a small award, large award, provide technical data, update the technical file, manage an item, process a due-in study?)

4. The only costs included in the original model were labor and non-labor (Operations & Maintenance) costs such as travel, training, supplies. Excluded were the large dollar items such as ADP support, DLA overhead, stock fund dollars, support from other agencies.

5. The first model was too complicated to be used and too hard to extract information.

6. Managers need more training on ABC—what the model provides and how they can use it.

7. The model did not include full range of costs therefore it could not demonstrate cost savings in areas other than labor.

8. The entire organizational structure was reorganized shortly after the completion of the first model creating problems for managers trying to get information about their process.

9. The implementation team elected not to include all costs associated with an activity because they were costs incurred by another activity or they were too hard to measure at this point.

10. Failure to include all costs which are other then negligible has the potential to create serious mistakes: First one may focus on the wrong area thinking it contributes the most time, cost etc., to the process. Second, a very bad decision could occur: suppose that automation of a process would eliminate one work year at a cost $35,000. If one happened to know that development of the software would cost $50,000, an ROI of less then 2 years would be pursued. But suppose that it would cost $40,000 per year to run this new program. It would not make economic sense.

11. Significant costs were not included as a part of ABC. These included such things as depreciation on facilities/equipment and reimbursement for services provided by other government agencies (i.e., DCMC or the supply depots) on the grounds that they were not controllable. They are very controllable and one can make decisions based upon DSCC ABC data which would significantly drive up the total DLA costs by causing DCMC or the depots additional work. In the case of DSCC total ABC expenses are $90 million and depot reimbursement is a $116M footnote. The first ABC decision was to recognize that one of the best areas to work on was reimbursement of the depots.

12. Rather than identify outputs, the model identified processes and related costs to something other then the product. At the highest level, eight "processes" were identified. Six of the eight have a cost per output (although at the lower levels outputs disappear). Two of the eight, "Manage the Business" and "Manage Resources" have the input, "work year," as their output.

Proposition 2 - Relevant Cost Information Provided by the Enhanced ABC Model

Proposition 2.a: Introducing additional resources into the enhanced ABC model will not give DSCC managers more relevant cost information to make managerial decisions.

Results: Insufficient evidence to reject proposition

Predicted: The additional resources introduced into the enhanced ABC model will give DSCC managers better information to make decisions.

Results: The predicted result can not be supported due to the model not being completed as of the close of this research project.

Findings:

The enhanced ABC Model had not been implemented at DSCC as of the conclusion of this case study. Therefore, a result for the proposition on whether the introduction of additional resources into the enhanced ABC model will give DSCC managers more relevant cost information to make managerial decisions could not be obtained. In addition, the predicted result, the additional resources introduced into the enhanced ABC model will give DSCC managers better information to make decisions, could not be answered either.

The research did, however, uncover observations that provide an indication about how the introduction of additional resources will provide better information to managers.

Major Terrance Pohlen, an Air Force Institute of Technology, Associate Professor of Logistics, who has been an active consultant to the ABC implementation effort, delivered a briefing to DSCC managers in March of 1996. During this briefing, he provided a hypothetical, though realistic, example of how the additional resources will provide better information for managers see Figure 4.2.

Activity volume example

Activity	DLA Distribution	DVD
Depot Handling	$66,650	
Transport, 1st Dest	$1,725	
Transport, 2nd Dest	4000 X $15 = $60,000	4000 X $15 = $60,000
Stockfund	$120,000	$176,000
Award DVD Contract		$3,000
Award Cont >$120,000	$1,500	
Contract Modifications		2 X $200 = $400
Process Delivery Orders		$5 X 4000 = $20,000
Inventory Carrying Cost	60,000 X 17%= $10,200	
DFAS Invoice Processing	1 X $50 = $50	4000 X $20 = $80,000
Total	$260,125	$339,403

Figure 4.2 Activity Volume Hypothetical Example

This example shows how the introduction of the additional information provided by the enhanced model will make an impact on the decisions made by managers. It takes a hypothetical item with stationary demand of 120,000 units per year that would be considered a good candidate for direct vendor delivery (DVD) under the current understanding of costs, and shows how the decision might change with the information provided by the enhanced ABC model. As an indicator that this is the current way of doing business, when the example was first introduced a comment was made indicating that this example would be a definite candidate for direct vendor delivery. However, when the next slide was shown (Figure 4.2), indicating that DVD was in fact not the best

choice, the example drew a lot of questions and did not seem to make a very good impression. After later reflection, at least one of the members of management present at the briefing, considered that without this type of cost information provided in the example, what they had been doing in the past might be just the opposite from should have been done in regards to the award of DVD contracts. "Maybe our past success stories are really failures, from a financial point of view." He also pointed out the example shows that what they do in DSCC on a DVD has a large impact on how they are charged by the Defense Finance and Accounting Service (DFAS).

It is evident that the end users of the information that will be provided to do not fully understand the concept of ABC and if they are not educated about this they not be able to understand how to use the ABC information provided them to make informed decisions. There must be an emphasis placed on this education the tendency observed so far in this research effort indicates that managers only look at the information provided by ABC as something to challenge. It appears that they feel it is not worth their time and effort as they are not presently measured by how they handle costs.

Proposition 3 - Management Acceptance of the Enhanced ABC Model

Proposition 3.a: DSCC management will not accept the cost information provided by the enhanced ABC model.

Results: Proposition Not Rejected.

Predicted: DSCC management will accept the cost information provided by the enhanced ABC model.

Results: Prediction Not Supported.

Findings:

The enhanced ABC Model had not been implemented at DSCC as of the conclusion of this case study. Therefore, a result for the proposition on whether or not DSCC management will accept the cost information provided by the enhanced ABC model could not be obtained. In addition, the predicted result, DSCC management will accept the cost information provided by the enhanced ABC model, could not be answered either. The research did, however, uncover attitudes by certain DSCC employees toward the implementation of the enhanced ABC Model.

By definition, an enhanced ABC model should provide an improved cost picture so that managers will know the cost of the processes they are responsible for, resulting in the ability to see areas where process improvements can save dollars from the budget by making better informed decisions on the material that they control. This research, found an apprehensiveness on the part of various DSCC employees concerning the enhanced ABC model. In a meeting with DSCC directors, a briefing was given on how ABC can assign costs to better make management decisions. Instead of assimilating the information to see how ABC could benefit DSCC, a general resistance to the information presented was observed. There were several questions and a concern regarding specific information contained on slides, yet no discussion about ABC or what they would like to see. This research also found a general attitude of surprise that the ABC model was still in work and a belief that the ABC model is a project of the current Agency director that may be discarded upon his transfer to another position.

It is evident that the end users of the information that will be provided to do not fully understand the concept of ABC and if they are not educated about this they will be

59

unlikely to buy-into the program. There must be an emphasis placed on this education the tendency observed so far in this research effort indicates that managers only look at the information provided by ABC as something to challenge. It appears that they feel it is not worth their time and effort as they are not presently measured by how they handle costs.

Other Findings.

What problems were encountered during the initial implementation process? Below is a compilation of quotations obtained through interviews and document analysis indicating problems that were felt to have impacted the implementation of the initial ABC model:

- DLA dictated how the model would look. It was their idea to cost out processes and not outputs. The cost of processes is important but the managers needed to know the cost of their outputs.

- All of DLA (all supply centers in this case) had to look alike. They had to have the same activities, processes, etc. All supply centers are not alike and some had to hide activities and fit everything into the uniform 127 activities and 8 processes. There was no allowance for the individual/unique activities.

- Management was not an integral part of the development of the model. HQ DLA staff made all the decisions as to what the model would be. There was never a feeling of ownership at the working level.

- It was apparent from the beginning this model was being built to cut dollars and people. There was a reluctance on the part of management to identify areas where costs were high -people were afraid they would lose resources.

- The implementation team was only given three months to implement the model which allowed no time to debug.

- The implementation team interviewed everyone instead of just the key people in the process

- They broke down the processes to their lowest levels across the board. This is a wasteful process because it goes below the level at which costs are accumulated. Once they got to a level where costs were/are accumulated at a level associated with specific products, they should only further subdivide those areas which promise pay back as indicated above. Not across the board as they did

How was the enhanced ABC model implemented, and what problems/lessons learned were encountered during the ABC implementation process at DSCC? The development of an expanded research model for DSCC initially focused on DSCC's Maritime Product Directorate as a representative sample of the DSCC organizational structure but was subsequently expanded to cover the entire center. The Maritime Product Directorate was chosen by Rear Admiral E. A. Elliot, USN, the Commander of DSCC. The team utilized a methodology for developing an activity-based costing system that consisted of five phases adapted from a methodology published by John G. Burch in his book *Cost and Management Accounting: A Modern Approach*. The five phases of this design were: (1) planning and design of an expanded ABC system, (2) analysis of

activities in the current ABC model, making necessary modifications, and identifying resource requirements, (3) analysis of the expanded set of resource categories, (4) development of methodology for assigning first stage cost drivers, and (5) development of methodology for assigning second stage drivers to customers and commodity groups. Below is a detailed discussion comparing the planned and actual implementation process at DSCC. There is also a chronological record of events covering the DSCC ABC implementation effort provided in Appendix A.

Start here

Phase five:
Determine second-stage activity drivers and assign costs to cost objects.

Phase one:
Plan the system.

Phase four:
Determine first stage resource drivers and establish activity cost pools

Phase two:
Analyze and define resource categories.

Phase three:
Analyze and define activities.
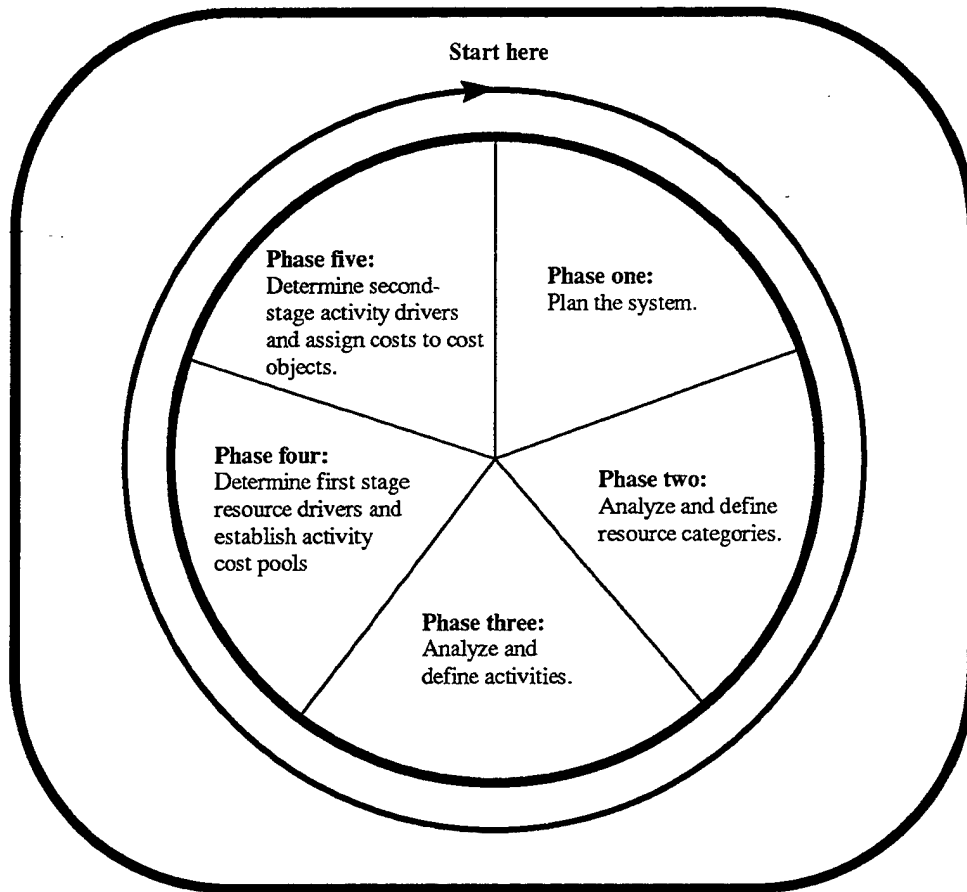
Figure 4.3 The ABC Systems Development Life Cycle

Planning and Design Phase

Planned: The first phase concentrated on determining the information required by DSCC material managers and what modifications will be required to

62

the existing ABC model to incorporate costs not included in the initial attempt. The information required by DSCC will determine the additional resource costs and the most meaningful cost objects for an expanded ABC model.

Actual: The ABC implementation team sent out requests to managers for information about what they would like to see in the enhanced model. However, obtaining the information from the managers turned out to be very difficult. This was due to the fact that managers traditionally were only provided with a budget and when they would run low they would talk to the budget analyst to get more money. The managers never had to manage by costs so they were not able to provide information about what costs they wanted or required. They had to rely on the ABC implementation team's judgment. Using their judgment and suggestions from management, the team made the decision to include all additional costs leaving nothing out. They aimed for between 30 to 35 outputs or output measures to keep the level of detail manageable.

Activity Analysis Phase

Planned: The activity analysis phase consists of an in-depth study of the activities performed by the Maritime Applications Group of DSCC. The analysis will identify the resource requirements of each activity which are external to the current ABC model. The analysis will conclude by determining how the activities consume the new resource categories.

Actual: The team first began its in-depth study of the activities in the Maritime Application Group in order to break out the Maritime portion of

overhead costs and support function costs. However as they were going through this process it became apparent that in order to break out Maritime's share of these costs they would have to calculate the costs for the rest of the center at the same time. This discovery, coupled with the fact that whatever activities went on in the Maritime Application Group, also went on in the other application groups with minimal change. This led the ABC team to expand their focus to include the entire center in their ABC model. For example: When the team started looking in the management area for the costs they needed. They discovered that all costs were included in their requirement by the time they were completed with their analysis. However, the rationale behind how to apportion some of these costs remain very complicated. For example: They need to determine the best method for apportioning the industrial stock fund cost of goods sold. Another remaining problem in this area is that there are no outputs in the administrative area and how could their costs be traced to production outputs?

Restructuring of the General Ledger

Planned: The third phase analyzes the expanded resource requirements for the DSCC ABC model and determines the best way to restructure the general ledger. The analysis will scope the costs to be included in the model, determine the information requirements, and a methodology for developing the resource costs. The research will incorporate findings from a related research effort examining the application of ABC within a DLA depot. Combination of the

research efforts may identify techniques for readily tracing depot and other resource costs to DSCC activities.

Actual: This phase of the model implementation is still in progress as of the close of this research project. Therefore this report can not provide what happened as a completed project. However, the ABC team is taking the DSCC net operating result, which is a document similar to a business income statement, and restructuring it to reflect the costs provided by the ABC model down to the Application Area. Figure 4.4 is an example of this net operating result with data taken from the 1995 General Ledger. Figure 4.5 illustrates the breakout of this net operating result down to the application area.

1995 DSCC Operations (Millions)

Revenues	
Net sales	989.300
Other income	145
Reimbursables	32.286
Total Revenue	1,021,731

Expenses	
COGS: Materiel Exp	818.100
Net PDO Transfers	156.800
Transportation	1.441
Other Mat'l Related Exp	1.218
Operations Expense	273.409
Total Cost of Sales	1,250.968

Net Operations	<239.237>

Figure 4.4 1995 DSCC Operations

Figure 4.5 Contribution Analysis by Application Area

This departure from aggregating all expenses for all areas at the Center level and

breaking the information out by individual components that can be traced to individual

outputs/activities should help managers see the impact of different management policy

decisions or process improvement efforts.

First Stage Cost Driver Phase

Planned: This phase of the research will concentrate in developing a methodology

for tracing the expanded set of resource costs to the revised activities in the existing ABC

model. For example, the analysis may determine that activity A42, perform procurement

planning, adds an average of 25 days administrative lead time (ALT) to a specific

commodity group. The 25 day ALT drives a stock level and an associated inventory carrying cost which should be traced to this activity and commodity group. DSCC management could use this relationship to demonstrate how streamlining activity A42 would reduce ALT and effect a cost savings through inventory reductions.

Actual: This stage of the plan is completed for overhead cost areas but is still in process for tracing industrial cost of goods sold and the administrative area. The enhanced model traced costs from overhead to the application area, through teams to the activities. They used cost drivers such as number of people in the application area to trace things like personnel support and security that apply to all areas. They used percent of work performed for an application area as a driver for work performed in areas such as Corporate Information where 80% of their work was done in support of the Commodity Application area. Functions like heat, facilities maintenance, and lighting were traced by square foot of floor space. Computer ADP support was traced by CPU time for the application areas that used the particular system.

Second Stage Cost Driver Phase

Planned: The research will identify a set of cost objects which provide DSCC management with greater insight into the costs of supporting specific customers or commodity groups. the research will also develop a methodology for assigning activity costs by customer of commodity group.

Actual: This phase of the implementation project is also in process as of the conclusion of this research study. The ABC team is in the process of developing a

spreadsheet allocation table that cross references all of the resources consumed by the center with the 30 activities that cause these resources to be consumed see Appendix B.

To get the appropriate percentages the team utilized work-standards that were developed by DPRA for labor as well as the best technical estimates from interviews. In the future this model will be linked with the Time and Productivity System that is now being installed. This linkage will provide more accurate data to refine cost driver percentages for labor. After all the resources and their respective drivers are placed in the allocation table the model will calculate the true cost of all 30 activities to outputs at a corporate level.

Summary

This chapter presented the results of the case study of the implementation of the enhanced ABC model at DSCC. The chapter comprised two main sections. Section One reported findings relative to the three research propositions. Findings relating to the relevance of cost information provided by the initial model and then the enhanced model an ABC system were presented first. Then the section considers management acceptance of an enhanced ABC model. Section Two presented other findings relative to the implementation of an enhanced ABC model within a government service organization that were not directly related to the research propositions

V. Conclusions and Recommendations

Overview

This chapter presents the conclusions derived from the research findings in Chapter Four. The chapter first provides the research objectives, investigative questions, research propositions, findings and conclusions, and then presents other findings not addressed in the research propositions. Information is presented in the following form: 1) a summary of the research proposition, 2) a summary of the findings for the proposition, 3) conclusions drawn, and 4) recommendations. The chapter closes with a recommendation to extend this research.

Research Objectives

The research had two goals. The first was to document the problems that DSCC encountered with the implementation of the first ABC model and reasons that the first model was not being used by management.

The second was to document the implementation of the enhanced ABC model. The first objective was to discover and document the reasons driving the need for development and implementation of an enhanced ABC model in order to highlight these reasons so that other organizations implementing an ABC model might avoid the pitfalls encountered in the first DSCC ABC model.

The second objective was to develop a documented case study of the implementation of the enhanced model at DSCC that might serve as a road map for other government organizations to follow as they implement ABC. The research documents

problems encountered as well as "lessons learned" during implementation. The final

objective was to identify areas for possible future research.

Investigative Questions

1. Why did DSCC management feel that it necessary to implement an enhanced ABC model?

2. What modifications were made to the initial model to provide DSCC managers with relevant cost information?

3. How did management accept the cost information provided by the enhanced ABC model?

4. How was the enhanced ABC model implemented, and what problems/lessons learned were encountered during the ABC implementation process at DSCC?

Conclusions

This section contains the research propositions and related findings. Data gathered

during the research process is used to support conclusions for each proposition, and

serves as a basis for determining recommendations.

Relevance of the Initial ABC Model to DSCC

Proposition 1.a:

The initial model provided management with relevant cost
information to meet their information needs to facilitate
sound management decisions.

Findings: The proposition is rejected. As shown in Figure 5.1, the

majority of observations appeared in the lower left hand quadrant, signifying that the cost

information provided from the initial ABC model was not providing information that was meaningful to management nor was it at all actionable.
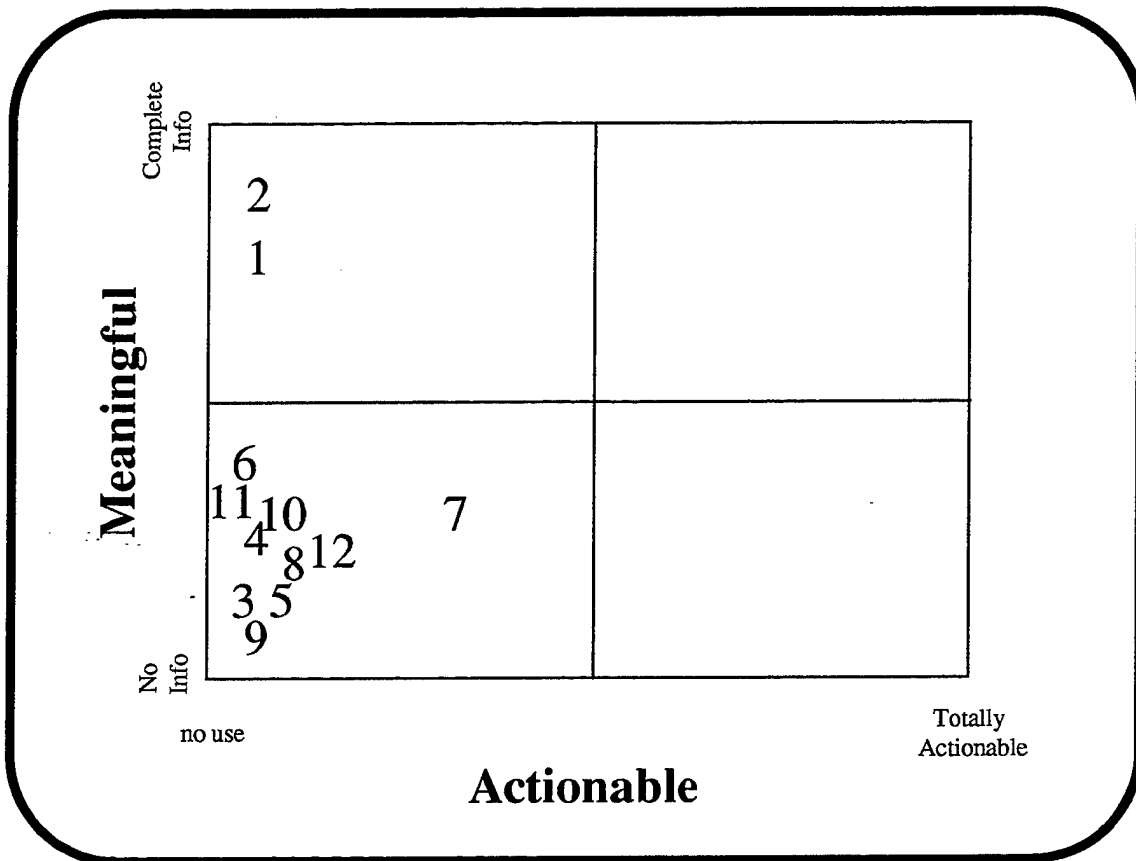
Figure 5.1 Actionable versus Meaningful Grid

The initial model was not being used by management for making decisions on how they managed their processes. The largest portion of the DSCC operating budget was excluded from the DSCC initial model. Also, industrial stock fund cost of goods sold which, according to the DSCC 1995 General Ledger, amounted to about $818.1 million, was not introduced. Without these costs included, the model did not provide managers with relevant cost information to help them make decisions on their respective processes.

Additionally, the information that was provided by the initial model was too detailed and was available to managers from other sources.

Conclusions: The research found evidence to reject the proposition. Managers at all levels must be educated about ABC. It is equally important that the users of the ABC information as well as top management be educated on what this information has to offer them in cost visibility over their processes. By failing to educate the end users of the ABC information as well as the implementation team, DSCC managers were not able to use even the limited information that the initial model did provide. Therefore the initial model merely became a space holder on the bookshelf and few DSCC users had enough exposure to ABC to know what they were missing.

Utilizing a prior ABC model as a road-map or building block to aid the implementation of an ABC system in an organization can be of great assistance. However, when a downward directed model is imposed by higher management without the ability to make necessary, substantial changes to fit the organization, this inflexibility becomes a great hindrance to successful implementation.

In order to capture relevant cost information, all resource costs that have an impact on the activities involved in an organization must be captured and traced through these activities to outputs. By being instructed from higher management to only trace resource costs down to the activity level, DSCC would never have a complete ABC model which set them up for failure from the beginning. Also, with the decision to exclude the largest portion of the DSCC budget as well as the industrial stock fund cost of goods sold from the initial model DSCC severely limited the relevance and applicability of the initial

model. A large factor in the decision to leave these costs out might have been the imposed six months time limit for implementation.

Recommendations: Prior to the completion of the enhanced ABC model, it is extremely important that DSCC educate the prospective users of the model on the capabilities of what the cost information provided by the model can do for them.

Any organization implementing an ABC model must be allowed the freedom to change a model to fit their unique needs. They must also be allowed to carry the implementation effort to the natural conclusion of tracing costs down to the output level.

As with any major project, the implementation team must be given adequate resources and sufficient time to do a thorough job of implementing the job correctly and not be rushed to produce a model in an inordinately short period of time.

In order to provide meaningful cost information to managers, the ABC model must be broken out and displayed at the appropriate level determined by management. This enables each individual area to see their impact on the total costs of the organization instead of having their costs hidden in an aggregate report.

Relevant Cost Information Provided by the Enhanced ABC Model

Proposition 2.a:

Introducing additional resources into the enhanced ABC model will not give DSCC managers more relevant cost information to make managerial decisions.

Findings: There is insufficient evidence to reject the proposition. The enhanced ABC Model had not been implemented at DSCC as of the conclusion of this case study. Therefore, a result for the proposition on whether the introduction of additional resources into the enhanced ABC model will give DSCC managers more relevant cost information to make managerial decisions could not be obtained. In addition, the predicted result, the additional resources introduced into the enhanced ABC model will give DSCC managers better information to make decisions, could not be answered either.

The research did, however, uncover observations that provide an indication about how the introduction of additional resources and tracing them down to the output level will provide better information to managers. During a briefing to DSCC managers delivered by the ABC team, a hypothetical example of how the additional resources will provide better information for managers is provided (Figure 5.2).

Activity volume example

Activity	DLA Distribution	DVD
Depot Handling	$66,650	
Transport, 1st Dest	$1,725	
Transport, 2nd Dest	4000 X $15 = $60,000	4000 X $15 = $60,000
Stockfund	$120,000	$176,000
Award DVD Contract		$3,000
Award Cont >$120,000	$1,500	
Contract Modifications		2 X $200 = $400
Process Delivery Orders		$5 X 4000 = $20,000
Inventory Carrying Cost	60,000 X 17%= $10,200	
DFAS Invoice Processing	1 X $50 = $50	4000 X $20 = $80,000
Total	$260,125	$339,403

Figure 5.2 Activity Volume Hypothetical Example

This example shows how the introduction of the additional information provided by the enhanced model will make an impact on the decisions made by managers. It takes a hypothetical item with stationary demand of 120,000 units per year that would be considered a good candidate for direct vendor delivery (DVD) under the current understanding of costs, and shows how the decision might change with the information provided by the enhanced ABC model. As an indicator that this is the current way of doing business, when the example was first introduced a comment was made indicating that this example would be a definite candidate for direct vendor delivery. However, when the next slide was shown (Figure 5.2), indicating that DVD was in fact not the best choice, the example drew a lot of questions and did not seem to make a very good

impression. After later reflection, at least one of the members of management present at the briefing, considered that without this type of cost information, what they had been doing in the past might be just the opposite from should have been done in regards to the award of DVD contracts. "Maybe our past success stories are really failures, from a financial point of view." He also pointed out the hypothetical example shows that what they do in DSCC on a DVD has a large impact on how they are charged by the Defense Finance and Accounting Service (DFAS).

Conclusions: As shown above, when the enhanced ABC model is fully implemented, the cost information provided by the model will provide DSCC's managers with the information necessary to see how the decisions they make or process improvement efforts they undertake will affect the processes they manage. They will be able to make better comparisons on issues such as privatization and will also be able to see how decisions they make have an impact on other organizations in DLA such as the depots.

However, the education of the end users of this model is the key. The users must be able to convey the depth of information that they require to make the cost information more relevant to them. If the costs provided are not given to the managers at the correct level of aggregation for them to make a decision they will not be able to use the model. They must be included in this process and therefore must know how it works.

The resource costs provided by the initial model focused primarily on labor costs, therefore any cost savings would be in identifying non-value-added labor

activities and eliminating them. With the resource costs introduced into the enhanced model, managers will see where cost savings in non-labor areas can be obtained by changing and improving processes. In fact, they may find that by increasing labor in an area they may be able to reduce a bottleneck that will more than pay for this increased labor by freeing up dollars in other areas such as depot costs.

Recommendations: This research recommends that the education of managers and users of the model be given prime consideration. DLA needs to ensure that the resources required for this education to take place are provided and that the time to accomplish this be given so that they might reap the benefits of a fully implemented Activity-Based Management System

DLA must also move to install the systems such as the Time and Productivity System so that the information required by the ABC model can be automatically input into the ABC model.

Management Acceptance of the Enhanced ABC Model

Proposition 3.a:

DSCC management will not accept the cost information provided by the enhanced ABC model.

Findings: The enhanced ABC Model had not been implemented at DSCC as of the conclusion of this case study. Therefore, a result for the proposition on whether or not DSCC management will accept the cost information provided by the

enhanced ABC model could not be obtained. In addition, the predicted result, DSCC management will accept the cost information provided by the enhanced ABC model, could not be answered either. The research did, however, uncover attitudes by certain DSCC employees toward the implementation of the enhanced ABC Model.

An enhanced ABC model should provide an improved cost picture so that managers will know the cost of the processes for which they are responsible. This results in the ability to see areas where process improvements can save dollars from the budget by making better informed decisions on the material that they control. This research found an apprehensiveness on the part of various DSCC employees concerning the enhanced ABC model. In a meeting with DSCC directors, a briefing was given on how ABC can assign costs to better make management decisions. Instead of assimilating the information to see how ABC could benefit DSCC, discussion focused on whether the ABC effort was necessary or should be continued. There were several questions and a concern regarding specific information contained on slides, yet no discussion about ABC or what they would like to see. This research also found a general attitude of surprise that the ABC model was still in work and a belief that the ABC effort will lapse in importance.

Conclusions: Unless the managers are brought on line and become part of the implementation process the enhanced model may not work even when all costs are properly traced to the outputs. According to R. Steven Player and David E. Keys, the number one pitfall to ABM projects is the lack of

top management buy-in. By top management, Player and Keys are including influential managers at key positions throughout the organization, especially the users of the model (Player and Keys, 1995:27). Without the buy-in of the intended users of the model, these people will just ignore the enhanced model as they did the initial model. This project will only be considered the latest of a long line of management ideas that have come down the pike and with patience will also go away.

If, on the other hand, the managers and users of the model are brought on line and educated on how to use the information, DSCC may see that some of the efforts that they have been pursuing have been the wrong thing to do and with the understanding of the full costs they can make better decisions on which things should be privatized and which items should be kept in-house.

Recommendations: It is very evident that the top management at DLA are very interested in adopting the benefits of ABM into the organization. However, this research recommends that more emphasis be placed on educating the middle managers who have traditionally never had to look at their responsibilities in light of costs so that they may have more buy-in to the process and will tend to understand, accept, and use the model to save costs and improve processes.

In order to drive a culture shift or behavioral change in the organization the performance measures that managers are rated on must be based on cost information/performance. Without this critical link to making managing by costs

the focus of managers it is doubtful that the jump from ABC information to ABM will ever occur. "What gets measured, gets managed."

Other Findings of the Research

This section addresses management implications of findings which were not addressed within the bounds of the research propositions. First, problems/lessons-learned encountered during initial implementation are discussed. Next, the implementation of the enhanced ABC model is examined.

Issue 1.   Problems /Lessons Learned During the Initial ABC Implementation Process

In their series of three articles *Lessons from the ABM Battlefield:* R. Steven Player and David Keys present a total of 30 pitfalls that an organization might fall into while implementing an ABC/ABM model. This section will present some of the problems in light of these pitfalls.

- DLA dictated how the model would look. It was their idea to cost out processes and not outputs. The cost of processes is important but the managers needed to know the cost of their outputs.

  - This is an example of management not fully understanding the concept of ABC which indicates the pitfalls "lack of training" and "the outside consultant did it to us" (Player and Keys, 1995b: 31,32). The fact that the ABC implementation was not carried out to the output stage indicates that personnel dictating how the model would look did not have the required training to fully understand the process they were trying to implement.

There was an outside consultant brought in to train personnel on the implementation of ABC in the beginning of the process. However, the training must have been insufficient in scope or not fully understood by the trainees for the implementation process to be stopped after the first stage of implementation and not carried through to costing outputs.

- All of DLA (all supply centers in this case) had to look alike. They had to have the same activities, processes, etc. All supply centers are not alike and some had to hide activities and fit everything into the uniform 127 activities and 8 processes. There was no allowance for the individual/unique activities.

- They broke down the processes to their lowest levels across the board. This is a wasteful process because it goes below the level at which costs are accumulated. Once they got to a level where costs were/are accumulated at a level associated with specific products, they should only further subdivide those areas which promise pay back as indicated above, not across the board as they did.

  - The above two problems are examples of the pitfalls "too much detail" and "inaccurate assignment of costs to activities and to cost objects" (Players and Keys, 1995b: 21,22). By forcing the DSCC implementation team to use the uniform 127 activities and not tailor their model to the reasons why DSCC was implementing ABC and take into account the differences between DISC and DSCC, the implementation team did not have a clear understanding of why they were implementing the model. They must be able to understand the problem they are trying to solve and be given the

flexibility to so that they can use this understanding to select the appropriate level of detail.

- Management was not an integral part of the development of the model. DLA HQ made all the decisions as to what the model would be. There was never a feeling of ownership.

- It was apparent from the beginning that this model was being built to cut dollars and people. There was a real reluctance on the part of management to identify areas where costs were high -people were afraid they would lose resources.

  - Both of the above problems are symptoms of the pitfall "lack of top management buy-in" (Players and Keys, 1995b: 26,27). In both of these cases top managers at DSCC would be reluctant to view the ABC initiative as something other than just another program foisted upon them from above that with patience would soon fade into the past with other such programs. With this as the number one pitfall that causes ABM projects to fail this type of situation needs to be avoided at all costs (Players and Keys, 1995b: 26).

- The implementation team was only given three months to implement the model which allowed no time to debug.

  - This problem obviously belongs in the pitfall category " people do not have enough time" (Players and Keys, 1995a: 28). Without sufficient time to complete a project as complex as this one, not having enough time is an

obvious hindrance to a quality product. This short deadline for

implementation might have also contributed to the implementation team's

willingness to accept stopping at the activity level instead of insisting on

completing the project down to the output level.

- The implementation team interviewed everyone instead of just the key people

  in the process

  - This problem would only exacerbate the time crunch problem above.

    However it also fits into the pitfall "Problems in collecting activity data".

    This problem would tend to lead to widely varying perceptions of the work

    accomplished and would increase the difficulty in establishing first stage

    cost drivers.

Issue 2.   Implementation of the Enhanced ABC Model

- Obtaining information from the managers turned out to be a very difficult exercise due

  to the fact that managers traditionally were only provided with a budget and when they

  would run low, they would talk to the budget analyst to get more money. The

  managers never had to manage by costs so they were not able to provide information

  about what costs they wanted or required.

  - This problem is an example of the pitfall "lack of training" and "lack of clear

    objectives." The users of the information provided by the enhanced model must

    have a clear understanding of what information they are being given and how to

    apply it. Obviously managers are not familiar with looking at problems from a cost

perspective and must be trained to handle this. The objectives of the ABC project must be clear to all people involved.

- The rationale behind how to apportion some of the costs remain very complicated. For example: What is the best method for apportioning the industrial stock fund cost of goods sold? Another remaining problem in this area is that there are no outputs in the administrative area and how could their costs be traced to production outputs?
  - This problem is currently being addressed by the team and will be handled in the future.
- The enhanced model did not have the luxury of the dedicated resources that the first model had.
  - This enhanced ABC project has been basically a "grass-roots" project since it was decided that an enhanced model was going to be necessary. Therefore, it did not have the proper resources to apply to the model causing the implementation of the enhanced model to take longer than it might have . The model also did not have the full support of top management until around July 1996. It was pretty much a stand alone project that was driven along by the tenacity of two members of the initial implementation team with the blessing of the DSCC Commander. The team was able to request the aid of a team from DPRA to aid in the building of the model.

Recommendation

This section provides a recommendation for further research in the implementation of an enhanced Activity-Based Costing Model at the Defense Supply Center Columbus. As revealed in the research, the implementation of the enhanced ABC model was not

complete as of the conclusion of the case study. Due to this situation, this research recommends that a follow-up case study be undertaken to test Propositions Two and Three, which were not fully answered. This continued research should be design in a similar fashion to this effort. To code observations on the category "Relevant Cost Information for Management," the same research variables, Meaningful and Actionable should be used. This research suggests using the single dimension variable "use" to code on the category "Management Acceptance." The range of the variable extended from the model not being used at all (taking up space in the credenza) to the cost information being used to make management decisions in day to day operations. To test this variable, use a survey of managers and users after the model has had a chance to be utilized and people have a chance to get familiar with the outputs.

This research also recommends further study on the newly initiated Supply Chain Model initiated at Headquarters DLA which will incorporate DSCC's enhanced ABC Model.

Summary

This chapter presented the conclusions derived from the research findings in Chapter Four. The major findings dealing with what happened to the first model had to do with the problems introduced into the initial model with high level management's insistence on strict adherence to the DISC model, costing out only to the activity level, not including all possible costs into the model, and the lack of middle management/user buy-in.

The major findings of the research indicate that managers at all levels must be educated about ABC. It is equally important that the users of the ABC model cost information as well as top management be educated on what this information has to offer them in cost visibility over their processes. By failing to educate the end users of the ABC information as well as the implementation team, DSCC managers were not able to use even the limited information that the initial model did provide. By being instructed from higher management to only trace resource costs down to the activity level, DSCC would never have a complete ABC model which set them up for failure from the beginning. Also, with the DSCC decision to exclude the largest portion of the DSCC budget as well as the industrial stock fund cost of goods sold from the initial model, they severely limited the relevance and applicability of the initial model. The resource costs provided by the initial model focused primarily on labor costs. With the resource costs introduced into the enhanced model, managers will see where cost savings in non-labor areas can be obtained by changing and improving processes. In fact, they may find that by increasing labor in an area, they may be able to reduce a bottleneck that will more than pay for this increased labor by freeing up dollars in other areas such as depot costs. This focus on cost savings through materials as opposed to people will tend to reduce the fear people have that ABC will be another way to justify cutting out jobs.

As DLA continues to implement ABC throughout its organization, and links these efforts to its Total Supply Chain model that it is implementing to be able to look at their entire system, it is important that each individual module of

the chain be educated on the process and be given the flexibility to take a basic model and adapt it to their own situation.

The benefits of implementing an ABC system and then putting this cost information to use in ABM have been widely documented. As the Department of Defense attempts to gain control of costs, it is very important that methods such as ABC, that have worked well in the commercial sector, be modified to fit in the public sector as well. The information provided in this research effort should help other organizations avoid some of the problems encountered by DSCC in their implementation effort.

Appendix A. Chronological Record of Major Events

Jan 1993   Major General Lawrence P. Farrell, Jr., the Principal Deputy

Director for the Defense Logistics Agency, issued a directive to all

six inventory control points (ICP) within DLA ordering the

expedient implementation of ABC with a target implementation

date of Mar 1994.

Jan-Feb 1993   Top management in DLA attended a two day contractor provided

training session on ABC during this time frame. The managers

were directed to return to their centers and select project managers

for implementing ABC.

Mar 1993   Selected project managers attended a one week contractor provided

training session on the implementation of ABC.

Mar 1993   Project managers return for another week of ABC training. They

were also given a IDEF model that was developed by DISC as a

simulation tool to assist the Joint Logistics Systems Center in

coming up with the system of the future. The project managers

were given the task of tailoring this model to a supply center to

develop business processes and activities. The managers came up

with 8 major business processes and 127 activities. This process

	never carried down to the output level it stopped at the activity definition level.
Mar 1993	DISC was chosen as the pilot organization to implement an ABC model. They were given a project completion date of Oct. 1993
Sept 1993	DISC completed their ABC model
Oct 1993	All supply centers were given instructions to implement an ABC model using the DISC model with no deviations from this model allowed.
October 1993.	Defense Supply Center Columbus (DSCC) initiated initial ABC project. All inventory control points were to have models in place by 30 Mar 1994.
Mar 1994	DSCC (then DCSC) completed their model implementation project
April 1994	DSCC ABC model briefed to Center Commander by project manager. Manager was requested to come up with the six costliest activities and to compare the numbers with the other centers activities as a benchmark.
Apr 1994	Program manager established six ABC focus teams to flowchart and analyze processes and make recommendations for changes to

improve those process. The recommended changes were briefed to the Center Commander and approved but were never implemented in the work sections.

Apr 1994   The organizational structure at DSCC was changed from a functional organizational structure to an end item application team structure. This change had a large negative impact on the usefulness of the model.

Jun 1994   Top management was not able to get the information that they needed to answer management questions.

Oct 1995   ABC implementation team briefed the DSCC Commander on the problems with the first model and what steps were necessary to implement an enhanced model to correct the problems with the first model.

Oct 1995   DSCC Commander commissions the ABC implementation team to design and implement an enhanced model at DSCC as a stand-alone project from DLA tailoring the model to a supply center

Nov 1995   ABC enlists aid from the Defense Performance and Resource Analysis (DPRA) to lend their expertise on work standards and

interviewing to the enhanced project. The ABC team and DPRA

personnel were able to Develop 50 outputs.

Jan 1996	The DLA ABC conference was hosted at DSCC in Columbus OH. The progress on ABC was briefed to the conference
Feb-Mar 1996	Joseph Meconnahey from Headquarters DLA was given the green light to develop the entire supply chain model for DLA.
Apr 1996	It was discussed at a meeting held in Richmond that we should bring everyone concerned with the supply chain together.
May 1996	ABC Conference held at HQ, Fort Belvoir, VA. This conference was attended by all participants concerned with the development of an entire "Supply Chain Financial Model." DSCC was chosen as the pilot site for the development of an ABC model as a part of this "Supply Chain Financial Model."
June 1996	The DPRA team returns to complete interviews and to continue to work with the ABC team on the DSCC enhanced model. The list of outputs was further refined to its present number of 30 activities/outputs
Jun 1996	DSCC sent a formal letter to Headquarters DLA to request resources and system development support.

July 1996   Activity-Based Costing and its current status was briefed at the

                   DLA Commander's conference. The information was very well

                   received and an Executive Steering Group Consisting of Flag

                   Officers was set up to oversee and coordinate ABC implementation

                   throughout DLA.

Aug 1996   ABC team at AFIT developing the final spreadsheets to be used in

                   the ABC model.

Present.

Appendix B. Enhanced ABC Model Spreadsheets.

This appendix contains the working model spreadsheet that is being developed by

the ABC implementation team. The spreadsheet has the resource categories listed down

the side of the sheet and the thirty activities/outputs across the top.

		C Activities / Packaging Options	C Action Request Rcvd (PR/CR &MWDL)	E Purchase Request Contract Referral Decontrolled	F Action Request Rcvd (PR/CR & MWDL : est. new CTDF)	G Pre-Award QA Action Processed	H Quality Complaint Processed	I Breakout Package Assembled	J Item Reviewed NSN	K Expedited Item Reviewed NSN	L Each Evaluation Completed	M Process Tech Data Requests	N Process New Items	O Catalog Maintenance (Transfers, Revis & Cancellations)	P Value Engineering	Q Long Term Contracts (Includes RFP & IFB)	R Simplified Acquisition $2,500 - $50,000 Award	S Delivery Order Processed
A	**B**																	
Resources																		
Depot Costs																		
	Issues																	
	Storage																	
	Receipts																	
	Overocean																	
Labor																		
	P100	5%		25%	10%	10%				20%		5%	25%					
	P200	10%		90%														
	P400																	
	P460																	
	PJ00																	
	PI900																	
	Military																	
	Disability Comp.																	
	NAVSUP																	
	SAVE																	
	Incentive Payments																	
	Terminal Leave																	
	Awards																	
	PCS																	
	Uniforms																	
	Contracted Labor																	
ADP Support																		
	SAMMS																	
	DBMS																	
	BOSS																	
	AUTODIN																	
	License																	
	CEDRL																	
	JEDMICS																	
	C-TOL																	
	EDASRE																	
	CAD																	
	PCs																	
Telecommunications																		
Postal																		
Printing																		
Medical Center																		
Depreciation																		
	RPM																	
	Office Furniture/Equipment																	
Training																		
	DSDC																	
	DCSPO																	
	ASBCA																	
DFAS																		
Stock Fund Dollars																		
Utilities																		
Transportation																		
Travel																		
Supplies																		
Inventory Carrying Cost																		
DLA Overhead																		
	DLA																	
	DLMSO																	
	DPPRA																	
	DORO																	
	DCIA																	
	DPAC																	
	DEUR																	
	DASC																	
	MIL PERS																	

		Award Under $2,500 (not including SPEDE)	Process Acquisition over $50,000 includes RFP & IFB)	Contract Mgmt. Actions	Requisitions Processed	Depot Discrepancies Resolved	Inventory Records Balanced	Each RB/IB Processed & each DLA Form 710 Output	Each NSN Backorder Reviewed for Action	Each Std. Supply Control Study (SSCS) Output to Item Mgr. (IM-RP/IB, CR & DI/OP Studies)	Each Credit Return Std. Supply Control Study Output to Item Mgr.	NSNs Reviewed for Disposal Action	Each DI/OP Std Supply Control Study Output to Item Mgr.	Customer Discrepancies Resolved	TOTAL
		T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
Resources	Depot Costs														
	Issues														0%
	Storage														0%
	Reciepts														0%
	Overocean														0%
Labor															0%
	P100														100%
	P200														100%
	P400														0%
	P460														0%
	P700														0%
	P900														0%
	Military														0%
	Disability Comp														0%
	NAVSUP														0%
	SAVE														0%
	Incentive Payments														0%
	Terminal Leave														0%
	Awards														0%
	PCS														0%
	Uniforms														0%
	Contracted Labor														0%
ADP Support															0%
	SAMMS														0%
	DBMS														0%
	BOSS														0%
	AUTODIN														0%
	License														0%
	CEDRL														0%
	JEDMICS														0%
	C-TOL														0%
	EDASRE														0%
	CAD														0%
	PCs														0%
Telecommunications															0%
Postal															0%
Printing															0%
Medical Center															0%
Depriciation															0%
RPM															0%
Office Furniture/Equipment															0%
Training															0%
	DSDC														0%
	DCSPO														0%
	ASBCA														0%
DFAS															0%
Stock Fund Dollars															0%
Utilities															0%
Transpoitation															0%
Travel															0%
Supplies															0%
Inventory Carrying Cost															0%
DLA Overhead															0%
	DLA														0%
	DLMSO														0%
	DPRA														0%
	DORO														0%
	DCIA														0%
	DPAC														0%
	DEUR														0%
	DASC														0%
	MIL PERS														0%

95

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Vita

Capt James A. Neice, Jr. ██████████████████████████████
██████████ He graduated from Walton Central High School, Walton, New York in
1982 and attended Husson College from 1982 through 1984 and Geneva College from
1984 until graduation in 1986. At Geneva, he earned a Bachelor of Science Degree in
Accounting and Business Administration.

After graduation, he worked as an accountant in Silver Spring, Maryland for three
years before entering Officer Training School where he earned his commission on June 22,
1989. He served two tours as a supply officer at RAF Upper Heyford, England and
Spangdahlem Air Base, Germany from July 1989 to May 1995. In May 1995, he entered
the School of Logistics and Acquisition Management, Air Force Institute of Technology.

Permanent Address: ████████████████
████████████████

Vita

Captain Vernon L. Scribner ███████████████████████

███████████████ He graduated from Noble High School, Berwick, Maine in 1976 and

attended Southern Maine Vocational Technical Institute (SMVTI) where he graduated

with High Honors in 1981, earning a Diploma in Automotive Technology and Associate of

Applied Science in Machine Tool Technology.

Upon graduation, he was employed as a machinist for GTE Sylvania in

Waldoboro, Maine. He entered active duty on 4 June 1985. Upon graduating from Basic

Military Training, he was assigned as a machinist to Pease AFB, New Hampshire. He was

promoted Below the Zone to Senior Airman and sewed on Staff Sergeant 1 January 1989.

He graduated Magna Cum Laude with a Bachelor of Professional Studies in Management

from the University System of New Hampshire, School for Lifelong Learning in June

1989. He was commissioned 2 March 1990 upon graduation from Officers Training

School.

His next assignment was to Chanute AFB, Ill. as a Headquarters Squadron Section

Commander, Chief, International Military Student Office, and Commander 3342 Student

Squadron. His next assignment was to Plattsburgh Air Force Base, New York as

Assistant Maintenance Supervisor, 380th Maintenance Squadron, Maintenance

Supervisor, and Squadron Maintenance Officer 380th Air Refueling Squadron.

Permanent Address: ███████████████████

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Vernon L. Scribner, Captain, USAF

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Air Force Institute of Technology
2750 P Street
WPAFB OH 45433-7765

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13. ABSTRACT (Maximum 200 Words)

This research explored the problems with ABC implementation at a government service organization. ABC implementation efforts within other government organizations were examined to determine what caused different organizations to implement ABC. Next a case study analysis was performed, following the implementation of an expanded ABC model within a government service organization. The research used unstructured open-ended interviews, on-site visits, and archival analysis to conduct the case study. The study examined how the organization developed its initial model and subsequently introduced an enhanced model. The enhanced ABC Model had not been implemented at DSCC as of the conclusion of this case study. The research concluded that managers at all levels must be educated about ABC in order to understand what the information has to offer them in cost visibility over their processes. By failing to educate the end users of the ABC information in addition to the implementation team, the case study organization was not able to use even the limited information that the initial model did provide. Also, top management should not limit the flexibility of the implementation effort to tailor the ABC model to the needs of the organization.

14. SUBJECT TERMS
Activity-Based Costing, Activity-Based Management, Activity Management, Activity Costing Accounting, Finance, Costs, Cost Analysis, Cost Models

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                                                            a. Yes   b. No

3. **Please estimate** what this research would have cost in terms of manpower and dollars if it had been accomplished under contract or if it had been done in-house.

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   a. Highly   b. Significant   c. Slightly   d. Of No
      Significant   Significant   Significance

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