Feature

Strategic Requirements For IS In The Turbulent Healthcare Environment

BY MICHAEL C. KETTELHUT

Executive Summary

The competitive environment for service organizations has changed dramatically in the last 10 years. Markets have become more fragmented, and the time required to emulate competitors' products has decreased. Organizations are using information technologies to provide competitive advantage. This article uses changes in the healthcare environment to illustrate the use of information technology in organizational strategies. Effective uses of information systems are identified and deficiencies are noted. The importance of maintaining or developing systems for measurement of internal efficiencies in service organizations is identified and a model of information system requirements driven by the competitive environment is proposed.

We met a man on the corner, who was selling tickets to the third NBA Championship game between the Bulls and the Lakers. He was charging $12.00 a ticket for seats under the basket. When we asked about the low price he said he would be reimbursed. He could attract customers at this price, and thought his final cost would be lower than $12.00. If not, he would make up the difference on volume.....

Different versions of this story express the same thought — some organizations believe they can ignore basic economic issues. Organizations in turbulent environments often lose sight of basic economics and develop strategies targeted to attract more business, even if that business isn't profitable.

The Environment

The competitive environment has changed in the last 10 years. This article identifies factors that increase turbulence in the competitive environment, strategies useful in such an environment, and the use of information technology as a component of those strategies. The healthcare sector provides examples of effective use of information technology. However, continued problems in healthcare suggest that information systems must support basic control processes —particularly cost accounting. Information technology, and the systems we develop must increase organizational effectiveness and efficiency.

This article defines environmental turbulence and strategies for survival in this environment. Strategic MIS initiatives in healthcare are reviewed, and the results of these initiatives are discussed. From a review of operating results, deficiencies are defined and a model for defining systems requirements in changing environments is proposed.

Environmental Turbulence

In volatile times, organizations must be adaptive to survive. Turbulence results from many factors, independently or in combination. These include changes in customers, basic economics and regulatory structure. Five factors are identified (Figure 1) and examined in the following paragraphs. Since healthcare organizations, hospitals in particular, face chaotic conditions, healthcare examples are emphasized.

The hospital environment has changed dramatically since the mid-1960s when there was no competition (Figure 2). General practitioners referred patients to hospital physicians. Patients entered the hospital, were treated and exited, hopefully in a better condition. Services were reimbursed at "cost" plus a reasonable profit. Cost was defined by charges accumulated for a patient but did not equal the actual cost of providing service. As reimbursement included a reasonable profit, there was little incentive to manage or control costs. The hospital environment resembled the regulated airline environment. Air fares were determined by defining costs, and profits were added. Changes in costs were simply passed on to consumers.

Organizations in both industries now face competitive and financial problems. Airlines have disappeared through mergers or bankruptcies, and hospitals have closed. Competitive factors in healthcare are easily identified.

Changing Customers

Changing customer requirements may alter an organization's ability to provide appropriate services. In healthcare, group care organizations and group insurers now negotiate for services on a fixed price basis. In San Antonio an insurer is comparing costs for total cardiac care before entering an agreement with a hospital. Most insurers provide reimbursement for second opinions, and sophisticated customers seek other methods of treatment at competing hospitals.

A primary hospital customer is the staff physician who admits patients. Physicians often have privileges at several hospitals. They can move patients to hospitals having

the best facilities or to hospitals that make it easier for the physician to manage his practice and his patients.

The patient population is aging. In Texas, more than two million people will be older than 65 by the year 2000. Senior citizens are hospitalized twice as often as other patients and tend to suffer from complex, chronic medical problems that are more expensive to treat.

Changing Technology

Physicians frequently demand that hospitals get the latest equipment, driving up capital and operating costs. New techniques facilitate outpatient treatment. Entrepreneurs have opened outpatient/ambulatory care facilities outside the high-cost hospital environment. About 30% of all hospital procedures can be done in ambulatory centers today. In five years, 70% of all procedures may be done in ambulatory care centers. Hospitals will be left with high-cost, intensive care patients.

Information technology has also disrupted markets. Western Union is no longer important in message transmission — they now focus upon wiring money in emergencies. Messages can be sent by fax from the corner convenience store. Fax technology also impacts overnight mail business of Federal Express and the U.S. Post Office.

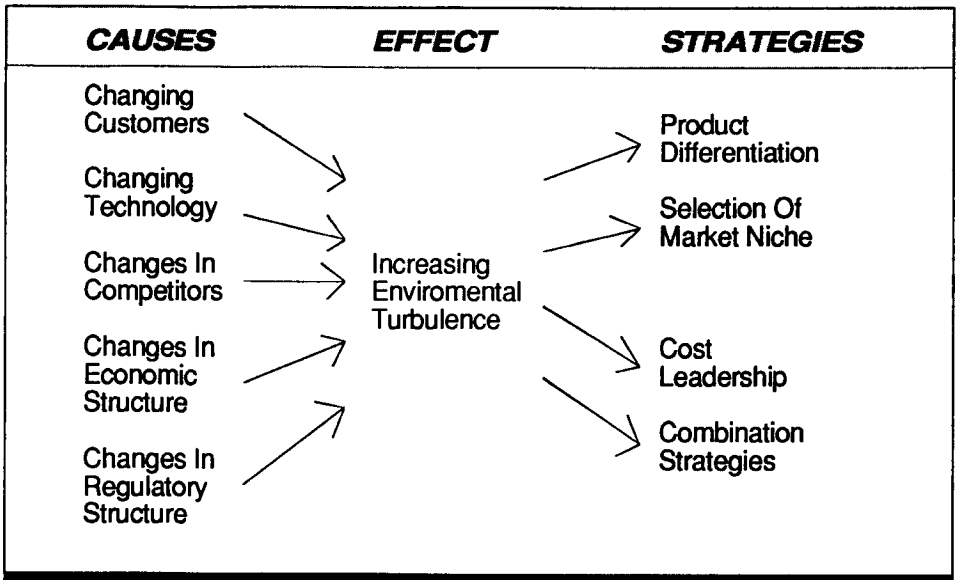
Changes In Competitors

Alternative care facilities have appeared. "Corner Emergency Clinics" (e.g., Primacare) provide emergency care for patients with minor lacerations, broken bones or sprains. Advances noted earlier led to development of ambulatory care centers where outpatient surgery is performed in direct competition with hospital facilities. Procedures performed range from cosmetic surgery and tonsillectomies to joint repair.

The corner clinic also competes for physicians and other medical personnel. Outpatient services are not strictly regulated by current fee schedules — physicians may be reimbursed at higher levels for outpatient care than for identical procedures performed in the hospital. As a result, ambulatory care centers are gaining an increasing number of patients who previously filled hospital beds.

Economic Changes

A basic issue in healthcare is evolution from a cost-plus-profit structure to a fixed price structure. This has reduced basic profitability of hospitals as it did for airline passengers following deregulation. National shortages of nurses and therapists have forced higher wages for personnel, adding to the general costs of healthcare. Last, but not least, the frequency of malpractice suits is rising. Liability and medical malpractice costs have increased dramatically.



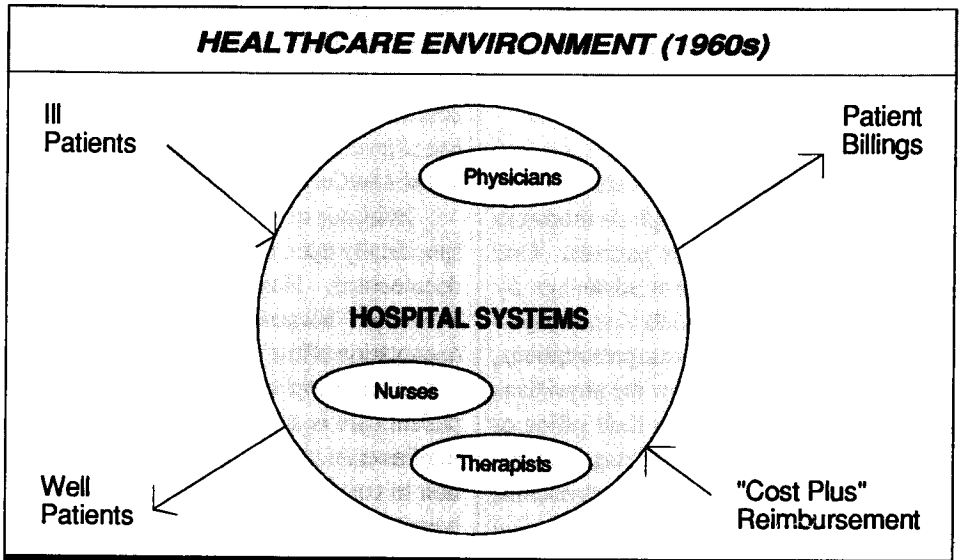
ENVIRONMENTAL TURBULENCE: CAUSES AND STRATEGIES
FIGURE 1

Legislative / Regulatory Changes

Legislative changes have a profound impact on healthcare. Basic economics are linked to legislation, particularly for Medicare/Medicaid patients. Early legislation allowed "cost plus" reimbursement. Legislation in 1983 set up a "prospective payment system" that based payments upon diagnoses. Reimbursement was tied to patient diagnosis, and different diagnoses were reimbursed at different levels. Charges would not be reimbursed if they were not defined within the specific patient diagnosis related group (DRG).

The development of DRGs led to definition of reasonable charges for procedures and treatments related to specific diagnoses. The immediate impact of this change was reimbursement at a fixed price level, based upon the DRG, rather than at old "cost plus" levels.

Summary Of Healthcare Environment



OPERATIONS IN A STABLE ENVIRONMENT
FIGURE 2

The current hospital environment is more accurately represented by Figure 3, and has moved from a stable environment to a changing one. There is uncertainty over reimbursement levels for procedures. Physicians, nurses and therapists are no longer assumed to be components of hospitals. They are scarce resources for which the hospital must compete. This view partially redefines the boundaries of the hospital system from Figure 2, which implied that physicians, nurses and therapists were within the control of the hospital.

There is also a high interest in outcomes — statistical information is required by accrediting organizations. Outcome statistics may be required by insurers who determine where patients go for medical services.

Strategies In A Turbulent Environment

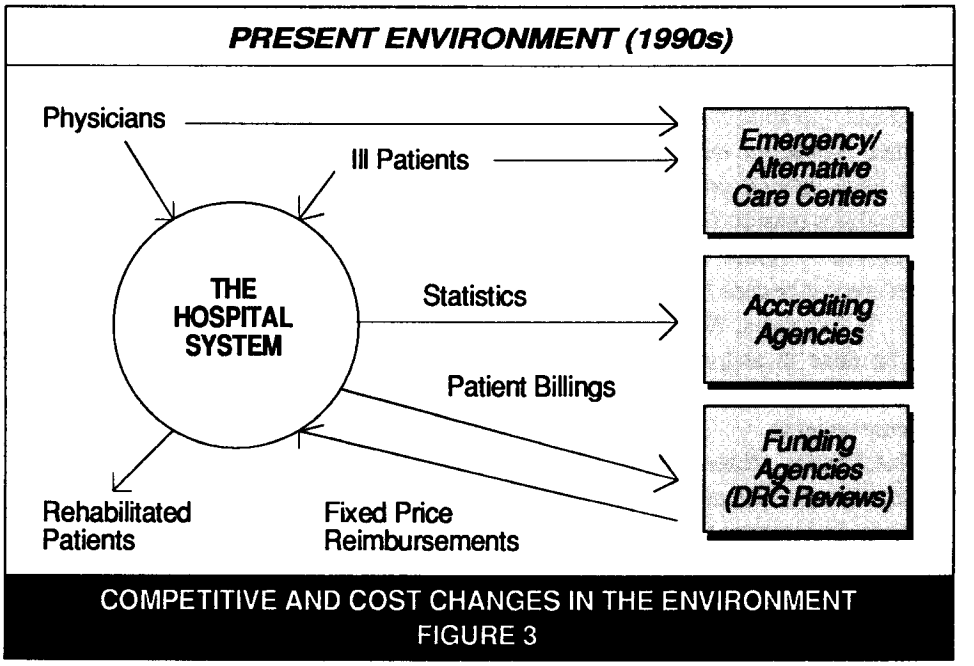
Harvard Professor Michael Porter, in *Competitive Strategy*, defines three basic strategies: market segmentation, product differentiation and cost minimization. Companies generally follow one or more of these strategies (following more than one is a combination strategy as shown in Figure 1).

Organizations can become proactive, and try to control the environment through lobbying or other means. The automotive industry succeeded in redefining vehicle size for EPA calculations. As a result, they could meet standards by matching engines to vehicles of different sizes and did not have to redesign the internal combustion engine. Hospitals have developed strategies, some of which use information technology to deal with the changing environment.

Product Differentiation

Porter suggests that producers must add value for the consumer. Hospitals market to physicians to capture their patients. One hospital gained competitive advantage by providing computer terminals to staff physicians. These were used to issue prescriptions, retrieve lab results and allow the physicians to check patient status from their office or home. This made it easier to manage patients and reduced the amount of time physicians had to be in the hospital. A Texas hospital chain used fax machines in a similar fashion and reported increased room occupancy in several of their smaller rural hospitals.

Hospitals have developed specialized MIS support services for physicians. One healthcare company established a group of surgical institutes to recruit top surgeons. For surgeons within the institutes, MIS provides support to manage patients, track quality and provide general office automation. Patient data is tied directly to clinical research and is immediately accessible. Most hospitals do not provide such access or support to physicians interested in research.



COMPETITIVE AND COST CHANGES IN THE ENVIRONMENT
FIGURE 3

Selecting An Appropriate Market Niche

Some hospitals serve specialized markets in treatment of psychological problems and substance abuse. Others develop "Centers of Excellence" that concentrate physicians in specific locations. This facilitates cost effective delivery of specialized expertise at levels not available in most hospitals.

Cost Leadership

Evidence of healthcare strategies based specifically upon cost leadership is not well documented. Hospitals avoid labeling as "low-cost" because low cost may have a connotation of low quality. Instead, there are non-profit hospitals in which the cost of patient care is subsidized. Cost leadership implies economies of scale, and close attention to cost of services. While "for profit" hospitals attend to these factors, they avoid the traditional cost leader image.

Operating Results

Are the strategies just described effective? We would predict financial ruin for our basketball game ticket salesman. Results in healthcare suggest that hospitals face a similar dilemma. Many cannot tell if they were profitable until books are closed at year end.

In the third quarter of 1989, Texas hospitals lost an average of $619 per Medicare patient, according to a 1989 *Health Care Advocate* article by W. Rogers. If their strategies induced physicians to admit more Medicare patients, then they were playing the same game as the ticket salesman. Further, Rogers notes that 105 hospitals have closed in Texas since 1980 (15 in 1989). Hospitals that closed could provide patient care, but they were inefficient, unable to cover costs with reimbursements from insurers, direct patient billings or medicare/medicaid payments. Even welfare/charity hospitals have been closed if they were perceived as inefficient compared to other hospitals.

We could conclude that hospitals are allocating MIS development funds to the wrong efforts. It is expensive to create linkages between hospitals and physicians. Rather than curtail these efforts, hospitals must increase spending on systems used to measure efficiency and control costs. Coile and Grossman, two healthcare forecasters, predicted in a February 1990 *Health* article that reimbursement will not keep up with inflation. They suggest that hospitals must become low-cost providers of services, and

will have to reduce costs by 3%-5% per year.

In short, the changing environment is having significant impact on healthcare. To ensure survival, hospitals must operate efficiently. Their systems must improve performance, and improvement of performance may require revision of basic systems.

Strategic Requirements For Hospital Information Systems

There are three basic requirements for hospital systems. First, they must continue to support traditional tasks. These include tracking patients, billing, payroll and other accounting functions. Second, hospital systems can be used to increase hospital marketing effectiveness. Examples cited suggest they are used in this fashion. Finally, they must be used to measure and improve hospital efficiency. In this area many hospital systems are deficient.

Job Shop/Production Accounting Systems

Improving efficiency requires identification of resources and measurement of resource consumption. Systems developed for hospitals in the past 20 years accumulate patient charges but may not collect appropriate resource consumption data. Many do not collect actual costs or provide tools for analyzing variances between actual and standard costs.

Hospitals may have to adopt a product line approach to manage services. This was suggested for other service organizations by Dr. Theodore Levitt in the September 1972 *Harvard Business Review*. For example, good manufacturing systems generate job numbers and machine scheduling information. Charges are based upon scheduled time in resource (machining) centers. As jobs progress, actual work time is collected, often with systems that read an employee badge and job number. This level of detail facilitates analysis of the resource costs associated with production of each type of product.

With these systems, requirements can be analyzed by department or cost center. Utilization can be evaluated. Finally, estimated resource requirements (those used to develop schedules and standards) can be compared to actual resource requirements. Comparisons allow adjustment to resource center scheduling, manloading within or between work centers, calculation of utilization and adjustments to standard costs.

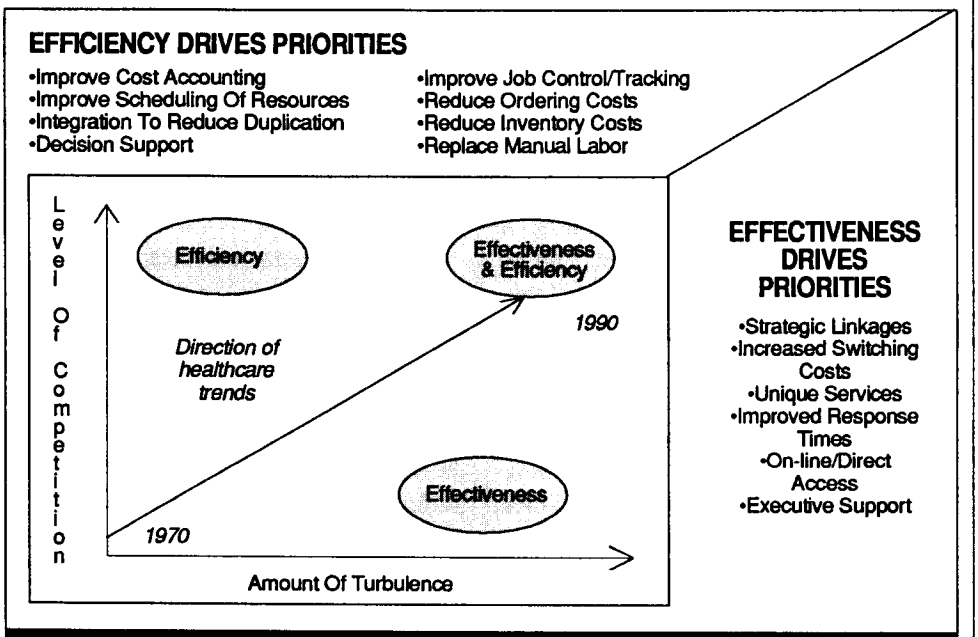
Implementation of "job shop" systems within hospitals could allow assessment of costs associated with delivery of services under specific DRGs. Until such data is available, management can only estimate the true revenue or cost associated with providing care for patients, by DRG. When detailed data on real costs becomes available, hospitals will be able to lobby effectively for changes in DRG levels of reimbursement.

Systems that provide good historical data on resource utilization by class of patient can provide an immediate strategic advantage. For example, availability of data on treatment and cost of cardiac cases could have secured contracts for services for more than 150,000 individuals covered by an insurer in San Antonio.

Automation Of Clerical Tasks

Many hospitals still have systems requiring manual manipulation of forms and data. For example, one hospital with more than 2,000 full- and part-time employees has a manual payroll system. All time records are hand-written and tallied using manual calculators. Processing costs for payroll could be significantly reduced by automating payroll records and only collecting actual time sheet data or employees who worked overtime, or who did not work their regular 40-hour week (used vacation or were sick during the 40-hour period).

Many activities could be reengineered and many systems could be integrated with current technology. Room charges are maintained separately from pharmacy charges. Surgical scheduling is not integrated with scheduling for intensive care or recovery rooms. Diagnostic and laboratory systems are also independent. Integration of standalone systems could automate scheduling and routing of patients, allocation of time in hospital service centers, and collection of information required to determine actual costs and charges for each patient. Further, the potential for errors is reduced with integrated systems. Basic patient information is not reentered each time a different patient service is required.



ENVIRONMENTALLY DRIVEN SYSTEMS REQUIREMENTS
FIGURE 4

Implications And Recommendations

Environmental change has dramatically affected healthcare and other industries. New technologies, legislation and competition have caused structural changes in the airline and banking industries. The Merrill Lynch money market fund competes with the corner bank. On-line databases (e.g., Prodigy) replace traditional sources of information (magazines or newspapers). They also substitute for traditional market channels. Book-

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Strategic IS Requirements In Healthcare Environment (continued from page 9)

ing airline reservations through Prodigy threatens business of travel agents.

Effectiveness is critical in unstable environments. However, when competition increases, efficiency is equally important. Figure 4 presents a conceptual model of systems requirements in a changing environment. The model suggests that as turbulence increases, organizations with few direct competitors must have systems that assure effective service for their customers. Initiatives that increase effectiveness are noted. These include building linkages, improving or defining unique services or providing executive support for strategic decision making.

If direct competition is increasing, organizations must be efficient. As competition increases, there is less product differentiation, and pricing becomes more important. As competition increases, information systems initiatives must address basic business operations — accounting, production scheduling, resource control and cost reduction, all essential to daily operating decisions.

If the change is occurring along both axes, becoming more volatile and attracting more direct competition, organizations must maintain effective systems development efforts addressing both effectiveness and efficiency. For hospitals, information systems tend to focus on organizational effectiveness. Hospitals must upgrade feedback and control systems to track costs, regulate inputs and monitor quality. Collection and aggregation of charges for patient billing is not sufficient.

New MIS applications and technology are required. Forecasters Coile and Grossman suggest that bedside computing and technological substitutions will become common. They predict that hospitals will double MIS spending from 2.5% to 5% of their budgets to save labor costs. They forecast these increases despite 3%-5% cuts in hospital operating budgets.

A changing environment has implications for service organizations in general. Attending to strategic linkages between customers and suppliers is not sufficient. Organizations increasing MIS investments for those purposes alone may not ensure success. They may also have come to address cost efficiency, if not "cost leadership." Service organizations may have to provide the lowest cost, or at a minimum, the lowest cost for a level of service, and their information systems may become a core technology required to improve organizational efficiency. JSM

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