

Cost Accounting and Cost Accounting Systems in Health Care Organizations

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HEALTH CARE INDUSTRY – COST ACCOUNTING OVERVIEW

The Health Care Environment during the 1990's has emphasized managed care principles where health care manager's efforts were directed to "reduce cost" and "maintain quality". The conflict created over cost reduction and quality improvement of health care services has created a greater need to know and understand the costs of the health care delivery system. The conflict has also created stress between the government, the employers, insurance companies (including HMO's), providers (including hospital, primary care physicians & specialty physicians) and ultimately patients. Each of these organizations has an interest in the cost and quality of the health care services being delivered, which has led to the increasing interest and development of cost accounting systems during the 1990's.

The driving force behind the development of cost accounting systems in health care organizations has been the change from fee for service and cost based reimbursement to prospective payment and capitation as a dominant form of payment to health care providers. Under the former reimbursement systems there was no incentive to reduce costs. If a provider performed a service they were paid a set fee or actual cost. The two major objectives under prospective payment and capitation are to control the growth of health care expenditures and manage the utilization of health care resources. Therefore, under these reimbursement systems cost management is integral to the success of the health care organization.

EVOLUTION OF COST ACCOUNTING

Departmental Costing

Historically, cost accounting has focused primarily on hospitals and hospital systems. This, in part, has determined the evolution of cost accounting. Initially, hospitals were interested in departmental costs, a department being defined as an organizational unit, which is responsible for a specific function, such as, laboratory, radiology etc. These departments could be responsible for strictly expenses or both expenses and revenues. Hospital's internal organizational structures, state cost reporting filings and the Medicare cost reimbursement filings have been set up based upon the departmental cost structure. Departmental costing would focus on the cost of producing a specific service (lab test, a radiology exam, etc.). To the extent that different types of services performed in a department the cost per unit might differentiate between the different

types by assigning Relative Value Units (RVU's) to each procedure. This is important to the management of the individual department.

Although departmental cost management is important to the management of the hospital it does not focus on the product being produced by the hospital, the care delivered to the patient. Diagnosis Related Groups (DRGs) represent one way of defining the product by patient by specialty. The ability to define the product is important prior to developing the cost accounting system in order to understand the required flow of cost information to provide the service. To paraphrase Yogi Berra, "If you don't know where you're going, you might end up somewhere else."

Product-Line Costing

Under the Prospective Payment System, DRG's became the foundation for payment from Medicare and ultimately many other payers. The reimbursement for a specific DRG is a fixed amount. Under this type of reimbursement system the relationship between the product's price and cost is essential for understanding the financial impact different types of patients have on the health care organization. If the cost of DRG 1 (Craniotomy Age > 17) is substantially higher or lower than the revenue paid by the insurance companies, the health care managers need to know why. What is the impact on the organization if a service is added or dropped? What is the impact on the surgical service profitability if ambulatory surgical services have to be priced at the competitive rate of a local freestanding ambulatory surgery center? What is the lowest price the organization can charge to an HMO for a particular service or procedure? If they want to be able to answer these questions, it is imperative for management to have a product line costing system in place in order to manage effectively.

Process Costing, Job Order Costing and Standard Costing

Product line costing approaches to accumulating costs and assigning them to products or services are generally accomplished through some form of "job-order" or "process costing" system. Job order costing is used to directly assign costs to patients that consume different amounts of resources. Process costing is used to allocate costs to patients that consume approximately the same amount of resources. Job order costing requires more detailed information to be retained and produces more accurate cost information. Process costing is less accurate than job order costing; however, it may generate costing data, which is reasonable for management purposes and is less expensive to obtain. Generally, most health care organizations use a combination of job order costing and process costing systems. No matter what product costing approach is chosen, there will invariably be some averaging of costs. Process costing averages costs over a large number of patients, whereas job order costing averages costs over a small number of patients.

In addition to developing actual incurred costs by patient, it is important to know how much it should have cost to treat the patient. Standard costs are predetermined estimates of what it should have cost to treat the patient for a specific illness. Standard costs are developed using actual costs, time-and-motion studies, etc. Several of the larger cost accounting systems build cost standards by cost types and cost categories.

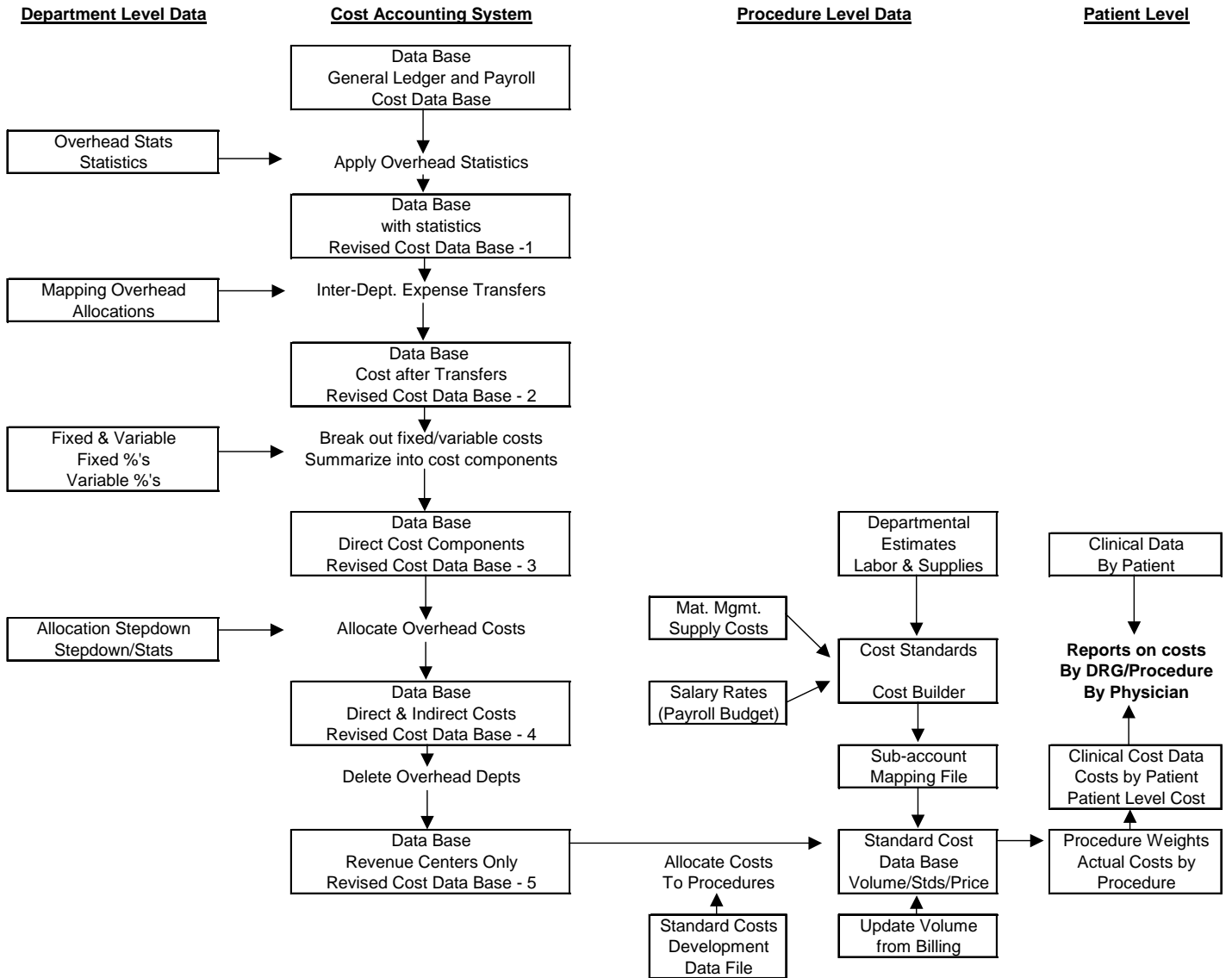
RVU's by cost type and category form the fundamental foundation for building cost standards. RVU's could represent minutes for the cost type variable labor but can represent any weighting scheme for all other cost types. The standard cost builders used in the more popular cost accounting systems utilize a variety of costs (fixed, semi-fixed, and variable) to derive a standard cost measure.

HEALTH CARE PRODUCTION PROCESS: INTERMEDIATE PRODUCTS AND PATIENTS

Typically the production process for health care product line costing is divided into two phases. Phase one converts hospital resources into intermediate products i.e. the cost of laboratory services, nursing services, operating room time, radiology services, etc. The second phase assigns the intermediate products to patients. The patients are identified as DRG's, ICD-9-CM's or any classification system deemed appropriate by the health care organization. The distinction between the two phases of the production process is important, in that, it reflects the difference in management control. The intermediate products are controlled in the departments and the efficient production of these products is the responsibility of the department managers. The utilization of these intermediate products is the responsibility of the physician; therefore, the amount and mix of intermediate products used by a patient will vary by physician. Both intermediate products and patient costs can have standard costs developed for management purposes.

Figure 1 outlines an example of the process used to develop a typical product line cost accounting model utilized by over 500 hospitals nationwide.

**Figure 1
PRODUCT LINE COSTING MODEL**



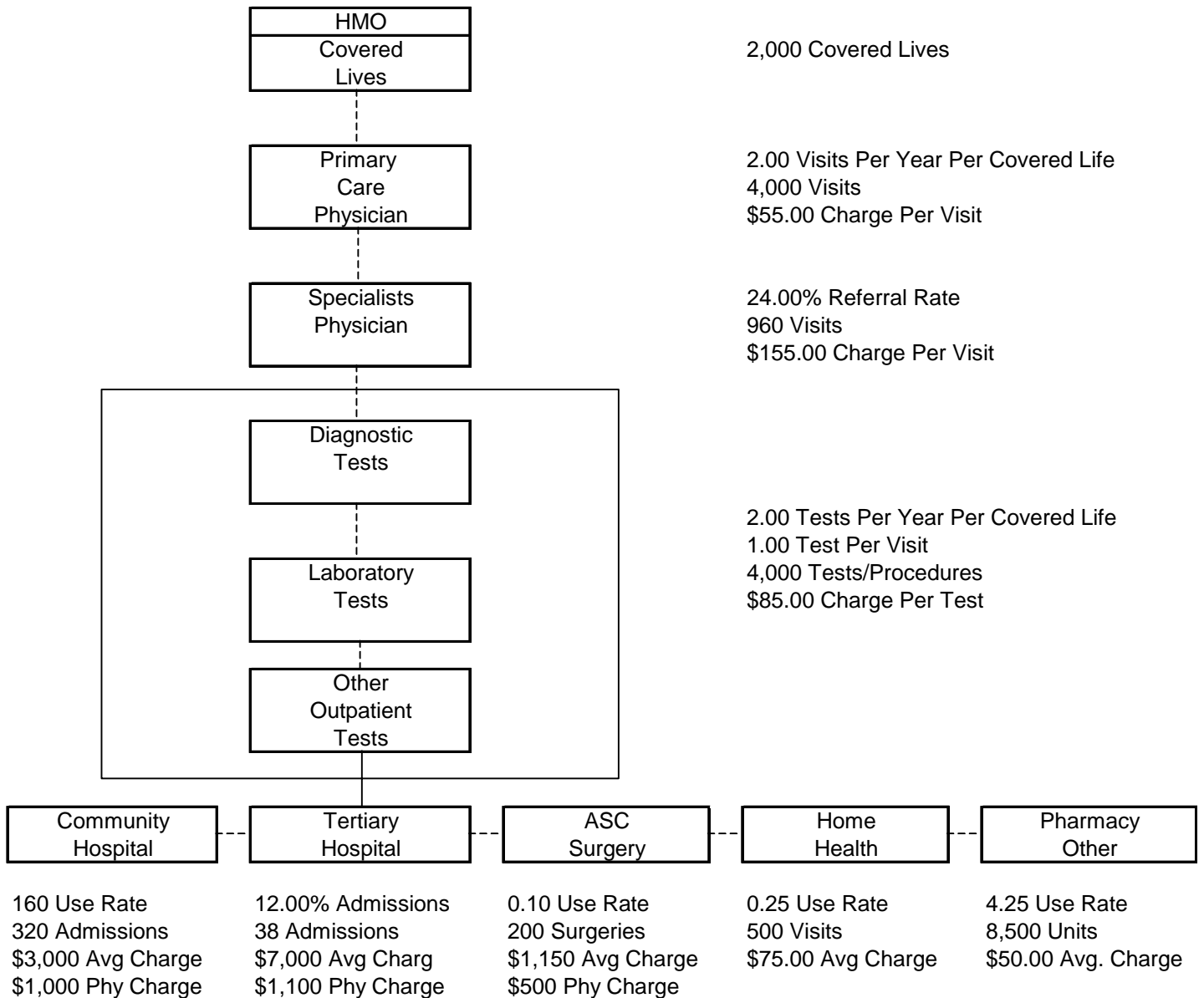
Cost Accounting in the Millenium – The Growth of Activity Based Costing

Traditional cost accounting, first developed by General Motors 70 years ago, postulates that total cost is the sum of the costs of individual operations. Activity based costing shows us why traditional cost accounting has not worked for service (health care) companies. It is not because the techniques are wrong. It is because traditional cost accounting makes the wrong assumptions. Service (health care) companies cannot start with the cost of individual operations, as companies have done with traditional cost accounting. They must start with the assumption that there is only one cost: that of the total system.

The famous distinction between fixed and variable costs, on which traditional cost accounting is based, does not make much sense in services. Neither does the basic assumption of traditional cost accounting: that capital can be substituted for labor. In fact, in knowledge-based work especially, additional capital investment will likely require more, rather than less, labor. Organizations have found that: all costs are fixed over a given time period and that resources cannot be substituted for one another, so that the total operation has to be costed i.e. activity-based costing. Health care organizations are therefore beginning to shift from costing only what goes on inside their own organizations to costing the entire economic process, in which even the largest health care organizations are just one link. This is referred to as economic chain costing. In health care this move toward economic chain costing is the result of the shift from cost-led pricing to price-led costing. The advent of capitation and market pricing of services is forcing health care organizations along with insurers (HMO's) to look at the cost of the entire health care process. Figure 2 outlines globally the various providers involved in the economic process.

Exhibit 1 summarizes the costs associated with providing care to patients over the continuum of providers, the payers and the patient in the economic chain. By observation, the exhibit indicates that there must be areas of conflict between the various parties in the economic chain if there is a fixed budget. This conflict exists because managed care is forcing providers to deal with the fact that there is a fixed budget to be divided amongst the various providers and the HMO. There will also be conflicts between the providers and payers with the patient since the patient is ultimately responsible for paying the bill either in premiums or taxes. The following conflicts will make cost accounting for all of the various provider entities more important:

Figure 2
ACTIVITY BASED COSTING & ECONOMIC CHAIN COSTING



1. **The Providers, HMO's and the government (Medicare & Medicaid) and the Public will be in conflict** over the high cost of health care. The public will demand more services at the same or lower cost. The inclusion of prescription drugs for Medicare beneficiaries will be a critical debate during the next decade between the growing number of baby boomers and the ability of Medicare to fund the cost.
2. **Primary care physicians and specialty physicians will be in conflict with the hospital** over the distribution of the budget. Higher hospital payments per day will mean lower fees for physicians and vice versa.
3. **Primary care physicians and specialty physicians will be in conflict** over who has control of the patient. Physicians have been in debate over who should have control of the treatment for the patients and ultimately control the quality and cost of services that are provided.
4. **Managed care organizations and payers will be in conflict with the primary care physicians, specialty physicians, hospitals and other providers** on the cost and quality of services. They will also be in conflict over who has control of the premium dollar.
5. **The government and providers will be in conflict** over the amount of money the government will pay for Medicare, Medicaid and uncompensated care.
6. **The academic medical centers and community hospitals** will be competing for patients on the basis of cost and quality. Each has a distinct role; however, the payers and the government are pitting the various providers against each other in their quest to obtain a larger portion of the health care budget.

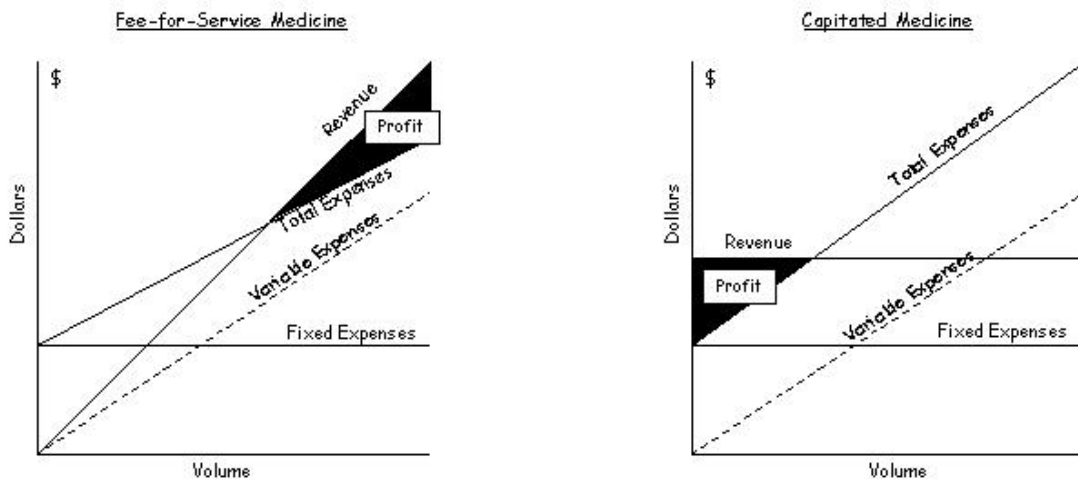
Exhibit I is an example of the distribution of the health care budget in the economic chain of a commercial health care product. The dollars are larger but similar for the Medicare health care budget. Figure 3 shows the importance of cost accounting when there is a fixed budget for health care services.

The future does not look good from the standpoint of increased provider payments for health care services. The Medicare Balanced Budget Act of 1997 significantly reduced the reimbursement for Medicare services and yet a key component of the health care budget is still not provided as a benefit, prescription drugs. Over the next decade beneficiaries will demand more benefits, providers will want higher payments for the services they provide and the government will attempt to develop a revenue stream to

Exhibit I
ACTIVITY BASED COSTING & ECONOMIC CHAIN (COST OF THE ENTIRE ECONOMIC PROCESS)

<u>Healthcare Organization</u>	<u>Use Rate</u>	<u>Units</u>	<u>Cost or Price Per Unit</u>	<u>Total Cost or Price</u>	<u>Total Cost or Price PMPM</u>	<u>% Cost or Price PMPM</u>
Subscriber Premium		2,000		\$3,720,000	\$155.00	100.00%
HMO/Insurer				\$631,500	\$26.31	16.98%
<u>Medical providers:</u>						
Primary Care Physician	2 visits per member	4,000	\$55.00	\$220,000	\$9.17	5.91%
Specialist Physician	24% Referral Rate	960	\$155.00	148,800	\$6.20	4.00%
Outpatient Diagnostic/Other	2 Tests per member	4,000	\$85.00	340,000	\$14.17	9.14%
Outpatient Surgery	.10 per member	200	\$1,150.00	230,000	\$9.58	6.18%
Outpatient Surgery - Physician		200	\$500.00	100,000	\$4.17	2.69%
Community Hospital	160 Admits/1,000	320	\$3,000.00	960,000	\$40.00	25.81%
Community Hospital - Physician		320	\$1,000.00	320,000	\$13.33	8.60%
Tertiary Hospital	12% of Admits	38	\$7,000.00	268,800	\$11.20	7.23%
Tertiary Hospital - Physician		38	\$1,000.00	38,400	\$1.60	1.03%
Home Health	.25 per member	500	\$75.00	37,500	\$1.56	1.01%
Pharmacy/Other	4.25 per member	8,500	\$50.00	<u>425,000</u>	<u>\$17.71</u>	<u>11.42%</u>
Total Medical Costs				<u>\$3,088,500</u>	<u>\$128.69</u>	<u>83.02%</u>
Panel Size		2,000				

Figure 3
Evaluation of Capitated or Fixed Budgets



pay for the added benefits and higher provider payments. Politically the baby boomers will have more and more political clout in order to increase the benefits provided to the elderly. Politically the government will have trouble increasing taxes to fund these benefit programs on a tax paying population, which will be smaller than it is today. Therefore, the providers will, in all probability, have to bear the brunt of the health care budget cuts. The implications are clear for hospitals, HMO's and other providers which represent a significant part of the health care budget: The hospitals, HMO's and other providers will have to figure out how to provide their health care services at a lower cost. This means that the importance of cost accounting will increase in the future. As good as a hospital or hospital system is in managing costs and maintaining quality, the health care organization will have to get better!

Despite the elegance of activity based costing, the economic as well as technical feasibility of implementing such a cost accounting system must be evaluated. That is, will the benefits derived from activity based costing system more than offset its costs of implementation and whether it is feasible to identify all of the activities that consume resources, in order to accumulate costs per type of activity. In the development of activity based costing systems, an activity analysis has to be conducted to identify activities that consume resources. This involves a detailed study of the entire organization's logistics and accounting information systems, and it is an expensive project in itself. It can be quite difficult and time consuming to identify and trace resource consumption to a specific activity because of the complexities involved. Therefore, it may be technically infeasible for some organizations to implement activity based costing.

DETERMINE WHEN COST ACCOUNTING SYSTEMS BE IMPLEMENTED

Goals and Objectives of a Cost Accounting System

Cost accounting systems generate information for a variety of purposes. Prior to implementing a cost accounting system management needs to determine the goals and objectives of the cost accounting system. The type of cost accounting system developed depends substantially on the type of information needed by management on a routine and on an ad-hoc basis. The managers within the organization must determine the provider organizations information needs. The installation of a cost accounting system often requires a major time commitment by all managers throughout the organization. If managers are not involved in the development and specification of the goals of the cost accounting systems it is unlikely they will support the efforts required to make the cost accounting system function effectively.

The development of the goals of the cost accounting system must find the link between the accuracy of the cost accounting system and the timeliness of the data and the cost of producing that data. When management has mastered the relationship between cost, accuracy and timeliness, they will be able to make decisions on whether increased levels of accuracy or timeliness are worth the cost.

An example of some goals and objectives of the provider organization are as follows:

Organizational Goals (Management Costing and Product Costing):

- Implementation of detailed cost management capabilities
- Evaluation of service line profitability and the financial impact of the promotion of specific product lines
- Assessment of strategic initiatives
- Negotiation of contracts with third parties based upon fixed and variable costs
- Facilitate performance measurement through cost variance analysis
- Support systems of utilization management and efficiencies
- Assist in long term planning and capital acquisition
- Improve the budget process

Departmental Goals:

- Supplement analytical tools available to department managers enabling them to further understand and manage their areas of responsibility
- Quantify resources required to perform patient services on a procedural level
- Identify the interrelationship between departments in providing total patient care
- Provide cost based input in establishing prices
- Allow department managers to better identify areas of economy and efficiency

Reporting Goals:

- To be able to report costs at a number of different levels:
 - Procedure Charge Code
 - Department
 - Patient
 - Physician
 - Payer or Financial Class
 - CPT-4 Code
 - ICD-9-CM diagnosis or procedure
 - DRG or MDC
 - Product Line
- To be able to break down the components of cost:
 - Direct fixed salary
 - Direct variable salary
 - Direct fixed nonsalary
 - Direct variable nonsalary
 - Direct capital
 - Indirect capital

- Indirect other

There are additional considerations in designing and implementing a cost accounting system. When is the cost information needed and at what level of detail? There are trade-offs in system responsiveness and the level of detail which management would like to see.

Information should never be collected if the cost of the data collection exceeds the benefit from the improved decisions made based on the availability of that information.

Cost accounting systems are very complex by their nature. In order to mitigate the potential problems arising from this complexity it is important to consider several factors in the design of the cost accounting system;

- Development of Ad-Hoc and Exception Reporting in order to minimize the impact of information overload
- Establish Quality Control procedures to maintain the reliability of the system
 - Test the cost accounting system frequently
 - Verify data input
 - Validate the system
- Cost accounting system should be flexible and accommodate a variety of users
- Cost accounting system should be dynamic, not static. The cost accounting system should be able to respond to changes in the environment.
- Individuals throughout the organization should be able to access and use the system. The successful operation of the system should not depend on one person!

Who Will Use the Cost Accounting System

A survey of healthcare financial managers by the National Healthcare Financial Managers Association found that the most important management information system application for the next five years will be cost accounting. This survey was prepared in the early 1990's and is still valid today. The primary users of the cost accounting information have been identified as:

- Outside third parties such as:
 - HMO's
 - American Hospital Association
 - Internal Revenue Service
 - Medicare and Medicaid
 - Other third parties
 - Community
 - Politicians
- Executive Management

- Operational Managers
- Physicians

WHAT IS THE PROCESS AND THE COSTS TO IMPLEMENT A COST ACCOUNTING SYSTEM?

The evolution of cost accounting systems is dynamic and will continue to change over the next decade. In the future management information systems will be collecting claims data by patient in order to capture the total cost of treating a particular patient. Technological change will allow health care managers to deal with this level of detail in an efficient manner. The process to implement a cost accounting system and the costs of implementing a cost accounting system will also change as the health care system changes. However, there are certain steps in the process of implementing a cost accounting system, which should not change significantly. Additionally, the cost of a cost accounting system will vary based upon a number of factors. The following steps are generally followed in the installation of a cost accounting system:

1. Establish goals and objectives of a cost accounting system
2. Plan and design the cost accounting system
3. Evaluate and select the cost accounting system
 - Determine the cost of the cost accounting system
 - Cost of Software
 - Cost of Hardware
 - Cost of Installation
 - Cost of Maintenance
 - Cost of Service and Support
 - Cost of software updates
4. Determine how costs are going to be measured
 - Product line costs
 - Management costs
 - Process & Job order costs
 - Standard costs
 - Industry Relative Value Units
 - Provider defined standards
 - Engineered Standards (time and motion studies)
5. Evaluate the reliability of the outcomes of the system

Establish Goals and Objectives of a Cost Accounting System

Section II identified in detail the goals and objectives, which need to be, determined prior to implementing a cost accounting system. Prior proper planning will limit the mistakes many providers have made when implementing a cost accounting system. As indicated before, there is a relationship between the accuracy of the system, the timeliness of the system and the cost of the system. Increasing the accuracy without lengthening the time to get a report may increase the cost of the system. Increasing the

frequency of the reports without lowering the accuracy increases the cost of the system. Reducing the cost of the system will eventually mean sacrificing the accuracy and timeliness of the system.

Management must then decide if the major goal is to determine product costs or develop a management costing system. Product costs are designed to determine the cost of delivering the hospital's services to patients. Management costing systems are more elaborate and focus mainly on properly modeling the cost behavior of service producing departments. Management costing focuses on internal control and is similar to a flexible budgeting system.

Plan and Design the Cost Accounting System

Planning and designing a health care cost accounting system has a number of distinct, yet interrelated requirements. Hospital managers at all levels of the organization will require concise, meaningful, and timely cost information to understand and control the costs for which they are responsible. Cost information must be organized to support management decision making throughout the organization. The cost accounting system must have the flexibility and adaptive structure to meet the specific and varying needs of strategic analysis and planning. Patient services must appropriately and consistently costed on a timely basis by DRG or other appropriate product line classification. To the extent possible, the hospital cost accounting system should be integrated with existing financial systems to ensure cost-effective operation.

The following factors should be considered as much as possible in the design of the cost accounting system because they are inherent in providing patient care services:

- Each patient's treatment is uniquely defined and modified to meet the patient's specific needs and the varying conditions of that patient
- Patient treatment and care can be defined as a number of service units, which are similar to component parts. The total treatment of a patient can be defined as a list of service units provided, that is, a bill of services.
- The individual service units provided are fairly uniform in nature and for the purpose of costing can be defined in terms of standard cost units.
- Identify the level of detail and number of areas to be costed.

Evaluate and Select the Cost Accounting System

The provider organization has primarily two options in developing a cost accounting system. Management can develop the cost accounting system internally or they can purchase the software from a management information systems vendor. The vast majority of healthcare institutions have opted for the latter choice i.e. purchase the system from an MIS vendor. The cost of cost accounting system include the following:

- **Cost of Software**
How often does the software get updated, if at all? What is the cost of the updated software?
- **Cost of Hardware**

Is the hardware compatible with the institutions existing hardware? Hardware estimates will vary depending upon whether microcomputers, mini computers or main frame computers are used.

- **Cost of Installation**

Many organizations require assistance in installing the software. Sometimes installation services are packaged in with a software sale, and sometimes they are sold separately. A separate part of the installation process is the actual development of the cost standards and design of the cost accounting system. This may require a consulting study costing in excess of \$100,000.

- **Cost of Maintenance(Hardware & Software Licenses)**

The cost of maintenance includes the software, hardware, cost accounting design and internal staff training. The cost of the software many times is the least expensive part of an accounting system. If the software is inexpensive but the cost accounting system is expensive to maintain and install, then management may have a problem.

- **Cost of Service and Support**

The vendor support for the product will be very important. Generally, only one or two individuals within the organization will have an in-depth knowledge of the cost accounting system. If either one or both of these individuals leave the investment in the system will be at risk. One solution to mitigate this risk is to have a vendor who can support the system while other staff are trained to operate the cost accounting system.

The estimated total cost of the system will vary depending on many of the factors previously discussed, however, the cost of a cost accounting system can easily approach \$1,000,000 to get the system operational. In addition, the on-going costs could approach \$250,000 annually with the internal staff support that is required. HBOC, SMS, Transition Systems Ins. (TSI), Kreg Corp. and HCM are some of the larger vendors offering complete cost accounting systems. There are a significant number of specialty cost accounting vendors for specific areas within the hospital.

The following criteria should be evaluated when selecting a vendor to implement a cost accounting system:

- **Vendor Experience** - How many clients does the vendor have locally and nationally. How many clients have they lost and why? It is important to make several visits to clients who use the system well and discuss the pros and cons of the system without the vendor present.
- **Service and Support Network** - What service organization is in place locally? What importance does the vendor place on service support nationally? What is the ratio of service support staff to clients? What level of service exists as part of the licensing agreement and what service is charged on an hourly basis?

- **System Functionality** - What is the flexibility of the vendors system? Does the vendors system meet the goals and objectives established by management? Is the provider's cost accounting design consistent with the vendor's specifications.
- **Cost Types and Cost Elements** – Does the vendor support the cost types and cost elements identified by management of the provider unit? Does the increase in detailed cost types and cost elements reduce the functionality of the system?
- **Integration with Provider Financial and Clinical Systems** - Has the vendor successfully integrated its cost accounting system with the provider's financial and clinical management information systems? Poor integration will result in more costly installation and will likely result in higher maintenance costs.
- **System Speed and Updating Process** - The speed of the system to produce reports and the ability to update or change the cost accounting should be carefully ascertained. A slow system may be unacceptable and not being able to add new procedures will limit the usefulness of the system.
- **Ownership and Price** - Does the hospital own the software license or is it leased? Can the software be installed at multiple sites? Finally, the price of the system given all of the above considerations needs to be determined.

Determine How Costs are going to be Measured

The measurement of costs is usually the most expensive part of the cost accounting system after maintenance of the system. The purpose of this process is to translate the costs from the general ledger to the individual procedures. The general ledger costs cannot be directly assigned to the procedures, first they have to be mapped to the cost elements. In other words, individual salary accounts have to be mapped to either fixed or variable salary or some other cost elements. Several methods exist for this mapping, and they can be broken down into four general categories, from least costly to most costly.

Direct Assignment

This method requires the manager to directly assign the costs to a cost component. The salary accounts are identified as fixed or variable as are the nonsalary and overhead costs of each department. This may seem overly simplistic, however, it is the most cost effective and is used frequently.

Direct Inspection

The assignment of costs are based upon reading contracts and other items which directly assign costs to a specific function.

Direct Observation

Observational techniques include work sampling, time studies, regression analysis, and many others. This technique requires going in and observing the services being performed and is used largely for measuring direct labor inputs.

Engineered Studies

These are the most expensive techniques and should be reserved for areas of highly repetitive work or for areas that have a high potential for staff reduction. A hospital will use a combination of direct assignment, direct inspection, direct observation and engineered studies for tracing costs to products. The technique chosen will be based upon the item to be costed.

Evaluate the Reliability of the Outcomes of the System

Once the cost accounting system is operational it needs to be tested. The department managers should verify the cost data and routine reports should be generated and tested for accuracy. The credibility of the system with internal management and physicians will depend on their input and the accuracy of the data. To minimize the testing phase will totally undermine the usefulness of the system. Once the system has been tested and found to be working effectively the system can be used for its intended purpose.

The most expensive part of a cost accounting system is continually maintaining the system each year. Part of the maintenance is related to updating the product costing as the production process changes. Switching to a unit dose in pharmacy or primary nursing on a nursing unit requires changing the cost accounting data. The second part of maintaining the system is the education of sufficient internal staff to make the system work effectively. As indicated previously, at least two people need to know how the system works in order to have the appropriate backup.

FUTURE FOR COST ACCOUNTING

The use of cost accounting by healthcare providers has gained tremendous momentum in the 1990's as the result of the implementation of prospective payment. The acceptance of capitation and fixed budgets for healthcare organizations as a means of payment and the continued pressure to reduce Medicare costs will make cost accounting more important in the future. Information must be available on what costs are for each health care organization product or product line, with the product typically being identified as the patient, but detailed information is also desired concerning the intermediate products required to treat each type of patient.