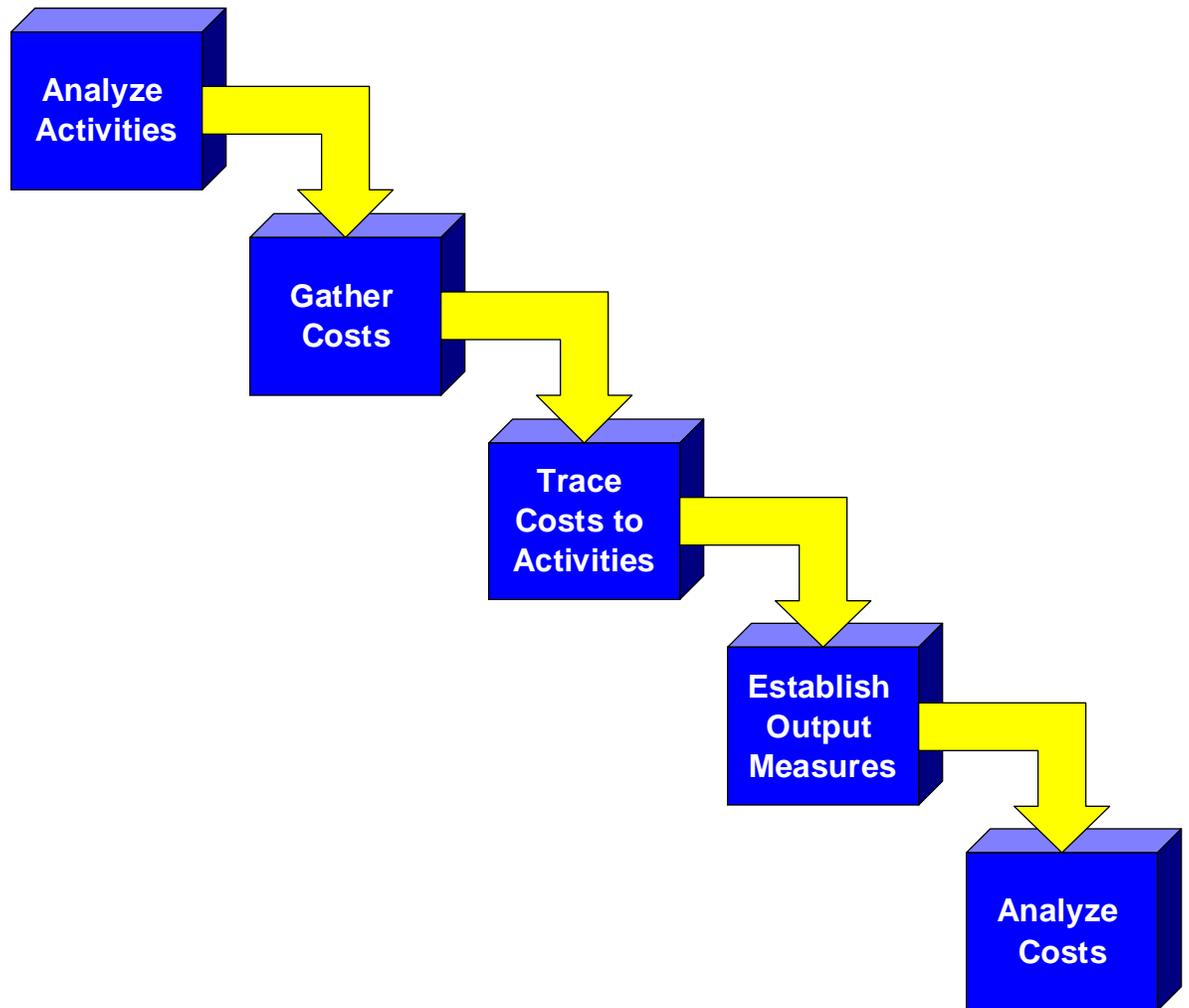
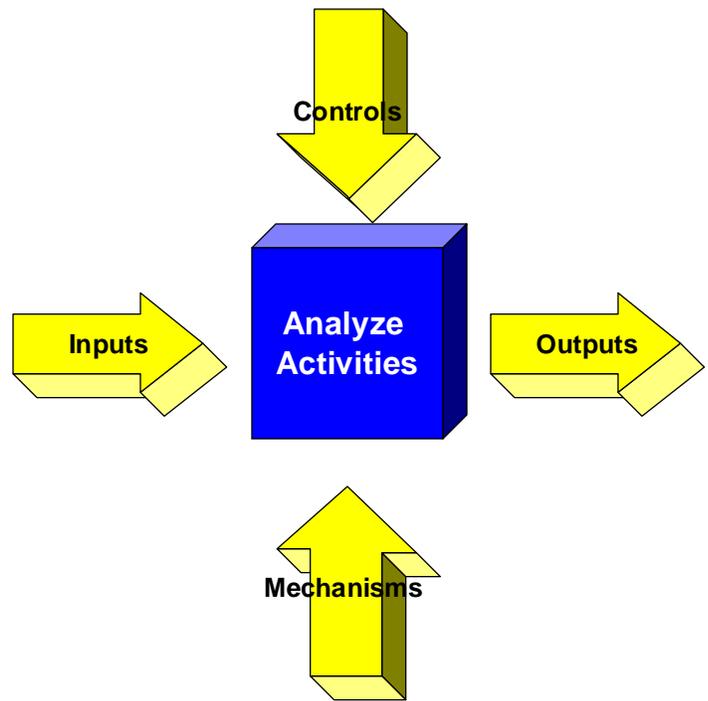


ABC Guidebook



Contents

Introduction	3
Chapter 1: Introduction to Activity-Based Costing	5
Comparative Costing Example: Production Site JKJ	8
Chapter 2: Analyze Activities.....	17
Chapter 3: Gather Costs	25
Chapter 4: Tracing Costs to Activities	32
Organization Cost Distribution Example	35
Chapter 5: Establish Output Measures	46
Chapter 6: Analyze Costs	52
Chapter 7: Final Thoughts	61

Introduction

Purpose: In 1994, the Office of the Assistant Secretary of Defense, Director of Defense Information, issued the Framework for Managing Process Improvement, A Guide to Enterprise Integration, providing Department of Defense functional managers with the processes and procedures that should be applied when conducting process improvement projects throughout the DoD. Since that time there have been various publications, policies and instructional material developed. This handbook is a further development of the methodology, procedures, and principles with particular emphasis on the practical use of Activity-Based Costing (ABC) within DoD, and is intended to be used by DoD personnel in conjunction with the current published guidance and policy of the DoD. It is important to note that this guidebook, while intended for DoD use, is based on solid, industry-wide principles of Activity-Based Costing and therefore can be used by other (non-DoD) governmental agencies and private sector enterprises.

This is a practical handbook for use during a functional process reengineering or improvement project. It will provide empirical guidance and suggestions on the basics of how to plan for, implement, and apply activity-based costing in evaluating and analyzing process flows and in performing a functional economic analysis of alternative courses of action.

Scope: Activity accounting is a fully inclusive management information concept which includes the total spectrum of accounting controls, reports and analysis. It is oriented on the activity structure of an organization rather than on the formal departmental or organizational format. The process provides quantitative activity-based cost information to:

- assess continuing operations and project future impacts for a mature activity-based organization.
- evaluate selected process flows, relative cost of various activities, and potential effects of modifications.
- analyze alternative process flows with comparative economic evaluation.

Experience has shown that an evaluation using purely qualitative judgement of possible alternatives and change opportunities is woefully inadequate to demonstrate the full potential of meaningful improvements, particularly in an environment where dollars and work hours are a major determinant of performance and

efficiency. It is the quantitative characteristics of activity-based costing that make it a key component of the analysis and evaluation process and improve the quality of the final decisions. This means that it cannot be ignored even if it is performed in a perfunctory manner.

The major difficulty in using activity-based costing has been the variance of the practices, methods, definitions, procedures, and standards applied under it. This guidebook is specifically designed to resolve this void and to provide guidance to those embarking on a redesign effort.

Chapter 1: Introduction to Activity-Based Costing

What is ABC?

ABC is an essential part of the functional process improvement and reengineering effort. It captures quantified cost and time data and translates this into decision information. ABC measures process and activity performance, determines the cost of business process outputs, and identifies opportunities to improve process efficiency and effectiveness. Qualitative evaluation and determination alone is totally inadequate as a single measure of improvement. Though quality might determine “better”, it does not contribute to other meaningful decisions such as what is “cheaper” and “faster”. It is the integration of these two dimensions that is the critical decision support element of the total process. ABC is the mechanism to integrate these two views.

ABC is a technique to quantitatively measure the cost and performance of activities, resources and cost objects, including when appropriate, overhead. ABC captures organizational costs for the factors of production and administrative expenses, and applies them to the defined activity structure. The application can be as rigorous as a definite mathematical distribution or as creative as a selective assignment using a surrogate indicator. Regardless of the method, ABC is a process of simplifying and clarifying decisions required by the process evaluators and senior management using activity costs rather than gross allocations.

What is the comparative advantage of ABC over traditional accounting methods?

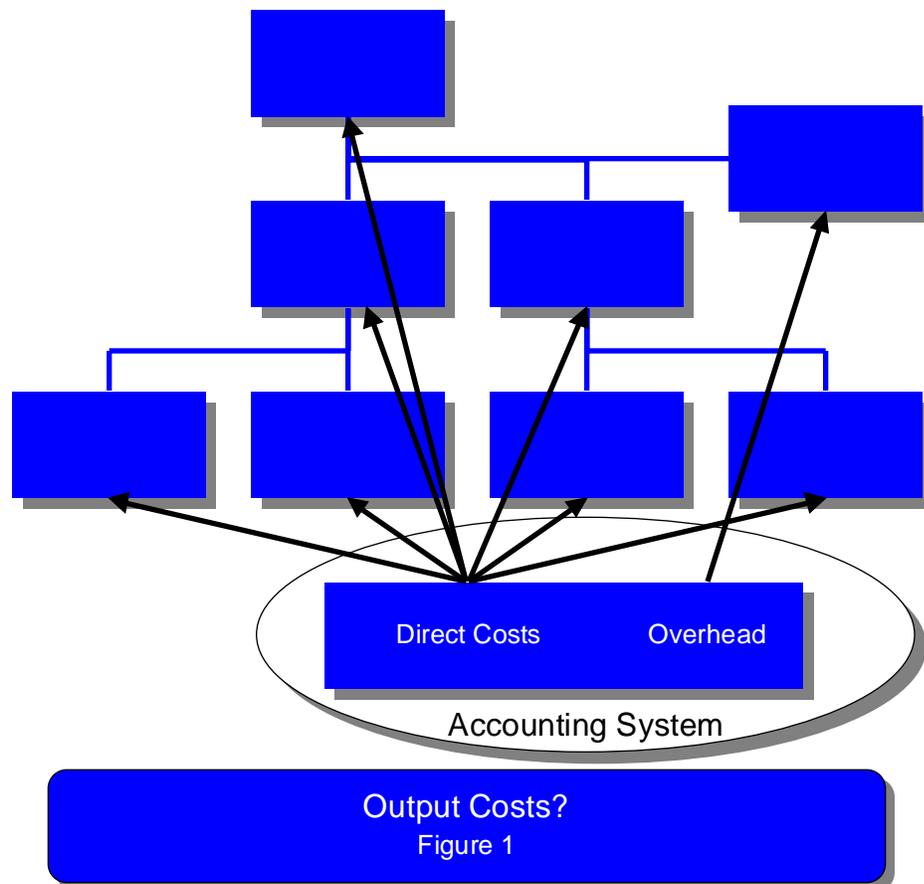
ABC is a consistent, disciplined process that is necessary to the functional process improvement effort in both an analytical and evaluation role. It is also a process that requires professional judgement and creativity when applied to a transitional business process model. This creativity does not invalidate the basic integrity of the idea, but is rather a necessity to bridge the gap from the traditional accounting data to the new process methodology. This idea will become more evident when ABC is compared to the traditional methods of costing. Although ABC is still an evolving discipline, it offers great advantages over these more traditional methods. Although evolving, ABC is nevertheless applied with sound accounting principles to translate cost data and to provide a reliable information source upon which to base managerial decisions.

Most current established accounting systems normally capture and distribute resource costs by one of the following methods:

- Organizational element
- Budgetary account
- Traditional cost accounting with direct and indirect cost allocation

Each of these methodologies has advantages and disadvantages which have met the past needs of the organization. Yet, every one of them fails to meet the full requirement for management information that occurs as the result of a redesign of the organization or any part of the organization. ABC is a more representative distribution of resource use since the cost allocations are based on the direct cost drivers inherent in each of the work activities that make up the organizational structure. ABC applies resource use directly to the output products and services based on the actual work activities of the process that produces the output with limited arbitrary allocations of indirect or overhead costs.

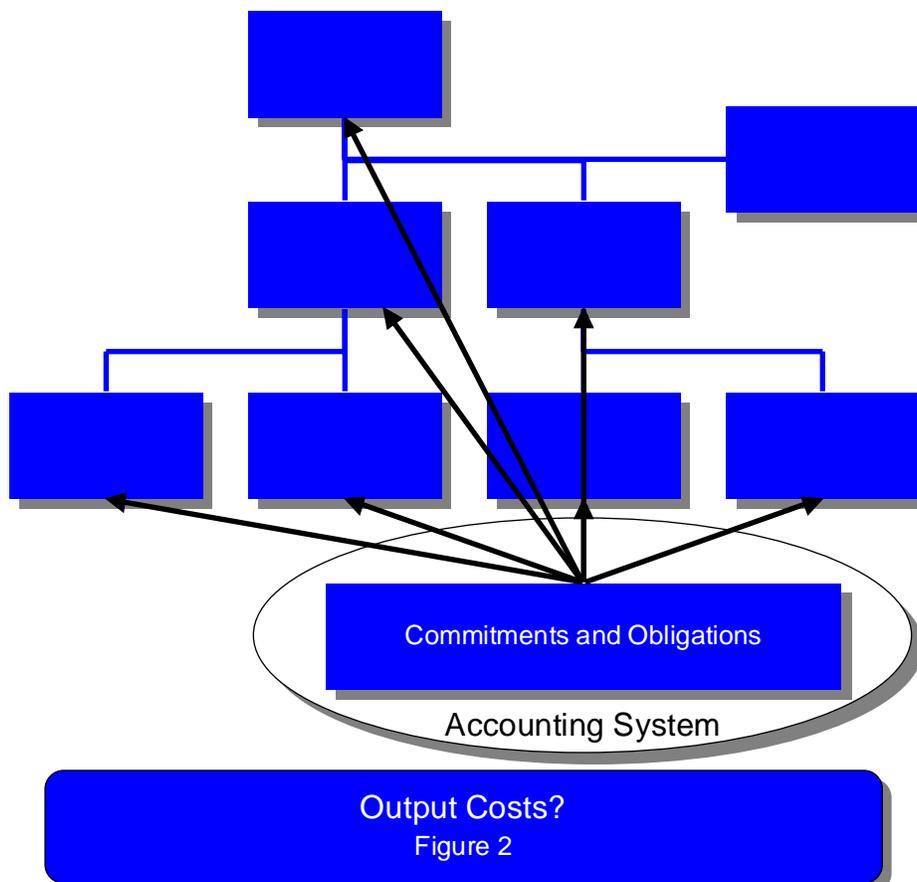
Organization Element Accounting: The model at Figure 1 is a graphic representation of the most popular method for applying resource costs to an organization. The accounting system identifies each of the organizational elements of the traditional bureaucratic structure and applies the identifiable costs of that element accordingly. Though overhead costs are sometimes applied, it is more common to find that these costs are ignored at the unit level. The indirect costs are usually captured and paid in a central repository with no attempt to subdivide



further. In many traditional organizations, the only costs that are identified to the organizational elements are the direct salary costs. This system was created to provide management with information on the costs of organizational elements, but was never intended to define the output costs either at the element or organizational level. Regardless of the approach taken within this methodology, this model is totally inadequate for making decisions on output variations. There is no application of costs to the ultimate output, activities or process flows of the organization.

Budgetary Accounting: The tracking of program costs by budgetary account is very similar to that of the organizational element (see Figure 2). Historically, DoD elements have been most concerned with ensuring that their total expenditures not exceed the allocated budgetary resources. Consequently, accounting systems became a safeguard mechanism to capture commitments, undelivered orders, and expenditures, normally divided by organizational element to enable tracking of budget execution. The major objective was to fully use the resources assigned rather than enhance productivity or to reduce expenses, because any attempt to conserve resources led to a reduction in the future budget resource level. Like organizational accounting systems, there was no attempt to cost output or in most cases to even define output.

Traditional Cost Accounting: There are organizations that perform tasks that are business-like or industrially-oriented which require a cost distribution to



output. Revolving funds involved with industrial operations or depot operations must have full cost accounting systems to support the cost allocation and capturing process. Most of these organizations are customer reimbursed based on sales of their goods and services. Hence, true cost accounting operations were established to capture and distribute costs to the output goods or services. These 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. Business and business-like structures have relied upon the historical model of cost accounting for over 100 years. This distribution is represented by the diagram at Figure 3.

With the recent advent of activity accounting, it has been discovered that the traditional cost accounting methodology can create a significant difference in output cost because of the manner in which overhead costs are allocated to output rather than traced to output. This difference in distribution can skew the ultimate price of the output and lead to poor management decisions. The following example will better illustrate how this difference can occur.

Comparative Costing Example: Production Site JKJ

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

	Production	Average Market Price	JKJ Cost
Output A	200 units	\$125.00	\$110.00
Output B	800 units	\$18.00	\$20.00

Operation Output and Pricing

Management has been concerned that the cost of Output B, which is above the average market price, makes it noncompetitive, and should be eliminated from the product line.

Managerial Analysis:

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:

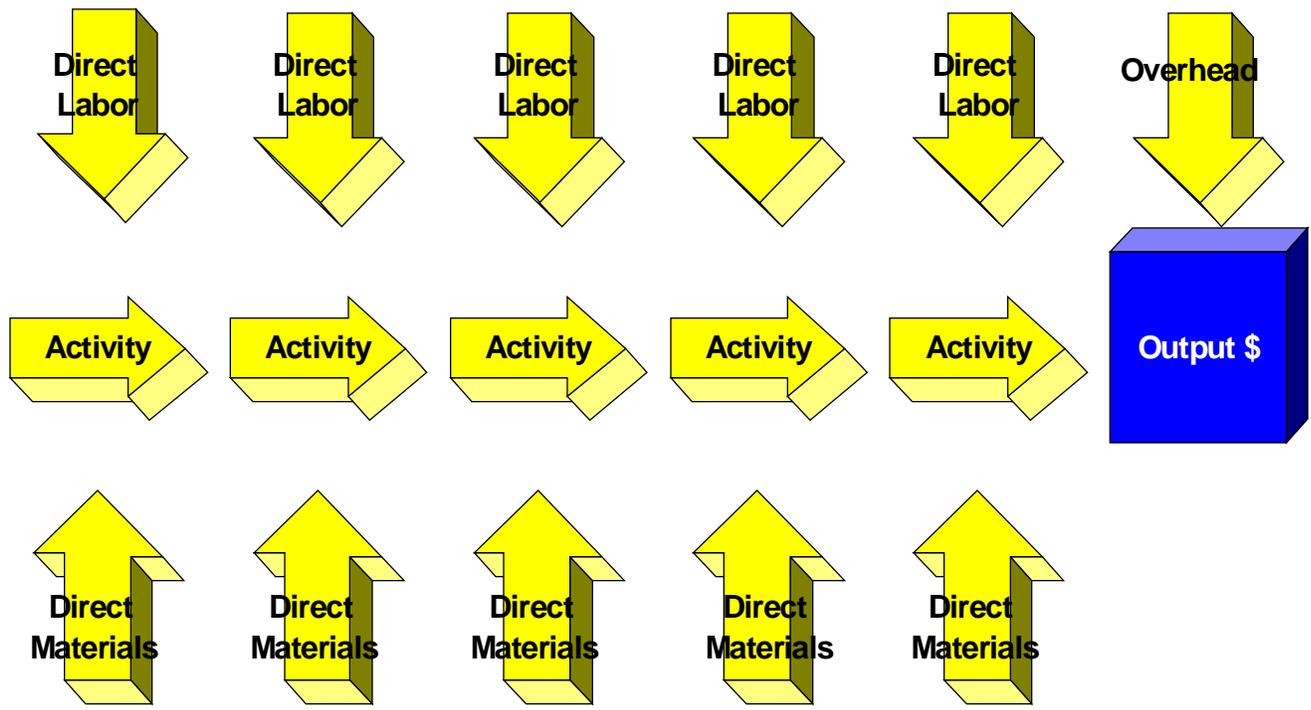
Additional Information:

Direct Costs: Output A: \$100 per unit

Output B: \$10 per unit

Overhead costs, Purchasing Department:

Annual workload: 10,000 purchase orders



Traditional Cost Accounting
Figure 3

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 Output / Total Overhead = Amount per Unit of Output

$$\frac{1000}{10,000} = \$10$$

Activity-Based Accounting

Activity Cost / Activity Workload = Amount per Unit of Activity

$$\frac{\$10,000}{10,000} = \$1.00$$

Activity Units x Amount per Unit = Total Output Cost per Unit of Output

Output A: $30 \times \$1.00 = \30.00

Output B: $5 \times \$1.00 = \5.00

Total Cost per Unit Output

Traditional Cost: Direct Cost + Overhead = Total Cost

Output A: $\$100 + \$10 = \$110.00$

Output B: $\$10 + \$10 = \$20.00$

Activity-Based Cost: Direct Cost + Overhead = Total Cost

Output A: $\$100 + \$30 = \$130$

Output B: $\$10 + \$5 = \$15.00$

When a comparison of the two sets of information was presented to management, it resulted in turmoil. The following activity-based analysis yielded results which were entirely different from that of their internal system. Activity-Based 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.

Results of the Decision: With Output B eliminated along with all 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

$$(\$20,000 + \$6000) / 200 = \$130.00$$

Alternative Decision:

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. Had this decision been made then the following results would have occurred:

Activity-Based review: 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

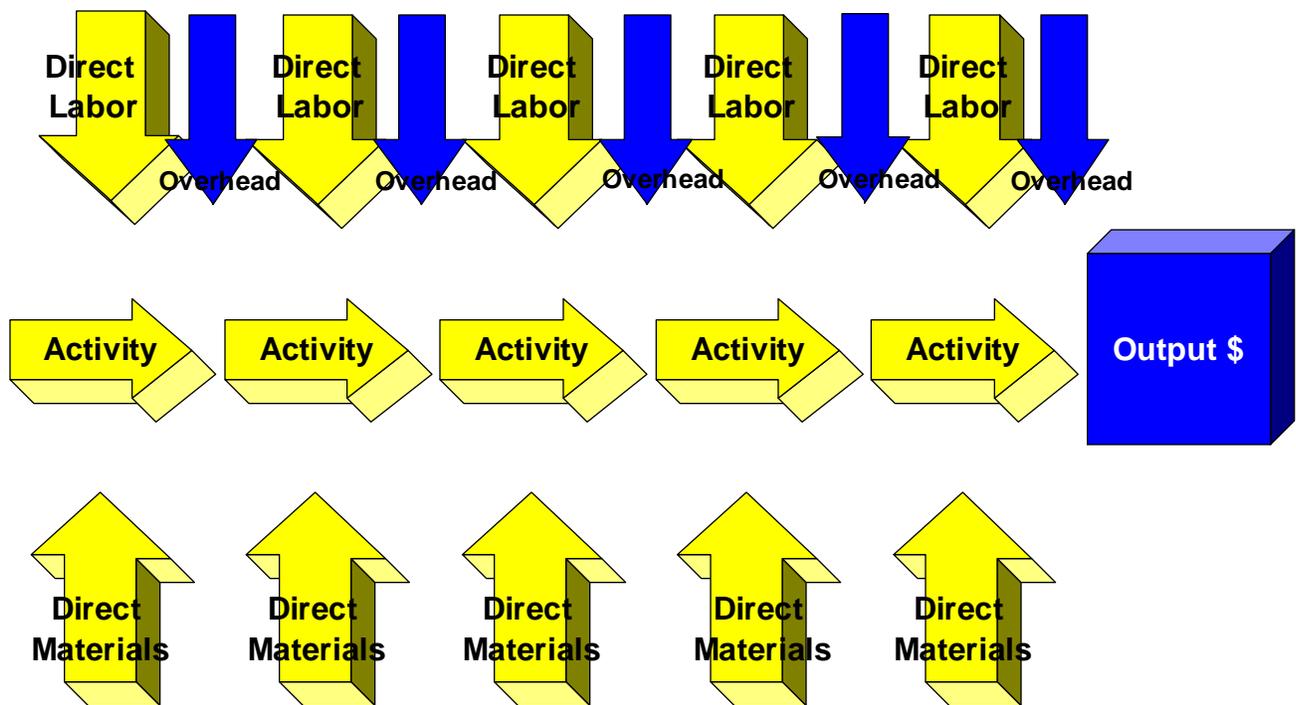
$$(\$8000 + \$4000) / 800 = \$15.00$$

The elimination of Output A had no effect on the organization since the remaining costs were those associated with Output B and Output B always was 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 ex-

ample was simplified for demonstration purposes, it nonetheless is an accurate representation of how the activity-based methodology more fairly distributes costs with fewer arbitrary distributions normally associated with traditional cost accounting procedures. Activity-based costing gives a more accurate picture of output costs by tracing overhead cost through the activities that are actually used to produce the output rather than straight allocation.

Figure 3 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 individually 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 3 are compared in Figure 4 with a model that represents activity-based allocation



Activity Cost Accounting
Figure 4

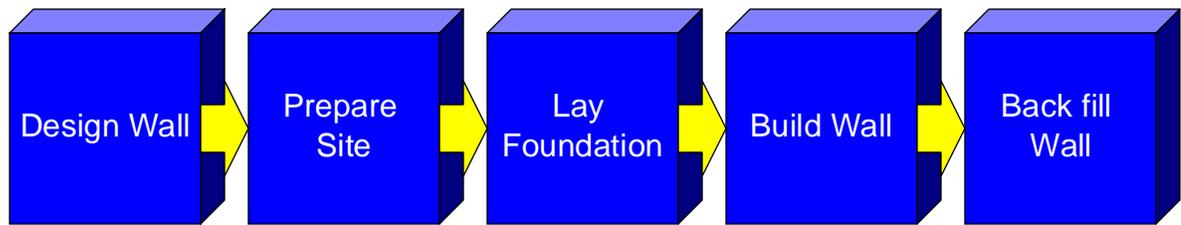


Figure 5

of overhead costs.

What does ABC provide to the decision-maker?

The decision-maker is always faced with difficult choices and multiple alternatives. Though decisions can be made with feelings and intuition, this is not the predominant situation. ABC identifies and quantifies activity cost and performance data into a format which stratifies decision variables into a configuration which makes the decision clearer and easier to make. It will be more beneficial to see how this takes place and the benefits that can be obtained by following through an example.

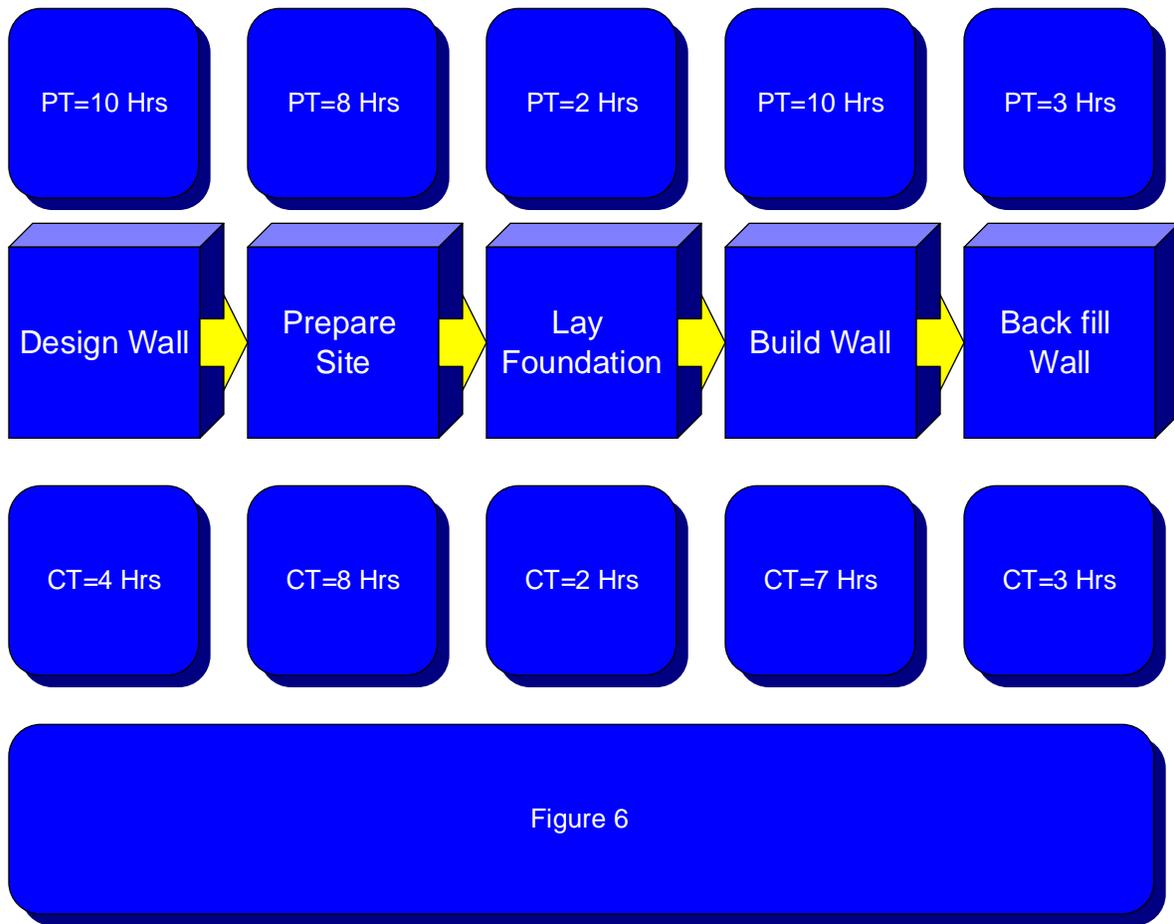
Process Decision Example

Problem: Determine if a needed wall should be built with personal activity or by a contractor.

The decision-maker is concerned about quality, speed and costs (better, faster, and cheaper). The following flow chart (See Figure 5) represents the process required to construct the wall. (The process was simplified for this example.)

Decision Point: The entire process has been laid out. It appears to be a very simple and straight-forward process. The decision-maker now has the opportunity to decide whether it is better, faster or cheaper to do the work or have a contractor do it. At this point there does not seem to be enough information for faster or cheaper, though a decision might be made that it is better for someone else to do the work. Regardless, simply knowing the process is insufficient to identify how it might be done more efficiently. There is a definite need to gather more information on which to base a decision.

In Figure 6, the total amount of time for the decision-maker, Personal Time (PT), and the time for the contractor, Contractor Time (CT), are shown for each task.



	Contractor	Personal
Design Wall	4	10
Prepare Site	8	8
Lay Foundation	2	2
Build Wall	7	11
Backfill Wall	3	3
Total	24	34

Decision Point: If a review is made of just the hours from the two basic courses of action, Contractor versus Personal Time, it shows that it is faster to let the Contractor do all the work. Even this additional data is not enough for the

Personal Time	\$40 per hour
Design	\$150 per hour
Hand Labor	\$10 per hour
Concrete Work	\$70 per hour

decision required. There is a need for more information.

The analysis requires some dollar information on how much the work is going to cost. (In this example, there is no need for costs on the materials, since the same amount will be needed no matter who does the work.) Below is more data on

the costs per hour to perform the various categories of work.

Now that all of the pertinent data has been collected for this decision, it is time to propose and evaluate courses of action.

When the cost per hour of labor is added to the number of hours, it shows that the faster course of action is not the cheapest. The cost effective course of

	Contractor					Personal					
Design Wall	4	x	150	=	\$600.00		10	x	40	=	\$400.00
Prepare Site	8	x	10	=	\$80.00		8	x	40	=	\$320.00
Lay Foundation	2	x	70	=	\$140.00		2	x	40	=	\$80.00
Build Wall	7	x	70	=	\$490.00		11	x	40	=	\$440.00
Backfill Wall	3	x	10	=	\$30.00		3	x	40	=	\$120.00
					\$1,340.00						\$1,000.00

action is to do all of the work personally but that alternative is not the faster nor is it the better if the quality of the work is taken into consideration.

This exercise is for demonstration purposes. It illustrates that the additional information has compounded the decision from the simple decision of “faster” or “cheaper” to one of “better.” The ultimate decision will be probably some mixture of the two extremes into a blended action that minimizes cost and time while creating a better outcome, a better decision than that first proposed. This additional alternative is only possible because of the quantified data which is created from the analysis of cost and activity information. The additional activity-based data improves the process and enhances the quality of the final decision.

What Can ABC Do?

ABC provides analysis information for consideration and evaluation of the processes of the organization activity model. It is specifically intended to further the accomplishment of the objectives of the DoD functional process improvement which are to:

- reconfigure the current organization into an activity structure
- select an “as-is” process flow for review and improvement
- make radical changes to develop a “to-be” process flow for dramatic improvements in performance

ABC functions in support of this process and enhances the analysis of selected opportunities and alternatives by gathering and interpreting existing organizational costs and translating the costs data into the activity structure. ABC analysis provides a meaningful appraisal of the identified activity costs along several dimensions. These various dimensions are like a menu to be selected from, as deemed necessary, to support the project objectives. The process improvement team can be provided with a vast amount of decision support information, depending on which items are selected for completion.

The ABC Menu

Categories with related Information Areas:

Activity

- **Total Cost of Activity** The total amount of direct and overhead charges associated with or allocated to a single activity
- **Cost Driver** A measurable factor that represents the amount of performance and creates or affects the costs within a single defined activity, i.e. the number of iterations, amount of effort, etc.
- **Elapsed Time** The total amount of time, to include the amount of time delay created while awaiting processing, consumed to complete the activity or an iteration of the cost driver.
- **Cycle Time** The amount of time to complete one cycle or iteration of the cost driver without including delay or wait times.

Process

- **Total Cost of the Process** The total cost of all the activities in a process determined by the amount of the cost driver for each activity in relation to the output of the process
- **Cost of a Single Iteration** The total cost of a single incident or cost driver allocation for each of the activities in a process flow which may be equal to the total cost when a single iteration occurs at each activity in the flow.

Output

- **The Cost of the Output** The total cost of the activity model allocated by the applied activity drivers to the output of the activity model.

Identification of Change Opportunities

- **Significant Cost Consumption** Activities identified which have an evidently larger consumption of inputs and mechanisms or the value of the output is less than the value of the inputs.
- **Significant Time Use** Activities identified which have evidently larger time periods or use of time or large non-value delay periods.

Evaluation of Change Alternatives

- **Cost Comparison** Analysis of the allocated costs from the activity model to two or more alternative process methods.
- **Time Comparison** Analysis of the total time or cycle times of two or more alternative process methods.

How is ABC done?

ABC has a very definite procedural flow, a set of steps that define the performance process. An activity structure of this process is as shown in Figure 8.

Though the process is relatively well-defined as a process flow, each of the

activity steps has more than one set of application criteria and individual options. The process has a disciplined approach which is applied as rigorously as the situation allows, but still has flexibility for a certain amount of creativity in the final use and evaluation. The discussion of these steps, the procedures and definitions, is the subject of the remaining chapters of this handbook. It is therefore sufficient at this point to say that the ABC methodology will follow this process flow through each step.

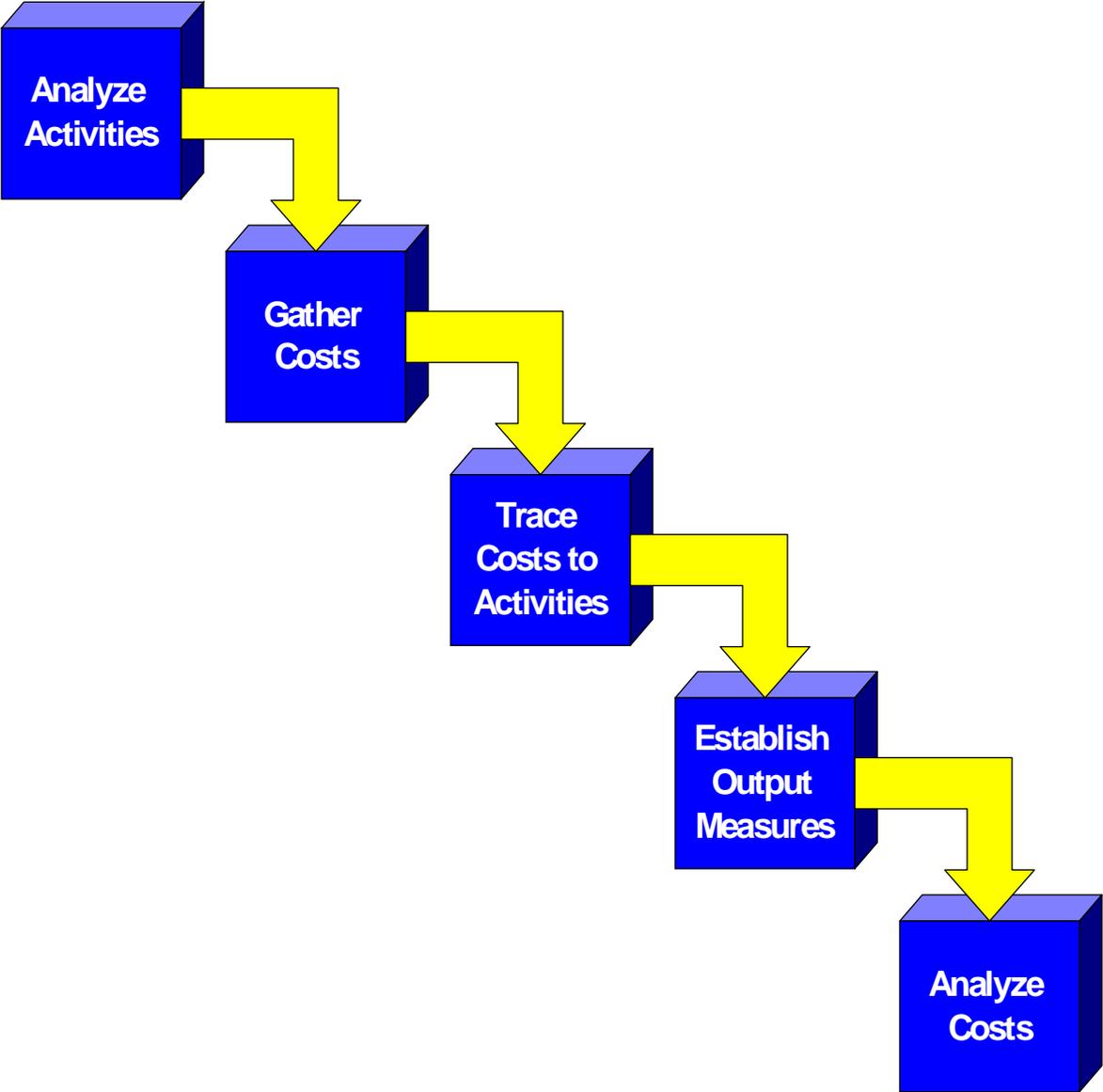


Figure 8

Chapter 2: Analyze Activities

The first major step “Analyze Activities” in the ABC process is preparatory. The name, “Activity-Based Accounting”, implies that the managerial cost data cannot be applied until the activities are defined for the organization model or the selected portion of the organization under review by the project team. The creation of the activity model is not traditionally considered as an integral part of the activity accounting structure, but cost allocation cannot take place without it, hence it is the first step, and therefore, necessary knowledge to the activity accountant.

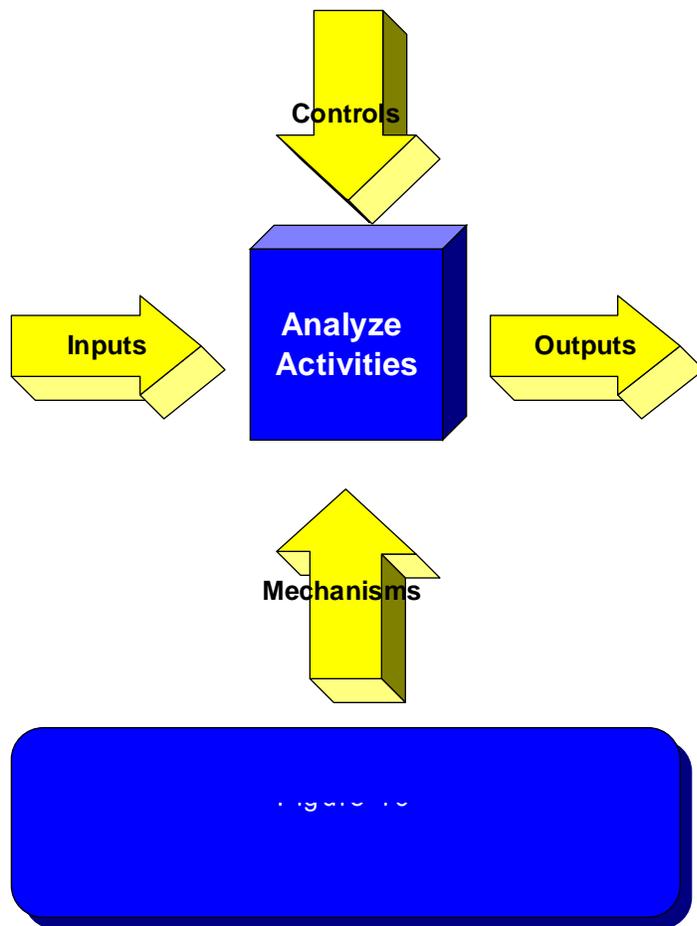
The Activity Model

An activity model is a tool to assist in understanding and defining the organization. By its very creation, members of the project team and management are forced to reevaluate traditional views, paradigms and thought patterns that have hindered realistic improvement programs. It realigns the resources and managerial effort along the real functions of the organization rather than the structure of the organization elements. This is a major departure from the historical view of the organization.

The DoD functional process improvement methodology uses two basic modeling techniques: IDEF0 for process modeling and IDEF1X for business rule (data) modeling. It is not the purpose of this text to fully explain the intricacies of employing either of these modeling techniques since they are covered in greater detail in DoD’s book, Corporate Information Management, Process Improvement Methodology for DoD Functional Managers, Second Edition. There is, however, a need to understand how the scope and definition of the activities within the model will affect activity accounting. Therefore, the following will briefly describe some of the components and how they are used:

The Activity: The activity is a basic component and an essential building block of the activity model. It is a unique process, function, or task that processes inputs and produces outputs. It is identified by a descriptive phrase that normally consists of a present tense verb and a noun. Graphically, it is shown as a rectangular box, see Figure 9.





Analyze Activities: The activity “Analyze Activities” is the first step defined in the ABC process. When an activity is identified in a process flow or activity model, it represents all of the effort that it takes to perform the identified task. It can be subdivided into subordinate activities which will enhance detailed understanding and further define the work done to complete this task.

The activity interacts with other activities in the process flow and activity model. It processes inputs (materials or information) from other activities or outside the organization and has outputs (products or information) which are used by other activities or the ultimate customer. Outputs are produced using resources (mechanisms) within designated restrictions (controls and standards). Restated, “An activity is the transformation of inputs into outputs

performed by mechanisms under the constraints set by controls.” A more complete graphic representation is a visual representation of these other components, as shown in Figure 10.

Inputs: Information or material used to produce the output of an activity. Input will be acted upon or altered to produce the output. In this example, the input would be the current organization structure, functions, and mission.

Controls: Information or material that constrains an activity. Controls regulate the transformation of inputs into outputs to ensure process consistency. Here, it could be DoD regulations and directives.

Outputs: Information or materials produced by or resulting from the activity. This output is the activity model.

Mechanisms: Usually people, machines, or existing systems that perform or provide energy to an activity. Sometimes the mechanisms may appear to be inputs. To differentiate, remember that a mechanism is never part of the output while inputs always are in some way. In this example, people, facilities, equipment, and supplies that are used to make the conversion.

Node Tree (Activity Model): An activity model is shown as a node tree to describe the organization's activities and their relationship. The IDEF activity model is hierarchical, consisting of multiple layers of increasing detail. At each node or layer of the model, a total of three to five activities are defined which encompass all of the functions at that node. In the IDEF0 model, the first node is known as the "A0" (pronounced A-zero) level. Figure 11 shows a typical A0 node.

Each of these individual activities represents a node that can be broken into three to five activities for further definition. Figure 12 demonstrates this decomposition of A1.

Each of the activities under the A1 node are called A11, A12, and A13 which is pronounced "A-one-one," "A-one-two," and, "A-one-three." All of the nodes together serve as a description of real functions within the scope of the organization or portion of the organization under analysis. The node tree can be decomposed as far as is necessary for effective study and evaluation. Normally this is no more than two or three levels. Whatever the number of levels, it is along the bottom (the greatest level of detail) that basic costs are assigned and analyzed in relation to processes. Information will also be available for study at the summary levels, but for different purposes. This will be discussed in greater detail in the chapter on analyzing costs.

Developing the Activity Model

The model is normally created by a project team which possesses subject area knowledge of the organization or project area to be analyzed. The team's knowledge is augmented and validated through interviews with other subject matter experts within the organization and from other available relevant materials, such as existing documents or results of previous Total Quality Management/Total Quality Leadership (TQM/TQL) projects.

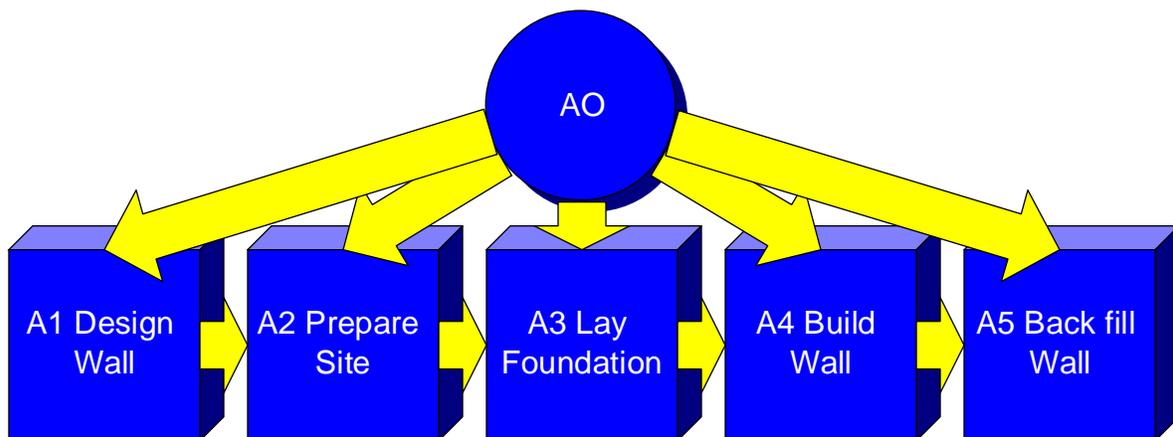


Figure 11

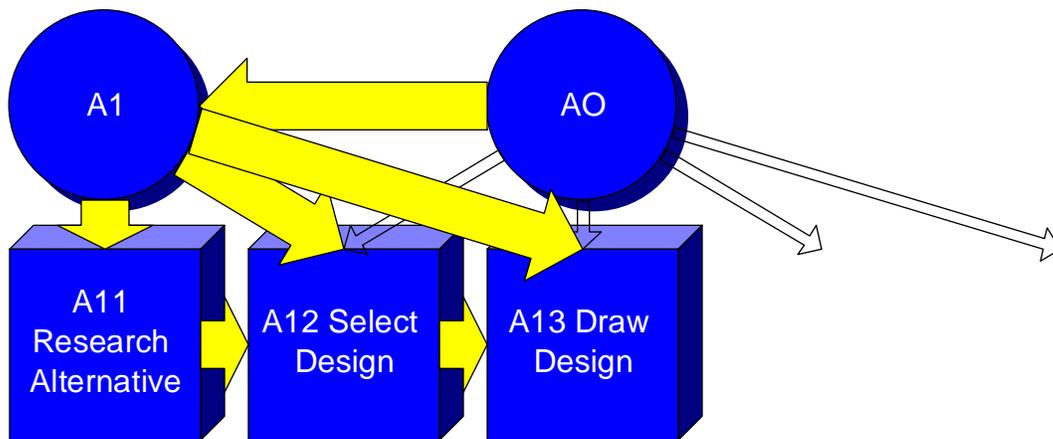


Figure 12

Normally the activity accountant is not required to participate in the development of the activity model unless that individual is otherwise a member of the project team. It is not necessary for the development and credibility of the model. The activity accountant can gather all the needed definitions, relationships and activity structures from the fully documented model. However, it is much more efficient if the activity accountant can participate as an observer or non-voting participant from the very beginning. This allows a full understanding of the model and many of the assumptions which were used in its construction. This innate understanding becomes very critical in the later stages of ABC when costs and costs drivers are under development for each of the activities. If the activity accountant is present, then there are opportunities to ask for more complete definitions of terms and activities at the time they are created and serve as another set of eyes for the project team.

RECOMMENDATION: The activity accountant should be present for the construction of the activity model.

The Scope of the Activity Model

Once it is decided to undertake a business or functional process review, it must be decided to what extent the organization will be affected. This decision, which is not normally discussed with the activity accountant, is extremely critical to the ultimate success or failure and credibility of the ABC allocations. The more comprehensive the activity model as a portion of the organization, the more uncomplicated and supportable will be the application of costs to the activity model from the current organizational structure accounting system.

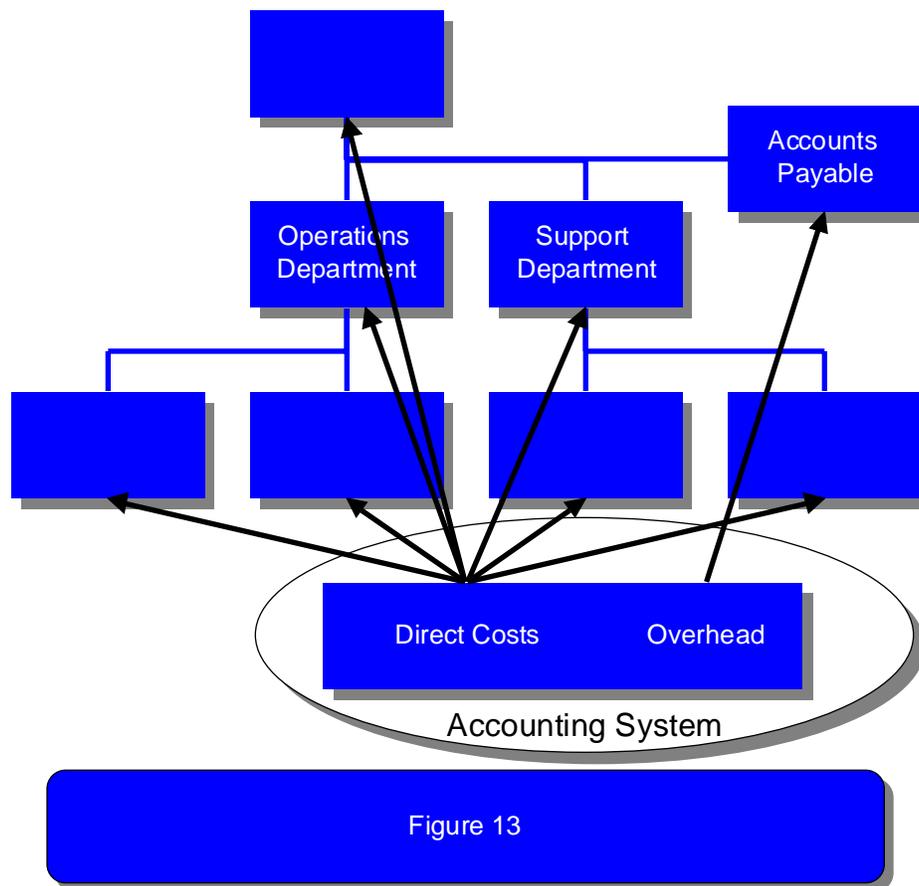


Figure 13

A narrowly defined project may make the allocation of costs nearly impossible or at least far more creative. Because the current accounting systems normally capture and assign resource costs to the total organizational structure, it is easier to reapply total costs when the entire organization is involved. The total costs are a closed system when the whole organization is included. This allows increased control to ensure total allocation. Alternatively, when only a portion of the organization is under review, it is more difficult to allocate overhead costs for the total organization. The lack of a total allocation base strains the credibility of a “fair” or “proper” distribution.

If there is time and capability within the team, a full organization or “enterprise” model is the best approach. This has several particular advantages:

- All missions and objectives of the organization are considered for inclusion. Major components are not accidentally overlooked because of a restricted definition of the project or a misunderstanding by the project team members.
- The total model easily interfaces external inputs and outputs. Smaller projects often mistake the source of their inputs and do not detect a direct link to an external customer when the borders of the model are arbitrarily restricted.
- An all inclusive model allows total participation of the organization’s members. Even when a team is not working on a particular section, there is much to be gained and learned from a simple but properly constructed activity model. This

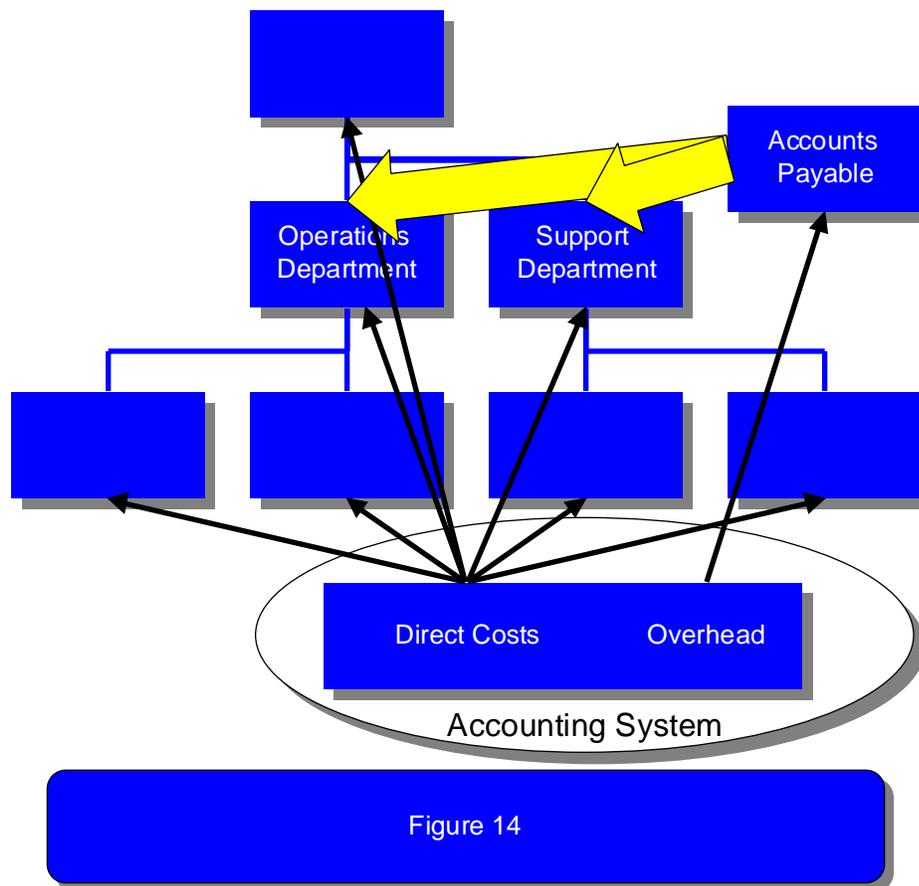


Figure 14

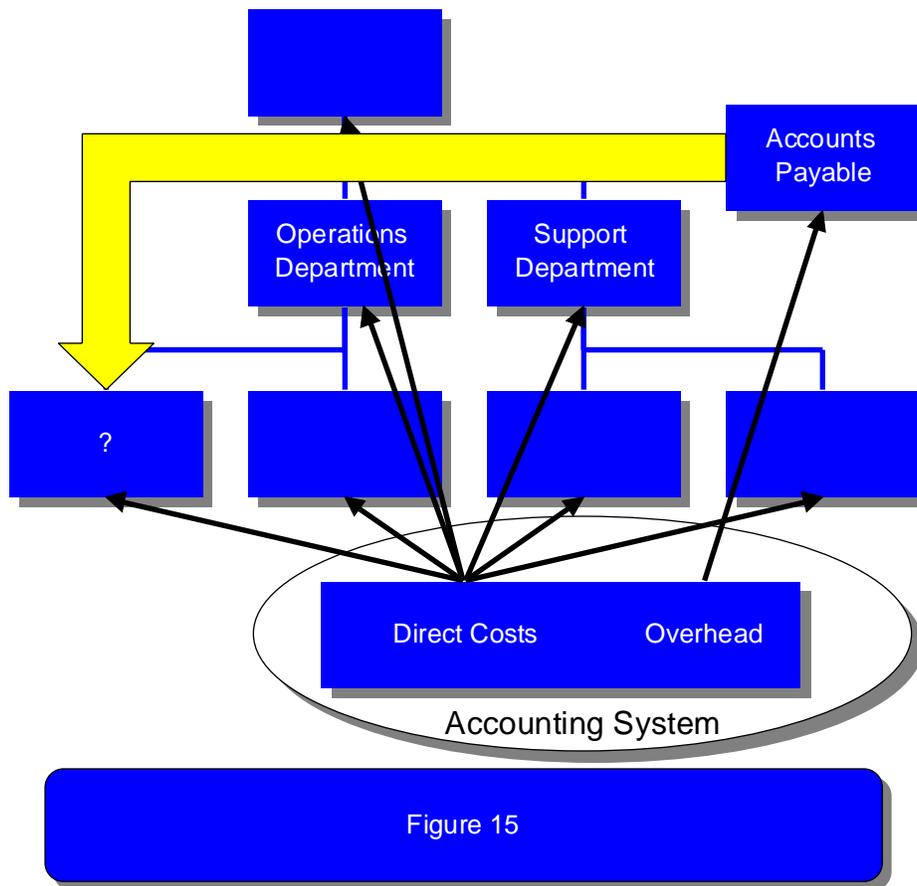
will contribute to acceptance in the later stages of a major reengineering effort.

- A single organization activity model allows for more than one project team to be in operation at the same time without each constructing different perceptions of the organization. The single model serves to keep all individual initiatives to be targeted into a coordinated plan.

- Even if other teams will not be operation, the model can serve as a guide for future projects. The completed and validated model will act as a set of guideposts for future initiatives and projects without duplication of the previous effort.

For the activity accountant, the entire ABC process is much easier if there is a total enterprise model from which to capture and assign costs. In the later stages of the process, it will become evident that one of the most difficult portions of cost to capture and distribute properly is overhead. This becomes especially difficult when there is no basis for allocating costs (from the total organization's accounting system) into a partial model. Many of these inefficiencies in the existing accounting system can be overcome if an all-encompassing strategy is in place for identifying and allocating from the total closed system.

For example, 13 is a traditional organization which assigns overhead to a central location for payment.



If a full enterprise model is developed, all organizational costs are considered and a full distribution is made. The activity accountant interacts with the major elements to determine how allocations will be accomplished. The overhead is allocated to two major operations of the organization, as shown in Figure 14.

The portion selected is broken into an activity model, but for the activity accountant this is likened to choosing a single apple and being unable to determine if the apple came from the tree or a box of apples. Without the full context of the total activity model, it becomes nearly impossible to make credible conclusions as to how much of the overhead, if any, should be applied to the portion of the organization under consideration. The activity accountant is faced with two possibilities:

- Make arbitrary allocations based on the best understanding of how the portion fits into the whole. This makes the selected distribution as strong as the accuracy of the assumptions.
- Conduct informal interviews within the other portions of the organization and individually determine the causal relationships. This possesses two flaws. First, the unilateral action of the activity accountant does not display the understanding of the organization that the project team has which leads to a weak analysis. Second, this action is not normally effective. The portions of the organization which are not involved in the project have little understanding of what is being undertaken and are suspicious of the questions asked. Whether it is suspi-

cion or fear of the results, the data collected becomes questionable.

This leaves the activity accountant with a situation that requires a creative solution to meet the mission of assigning costs to the activity model. Basically, the activity accountant will assign costs based on a perfunctory review and individual experience. A graphic of this situation would appear as shown in Figure 15 where the selected area is the darkened box.

RECOMMENDATION: The activity model should be a total model of the organization at least at a minimum level equal to the level at which accounting costs for overhead are captured and distributed.

Chapter 3: Gather Costs

The second major activity of the ABC process is “gather costs.” This means capturing all relevant expenses that pertain to the selected model and processes. It may mean capturing, constructing or synthesizing the correct cost figures to support the costing of the activities. Regardless of the method used by the organization to create and allocate costs, it is the activity accountant’s job to define, find, refine, and document the costs of the existing organizational structure.

Scope of Cost Data

The scope of the data required relates to the scope of the activity model and processes under review. If it is to be a full activity model of the organization, then all pertinent costs must be captured that pertain to the total structure. If it is to be a partial model, then it will be all direct costs for the selected activities plus some portion of the total overhead costs. The activity accountant will have to apply professional judgement when selecting the data and the source to be used.

Objective

The costs should be gathered and allocated within the organization at the lowest possible structural layer. This normally will be the smallest element that has an assigned manager, whether it is a team, unit, or branch. Where there are multiple teams or units with similar missions within a single branch or element, it is not necessary to differentiate, since the functions performed are more important than the organizational components.

Having all of the costs as the lowest level greatly facilitates translation from the organization to the activity model. If costs are at too high a level, it will be harder to subdivide costs by functions. Costs are usually allocated based on interviews with managers on the functions. Estimates become more reliable when managers are closer to the actual work.

Though it may not always be practical or possible, the objective is to align cost data at the lowest organizational element. If this cannot be accomplished, it will lead to more difficulty later in the process when costs are allocated in the activity model.

Credibility of the Cost Data

Cost data is usually not perfect for ABC analysis and distribution. Traditional accounting systems are just not adequate for more than their original intended purpose. There are always on-going changes to the organization and its missions that restrict the use of past data. Available cost data will have to be adjusted for change, corrected for undocumented element costs, or combined with different types of data from alternate sources. These measures do not damage the credibility of cost data; but adds complexity to the process.

It is important to remember that throughout the activity accounting process the resultant cost of the activity model is not a “true” cost, rather it is a “representative” cost drawn from existing information. The translation process from the traditional accounting system into the activity allocation process tends to be less than a perfect system, and the transformed costs lose some of their form and content. ABC costs serve as a basis for comparison and fairly represent the best approximate cost that can be determined. The data is credible for comparative analysis though not totally suitable for absolute measurement.

Management and project team members must be constantly reminded that the costs assigned to activities and processes are the best professional estimates available and are intended to support comparative analysis within the context of the model and the project. There is a tendency to assume that the final cost will be that savings associated with eliminating an activity or process. This high level of credibility can only be obtained by a full activity-based cost accounting system. Since this is not available, the next best thing is a professional assessment. Fortunately, this has proven to be more than adequate to validate and implement improvements and changes resulting from the functional reengineering process.

RECOMMENDATION: The activity accountant should brief management and the project team early in the reengineering project to explain how costs are captured, estimated, translated and allocated to the activity model, emphasizing that the information is intended to be comparative within the context of the model and project and should not be used for external evaluation or decision-making.

Timing

There are two basic questions relating to timing of the data collection process that are constantly asked:

- when can data collection begin?
- what length of time will be appropriate and sufficient for data collection?

First, the gathering of the actual organization costs can begin as soon as the scope of the activity model is determined. It is not required that the entire activity model be finished. It is not a problem if too much data is gathered rather than too little, since data can be removed if it is not appropriate. Being too early in the process is better than being too late.

Second, the time period is a little too complex for a simple answer. The best time-frame to look for an appropriate and sufficient amount of data is the first previous full fiscal year and, when possible, the two previous full fiscal years. The greater length of pertinent information enhances reliability and credibility. However, to ensure that the information in that timeframe is appropriate, the activity accountant must evaluate the previous data for certain criteria such as similar mission structure, prior organizational changes, or similar accounting procedures.

Similar Mission Structure. Has the overall mission of the organization been changed during the timeframe that data was collected? Have new missions been added? Have missions been deleted or transferred? Has there been enough time to gather costs on the new missions?

Missions Added. New missions can materially affect the timeframe for the acceptability of data as well as the sufficiency of the data itself. The key criterion is whether the new mission has been in place long enough to gather enough reliable accounting information to be reasonably assured of its true costs. If the size and impact of the new mission is substantial enough to warrant attention, then an evaluation must be made as to when it took effect and its costs began to appear. If more than a year old, then a lesser period of data can be used than would normally be desired. If it is less than a year old, then the activity accountant will have to gather normal data and interpolate the impacts of the new mission into the data. Special care must be taken to consider one time or start-up costs. This task can become even more complicated when there have been several changes during the period. Complexity does not invalidate the process, it merely requires a great deal more detailed work supported by an extensive log of assumptions and actions to ensure that it can be replicated.

Missions Deleted. Missions that have been deleted can pose as large a difficulty as those added, if there has not been sufficient time for the costs to return to normal. Basically, the same considerations must be used as those used for added missions.

This is also an opportunity for the activity accountant to study the effects of a reduction in the organization. The changes to direct and overhead costs can render valuable information to predict what will occur to change that result from the functional process improvement project.

Prior Organizational Changes. Organizational changes are similar to mission changes. They differ in that the cost data is still available, but there are changes in where those costs were and will be applied. Consolidations are relatively easy in the new organization since all costs can be added together, however, separations pose a special difficulty when it is hard to determine which new element will get the historical costs. The activity accountant must also be aware that many of the organizational changes are cosmetic such as name changes which do not destroy the data but do make the capture process more intricate.

Similar Accounting Procedures. This can be the activity accountant's nightmare if there are major changes to the accounting systems and procedures or multiple accounting systems in operation within the project scope. When there are changes or multiple systems, the activity accountant will have to match data across codes, time periods, and systems into a single set of acceptable data. This will perhaps be the greatest strain on the credibility of accounting data. It is important to overcome this by keeping extensive records of the process, procedures, and assumptions as an audit trail that can assure the same data can be replicated by another person. It is the consistency and comparability that are of the greatest relevance.

Sources

The accounting records will serve as the major source of cost data, but they are not the only source. Meaningful information is available throughout the organization.

Accounting Records. The organization's accounting system is the major source of cost data. As was discussed in the introduction, there are various types of accounting records: organizational element, budgetary account and traditional cost accounting. Each of these has different characteristics which will yield some or all of the cost data. Much depends on how reports are constructed and what level of detail is obtainable.

Organizational Accounting. The organizational element accounting system will have direct costs associated with organizational elements. This is useful since the primary purpose is to translate from the existing organizational structure to the activity structure. Interviews with the organizational elements will help to further divide this data to the activities. Indirect costs will be more difficult to identify and translate. Overhead costs typically will be assigned to a single element within the organization for control and payment, but costs could be assigned to more than one element depending on the structure of the cost control philosophy. Once determined, indirect costs must undergo two translations, one to the organizational structure and a second from the organizational structure to the activity model. Great care is necessary to ensure costs are not lost or over-allocated.

Budgetary Accounting. The budgetary accounting system will have obligations which are similar to direct costs. For the purpose of ABC, these can be used in the place of accounting direct costs. Problems may be encountered if the budgetary allocations and execution figures are not divided to all organization elements for execution. This may require some distribution within the organizational elements before it can be translated. Additionally, the indirect costs normally will be budgeted to a single location rather than divided. Both of these areas will require an extra allocation before being assigned to the activity model.

Cost Accounting. The traditional cost accounting system will yield an abundance of usable data. This will not preclude a translation since cost centers will still require a crosswalk to the new activity model. The greatest benefit will be that indirect costs will be identified separately and are available for distribution into either cost centers or organizational elements.

Budgetary Records. Possibly there will be budgetary records maintained separately from the accounting systems. In the case of organizational element accounting, there almost always will be a separate budgetary system. The records are useful to validate accounting costs, provide a rationale for division of costs, or to replace missing data. Remembering that the objective is to create meaningful, comparative data, it is sometimes more useful to use budgetary allocations rather than accounting records where they more properly represent the costs of organizational elements.

Miscellaneous Records and Reports. Organizations will have various records and reports from past actions and initiatives. These could be managerial studies and analyses or previous cost studies. Some organizational elements may keep supplementary logs to record workflow, specific costs, or the usage of major pieces of equipment. External and internal audit reports can yield substantial information and cost allocation formulas. This general area of source data can provide meaningful information when it is not available elsewhere. Work should not be repeated where the organization has already performed analysis since it would be redundant and could create conflicts. The data from this general area serves to validate and complete information that might be suspect or incomplete.

Categories

There are multiple categories of costs that must be captured and identified for the activity model. Each of these categories exhibits different characteristics and behaviors that will affect its use. Below are some of the major categories which will be considered along with guidance on some of the anomalies involved. The activity accountant does not have the luxury of just taking the numbers provided by the reporting system. The cost categories must be examined for usefulness and appropriateness. The objective is to obtain the best set of comparative and meaningful data available from existing data sources. Every category is a questionable amount until a final determination is made.

Labor. Personnel cost is the most significant variable expense of the organization. It alone will account for 60 to 80 percent of the total organization's costs. Labor, fortunately, is also one of the easiest costs to trace to organizational elements because of the method in which people are assigned to do work. Due to its potential impact on decisions within the project, it is important that this cost estimate be as accurate as possible. There are two data components of the labor force to be determined, number of employees and cost of labor. Both of these factors will be important at different times in the evaluation process. The number of employees is normally expressed in full-time equivalents (FTE). For the calculation of actual strength, each person who works the entire period is considered a full-time employee and is counted as 1 FTE. It is necessary to include temporary and part-time personnel, if they are used on a recurring basis for normal operations. However, they cannot be counted the same as a full-time employee since they did not work all available hours. To account for this difference, the employee will be counted as a fraction based on a percentage of time worked. A part-time employee that works half the normal hours counts as 0.5 FTE. Each organizational element will have an FTE strength expressed as a number to the first deci-

mal place. The cost of labor is expressed in dollars for each organizational element. There are several factors to be taken into consideration when gathering the cost of labor. How each of these factors is treated will materially affect the final dollar amounts. It is important to be consistent with any policy applied. Direct labor costs will be the most easily assigned, while indirect or support labor cost may require allocation to other elements within the organization (this will be discussed further in Chapter 3: Tracing Costs to the Activities).

- *Salaries and Hourly Wages.* The basic salary or yearly wages is the largest cost of the labor force. This figure can be determined in several ways, depending on which is most representative and accurate. This determination will be based on the professional judgement of the activity accountant and the approval of the project team. The actual amount of salaries from the accounting system is usually the best source. This may contain one-time costs or may not be divisible to organizational units. If for any reason this is skewed or cannot be subdivided, a standard payroll rate by grade and classification for the actual employee strength may be used. Occasionally, budget records are the most reliable if there is borrowed or allocated labor which has been charged to other budget areas, hence other organizational elements. It is best to compare the different available sources and validate one against the others for reliability.

- *Pay Increases.* Any known or projected pay increases should be used to adjust actual amounts. This represents the best known cost for the period under consideration, the future. This will probably be applied differently to salaried versus hourly employees, since the changes are normally calculated under separate rules or may not apply to all employees.

- *Fringe Benefits.* Fringe benefits are normally calculated as a percentage of the basic labor cost. Once basic salaries and wages are determined, this is a mathematical calculation.

- *Overtime.* Overtime must be analyzed before it is used in the calculation. If it is not separated from the basic cost, it may be used for practicality purposes. But if it can be identified, then a determination needs to be made if the overtime used is recurring and necessary for normal operations. Overtime spent for emergencies and one-time events should not be included, since this will overstate the true cost of continuing operations.

- *Vacancies.* Unfilled positions which have occurred during the past period plus those which are currently unoccupied create problems. Unfilled positions of the past normally should not be taken into consideration since there will always be some positions in the organization that are unencumbered. However, if there are positions which have been vacant for a long time and which management has chosen not to fill in the future, the costs for these positions should not be used. There is a tendency to use the full anticipated budget amount for all positions, filled and vacant, rather than projected actuals. Using these permanent vacancies overstates costs and potential savings for any suggested reductions.

Supplies: Costs for supplies is normally easy to find within all of the different systems. Supplies is one of the categories that management typically tries to keep under control. The only difficulty may be that the amounts are not divided down to the lowest level of the organization. If this is necessary for the translation to the activity model, then it should be interpolated based on the number of employees. There is a natural relationship between the number of employees and the use of operating supplies. There may be a need for adjustments, if the element serves a special purpose which would require abnormal amounts of supplies, such as print shop, word processing pool, or graphics design center.

Rental Equipment: Rental equipment is a variable expense that can be readily eliminated with organizational changes. These costs can also be allocated to organizational elements. If more than one element makes primary use of equipment, it will be allocated based on use. Major pieces of equipment or equipment used in support elements probably should be allocated as overhead to each element served based on the most representative evaluator of service provided. Equipment rented on a temporary one-time basis which is not necessary for recurring normal operations should not be included.

Direct Materials: Materials used in the direct production of output are assigned to the organizational element which adds them to the process. These costs are simple to calculate but should not be confused with supplies for the element's administrative functions.

Facilities: The cost of facilities is usually included and distributed as depreciation which represents the cost of using the facility. The costs to maintain and run the facilities are usually captured in overhead expenses. Depreciation costs are allocated to organizational elements based on some use factor determined by the activity accountant. Land would not be included in any calculations since it does not depreciate.

Overhead Expenses: Overhead expenses such as utilities, maintenance, security, etc., must be identified for applicability and a relationship. Because many of the accounting systems used tend to consolidate these costs or pay them centrally, there are often problems with defining and documenting separate amounts by type. The identification process should be as detailed as possible since some costs may be used while others are excluded by a defined rationale that meets the ultimate objectives of the reengineering project. Of particular importance are semi-variable costs which could be affected by changes in the mission and size of the organization. Truly fixed costs which cannot be changed by minor organizational changes may not have a significant role in the activity model.

Chapter 4: Tracing Costs to Activities

The third major activity of the ABC process “Trace Costs to Activities” combines the first step “Analyze Activities” with the second step “Gather Costs.” Organizational costs which were identified are divided within the organization structure and then assigned to the activities. It is not a simple mathematical formula or a mere spreading of data to multiple blocks. This meshing and allocation procedure will require the full measure of analytical skill and experience from the activity accountant and project team members, they define the best selection of representative costs, decide the procedural priorities, and track appropriate organizational costs to every activity. The resulting costs for each activity will represent resources used by that activity to convert inputs into outputs.

General Data Flow

The general flow of cost data from the organization to the activities is done as a series of distributions, redistributions and allocations. Costs which were identified for each organizational element must now be divided to the pertinent portions of the organization and then allocated to the activity model. The process must identify the best representational costs and the most appropriate procedures for allocation. The entire flow can be broken into the following six phases:

Phase 1 - Identify organization costs

This entire phase was accomplished in the second activity step, “Gather Costs.” All the organizational costs were identified and documented using various sources from within the organization.

Phase 2 - Distribute organizational costs to the organization structure

This entire phase was also accomplished in the second activity step, “Gather Costs.” The identified costs were divided up into the existing organization struc-

ture. No attempt was made at this stage to move costs from one element to another or to individually allocate the overhead costs to the elements.

Phase 3 - Identify categories of organizational elements

Each organizational element serves one of three functions: managerial, support, or operational. It is possible to be in more than one, but this is an exception rather than a normal condition. Assignment or reassignment of costs depends on which category is selected. Not all organizational elements perform the “real” activities of the organization and would not translate into the activity model on a direct basis. By categorizing elements, it allows distribution rules to be applied and costs reassigned to areas where ultimately they will be allocated in the activity model. Descriptions of each of these functions are as follows:

- **Managerial:** Managerial elements serve as the leadership and coordination of the organization. Management personnel along with their small support staff do not contribute directly to the organization’s output and must be distributed to the operational elements that do. The elements identified as managerial typically will have more than one element under their control for oversight and direction and be shown separately in organization charts and listings. Operational and support elements also have managerial personnel within their elements. However, it is not necessary to define these costs separately since they are already included with the most appropriate organizational element. If support elements are further divided for assignment to other elements, then the managerial costs are assigned as an integral part of the support cost total.

- **Support:** Support elements perform important services that benefit the entire operation but do not contribute directly to the output. The larger the organization, the more likely these elements will be large and diverse to support internal requirements. These functions are important to the smooth internal operation and consist of elements such as: payroll, accounting, automatic data processing, etc. Costs for these internal requirements must be redistributed to the operational elements that they support. If an element is both support and operational, then it will be necessary to separate the support portion for distribution to the operational elements. The only exception may be where the activity model calls for the specific support function as one of its activities; it would not be distributed to the organization, but allocated directly to the model.

- **Operational:** The operational elements are those which do the work of the organization and contribute directly to the output. These elements are usually referred to as the first-line or production units. Normally, these will be the lowest level of division on the organization chart. If lower organizational elements are combined because of the similar nature or by the preference of the project team, then it would be considered a single operational element, provided the mission it performs is relatively the same.

Phase 4 - Select the appropriate level of representative costs

Early in the allocation process, a critical decision must be made to select an appropriate tier of costs. This decision defines the level of effort which will be

made to capture and identify the organizational costs. Each tier includes a progressively greater percentage of the total costs, but also increases the detail and complexity of the assignment and allocation process. There are advantages and disadvantages to each that need to be understood before a selection can be made. The tiers are:

- **Direct costs:** The first tier includes only the direct costs that have an apparent relationship to the organizational element plus the allocated managerial costs from the managerial elements. These direct costs normally only include the personnel payroll, supplies, and individual rental equipment that would vary with the size and mission of the element. Other variable costs may be included if the accounting system is sufficiently sophisticated. This is the lowest tier and contains the smallest percentage of the total costs. Support costs and organizational overhead are not distributed nor included. It is generally believed that because of the somewhat arbitrary procedures of distribution, added costs only tend to skew or increase the costs rather than improve the decision information. This tier has the advantage of being the simplest to calculate and justify. It is especially well suited to smaller projects where the main object is to improve the process rather than deal with the price of output. It also works well with limited projects that address only a portion of the entire organization where the support and overhead costs are difficult to capture and distribute properly. It does not capture all of the costs nor reflect their total impact, but because these costs are usually allocated based on one of the other factors of direct costs, the cost relationships are still considered valid even with lesser amounts. This tier cannot be used to evaluate the cost of output, unless it is on a comparative basis with other outputs which have been costed using the same data. This is the most popular method used because of its straightforward simplicity and flexibility.

- **Incremental costs:** The second tier includes all of the costs of the first tier plus the support costs of the organization. This represents a larger portion of the total costs and a truer representation of the actual costs. Incremental costs typically include over ninety-five percent of the total organizational costs. The only question is the reliability of the additional costs. Because these costs are not directly related to operations they must be distributed twice, once to the operational elements and again to the activity model. There is also the added complication of inter-support activity costs, where one support activity supports another. Depending on which is allocated first, dollars may be distributed differently. Even with a strong rationale, this increases the subjectivity of the comparative cost figures that result. For this reason, this method is used less often than tier one.

- **Full costs:** The third tier includes all of the organization's costs, including direct, managerial, support, and general overhead. This tier has the capability of producing the approximate full cost of the output and all of the activities. It is also misleading that this can be easily accomplished and still be a representative cost. Because so many decision rules and procedures have to be determined at each distribution and allocation, the final relationships are merely a function of the assumptions made. Because of its complexity and theoretical unreliability, this method is rarely used and is not recommended for functional process

reengineering projects. This is the concept that would be employed to establish and maintain a fully functional activity-based accounting system rather than to capture costs for a project. Tier three distributions will not be included in any examples in this text for the reasons mentioned.

RECOMMENDATION:

1. For small projects, quick projects or projects which will not include the entire organization, use tier 1, direct costs.
2. For big projects that include the entire organization and will have dramatic effects on the total structure to include the support elements, use tier 2, incremental costs.
3. Use tier 3 only when a full organization model is used and the final cost of the output is important and there is more than sufficient time to analyze and distribute the costs.

Phase 5 - Redistribute organization costs to operational elements

The division of an existing cost to multiple organization elements does not have a simple book solution. Each type of organization, depending on its structure and mission, will face slightly different circumstances which will affect distribution decisions. Some rationale will have to be selected which represents the relationship between the cost and the elements where the work is performed. Then the selected factor will be used to divide the pertinent cost and distribute the parts to the remaining organizational elements.

The following example will demonstrate the distribution procedure for a typical scenario. For clarity it will be an entire process, though it has been simplified by providing tables of data that has already been collected and collated. In this example, both cost tiers, direct cost and incremental, will be used in separate calculations and then compared.

Organization Cost Distribution Example

This example will illustrate the cost distribution flow within the organization in preparation for allocation to the activity model. Cost distribution will be done first using the direct cost and then the incremental cost method. The final result will be two sets of cost data for the lowest level of the organization, the branch. This is the data which will be allocated to the activity model.

Figure 16, represents an illustrative organization. It contains a headquarters with two divisions each consisting of three branches. There are also four subordinate elements that report directly to headquarters which provide accounting, automatic data processing, human resource management, and security.

The activity accountant has collected the costs for the organization. The direct costs for each of the organizational elements include salaries (adjusted for pending promotions, benefits and inflation) plus office supplies. None of the organizational elements has any other direct costs. This information represents the average of

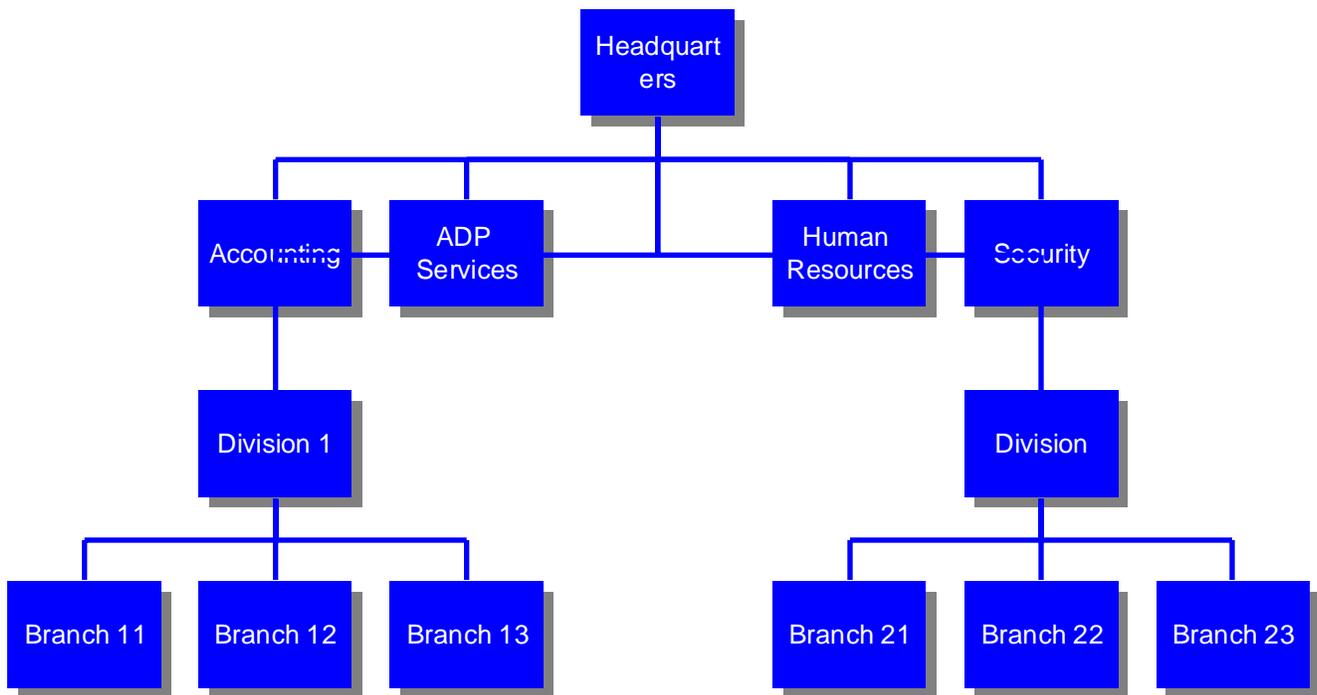


Figure 16

two fiscal years of data adjusted to remove permanent vacancies. The data also has been adjusted for any known variables identified by the project team. Table 4-1 shows the amount of each cost and the total costs for the current organization.

Table 4-2 is an array of additional information which was determined for the distribution process.

The information in Table 4-2 was gathered in preparation for whichever cost distribution method tier would be chosen. Organizational elements were reviewed and categorized into the three functions (management, support or operations) in preparation for either tier. Remaining information was gathered to allocate the support costs to the rest of the organization. Both accounting and ADP services will be divided based

Organization Element	Salaries	Supplies	Total Costs
Headquarters	\$170,000.00	\$500.00	\$170,500.00
Accounting	\$172,000.00	\$4,000.00	\$176,000.00
ADP Services	\$190,000.00	\$3,000.00	\$193,000.00
Human Resources	\$166,000.00	\$6,000.00	\$172,000.00
Security	\$347,000.00	\$1,000.00	\$348,000.00
Division 1	\$80,000.00	\$400.00	\$80,400.00
Branch 11	\$292,000.00	\$600.00	\$298,000.00
Branch 12	\$409,000.00	\$9,000.00	\$418,000.00
Branch 13	\$151,000.00	\$3,000.00	\$154,000.00
Division 2	\$80,000.00	\$400.00	\$80,400.00
Branch 21	\$621,000.00	\$17,000.00	\$638,000.00
Branch 22	\$392,000.00	\$14,000.00	\$406,000.00
Branch 23	\$151,000.00	\$2,000.00	\$153,000.00
Table 4-1			

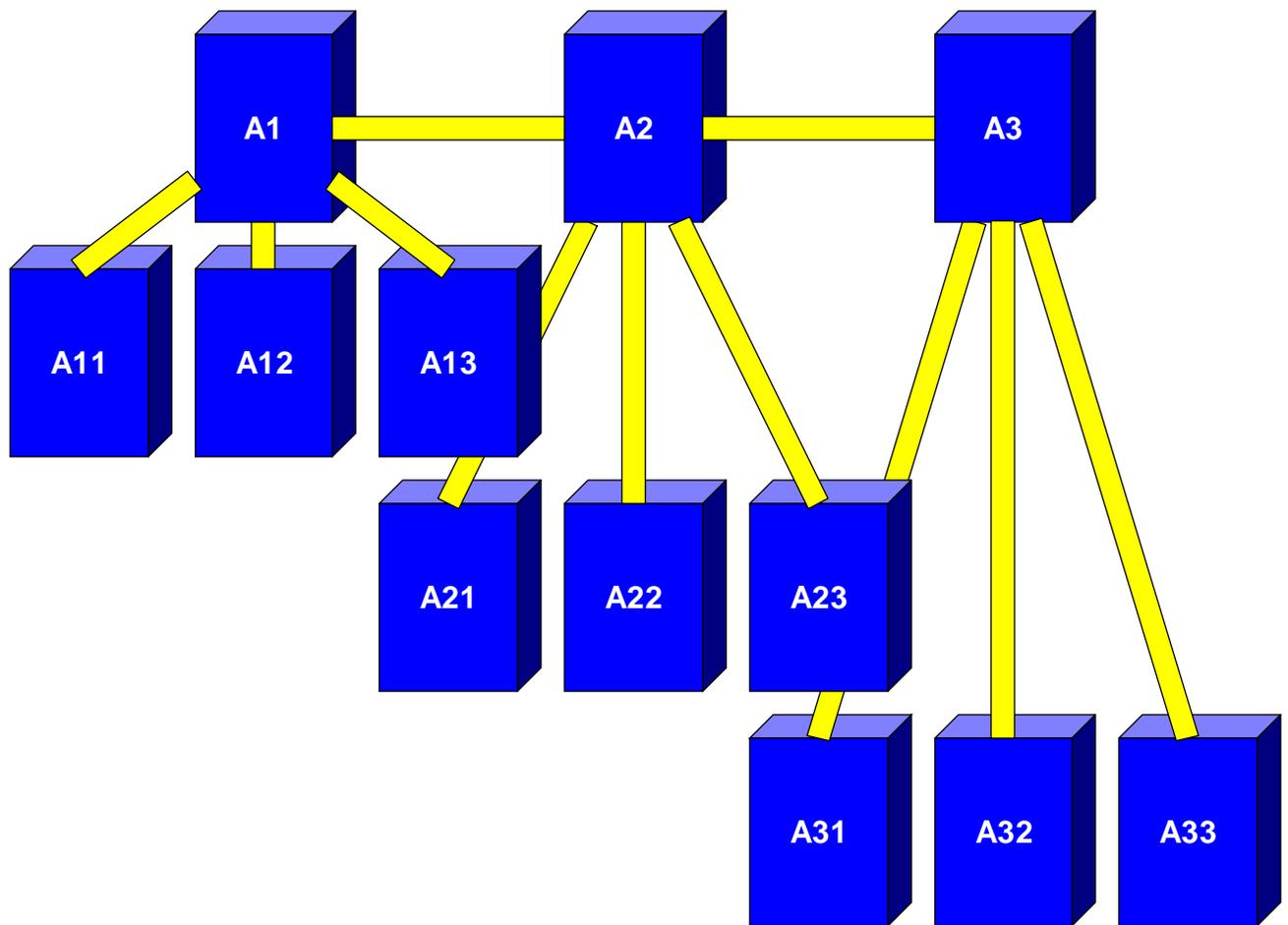


Figure 17

distribution will be:

1. Security
2. Human Resources
3. ADP Services
4. Accounting

Using this approved prioritization for the division of the incremental costs, the distribution will be done into two parts. First, the support costs will be divided among the support, managerial, and operational elements one at a time in the order given until all the support costs have been totally divided. Then, in the second part, the managerial costs will be assigned to the operational elements just as it was done in the direct costs methodology example.

Table 4-5 is the distribution of the support costs to the other elements. The results of this table will be used in the second part. In this table, first the security

Incremental Costs									
Org Element	Hqs	Div 1	Div 2	Br 11	Br 12	Br 13	Br 21	Br 22	Br 23
Direct and Support Costs	\$216.3	\$96.7	\$97.9	\$439.2	\$545.5	\$203.9	\$951.0	\$533.3	\$198.1
Hqs Allocation	(\$216.3)	\$129.8	\$86.5						
Subtotal Divisions		\$226.5	\$184.4						
Division Allocations		(\$226.5)	(\$184.4)	\$90.6	\$90.6	\$45.3	\$92.2	\$73.8	\$18.4
Final Incremental Distribution				\$529.8	\$636.1	\$249.2	\$1,043.2	\$607.1	\$216.6
Table 4-6									

then the remaining support elements are divided based on the selected rationale. A new calculation is made of the costs for each element, then the next support function is divided. This repeats itself until all support costs are distributed. The results are the costs of the organizational elements to include the support element's costs.

Table 4-6 is similar to that which was used to finalize the direct costs and divide the managerial costs. It provides the total distribution costs for the incremental cost tier. Using the total distribution costs from the table above which included the support costs, the managerial elements are now distributed to each of the operational elements in preparation for final allocation to the activity model.

Now with both calculations completed, the final distribution figures from each method can be compared in Table 4-7 to see what kind of differences occurred.

The comparison in this model shows that though the dollar values are higher with the additional cost distributions, the basic percentages are approximately the same. Under some special circumstances, these differences could be more radical, but normally the final distributions will be similar. Hence, as was discussed and recommended, either method could have been used and rendered similar results in a comparative analysis.

Exercise Summary: The distribution process appears to be relatively simple once the data have been collected and decisions have been completed. The data collection can be extremely difficult depending on the sources available, but it is

Operational Element	Br 11	Br 12	Br 13	Br 21	Br 22	Br 23
Direct Costs						
Final Distribution	\$365.7	\$491.1	\$190.5	\$712.3	\$465.4	\$167.9
	15.0%	21.0%	8.0%	30.0%	19.0%	7.0%
Incremental Cost						
Final Distribution	\$529.8	\$636.1	\$249.2	\$1,043.2	\$607.1	\$216.6
	16.0%	19.0%	8.0%	32.0%	18.0%	7.0%
Table 4-7						

	Br 11	Br 12	Br 13	Br 21	Br 22	Br 23
A1	30.0%	35.0%	10.0%	33.0%	60.0%	5.0%
A11	15.0%	5.0%	4.0%	3.0%	50.0%	1.0%
A12	5.0%	5.0%	1.0%	1.0%	100.0%	1.0%
A13	10.0%	25.0%	5.0%	29.0%	90.0%	30.0%
A2	50.0%	45.0%	0.0%	33.0%	30.0%	5.0%
A21	35.0%	30.0%	0.0%	30.0%	25.0%	3.0%
A22	10.0%	5.0%	0.0%	2.0%	3.0%	2.0%
A23	5.0%	10.0%	0.0%	1.0%	2.0%	0.0%
A3	20.0%	20.0%	90.0%	34.0%	10.0%	90.0%
A31	4.0%	1.0%	10.0%	2.0%	1.0%	3.0%
A32	12.0%	1.0%	10.0%	2.0%	1.0%	3.0%
A33	4.0%	18.0%	70.0%	30.0%	8.0%	84.0%
Table 4-8						

relatively simple when compared to creating the distribution decision variables and control mechanisms. A major portion of the effort to this point is comprised of analyzing the structure of the costs, organizational elements, and activity model using professional expertise and experience to determine the most rational, representative method for configuring and distributing the documented costs. Even though the organizational distribution process appeared elementary in the exercise, it is time-consuming and exacting. It best accomplished by personnel who are knowledgeable in accounting and the reengineering principles.

Phase 6 - Allocate final distribution costs to the activity model.

The division of the final organization costs to the activity model is more of a subjective procedure, even though it is executed within rigorous controls. The procedure is substantially subjective because there is no direct objective relationship between the activity model and the organization structure that can be observed or measured. The project team does not usually possess the knowledge and experience to decide which activities apply to which organizational elements. Therefore, the final distribution relies upon the judgement and knowledge of the operational element managers.

To capture the necessary information to complete this final phase, the activity accountant and project team members must establish a set of procedural controls and interview a proper selection of key individuals.

As in Phase 5, an example will be used to demonstrate the activity allocation procedure using the resultant values from the previous organizational distribution example. In this example both cost tiers will again be used in separate calculations so that a final comparison can be made.

Activity Cost Allocation Example

The first requirement of the allocation is the completed activity model. This was begun in the first process step of the ABC process and must be finished in order to continue. It is important that all parts of the model be diagrammed and

fully explained with all the model's terminology defined and documented. It must be available in some illustrated medium that can be made readily understandable to individuals other than the project team. To accomplish the allocation of costs, all of the individuals interviewed, whether they have been involved in the project or not at this point, must be generally conversant with parts and terms within the activity model and have at least a rudimentary understanding of the reengineering process. It will be incumbent upon the interviewers to impart the majority of this knowledge and guide the interviews to successful completion.

Rather than creating a fully documented activity model like that which would normally be required, this example will use a simplified, generic model for illustration purposes such as was shown earlier in Chapter 1. The following diagram at Figure 17 is a graphic representation of the selected activity model.

The second requirement is the creation of a simple questionnaire which will be completed in interviews with selected organization personnel. The questionnaire contains:

1. Name(s) and telephone number(s) of the interviewer(s)
2. Date of the interview
3. Name and telephone number of the individual interviewed
4. Position and organizational element of the individual interviewed
5. A listing of the activity model with a space for writing information

The third requirement is a list of the individuals to be interviewed and the names of the interviewers. This list can be created by the full project team or a selected committee in conjunction with members from the organization.

- Interviewees: The interviewees should be key personnel from the operational elements of the organization. This could be the manager in charge or any other knowledgeable person. More than one person can be interviewed for comparison and confirmation; this does create more complexity if there are major differences in the sample percentages. Regardless of the structure of the interviews, the activity accountant must end up with a set of percentages and a methodology for the allocation of organizational costs using this data.

- Interviewers: The interviewers should be members of the project team. There should be as few individuals as practicable, considering the number of interviews and the time allowed. This contributes to consistency in the interviews and questions asked. The interviewers need to be fully knowledgeable of the activity model with its terminology and the reengineering project, since they will be required to explain the process to each of the interviewees and answer all questions.

RECOMMENDATION: The interview team should include at least two but not more than three people. This allows one individual to concentrate on asking the questions and filling out the questionnaire while the other individuals independently evaluate the interview process for completeness and accuracy. Having more than three interferes with the interview by allowing too many opinions and distractions.

The fourth requirement is the completed interview questionnaires. The ques-

tionnaires are completed by the interviewers with information from the interviewees. The interviewers play a sensitive but important role when interfacing with individuals that have not been involved with the creation of the activity model. They must:

- educate interviewees on the functional process reengineering concept
- explain the current reengineering project, activity model, and all pertinent definitions
- encourage interviewees to respond truthfully and without bias (an attempt to provide information that will avoid perceived adversities or will meet the expectations of interviewers)

Table 4-8 shows a chart reflecting interview results which were conducted within the illustrative organization. Note that there was an interview conducted within each of the operational elements or branches. This renders six sets of percentages. Each set of data represents how much of that particular activity is conducted within that organization element. This data is derived in stages using the nodes of the activity model. First the interviewees are asked to select what portion of 100% of their time they perform each of the A0 level activities (A1, A2, and A3). For each interview questionnaire, the A0 level activities add up to 100%. In the second round, interviewers are asked to divide the percentage for each of the A0 level activities into percentages that add up to the total for that A0 activity. For example, the A1 total for Branch 11 is 30%. The total for A11, A12, and A13 is also 30%. Regardless of the number of levels that are in the activity model, each level is the total of the node above it. (A common error is to treat each level as 100%. This creates an additional problem for the activity accountant who must convert these questionnaires back to the correct format.)

Now, that all of the requirements have been completed the translation is a mathematical calculation using the percentages which were determined in the interview process.

Table 4-9 is the calculation of the activity costs using the direct cost tier infor-

Activity Model Allocation with Direct Costs							
Org Costs	\$365.7	\$491.1	\$190.5	\$712.3	\$465.4	\$167.9	
	Br 11	Br 12	Br 13	Br 21	Br 22	Br 23	Total
A1	\$109.8	\$172.0	\$19.0	\$235.1	\$279.3	\$8.4	\$823.6
A11	\$54.9	\$24.6	\$7.6	\$21.4	\$232.7	\$1.7	\$324.9
A12	\$18.3	\$24.6	\$1.9	\$7.1	\$4.7	\$1.7	\$58.3
A13	\$36.6	\$122.8	\$9.5	\$206.6	\$41.9	\$5.0	\$422.4
A2	\$182.9	\$221.0	\$0.0	\$235.0	\$139.7	\$8.4	\$787.0
A21	\$128.0	\$147.3	\$0.0	\$213.7	\$116.4	\$5.0	\$610.4
A22	\$36.6	\$24.6	\$0.0	\$14.2	\$14.0	\$3.4	\$92.8
A23	\$18.3	\$49.1	\$0.0	\$7.1	\$9.3	\$0.0	\$83.8
A3	\$73.1	\$98.2	\$171.6	\$242.1	\$46.6	\$151.0	\$782.6
A31	\$14.6	\$4.9	\$19.1	\$14.2	\$4.7	\$5.0	\$62.5
A32	\$43.9	\$4.9	\$19.1	\$14.2	\$4.7	\$5.0	\$91.8
A33	\$14.6	\$88.4	\$133.4	\$213.7	\$37.2	\$141.0	\$628.3
Table 4-9							

mation determine in Phase 5. The row marked “Org Costs” is the amounts from the table in Phase 5. These amounts are multiplied by the percentage in each block in Table 4-8. This translates the costs of the operational elements into activity costs equal to the amount of effort the operational elements defined as appropriate. Because the percentages were controlled by node, the costs will also reflect totals at the nodes. The A1 activity for Branch 11 is the total of A11, A12, and A13. This facilitates later analysis at different levels of the activity model.

The same procedure is performed for the organizational costs from the incremental cost example. The results are shown in the Table 4-10.

Now that both calculations have been completed, Table 4-11 reflects the final figures from both methodologies.

As was demonstrated in Phase 5, the resultant numbers, though different in the amount of costs, are substantially the same on a percentage basis. In this case, either method would have been acceptable for doing a comparative analysis of the model and its activities.

Exercise Summary: The allocation process is the end result of all the data that have been collected and decisions that have been completed. The final allocation is dependent upon the technical knowledge and communications’ ability of the interviewers and interviewees. The most difficult part is the designing and collection of information that will be needed to complete the process. The allocation process is very simple when seen as a single flow where all the decisions and work have been done. It is the design and control of the process that creates anxiety and requires expertise.

Tracing costs to activities is a comprehensive and controlled process flow. As was shown in the examples, the internal mechanics are easy to perform once the data and decision variables have been structured. Following the six phases outlined herein, the activity model and organizational data will result in a set of cost information that will be the basis for evaluating decisions and recommendations.

Activity Model Allocation with Increment Costs							
Org Costs	\$529.8	\$636.1	\$249.2	\$1,043.2	\$607.1	\$216.6	
	Br 11	Br 12	Br 13	Br 21	Br 22	Br 23	Total
A1	\$159.0	\$222.6	\$25.0	\$344.2	\$364.2	\$10.9	\$1,125.9
A11	\$79.5	\$31.8	\$10.0	\$31.3	\$303.5	\$2.2	\$458.3
A12	\$26.5	\$31.8	\$2.5	\$10.4	\$6.1	\$2.2	\$79.5
A13	\$53.0	\$159.0	\$12.5	\$302.5	\$54.6	\$6.5	\$508.1
A2	\$264.9	\$286.2	\$0.0	\$344.2	\$182.1	\$10.8	\$1,088.2
A21	\$185.4	\$190.8	\$0.0	\$312.9	\$151.8	\$6.5	\$847.4
A22	\$53.0	\$31.8	\$0.0	\$20.9	\$18.2	\$4.3	\$128.2
A23	\$26.5	\$63.6	\$0.0	\$10.4	\$12.1	\$0.0	\$112.6
A3	\$106.0	\$127.3	\$224.2	\$354.7	\$60.8	\$194.9	\$1,067.9
A31	\$21.2	\$6.4	\$24.9	\$20.9	\$6.1	\$6.5	\$86.0
A32	\$63.6	\$6.4	\$24.9	\$20.9	\$6.1	\$6.5	\$128.4
A33	\$21.2	\$114.5	\$174.4	\$312.9	\$48.6	\$181.9	\$853.5
Table 4-10							

Activity Model	Direct	Costs	Incremental	Costs
A1	\$823.6	17.2%	\$1,125.9	17.2%
A11	\$342.9	7.2%	\$458.3	7.0%
A12	\$58.3	1.2%	\$79.5	1.2%
A13	\$422.4	8.8%	\$588.1	9.0%
A2	\$787.0	16.4%	\$1,088.2	16.6%
A21	\$610.4	12.8%	\$847.4	12.9%
A22	\$92.8	1.9%	\$128.2	2.0%
A23	\$838.0	1.8%	\$112.6	1.7%
A3	\$782.6	16.4%	\$1,067.9	16.3%
A31	\$62.5	1.3%	\$86.0	1.3%
A32	\$91.8	1.9%	\$128.4	2.0%
A33	\$628.3	1.3%	\$853.5	13.0%
Table 4-11				

This amount of data is often sufficient for the majority of analytical requirements of a typical reengineering project, however, more must be done to cost and improve selected process flows.

Chapter 5: Establish Output Measures

The fourth step of the ABC process, “Establish Output Measures”, changes the focus from the macro-view to the detailed level—the activity. Up until this point, all effort has been aimed at interpreting existing structure and cost data into the newly created activity model. Now it is time to examine the components of the activity and see how these pieces of information will be used as a source of improvement in the evaluation analysis.

Conceptually, activities consume resources while converting inputs to outputs. Conversely, from the organizational view, outputs consume activities during their creation. Since the cost of the activities has now been determined, it is now a matter of determining how to measure the consumption of the activities that go into the outputs. To accomplish this, two questions must be answered:

- How much of the cost of an activity is used for a unit of output?
- How much time, actual and elapsed, does it take for one unit of output?

Activity output measures serve as the ABC device to directly answer the how many, how much, and how fast information needs of management and the ABC project team. These calculations are also known as output drivers since these output-activity relationships drive the cost of the activity during the creation of the output. Output measures display cost and time relationships of the individual activity and its output. Using these measures allows the cost and time requirements of output to be calculated and evaluated on an individual and comparative scale.

The problem for the activity accountant and project team is the diversity of the activities, their outputs, and their possible measures. The identification of the correct output and right set of measures is often more a matter of art than science which will severely test the insight, creativity, ingenuity, and patience of all concerned.

Creating The Output Measure

Even an essentially creative process must have some form of procedural control to ensure consistency and utility. Within a single activity model of any design, there will be a multitude of different types of output measures. Each one created specifically for the activity that it measures. Even activities with similar types of

output may be measured differently because of subtle differences. Therefore, the determination of an activity output measure is an iterative process that must be repeated for each individual activity within the model. To ensure consistency from activity to activity, a standard approach is required to guarantee the compatibility of the process.

Even in a medium size model with thirty to fifty activities, this evaluation stage can be extremely time-consuming. A substantial number of projects do a very perfunctory job on this analysis or try to avoid it and use only activity cost data because of the time and exertion involved. Using an established but similar set of control procedures, along with the oversight of the activity accountant, allows several teams to be working in parallel without a loss of reliability, thus shortening the overall time required and reducing the effort of each individual.

The following five step approach is effective in extracting the key factors required:

Step 1 - Analyze Activity Output and Performance

This first step seems rather elementary but is the most critical. Jumping to conclusions without thorough study leads to questionable results. Because each activity is unique, this first step is a complete review of what the activity does and what it produces. This analysis is essentially an effort to fully understand the activity and its components before making decisions.

The results will be information that can answer the following questions:

What is the activity output?

The first priority is to discover what is the output of the activity. Outputs can qualify and be named as any one of several categories. It can be a product, an event, an action, an alteration, a document, a decision, a number, etc. It does not matter exactly which category it is so much as it is recognized as the output of a particular activity. Essentially, the evaluators must determine what observable action or product the activity produces.

The output must not be confused with the mechanisms used by the activity. The activity uses resources (mechanisms) to convert inputs to outputs, but it is not the resources that are the output. For instance, an activity, "Paint Car," may require two kinds of paint jobs, regular and special. The regular takes two hours and the special takes four. The output is not hours (labor hours are a mechanism to convert the input to the output), but paint jobs even though one requires twice the resources. The difference in the resources to do a paint job must be reconciled when we make the final determination, but not by compromising the output identification procedure.

It is possible that an activity may have more than one output identified in this initial analysis step, similar to the dilemma in the previous example. This is a significant problem which also must be resolved. For measurement purposes, each activity may have only one primary output. There are several options which

may be considered to reconcile this predicament when it reaches the determination stage. Each possibility should be explored during this analysis step so data will be available for evaluation. Some of the most acceptable options are:

1. Disregard the difference in outputs and establish one as the primary output with the others merely as by-products. This does not resolve major conflicts but is available when other options are equally infeasible.

2. Define a surrogate output that is more representative. (A surrogate is a factor representing the output which is used when it is infeasible to use the best activity measure.) If a compromise output measure can be developed, this can resolve the problem satisfactorily without loss of reliability.

3. Redefine the activity into several activities which align with the outputs. This requires more work on the activity model to decompose the activity node to another level. Depending on the team and time requirements, this is often the best solution.

Each of these solutions create problems of their own and must be balanced and weighed. It is a common phenomenon that the requirement for greater detail makes it more difficult to obtain. Increased accuracy and reliability come with a price. To resolve the output selection crisis, there are several dimensions to the problem that must be reviewed and considered when deciding which approach to take and how much detail is really required:

1. Representation - Is the selected output measure representative of the relationship between the activity performance and the output produced? Does it account for all the costs involved? Does it represent all of the effort employed? Does the output measure vary in direct relation to increases and decreases of activity performance?

2. Measurability - Is it measurable? Can the data be obtained from existing sources? Is the measure objective (verifiable data) or subjective (estimates)? Is the measure reliable? Can it be measured accurately and consistently? Is it simple to measure? Is it economical to measure?

3. Homogeneity - Is this output homogeneous with the secondary outputs and by-products? Is it similar enough to recognize the total performance?

4. Detail - Is this output sufficiently detailed to provide the relationship and cost distribution required? Is it so detailed as to be unnecessarily difficult to measure and record?

5. Relativity - Is the cost associated with this activity and the output in relationship to the rest of the model of sufficient importance that it must be more exact? If this is just a very small portion of the total cost, is it really necessary to obtain a lot of detail? Will an improper distribution sufficiently affect the output cost so as to change the outcome of major decisions?

The critical issue in this analysis is to understand the issues that will be relevant when the time for a final decision has arrived. The more the various issues and problems are understood, the easier it will be to arrive at a workable solution.

How long does it take to produce the output?

This particular dimension needs to be measured in two parts, the actual or cycle time and the elapsed or total time. The actual time is the time required to conduct the work of the activity from input to output without consideration or additions for processing delays or normal backlogs. The elapsed time is the actual time plus any normal delays or routine pauses that occur within the regular activity processing.

This information can be derived from records within the organizational elements that perform the activity or simple time measurement techniques and observations. For the purposes of accuracy, it is always better to have as much objective information as is available. If the information is somewhat subjective, such as the performance time kept by the individuals who perform the tasks, then it can be used, but should be validated by some other method at least on a sample basis.

Step 2 - Select the Output Measures

An ideal output measure is easy to understand, relatively simple to objectively measure, available from existing information sources, and directly related to the activity's output. It should also be economical and pragmatic.

Using the analytical information from Step 1, a decision is required to pick the output measures that will be used for this activity. This should consist of one primary output that can be readily observed and measured. Whatever measure is selected should meet as many of the criteria as possible. Even though a perfect measure will rarely be available that meets all of the criteria, it does not preempt the requirement to select something that will be used.

Examples of Activities and Possible Output Measures:

Pay Invoices

- Number of Invoices or
- Number of Line Items Paid

Shelve Books Number of Books Shelved

Answer Correspondence Number of Letters Answered or
Number of Response Pages

Deliver Mail Number of Letters and Packages Delivered

Fill Customer Orders Number of Customer Orders or
Number of Line Items

Conduct Legal Review Number of Requests or
Number of Responses or

Number of Pages of Responses

Make Policy Number of Decisions Required or

Number of Policy Statements Issued or

Number of Pages of Policy Issued or

Number of Requests for Policy

Step 3 - Determine the Activity Output Costs Per Unit of Output

This is a mathematical calculation. Using the amount of output measure that was selected in Step 2 and the total cost of the activity that was calculated in previous parts of the ABC process, the amount of cost per unit output is assessed by the equation shown in Figure 18.

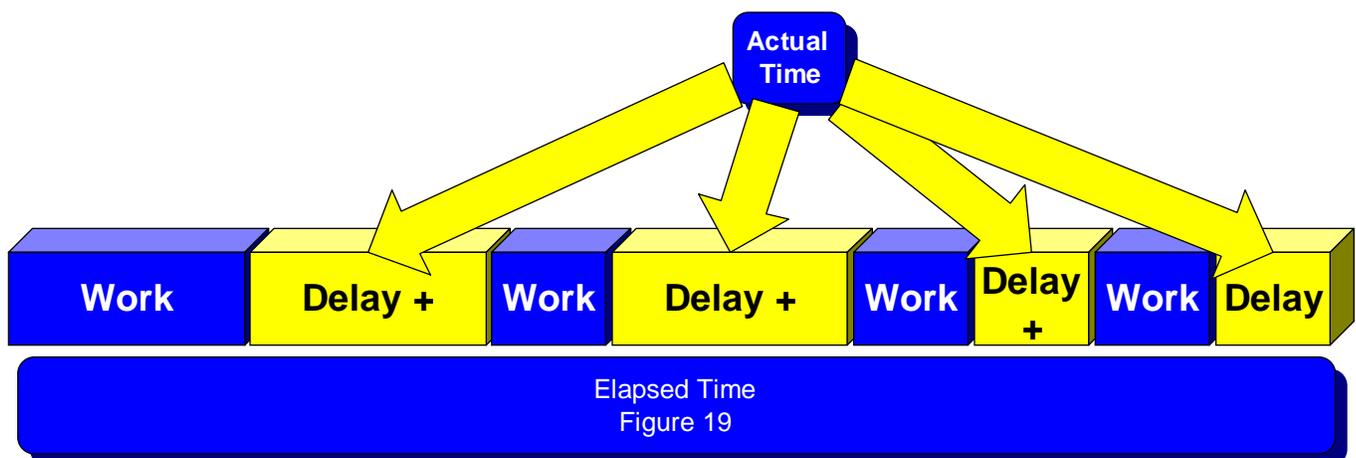
$$\text{Figure 18: Cost Per Output Unit} = \frac{\text{Total Activity Cost}}{\text{Total Units of Output}}$$

This factor will be used to allocate the consumption of this activity to the output in a process flow based on the units of output produced or for a single cycle of the output production.

Step 4 - Determine the Time Requirements

During the analysis in Step 1, information was gathered on the amount of time required to create one unit of output. This data should have been captured and recorded in two parts. The first part is the amount of actual time it requires if there were no unnecessary delays or postponements. A required wait, such as drying time for paint, would be part of the actual work time. The second time is the total elapsed time to complete one unit of output including all of the normal time delays. This would be the total time that has occurred starting when the activity begins until the output is released as finished and passed on to the next activity or customer. A graphic representation of the difference between these the actual and elapsed times is shown in Figure 19.

One factor that affects the total elapsed time and will require a separate decision is how to handle abnormal backlogs in the process flow that have occurred due to inefficiency, reduced resources, or unexpected work load. This backlog is an unnecessary delay in the work flow that was created by decision or lack of control and response by management. There are two schools of thought on how this issue should be handled.



First, the abnormal backlog is actually normal part of the current processing procedures and should be included in the elapsed time even though theoretically there should be no abnormal backlog to a properly designed system. It arose due to the current procedures and policies and must be addressed as a candidate for improvement.

Second, the abnormal backlog should not be considered in the elapsed time since it is the improvement of procedures that is at issue, not whether or not management is efficient. The backlog is insignificant as a factor in the decision model and will only skew the time that was designed into the current flow.

To assess a proper stance on this issue, the backlog needs to be analyzed. It is probably more important to determine if the backlog is a short-term situational problem as opposed to a systemic problem. If it is the former, then it does not make sense to include a unique problem into a continuing evaluation. However, in the latter case, if the backlog is a chronic problem, brought on for any reason, then it should be added since it is these failures in the current system that are the target of improvement by a reengineering project.

Step 5 - Document the Output Measures

Every step taken and decision made should be documented for the validation of the reengineering project. The documentation for output measures should include at a minimum:

1. The identification of the activity
2. The output-definition and measurement criteria
3. Procedures used to determine cost per unit of output
4. Actual and elapsed time measures - how they were measured and validated
5. Any special information or considerations - additional data that may be important to an evaluation

Documentation is a consistent behavior that must be included in each step of the functional reengineering project. Due to the number of decisions and judgment calls, other individuals need to review rationale and resolutions for reasonableness to ensure a valid model.

Output measures are the product of all of the effort that has taken place so far in the functional reengineering effort. In conjunction with the activity model and activity costs, these factors will enable to project team members to conduct intensive reviews and evaluations on the model and the processes represented throughout the model. It is important that the factors determined in the process steps be the best representation of the data and time available. As the case study demonstrates in the introductory chapter, if the data is not a fair representation, as the traditional cost accounting data was not, then the decisions that are made will be just as bad.

Chapter 6: Analyze Costs

The fifth major step in the ABC process is “Analyze Costs”. This is the culmination of all measurements and calculations that have occurred. In this stage, the activity model and process flows, in conjunction with its cost and time measurements, will be reviewed and analyzed in depth to determine the candidates for improvement that are the hallmark of the functional process review methodology. This is a totally creative procedure that is only possible because of the information that has been obtained through the ABC process phases and the detailed work of the project team, along with the activity accountant. There is no three or five-step approach which will mechanically render an effective new process design. This step is relatively open-ended with undefined specifics, but will yield results equal in proportion to the amount of effort applied.

Identification of Change Opportunities

The identification process begins when the activity model is under construction and never ends. Improving the processes and activities is the objective of the Functional Process Improvement methodology. It is a journey rather than a target event. Everyone who works on any piece of the project is a possible participant at any stage. If the methodology is inculcated into the culture of the organization, then there will be a continuous flow of change opportunities identified. There is no set pattern or procedure for finding or discovering change opportunities. It is an entirely creative process. As the model is being built, if a condition is identified, it should be noted for later review. As the costs are being captured, any irregularities or special cases should be documented for later review. When the costs are being distributed and allocated, if a strange or unusual condition is recognized, it should be marked for analysis. It is not necessary to wait until the analysis stage to begin an identification of change opportunities. The key is to establish a mechanism early in the project to capture any suggestions or recommendations. This listing will be the first source of actions.

Taking a New View

The discovery of new opportunities is a concept of stepping outside of the current limitations, forgetting previous assumptions, and breaking old paradigms. Radical thoughts and suggestions are acceptable. It is not a matter of small improvements or fixes; it is a desire to make dramatic change to the old ways and a

leap of faith to totally different ways. The object is to achieve massive savings in time and dollars by changing the basic rules and structure. Some basic achievements of past projects have been to eliminate inspections, remove job descriptions, create self-managed teams, eliminate time cards, and allocate authority to the employee. If a concept or process does not contribute value to the output, with value described as value to the customer, then it may not be necessary. If it is not required by law, then it should be eliminated or reduced substantially. Budgetary controls, work year restrictions, all defined standard operating procedures or policies and current work rules are all open for review and change. The major notion is that nothing in policy or procedures is sacrosanct.

Where to Look

Activities and work processes are the objective of reengineering or improvement processes, not the organizational elements. Merely reorganizing departments and branches will not achieve the dramatic results that are sought. The major purpose for so much effort in developing the activity model is to allow the reengineering effort to be applied to how the work is actually done, not how the entity is organized to accomplish the work. This model and the identification of the resulting process flows is intended to strip away the veneer of organizational structure that hides the real functions.

There are two basic areas available for review in selecting possible change opportunities. The first is the activity model. The second is the process flow(s) selected by the project team or management for primary review and improvement. The ABC process has collected and stratified several bits of information about the activities in the activity model which can now be applied to both. Below is a list of the characteristics which are now available for review.

The Activity Model

1. Total cost of the activity - The sum of all mechanisms employed within the activity to produce output.
2. Cost driver - The measure of activity output which quantifies what is produced.
3. Elapsed time - The total amount of time it takes to produce one unit of output to include all normal delays.
4. Cycle time - The actual time it takes to produce one unit of output not including any normal delays.

The Process Flow

1. Total cost of the process - The sum of all the activities employed to complete the process.
2. Cost of output - The sum of all the cost driver determined costs applied to the output as it passes through the activities. (This is comparative information and not absolute cost.)
3. Total elapsed time of the process - The sum of the elapsed times of the activities in the process flow.
4. Total cycle time of the process - The sum of the actual times of the activities in the process flow.

This still only gives a general area at which to look. Merely reviewing data and anomalies will not yield improvement suggestions. There are some symptom areas which have been noted by other redesign projects that automatically mark situations for possible reengineering efforts. Several key areas which might be of interest are suggested below:

- excessive interchange of information
- data redundancy and repetition
- multiple data capturing points for the same information
- inventories and safety stocks
- backup systems
- error correction and rework
- high ratio of verification and checking
- complex procedures
- exception processing
- special and one-time procedures
- overlapping responsibility and authority
- excessive time and resource consumption
- important or critical processes

Tools for Review Process

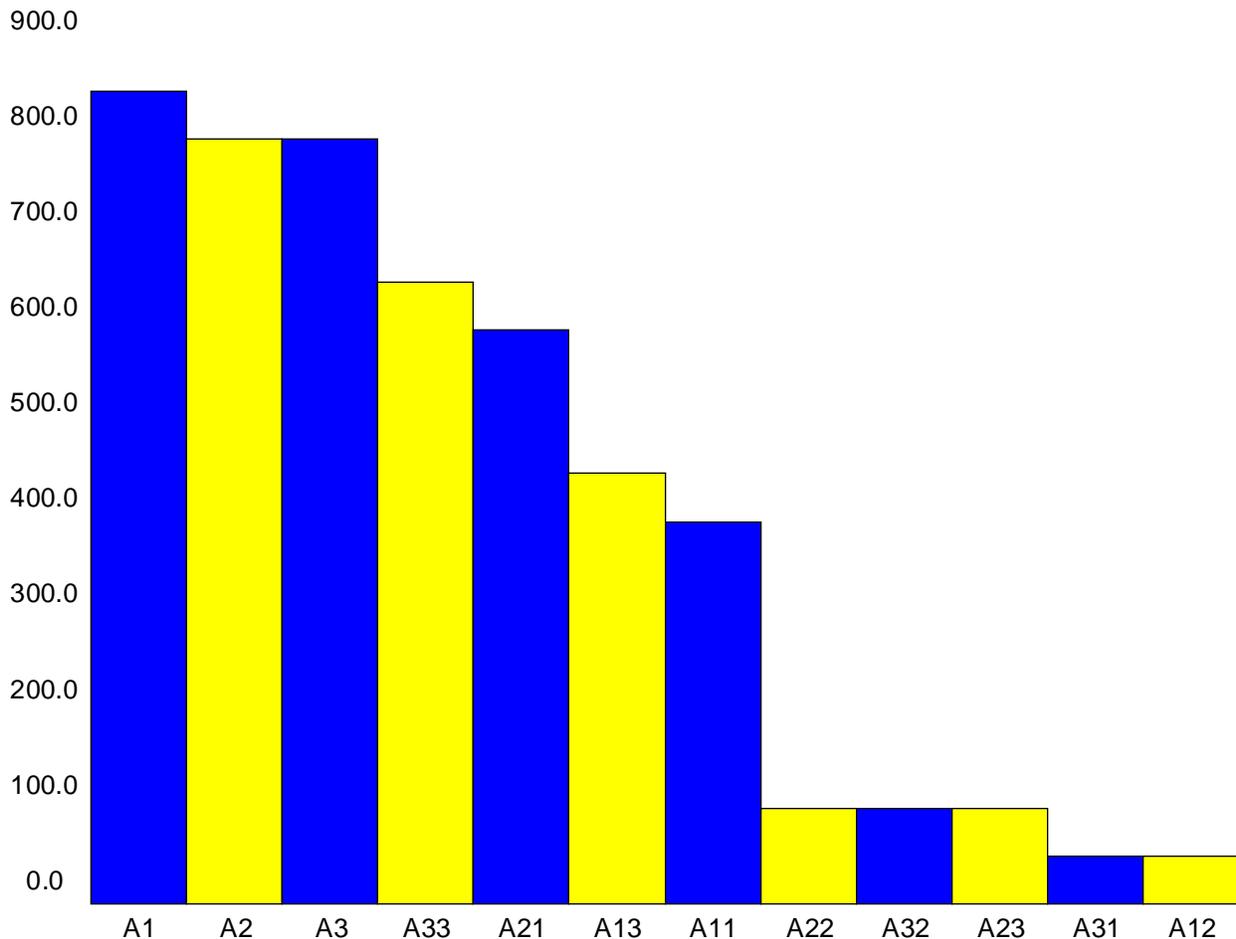


Figure 20

To convert the raw indicator data of the activities and process flow to useful information and change scenarios, requires a set of analysis tools that can be applied to the characteristic information. There are a multitude of helpful analysis tools available. Though they are not a replacement for intuition and thought, these tools are an adjunct that can be applied as creatively as imagination will allow to assist in the development of original ideas. The following partial list is some of the more important and useful tools that routinely yield productive results:

Pareto Analysis: Pareto analysis is a simple ranking tool to assist in the selection of the largest or smallest component of costs. Based on the theory that eighty percent of the total cost is normally generated by twenty percent of the activity, this analysis is used to array activities or elements of cost in various displays using different ranking criteria. An example of this analysis would be to array all activities by their total cost in columns from left to right with the highest cost first. This would yield a chart as shown in Figure 20.

Pareto Analysis Chart

Activity Costs: This type of analysis allows several very quick conclusions to be reached which can help target further attention into areas where significant improvements can be made. When limited time and ability are available, this tool can play a major role in prioritizing the application of reduced resources. Regardless of resources available, the results of even a rudimentary chart can yield helpful information. Following are some examples, using Figure 20, of conclusions that can be drawn from a simple Pareto display:

1. Activity A1 has the largest cost of the three A0 activities.
2. Even though A1 is the largest of the major activities, a further review of decomposed activities under the A0 level shows that A33, followed closely by A21, is the largest area of costs.
3. A33, A21, A13, and A11 comprise over eighty percent of the total costs.
4. First priority should be given to reviewing alternatives that would make major changes in A33 or A21. These two activities make up over half of the total activity model costs. Any improvements to eliminate or provide a cheaper alternative would have material impact.
5. Second priority should be given to reviewing the entire A1 activity node. This node has the potential, with over one-third of the costs, for substantial savings.

Pareto analysis quickly creates targets of opportunity for further review and study. Though the conclusions are rather simplistic, they are nonetheless meaningful for targeting follow-on work. This saves effort and maximizes time and resources available. Items within each area that have a potential for change can be decomposed and again arrayed in a Pareto chart to prioritize further analysis. The results are not useful by themselves but are a meaningful part of the procedure.

Benchmarking

Benchmarking is a method of measuring the performance of activities and processes against known or recognized leaders. Find someone who is doing it right or best and compare the differences. Learn from their procedures and methods to either apply or adapt them for internal use.

The candidates for comparison should be reasonably unrestricted. The objective is to find similar situations that can be observed and evaluated for improvement opportunities. The comparative processes may not be exactly the same but may bear characteristics that make them similar enough to use, such as, magazine subscriptions and catalog merchandise sales. The candidates can be either internal or external. Internal candidates may occur in areas other than those under review or may just be one element's superior performance. External candidates are naturally those from outside of the organization.

Benchmarking is an excellent tool for garnering ideas without the stress of original creative thinking. The major danger is that it will inhibit real improvement. The candidate for comparison and observation should not only be the best in their line of work but the best in the world, if possible. When this is not true or sometimes even when it is, the comparison allows the improvement team to observe a major performer and then set their improvement goals too low. This serves to limit what can be accomplished. Benchmarking is for gathering ideas, but the application and improvement should springboard from these ideas, not be limited by them.

Best Practices

Best practices is similar to benchmarking. It differs in that is not the review of a best process but of isolated best performances of parts of the process. These may also be internal or external. Finding the best tool, procedure or method is still an improvement with a potential productivity increase. This cross-fertilization of good ideas is excellent not only for creating new ideas in process design, but also as a mainstay program for continued excellence.

Value Added Analysis

This conceptual tool is a simple review technique to determine if elements within a process flow provide value. If an activity step in a process flow does not provide additional value, then it may be unnecessary with the possibility of being eliminated. This would be an immediate process improvement with minimal to no cost. This is a bit more difficult that it first appears.

The major question is, what is value? Value implies that something has worth. If it is value added, then it is worth more that it was before. The problem is that value is not necessarily a dollar figure. For instance, it costs just as much to paint a car white as it does to paint it shocking pink. The white car, however, has value to more people than a car that is shocking pink. The value in question is not of dollar improvement, but in value to the ultimate customer. Each activity must be evaluated from the view of the customer to determine if it has sufficient worth to be maintained.

Activities which are non-value added cannot always be removed just because the customer does not have an appreciation for its worth. Though the activity does not directly contribute value, it may be required for a variety of other reasons listed:

1. The current procedure or process may require this particular activity to make the current procedure or process work. This means that it may be eliminated only by redesigning or removing the current procedure or process. For instance, a remote payment site may require a dual certification of all payments, a clear redundancy. Automating or centralizing all payments would eliminate the entire remote process along with the redundant practice.

2. An activity may be required by the organization's mission, objectives, or strategies. Advertising, research, and development may not directly enhance the value of the current output for the current customer, but these functions may be required for the continuity and future business of the organization.

3. Some activities may be clearly non-value added but required by regulation or law. Safety standards, personnel protection requirements, or anti-discriminatory restrictions do not add value to the output. Each is required for societal reasons.

Value added analysis helps to identify potential activities that may be omitted immediately. Like the other tools, it is to assist the planners and project team. It must be used with discretion and good judgement.

Comparative Analysis

This methodology is a simple practice of comparing existing activities within the activity model or process flows. Best practices and benchmarking are aimed at finding the best method or procedure to replace or upgrade the existing structure from either an internal or external source. Comparative analysis is more targeted on similar activities or flows that exist in parallel within the activity model or process flow to ensure that they are being done the same "best" way. Assumed in this analysis is the possibility of combination or co-location of similar functions. Less sophisticated than some of the other tools mentioned, this is a review to ensure consistency within the activity model and process flows.

Cost Benefit Analysis

This is the simplest form of comparison between ideas to determine which is faster, better, or cheaper. Without regard to overall effects or to interrelational impacts, this analysis merely determines if a new element or minor change will be in some way improved over the previous option. The assumption is that if it is changed there will be a positive impact. If no other possibility for comparison on a larger scale is available, this is an effective tool. The inherent danger is that the selection of a change, that is cost beneficial as a stand alone solution, may be detrimental to other steps or activities within the organizational activity model. For instance, it would be cheaper to eliminate all copier paper, but the copiers would be rendered useless without the paper. The number one cause of problems is solutions. It is recommended, therefore, that one of the next two analysis tools be used whenever possible.

Economic Analysis

Economic analysis is a subset of a full functional economic analysis. More than a cost-benefit analysis, the economic analysis usually covers a small number of improvement alternatives which have been determined as feasible improvements by the project team. Like the functional economic analysis, economic analysis compares alternatives for the best overall solution in terms of dollars and time. Using data from the ABC activity model, the economic analysis looks to the future to add investment costs and projected costs of the suggested process. Overall, this becomes a two-step procedure. First, the team identifies and sorts out the improvement alternatives which have been developed, looking for the best and most feasible set of possibilities. Second, the resulting best alternatives are used in a full functional economic analysis.

Functional Economic Analysis (FEA)

The FEA is a technique for analyzing and evaluating alternative process improvements, management practices, and new investments in relation to the overall goals and objectives of the organization. This tool encompasses a vast array of information and policy into one evaluation. The result is a fully considered organizational decision that fulfills as many of the objectives and goals as possible at the most effective cost-benefit ratio. The full analysis includes the components shown in Figure 21.

Figure 21: Functional Economic Analysis Contents

1. Functional Area Strategic Plan
2. Functional Activity Strategic Plan
3. Performance Measure and Targets
4. Improvement Program
5. Economic Analysis
6. Data Management and Information Systems Strategy
7. Data and System Changes
8. Data and System Cost Analysis

The FEA plays two major roles in the functional process improvement process methodology. First, it gathers and interprets data needed by functional managers to choose the best set of process and activity improvements. Using the “AS-IS” model and “TO-BE” model with associated baseline and alternative costs, alternatives can be evaluated in light of functional goals, speed and cost—better, faster, cheaper. Second, it formally documents the total modeling process, data collection, and final decision structure. The total FEA packet contains all case history information for management review and continuing future actions. Official guidance describing what FEA is and its role within functional process improvement is contained in Interim Management Guidance on Functional Process Improvement (DoD 8020.1-M) and Corporate Information Management Functional Economic Analysis Guidebook, Version 1.0.

Structured Approach to Analyzing Costs

The entire process of analyzing and evaluating costs and improvement opportunities is one of the most challenging portions of the entire functional process improvement methodology. In conjunction with the guidance and tools which were already discussed, there is more than one approach which can be used to complete difficult tasks and draw creative conclusions which are required. Regardless of the method, there will still be a continuous demand on all of the participants for tenacity and ingenuity to make the process a success. Though not offered as a panacea, the following steps are suggested as approaches which contain all of the requirements and that lead the way along a path to making the project a reality.

Step 1: Training

Train all project team members in the basics of FEA, problem solving, and analysis techniques. At this point, functional knowledge is not sufficient to complete the project. Each individual must apply the tools at hand in order to identify conditions and opportunities. Not understanding the possible tools with their capabilities and limitations places an unnecessary restriction on the potential for success. The time invested in training will be more than repaid through the quality of the final solution.

Step 2: Awareness

Make the maximum number of people fully proficient and knowledgeable of the model, process flow(s) and terminology.

1. Review and understand the activity model and process flow.
2. Identify and document problems and improvement opportunities
3. Collect data on the problems and opportunities
4. Verify the legitimacy of the problems and opportunities
5. Prioritize the problems and opportunities

Step 3: Analyze

Analyze the list of problems and opportunities

1. Pareto analysis
2. Failure analysis
3. Cause and effect analysis
4. Comparative analysis
5. Other analyses

Step 4: Formulate

Create and define new process flows, procedures and improvement actions.

1. Benchmarking
2. Brainstorming
3. Suggestions
4. Best practices
5. Other techniques

Step 5: Select and Evaluate Alternatives

Review alternatives and select the best solutions and actions.

1. Cost-Benefit analysis
2. Economic analysis
3. FEA

Step 6: Document Final Recommendations

Records are critical in recreating the actions leading to the decisions and obtain support for implementation.

The Bottom Line

The major objective of the ABC process is to objectively determine a better way of doing business. The analysis of these costs and models serves to provide the basis from which these decisions can be made and evaluated. The determination of different and improved ways of accomplishing the major objectives and goals in a better, faster, and cheaper way is difficult to achieve even in the most simple structures. The project team and activity accountant must keep the ultimate goals of the project ever in mind if the project will ever be completed in a successful manner. When this is done and the work is accomplished, the results will more than pay for the means to get there. The bottom line is to achieve a better method of doing the right business of the organization.

Chapter 7: Final Thoughts

This chapter contains some omnibus subjects that address the role and capabilities of the activity accountant and activity accounting that are not specific to the functional process improvement and ABC processes. These are considerations that are tantamount throughout the current and follow-on projects.

Standards

The activity accountant is a critical player during all stages of the functional process improvement project. Beyond the more obvious technical tasks, there are a set of responsibilities which are required to ensure the integrity of the process and analytical data. These are standards of performance and excellence for the quality of the technical data:

1. The activity accountant establishes and maintains a high standard of professional reliability and discipline for the ABC process, existing data, and resulting projections. Cost data and estimates must be recorded and retained with sufficient documentation to meet acceptable audit requirements. This cannot be overlooked even under the pressure of timeliness and turnaround.

2. The activity accountant is responsible for providing the appropriate data to fully support the identified needs of the project and team members. This implies that the information required will be located, purified, interpolated, or derived to fulfill the condition. It is never expected, nor should it be expected, that data will be created or manufactured to support a conclusion or option.

3. The activity accountant should be the single source of all cost related information. The consistency of credibility and content of information is a professional judgement that can become skewed when different sets of options or assumptions are used. This does not preclude additional assistance or opinions from being included, but the final decision and evaluation should come from only one person.

Skills

During the course of the project, ABC translates the existing cost data from the organization to the new activity model. As has been shown, this seemingly simplistic process is in reality imbued with a multitude of judgement calls and policy decisions. This type of “soft” skill requires hard technical ability, knowledge and understanding. This becomes even more important when projecting the im-

part of potential changes and estimating investment costs. The individual chosen to fulfill the role of activity accountant should have a diverse background with strong accounting skills. It is highly desirable to have management, modeling, and analytical experience along with a technical accounting background and training. If this cannot be found in a single individual, it might be important to have more than one person work on this aspect so that the interactive experience will yield an acceptable result.

Activity Accounting

In the introduction, it was mentioned that activity accounting for the mature organization would not be used in the discussion of the ABC process. Because the ABC defined in this handbook is a single purpose approach to project costing, it is but a pale representation of full activity accounting. This reduced version meets the need for interim process improvement, but does not displace the theme that activity accounting is the best goal for the organization.

Activity accounting is the manifestation of continuous improvement. Constant gathering and evaluation of cost data from an activity accounting system, displayed along activity and output lines, gives management a first-class view of performance and an array of problem indicators to preclude crises. This is a meaningful goal to which all management should aspire. The difficulty has been in getting there.

The activity model, output measures, and analytical data from the full enterprise improvement process are not lost at the end of the project, if they are carried forward into the creation of an activity-based accounting system. Policies and judgements that are made during the project should bear this goal in mind. This will maximize the utility of the ultimate project results and pave the way for follow-on work. Improvement is not a destination but a journey that never ends. ABC is the beginning, and activity accounting is the mechanism to maintain the course.