Strategic planning has been called the most important aspect of a CEO's job. Computers can help

Management information systems: key tools for CEOs

by C.L. Packer and the research staff of Shared Data Research

Imagine that you are the CEO of a hospital in a good-sized midwestern town. The new fiscal year has just begun. You are sitting at your desk reviewing the hospital's performance over the past four years, relative to how the other three hospitals in town have done. Exactly what sort of information do the pieces of paper in front of you present?

Probably *not* that found in figures 1 through 7 below (pp. 107-109). These graphs were generated by a management information system. They provide the CEO with a wealth of information, clearly presented.

From examining the computer-generated graphs, the CEO learns the following:*

- His hospital's (hospital D's) market share of admissions declined by 3.8 percent during the four-year period, while that of two of the other hospitals climbed (figure 1).
- Hospital D's market share of beds has declined by 4.3 percent (figure 2). Hospitals B and C have added beds over the period.
- Hospital D's occupancy rate has fallen by 8 percent—a dramatic drop (figure 3).

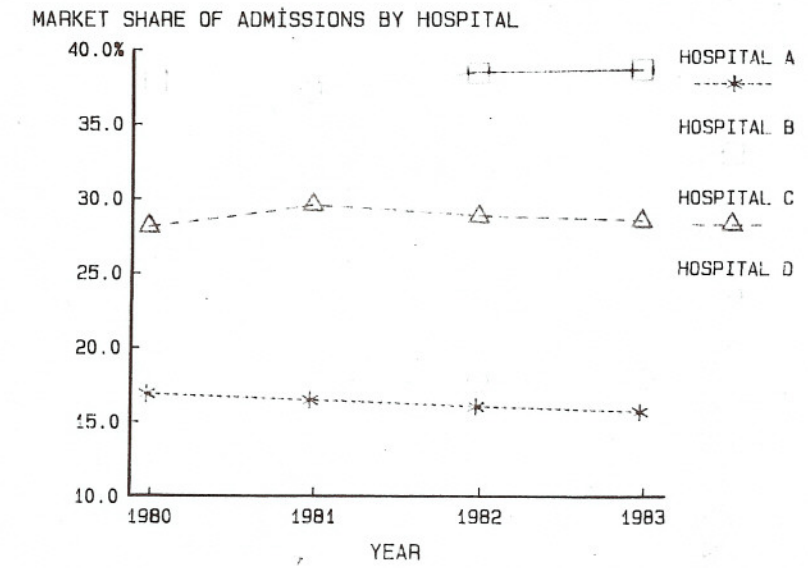
Hospital D's CEO slumps a little in his chair. In a fast-changing environment, the graphs reveal his hospital is losing patients to its competitors. But other graphs generated by the hospital's management information system give him cause for optimism:

- His hospital is making excellent use of its facilities. In 1984, for example, each of its beds had 48.9 admissions—a figure 23 percent higher than that of its closest competitor (figure 4).
- The hospital has experienced a decrease in FTE (full-time equivalent) days per admission. Its competitors have all experienced increases (figure 5).
- The hospital started the time period with the lowest cost per admission. During the period, its cost per admission actually declined, while that of all its competitors rose steeply (figure 6).
- Hospital D's ratio of market share of admissions to market share of beds has shown growth (figure 7). (Values greater than 1.00 indicate a proportionately large share of admissions.)

Leaning back, hospital D's administrator reflects on the future. The graphs show him the overall outlook isn't bad. But some decisions are necessary. What steps must be taken to keep the hospital healthy?

This CEO—unlike most—turns to the hospital's computer system for more assistance. Though the decision-making process is complex, the sys-

Figure 1



HOSPITAL A	16.6%	16.2%	15.8%	15.5%
HOSPITAL B	37.2	36.9	38.3	38.6
HOSPITAL C	27.8	29.3	28.6	28.3
HOSPITAL D	18.4	17.7	17.4	17.7

This and the following figures are derived from actual statistics in Shared Data Research's national information system data base.

*The CEO already knows that over the preceding four-year period, the number of admissions at his hospital has decreased by 2 percent. During the same period, the average number of admissions at his hospital and its three local competitors increased by 2 percent.

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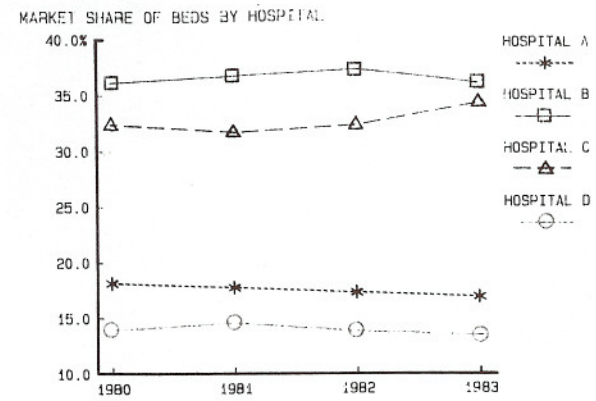
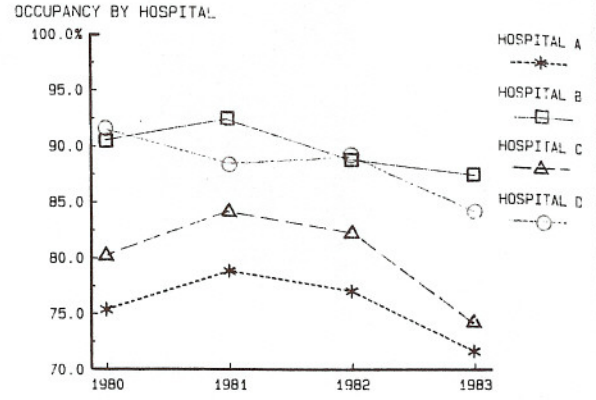
Figure 2



HOSPITAL A	18.1%	17.7%	17.2%	16.8%
HOSPITAL B	35.7	36.2	36.9	35.8
HOSPITAL C	32.3	31.6	32.2	34.1
HOSPITAL D	13.9	14.5	13.7	13.3

Figure 3



HOSPITAL A	75.4%	78.9%	77.1%	71.7%
HOSPITAL B	90.6	92.3	88.9	87.6
HOSPITAL C	80.2	84.2	82.3	74.3
HOSPITAL D	91.5	88.5	89.2	84.2

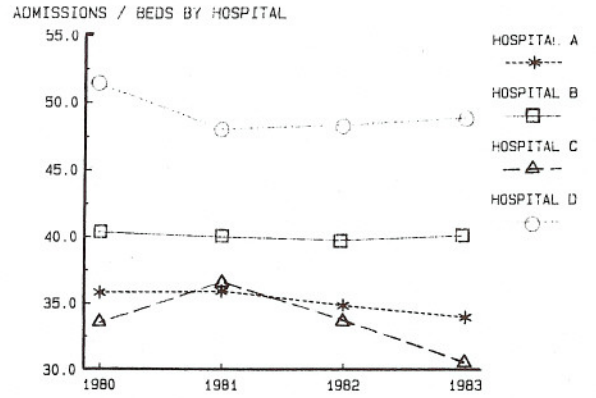
tem can assist in many of its steps, both now and in the future:

- *Recognition of problem or opportunity.* As is apparent from the graphs just discussed, computers can measure projected vs. actual performance, thus revealing problems or opportunities.
- *Generation of responses.* Some problems or opportunities may be responded to in any number of ways. Others allow only a few responses. Thus, some might benefit from a computerized generation of possible responses, while others require only the attention of one person working for a few minutes.
- *Data collection.* Each of the possible responses will have certain consequences. Management information systems can help predict what they will be. Much of the data the systems will require in order to give that help will be available within the hospital; some may come from local, state, or national sources. The consequences of the various alternatives may be simple enough to express in English or so complex and numerous that they require mathematical simulations, produced by outside expertise working with large-scale computing power.
- *Choice.* Armed with all the possible responses and their consequences, the CEO makes a choice.
- *Evaluation.* The hospital begins to implement its choice, perhaps establishing a timetable governing the implementation. As implementation progresses, the CEO compares the consequences the chosen alternative actually has with those he anticipated. The comparison may lead to the identification of new problems or opportunities—which starts the process over again.

A reality today. Futuristic? By no means. Most CEOs and other hospital administrators simply do not realize that they probably already have computers with the capacity to be this useful.

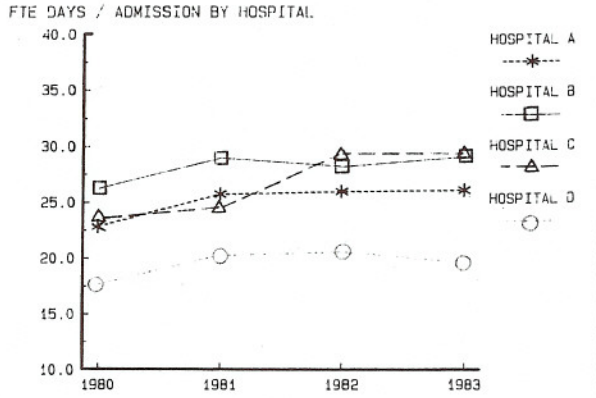
How useful is that? *Health Care in the 1990s: Trends and Strategies,* a major study released this year by Arthur Anderson & Co. and the American College of Hospital Administrators, states that strategic planning is the single most important aspect of a CEO's job. Computer technology

Figure 4



HOSPITAL A	35.9	36.0	34.9	34.0
HOSPITAL B	40.6	40.0	39.5	39.8
HOSPITAL C	33.7	36.6	33.8	30.6
HOSPITAL D	51.4	48.1	48.4	48.9

Figure 5



HOSPITAL A	22.9	25.8	26.0	26.1
HOSPITAL B	26.5	28.6	28.8	29.4
HOSPITAL C	23.5	24.5	29.2	29.2
HOSPITAL D	17.7	20.3	20.6	19.6

can—perhaps it is not too strong to say *must*—play a part in such planning.

A recent article pointed out, "The intervention of the two variables—information technology and a challenging environment—has generated what might be called 'the economic imperative of information technology.' Organizations that do not take advantage of the growing opportunities provided by information technology are likely to slip behind in the competitive business world."**

Hospitals are spending an estimated $8 billion a year on information systems. About 350 vendors sell system products and services to hospitals. Management information systems are expected to grow faster than any other segment of the hospital information systems market—at a rate of 35 percent per year.***

Hospital-based information systems have come a long way in a short time to deliver to administrators the capacity for strategic management assistance. The earliest systems supported only *transaction processing* and some *operational* activities: patient billing, accounts receivable, and payroll. (Systems supporting these and lower-level management activities are termed electronic data processing—EDP—systems.) It is now rare to find a hospital of any size that does not have some form of EDP system.

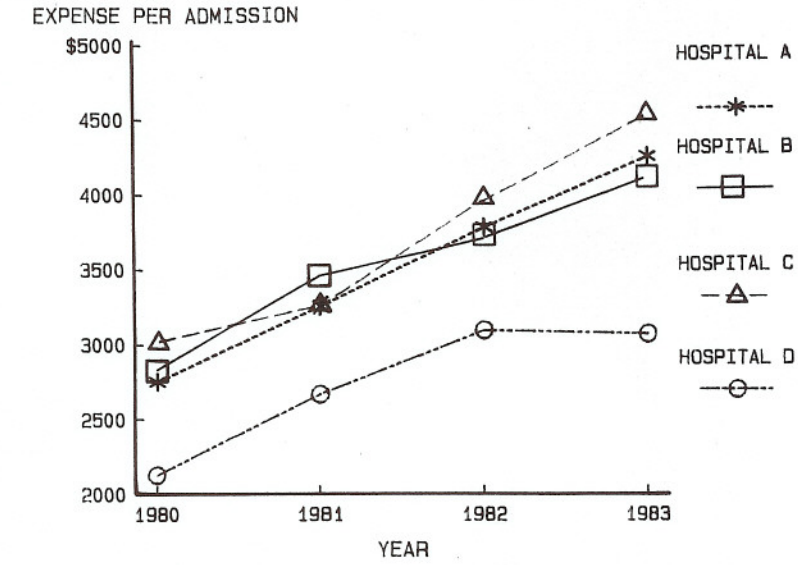
Computer technology can—*must*—play a part in strategic planning.

In the late 1960s, researchers conceived of a management information system (MIS) that would support transaction processing and operational activities—and, in addition, *managerial control* activities and *strategic management*. Attempts through the early '70s at implementation generally fell short of their goals with respect to the managerial-control and strategic levels; MISs were unable to respond to the needs of higher-level managers faced with problems that were nonrecurring and were difficult to quantify or even estimate.

As an alternative to MISs, a two-level structure is now emerging. EDP supports lower-level, routine, structured activities, while decision support systems (DSSs) assist in the less routine, less structured decisions involved in managerial control and strategic management.

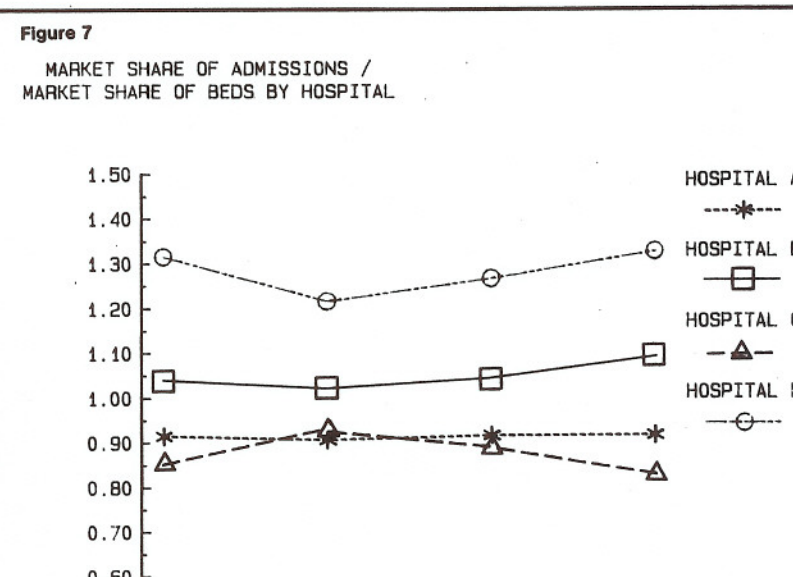
Properly programmed, a management information system is a vital aid—available *now*—to the administrator struggling with the complex problems of today's environment. ■

Figure 6



	1980	1981	1982	1983
HOSPITAL A	$2,758	$3,264	$3,797	$4,282
HOSPITAL B	2,814	3,423	3,761	4,168
HOSPITAL C	3,024	3,278	3,993	4,565
HOSPITAL D	2,133	2,677	3,108	3,089

Figure 7



	1980	1981	1982	1983
HOSPITAL A	0.92	0.91	0.92	0.92
HOSPITAL B	1.04	1.02	1.04	1.08
HOSPITAL C	0.86	0.93	0.89	0.83
HOSPITAL D	1.32	1.22	1.27	1.33

**Benjamin, R.I., and others. Information technology: a strategic opportunity. *Sloan Management Review*. 25:3, Spring 1984.

***Hospitals' systems expenditures skyrocket. *Hospitals*. 58:39, Apr. 1, 1984.