1990

The IOM study is the first factor in building the momentum to fuel huge investments in the CPR.

1992

Integrated delivery and managed care model gain popularity fueled by President-elect Clinton's healthcare reform platform.

1994

Organizations begin to invest in quick changeovers to new CPR systems or modifications of existing systems.

THE DECADE OF THE '90s

Poor use of IT investment contributes to the growing healthcare crisis

by Sheldon Dorenfest

Healthcare industry leaders are moving into the future with as much sense of direction as a colleague who faced an emergency and needed to get from Chicago to Denver as quickly as possible. With little sleep and no map, he headed onto the roadway. After a few hours he saw a road marker, "50 miles to Cleveland." Ignoring it, he kept driving. He also ignored the "20 miles to Pittsburgh" road sign. Then, "Philadelphia, 20 miles." When he stopped to get a road map, he turned around and headed toward Denver.

The healthcare industry is also heading the wrong way. It needs to turn around and get started in the right direction.

Healthcare information technology (IT) investment has more than tripled during the '90s, with annual expenditures for products and services rising from $6.5 billion in 1990 to a projected $20.4 billion in 2000.

IT was a top priority for capital investors in the healthcare industry over the past decade, with total investments by providers for products and services to support IT exceeding $125 billion. What did this investment buy for the nation's health? As we entered the '90s, healthcare was investing in new technology at a relatively modest pace. At the time, the industry received criticism for being technologically behind the rest of the world. Industry leadership defended its low investment strategy by citing poor returns from IT investments in the '80s, as well as the widespread perception that the software available in 1991 didn't offer enough benefits to justify its purchase.

Healthcare IT market growth during the decade proceeded slowly until early 1993, when several key factors converged to fuel large investment in the computer-based patient record (CPR) and integration of legacy systems already in use. These major factors included the following:

■ The 1991 Institute of Medicine (IOM) study. The IOM study played an integral role in fueling significant investment in the CPR. Disregarding substantial investments over the previous 20 years in a series of failing attempts to automate the patient record, the 1991 IOM report led less experienced observers to conclude that the IOM was discovering the concept of a CPR for the first time (see "Early IT").

■ Integrated delivery and managed care. This model emerged most prominently in California in the late '80s

1996	1998	2000
The Health Insurance Portability and Accountability Act of 1996 (HIPAA) was signed into law on August 21, 1996.	Industry leaders come to realize the failure of their present investments in the CPR.	Emphasis increases on improving processes, simplifying workflow, reducing redundancy and saving money.

with the creation of numerous healthcare delivery systems providing a continuum of care services to a regional population. Proponents of the model presented its advantages nationally as a method of providing better patient care at lower cost. A key component of the integrated delivery model was that a person could enter the system at any location, and caregivers could access data about the person's healthcare status immediately through a multi-facility CPR. When President-elect Clinton made healthcare reform a key element of his platform in late 1992 and early 1993, the healthcare industry began a "reform" program of its own by implementing the California experiment throughout the nation.

As a theoretical vision, the early concept of the CPR had merit. But given the conditions of the healthcare industry at the time, the capabilities of its leadership, the timetable established for implementation, and the over-simplification of the solution, experienced observers predicted that the programs undertaken to implement such CPRs would surely fail.

■ The Community Health Information Networks (CHINs). As the integrated delivery model began to take hold across the United States, many healthcare delivery organizations that didn't want to integrate through mergers explored local and regional collaboration. Large investments in CHINs to create programs for sharing patient data peaked between 1993 and 1996, with one or more CHIN efforts under way in most urban areas. Because of poorly conceived objectives for these collaborations, which led to much wasted effort, nearly all CHINs efforts failed by 2000, and little evidence of their existence remains.

Everybody invests in CPRs

The cumulative impact of the IOM study, the integrated delivery model, managed care and CHINs fueled a huge investment in CPRs. Nearly every healthcare delivery system in the country invested between $5 million and $50 million in CPR efforts between 1993 and 2000.

Despite serious criticisms from some experts that almost all investment plans to implement the vision of a CPR were flawed at inception, the majority prevailed, creating tremendous industry momentum. The newly evolving healthcare delivery model was driven by inexperienced industry leaders, consultants who increased their revenue by oversimplifying and overselling the ease of accomplishing CPR initiatives, IT vendors whose products were presented as keys to accomplishing CPRs, and various experts who contended that past failures weren't good indicators for predicting future success.

The CPR delivery model, presented by the IT industry, was based on the purchase of one of a number of suppliers' CPR systems. All were purported to integrate proprietary applications and provide an interface engine to merge data from a series of legacy systems and new applications provided by other suppliers. The model was built on the concept of housing data from previously disparate systems in a clinical data repository (CDR) from which a CPR would be produced. Many billions of dollars were spent on such CPR programs.

CPR programs fail

As the '90s came to a close, it became obvious that CPR investments were not accomplishing their objectives. While the vision of the CPR continues to be appropriate in 2000, faulty implementation in the '90s caused the healthcare industry to further weaken its work processes by building in another layer of redundant systems.

For example, a visit today to a nursing station at one of the facilities that once envisioned a "CPR" system would find, instead, a universal workstation accessing numerous legacy systems operating throughout the organization. Graphic user interfaces would be presenting a variety of attractive user views of data contained in these systems. A richly populated CDR would be accessible by users throughout the organization. Next to this universal workstation would be a pile of paper referred to as the manual patient record, which would be the patient record used by most physicians who usu-

ally only access the automated system for results not yet entered into the paper record.

Why is this so? There are a variety of opinions about why physicians tend to cling to paper-based records, and most center on physicians' trepidation about embracing technology. But this is far from the case. For physicians, time is money and patient lives. By reviewing the paper-based record, physicians gain immediate access to the only complete set of information regarding a patient's visit. Physicians who access the CDR must also use the paper record to obtain any information not yet in the system.

The industry's investment in the CPR in the '90s produced a highly redundant system that added substantial cost, produced little benefit and could be said to be analogous to going to a plastic surgeon to treat liver cancer. Most of the work processes involved in maintaining the paper record remained intact while new processes and IT systems were implemented. Meanwhile, many antiquated IT systems continued to be used, layering more redundant, tangled and convoluted work processes on top of already complex and inefficient methods.

Toward the close of the decade, the impropriety of these CPRs and other poorly conceived IT investments

The healthcare industry's investment in CPR in the '90s produced a highly redundant system.

became obvious to more and more industry leaders. And Y2K was an issue. Many organizations invested in quick changeovers to new systems to replace old legacy systems that needed to be modified to operate in the new millennium. Others simply invested in the required modifications to the old systems.

As we enter the new millennium, the healthcare industry is in transition. The operating model of the '90s—integrated delivery and managed care—will not suffice. Experts argue about what form the new model of delivery should take, but all agree that the current model is not working.

Too much to do, too little to do it with

Although the nation's cost of healthcare stabilized for a

Early IT

WHEN I ENTERED THE HEALTHCARE IT INDUSTRY in 1969, it was in its infancy. Most hospitals operated 100 percent manually; only the largest providers had implemented automated billing systems. Software companies sold products by spinning a tale to meet client needs, which had to be "unspun" during implementation to align with product capabilities.

When a doctor prescribed medication, a nurse would post it to a requisition, enter data into a file at the nurses' station, update the patient's chart and send the order to the pharmacy by messenger or tube. The pharmacist would type a label, update the patient's profile and the inventory-control record, create a billing file, and forward a record of the transac-

tion to a business office. At the business office, the transaction would be entered into an automated billing system.

Soon it became clear that everyone would benefit if the ordering process could be streamlined to a single entry of the order, updating of files and communication of new information to all involved personnel. Doctors could save time and money while improving quality of care. Medical records and patient bills would automatically be prepared as a by-product of this system. This became the industry's vision.

By 1974, some clinical processes had been automated, but the steps a hospital should take next to realize a true computer-based patient record (CPR) were unclear. Believing that I could serve the in-

dustry by helping providers realize what CPRs had to offer and by helping vendors improve the functionality of their products, I formed Sheldon I. Dorenfest and Associates Ltd., Chicago, in 1976.

Since then, hundreds of CPR-related products have been introduced, but due to limited understanding of change management, these offerings typically automate only part of the process. For example, a "bed board" with colored flags indicating room availability and patient condition is still used in many hospitals. The system could have been replaced by early automated patient-registration systems, but today it often operates parallel to present systems.

—S.D.

period of years, costs are again rising—and at a time when government reimbursement procedures are reducing resources to providers. In addition, consumers are adding their votes of dissatisfaction to the healthcare system and to declining quality of care.

A variety of well-intended government initiatives, including the Balanced Budget Act of 1997, Health Insurance Portability and Accountability Act of 1996 (HIPAA), Ambulatory Patient Classifications, and the IOM study on life-ending medical errors are creating awareness and increasing the pressure on the healthcare system. Frequently, these well-intended initiatives have a crippling rather than positive impact.

For example, the IOM assessed, using questionable statistics, that the number of life-ending errors ranged from 44,000 to 98,000. While medical errors may be growing, questionable statistics produce large numbers that are really meant to get people's attention. Also, the proposed remedies under consideration will not result in error reduction in the foreseeable future. Many other current thrusts in the healthcare industry create too many priorities and problems that are being addressed with too little management and resources. So how will IT use in healthcare evolve over the next few years?

Too much technology

Technology is taking the world by storm, with PCs on every desk transferring instant and frequent communications. There are a myriad of opportunities for improvement in healthcare through better use of IT. But is the industry up to the challenge? Can it benefit? Will its leaders know how to manage the change? Or will they be hornswoggled again?

Several consecutive generations of improperly implemented IT have confused the work processes within our organizations and created incredible redundancy. Work processes that required one step when carried out manually now require two or three steps. Dorenfest and Associates estimates that between 25 and 50 percent of a typical hospital's operating costs are invested in redundant work processes.

A well-orchestrated, long-term work simplification program could significantly reduce healthcare organization operating costs while improving quality of care by reducing opportunity for error in processing physicians' orders. Will this opportunity be addressed in the next few years?

As we enter the new millennium, the healthcare industry is in transition.

The next wave

Numerous forces are pushing the industry to continue to implement IT improperly. But other forces are beginning to form that may help the industry approach things more appropriately. Past technology investments haven't garnered the desired results because the industry has been oversimplifying the process, making too many mistakes and, thus far, not learning from its mistakes. The industry is in the early stages of shifting from rapidly assimilating poorly understood and poorly implemented technical solutions to improving use of technology already in place while simplifying its work processes. If it does this well, the industry stands to save considerable money.

Although IT budgets will continue to grow, fewer capital resources will result in slowed growth rates in IT spending. Spending will shift direction because products and services purchased over the next several years will differ in form from those purchased in the '90s. Growing emphasis will be placed on improving work processes, simplifying workflow, reducing redundancy and saving money. This emphasis will result in improvement in quality of care and patient satisfaction.

We will be moving toward a back-to-basics approach, with the industry focusing on gaining a greater return from its IT investment. It will invest in stronger analytical efforts to support IT investment decisions and move away from making strategic-advantage investments that don't accomplish these advantages.

The industry is at a crossroad. We can only hope that industry leadership and the federal government will recognize what needs to be done. A tremendous number of forces are moving in the wrong direction, so bringing change will be similar to turning around a semi-trailer. But let's hope that enough people with wisdom, clear thinking and an up-to-date road map soon will come to see the route that is needed. ∎

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