Strategic cost management: an activity-based management approach

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The design and implementation of new strategic management initiatives, such as reengineering, have been common since the publication of Hammer and Champy's (1993) popular book on reengineering. In the process of designing and implementing these new initiatives, however, managers have virtually ignored the cost management system. Activity-based management (ABM) is a system that incorporates many of the concepts of strategic management reengineering and applies them to cost management. ABM consists of two viewpoints: a cost view and a process view. ABM is both an accurate cost accounting system (the cost view) and a performance evaluation tool (the process view). This paper presents the ten steps to design and implement an ABM system and offers an actual application.

Many organizations are designing and implementing new strategic management initiatives, such as reengineering (Hammer and Stanton, 1994). Reengineering and other strategic management initiatives have become popular since the publication of Hammer and Champy's (1993) *Reengineering the Corporation: A Manifesto for Business Revolution*. However, the cost management system has been almost completely ignored from the discussion. Activity-based management (ABM) is a modern cost accounting and management model that is consistent with the concepts of strategic management and reengineering. ABM is both an accurate cost accounting system and a performance improvement tool (Turney, 1991). Like reengineering, ABM focuses on business processes, which are collections of activities or work that result in valuable output. The purpose of this paper is to describe the design and implementation of an ABM system. The design and implementation steps are applied to an actual organization.

Overview of activity-based management

Business process reengineering (BPR) is a management tool for redesigning business processes in order to obtain dramatic improvements in performance measures, such as cost and quality. The idea behind BPR is to fundamentally revise all aspects of performing activities, from a revision of strategic goals and operating objectives to an alteration of work methods. Under BPR, work should be focused on processes and not functional tasks. BPR begins with a clear mission statement and continues with a redesign of processes in line with the mission statement.

Activity-based management (ABM) is similar in nature to BPR but adds the analysis of the cost management system. ABM consists of two primary viewpoints: a cost view and a process view. Under the cost view, ABM is a cost accounting system (called activity-based costing). It is a system that is used to more accurately determine the full costs of services and products. This system allows for the cost analysis of service activities (such as payroll accounting and duplicating), costs of core activities (such as production processes) and costs of products, services, and other cost objects.

Under the process view, ABM is used to develop financial and non-financial performance indicators for the output of each activity center. The two viewpoints of ABM are summarized in Figure 1. The goal of the cost view is to determine the cost of a product or service, while the goal of the process view is to measure performance. The attractiveness of ABM is that the same information system accomplishes both goals.

The principles of ABM can be used for budgeting, performance evaluation, and resource allocation decisions. Like reengineering, ABM is more concerned with planning and controlling the various activities or processes of a company, rather than its functional tasks.

Under an ABM system, a two-stage process is utilized. Resource costs are first assigned to activities, and then activity costs are assigned to cost objects (see Figure 1). In the first stage, the ABM system is designed to trace costs to activities or processes (i.e. activity centers). All tasks or work performed that result in a valuable output are grouped together into an activity center. Using ABM, the costs of operating each activity center is determined and reported. In the second stage, the costs of activity centers are traced to cost objects (i.e. products, departments, divisions, customers, or other defined services). In both stages, cost drivers are utilized to assign costs. The cost drivers have a causal relationship between the activity and the cost object.

Designing and implementing the process of ABM

Implementation steps
The steps necessary for designing and implementing the process view of activity-based management are outlined below. The steps are based upon procedures espoused by Hammer and Champy (1993) and Cooper *et al.* (1992). The steps follow:

1 *Develop a clear and succinct mission statement*. What is the organization's *raison d'être*?

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Figure 1
Activity-based management
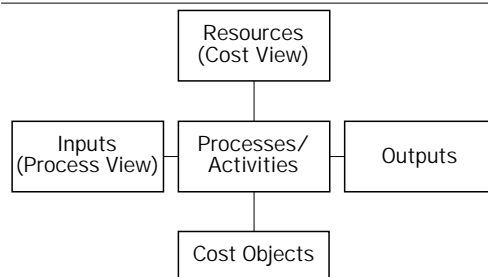
2 *Determine the core processes and the major cost objects*. What are the processes that are central to the mission of the organization? What are the items to be ultimately costed?

3 *Determine the supporting processes*. What are the processes that sustain the core processes, such as certain administrative activities?

4 *Form the process teams*. What teams should be in place to perform the core and supporting processes? As espoused by reengineering theory, the process teams essentially replace the old function-oriented departments. Each team consists of employees trained (or to be trained) to accomplish the activities within each process.

5 *Define the strategic objectives of each process*. What are the long-term strategies and goals of each process?

6 *Set the major operating objectives of each process*. How can the long-term strategies and goals be achieved?

7 *Identify the main activities in each process*. What are the activities (work to be performed) that encompass each process? In ABM terminology, these are the activity centers.

8 *Develop key performance indicators for each process and activity*. How should performance for each process and activity center be measured? The performance indicators may include both financial and non-financial measures.

9 *Define the cost drivers for each activity*. What is causing resources to be consumed by each activity and cost object?

10 *Take steps to ensure the acceptance of the new system*. Employees must be oriented and trained to implement the new system and understand its output.

Implementing the new system: a case study

To illustrate the design and implementation procedures of an ABM system, the results of an actual organization, a small college, are summarized. Prior ABM research discusses other industries besides higher education. For example, Cooper *et al*. (1992) discuss the

implementation strategies of ABM systems for eight companies: five manufacturing entities, one distribution company, one financial services provider, and one energy company; however, they did not include a college or university nor did they relate the design steps to reengineering. Anotos (1992) discusses ABM for not-for-profit organizations, but is not specifically related to higher education. Hammer and Champy (1993) discuss the implementation of business process reengineering for several companies, but they did not include a discussion of the accounting systems. Hammer and Champy's reengineering concepts were applied to higher education by the National Association of College and University Business Officers (1994). However, the cost accounting system was ignored in this publication.

During the summer of 1995, Hood College began to reengineer its work processes and to develop an activity-based management system. Hood College is a private institution of higher learning with undergraduate and graduate enrollments of approximately 1,100 and 900, respectively.

In July of 1995, an ABM team was formed, consisting of four members from the faculty and three members from various supporting staff positions. The main charge of this team was to diagnose the existing processes and oversee the redesign and implementation. In preparation for this task, a process inventory was conducted by the team. This consisted of interviewing the head of every functional department on campus, from administrative departments, such as accounting, to academic departments, such as English and Communications. This information was utilized to determine the reporting structures and work processes that were in place.

The results of the ten-step design and implementation of the ABM system follow.

Step 1: the mission statement

Hood College prepares students to excel in meeting the personal, professional, and global challenges of the future. Hood is committed to the integration of the liberal arts and technology, to the exploration of values and community, and to the preparation of students for lives of responsibility and leadership.

Step 2: the core processes and the cost objects

The ABM team determined which processes are central to achieving the mission of the college. This determination was made using various sources of information, such as a survey of the work processes, benchmarking, and individual interviews. Viewing students as the focal point of the college, the core processes are to attract, enroll and keep the students (the

enrollment management process); to feed, shelter, and provide for the wellbeing of the students (the student life process); to educate the students (the education process), and to provide the students with a window to the outside world (the external relations process).

The team also determined the cost objects. In a manufacturing environment, the cost objects are normally products or customers. The analogy then is that the academic programs are the "product" and the students are the "customers". Thus, there are two primary cost objects: academic programs and students. There are over 30 academic programs at Hood College, including undergraduate, graduate, core, and honors programs. Each of these programs is considered a cost object. There are six classifications of students, including traditional-aged residential, full-time traditional-aged commuting, part-time traditional-aged commuting, full-time non-traditional-aged commuting, part-time non-traditional aged commuting, and graduate students. Each of these classifications is considered a cost object.

Step 3: the supporting processes
The ABM team concluded as to which processes are absolutely necessary to support the core processes. That is, the team determined what processes must be in place to operate the core processes. With the core processes as the focal points, the key supporting processes are to gather, report, and provide information (the "management information" process), attract, hire, maintain, and release competent personnel (the human resources process), to finance the operations of the school (the financing process), to provide adequate facilities (i.e. the "physical facilities" process) and to adequately plan and control the strategies and operations of the college (the planning and control process).

Step 4: the process teams
One process team exists for each of the core and supporting processes; thus, there is an enrollment management team, a student life team, an education team, an external relations team, a human resources team, a management information systems team, a finance team, a physical facilities team, and a planning and control team. Except for the planning and control team, each team constitutes a stand alone team and includes a liaison member from each of the other teams. The planning and control team consists of a representative of each core process team, one member of a supporting process team, and the president of the college. Figure 2 summarizes the processes and the process teams.

Step 5: the strategic objectives
Each of the process teams was charged with developing long-term goals and objectives. To illustrate the development of strategic objective, one of the process teams is selected – the physical facilities team. The strategic goal of this team is to develop a long-range, forward-thinking facilities plan to support the programs of the college. The team is to formulate plans, policies, and procedures pertaining to facilities development, allocation, and use. The team has four focal points: space utilization and allocation, capital improvements, campus aesthetics, and maintenance.

Step 6: the operating objectives
The operating objectives define how the strategic objectives can be achieved. Again, the physical facilities team (PFT) is used to illustrate the implementation of this phase. The team proceeded to achieve its strategic goals by using several operating objectives. The first operating objective was to determine the space, capital, and maintenance requirements of the college community. The second was to develop an inventory of space utilization. The third was to prioritize the space, capital, and maintenance needs of the college. The last was to develop a facilities master plan. The PFT accomplished these operating objectives by conducting a campus-wide survey of needs, interviewing key personnel, inspecting the facilities, and considering the budget implications.

Step 7: main activities in each process
Each process consists of a set of activities that provides a valuable output. These activities are essential to each process. Each team was given the task of defining the main activities and redesigning them to provide a seamless process to the user of the service. The activities are listed below:
- *Enrollment management team*. The main processes are marketing the offerings of the college, communicating with prospective and existing students, obtaining information regarding the prospective and existing students, evaluating the applicants, accepting or rejecting them, pricing, providing incentives to accept, obtaining a commitment, collecting funds, assimilating the accepted students, and retaining the students.
- *Student life team*. The main processes are providing for the wellbeing of the students, providing them food and shelter, and communicating with them.
- *Education team*. The main processes are instructing, evaluating, mentoring, providing experiential opportunities, certifying, and providing for lifelong learning.

- *External relations team*. The main processes are providing the students a window to the outside world, continuing the commitment and communications with alumni, continuing to provide lifelong learning, and relating with the community.
- *Human resources team*. The main processes are attracting, hiring, maintaining (training, supporting, and evaluating), and, in some cases, releasing personnel.
- *Management information team*. The main processes are gathering and reporting information to various users, including the core process teams and other supporting process teams.
- *Financing team*. The main processes are budgeting, obtaining, redeeming, and controlling the financing needs of the college.
- Physical facilities team. The main processes are scheduling, maintaining, and controlling the facilities of the college.
- *Planning and control team*. The main processes are strategic and operational planning and control of all major college activities.

Step 8: the key performance indicators
Key performance indicators (KPIs) are financial and non-financial indicators of the performance of the college, a division, a team, or an individual. KPIs should be tied to the team's major output or value added to the process. Thus, the KPIs will vary by the type of service being provided by the team. For example, some of the KPIs for the enrollment management team are the matriculation rate

Figure 2
Process teams

of new students and the retention rate of returning students.

Step 9: cost drivers
As previously stated, ABM is a two-stage process: first, resources are assigned to activity centers, and second, activity costs are traced to cost objects. At Hood College first-stage cost drivers are needed to assign costs from supporting processes to core processes, and second-stage cost drivers are utilized to trace core process costs to the various academic programs and student classifications (cost objects). The first-stage and the second-stage cost drivers are included in Table I.

Step 10: gaining acceptance of the new system
The members of the ABM team used a variety of methods to gain acceptance of the ABM system. First, the president of the college fully supported the project. Second, all constituencies of the college (students, faculty, staff, and administration) were surveyed or interviewed on topics ranging from work processes and data availability to performance evaluations and communication. Third, the team discussed the entire process with key administrators. Last, members of the ABM team helped to facilitate the development of the process teams and acted as consultants to the teams.

Designing and implementing the cost view of ABM
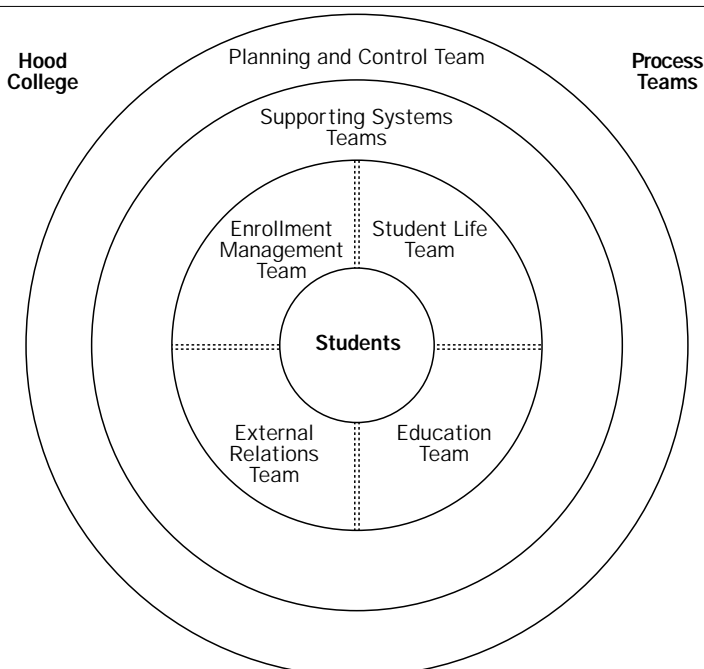
Implementation steps
The steps necessary for designing and implementing the cost view of ABM follow (Cooper *et al.*, 1992). The cost view of ABM is called activity-based costing (ABC):
1. *Determine the activity centers*. Activity centers were discussed in the process view (step 7).
2. *Assign costs to the activity centers*. Using first-stage cost drivers, costs are traced to the activity centers.
3. *Define the cost objects*. The cost objects were discussed in the process view (step 2).
4. *Link activity costs to the cost objects*. Using second-stage cost drivers, costs are assigned from the activity centers to the cost objects.

Implementing the new system: a case study
The Hood College example from the process view is continued here. Hood College has eight service activity centers, four core activity centers, and over 30 programs in 15 departments. Since there are so many programs, it is difficult to illustrate all of the mechanics of the activity-based costing (ABC) system; therefore, only a portion of the activities and programs at a college are presented.

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The steps illustrate the actual approach used to design the system at Hood College, but the numbers and programs are disguised.

Assume that the college has two academic programs: Program A is a low-volume one (i.e. it has a low student-faculty ratio of 10:1), with 2,000 students, and Program B is a high-volume one (i.e. it has a high student-faculty ratio of 20:1), with 4,000 students. Costs for faculty salaries average $30,000 in each department and each department has 200 faculty members; thus, the total salary cost in each department is $6,000,000 ($30,000 × 200).

The total overhead costs of providing these programs is $33,000,000 per year. Although each program has the same number of faculty members and program B has more students, program A requires more space for laboratories, classrooms and the like as compared to program B.

The direct cost of operating each program is only the salaries of the faculty members. The direct cost per student for program A is $3,000 per student (i.e. $6,000,000 salaries, 2,000 students) and for program B is $1,500 (i.e. $6,000,000 salaries, 4,000 students).

If the college allocated indirect costs (overhead) to programs based on the number of students in each program (i.e. a volume-based costing method), then the overhead application rate would be $5,500 per student (i.e. $33,000,000 overhead, 6,000 students). Using this rate, the cost per student of operating each program would be:

	Program A	Program B
Salaries (direct costs, from above)	$3,000	$1,500
Overhead rate (indirect costs)	$5,500	$5,500
Total costs per student	$8,500	$7,000

The problem with this volume-based costing method is that it considers only the number of students and ignores the impact of other factors, such as the space occupied or the number of computers used by the programs. Since other factors are being ignored, each program is assigned an equal amount of overhead costs per student. While this method is simple to apply, it is only relevant when other factors affecting overhead are not significant. In institutions of higher education, factors other than the number of students are significant in determining overhead costs for a particular program. Owing to this problem with the volume-based approach, the college decided to design and implement an activity-based costing system. With ABC, costs that were once considered to be indirect costs (overhead) are now traced directly to cost objects (programs).

Step 1: activity centers
Assume that the college analyzed its operations and identified three core activity centers (i.e. enrollment activities, student support activities, and academic activities) and four service activities (i.e. human resources, computing, duplicating, and maintenance services).

Step 2: cost assignment to activity centers
The determination of the costs per item for each of the activities is included in the Appendix. For simplicity, reciprocal services provided among activity centers, such as duplicating services provided to human resources, are ignored.

Step 3: cost objects
As discussed in the process view, cost objects for colleges are academic programs ("products") or students ("customers"). In this simple example, the cost objects are the two academic programs: Program A and Program B.

Step 4: cost linkage from activity centers to cost objects
Costs are linked to cost objects using cost driver rates for each activity. The cost driver rate for each activity is determined by dividing the total cost of each activity by the total expected activity of the cost driver. The Appendix includes all of the cost driver rates.

Analysis of ABC information
In the past, the college has been charging $5,500 in overhead cost per student in either program; whereas (per Table I) it should have been charging $6,845 in overhead cost to each student in program A and only $4,827 to each student in program B. As a result of using the volume-based costing method, too little overhead has been charged to program A and too much has been charged to program B. Through

Table I
Cost drivers

First stage cost drivers	
Supporting activities	*Cost drivers*
Human resources	Number of employees
Payroll and other accounting	Number of employees
Management information systems	Number of computers
Utilities	Square feet occupied
Physical facilities	Square feet occupied
Duplicating	Number of copies
Security	N/A: facility sustaining
Other administration	N/A: facility sustaining
Second stage cost drivers	
Core activities	*Cost drivers*
Enrollment management	Number of new students by type
Student life	Number of students by type
Education	Number of students by type and number of faculty
External relations	Number of students by type and n/a: facility sustaining

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Table II
Volume-based versus activity-based costing

	Volume-based costing		Activity-based costing	
	Program A ($)	Program B ($)	Program A ($)	Program B ($)
Tuition revenue	9,000	9,000	9,000	9,000
Salaries	3,000	1,500	3,000	1,500
Other costs	5,500	5,500	6,845	4,827
Total costs	8,500	7,000	9,845	6,327
Income (loss)	500	2,000	(845)	2,627
Number of students	× 2,000	× 4,000	× 2,000	× 4,000
Total income (loss)	1,000,000	8,000,000	(1,690,000)	10,690,000

ABC, overhead costs that are traceable to each program have been identified and thus cost data are more accurately determined. Assuming that tuition revenue is $9,000 per student, the unit costs and profit/loss per student and in total are presented in Table II for both volume-based costing and ABC. What looks like a profitable program under volume-based costing, program A actually incurs a loss of $845 per student or a $1,690,000 total loss.

The pattern of cost distortion under volume-based costing methods is quite common. When an entity installs an ABC system, overhead cost is often shifted from the high-volume programs to the low-volume programs, resulting in a higher cost per student for the low-volume programs. The reason for this shift is due to the way overhead costs are treated. Rather than treating overhead cost as a lump amount and spreading it uniformly over all students, ABC attempts to trace costs to specific programs. Since low-volume programs, with low student-faculty ratios often require the same amount of total support (such as space and maintenance) as high-volume programs, they typically are responsible for the incurrence of a disproportionately large amount of overhead costs. As this cost is traced to the low-volume programs, it drives their cost per student upwards.

Uses of ABM information

The output from the ABM system can be utilized for many purposes. The costs of all activities and all programs are more accurately determined. As a result of having more accurate activity and program costs, college administrators are in a position to make better decision relating to resource allocation, program retention, marketing strategies, program returns, and the like. Some application questions on how the information from the ABM system is utilized follow:
- Budgeting: how many resources should be allocated to activities and programs?
- Performance evaluation: how well did the activity centers perform? Note that there are non-financial indicators of performance, as well as financial. For example, how many new students does the enrollment activity center process? How many copies does the academic activity center use?
- Efficiency reports: how efficient were the programs? For example, Program A at the college appears to cost much more per student than Program B.
- Pricing/tuition: what should the college be charging for tuition? With accurate cost of operating each program, tuition can be set at an appropriate rate to obtain an adequate return.

When an organization is in the process of designing and implementing a strategic management initiative, such as reengineering, the cost management system cannot be ignored. Using an ABM system, the costs of operating the activity centers, as well as the costs of the products and services can be determined. The cost figures will not be exact, but they will be approximately right. Current cost management systems are very precise in their measurements, but the problem is that their measurements are not relevant to decision making. ABM is the cost management side of strategic management and should proceed in tandem.

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Appendix: Activity-based costing example

Table AI
Basic data

Activity center	Cost driver	Estimated traceable costs ($)	Total expected activity (of cost driver)	Expected activity: Program A	Expected activity: Program B
Human resources	Employees	1,000,000	500	250	250
Computing	Computers	2,000,000	2,000	1,200	800
Duplicating	Copies	100,000	100,000	40,000	60,000
Maintenance	Square feet	5,000,000	50,000	30,000	20,000
Enrollment	New students	12,000,000	1,500	500	1,000
Student life	Total students	9,000,000	6,000	2,000	4,000
Academics	Faculty	4,000,000	400	200	200

Table AII
Step 2 – cost assignment to activity centers

Activity center	Estimated traceable costs ($)	Total expected activity (of cost driver)	Cost driver rate (cost per item)
Human resources	900,000	500 employees	$1,800/employee
Computing	2,000,000	2,000 computers	$1,000/computer
Duplicating	100,000	100,000 copies	$1/copy
Maintenance	5,000,000	50,000 sq. ft.	$100/sq. ft
Enrollment	12,000,000	1,500 new students	$8,000/new student
Student life	9,000,000	6,000 students	$1,500/student
Academics	4,000,000	400 faculty	$10,000/faculty

Table AIII
Step 4 – cost linkage to cost objects

Activity center	Cost per item	Program A Expected activity	Program A Amount ($)	Program B Expected activity	Program B Amount ($)
Human resources	$1,800/employee	250	450,000	250	450,000
Computing	$1,000/computer	1,200	1,200,000	800	800,000
Duplicating	$1/copy	40,000	40,000	60,000	60,000
Maintenance	$100/sq. ft	30,000	3,000,000	20,000	2,000,000
Enrollment	$8,000/new student	500	4,000,000	1,000	8,000,000
Student life	$1,500/student	2,000	3,000,000	4,000	6,000,000
Academics	$10,000/faculty	200	2,000,000	200	2,000,000
Total costs			13,690,000		19,310,000
Number of students			2,000		4,000
Cost per student			6,845		4,827.50

Application questions

1 If activity-based costing is as effective as many authors claim it to be, why do more people not use it?

2 Is ABM the natural partner to a business process management approach?