New Role for HIM in the Knowledge Economy

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As we face a new century, both the national and global economies are undergoing forces and changes of epic proportion. As the economy changes, some experts believe, Americans will see the emergence of a "knowledge economy" in which information is a valuable resource. Those who succeed in this economy will know how to work with data and use it to solve problems.

HIM professionals, with their understanding of the healthcare system and their expertise in managing and understanding clinical and administrative data, are well equipped to step into a new role as this new breed of knowledge worker. This role has found its way into the constellation of AHMA's Vision 2006 roles-as the Research/Decision Support Analyst.

How did we get here? To answer this question, we need to go back nearly half a century-to the dawn of a revolution.

What Did You Do During the Third Industrial Revolution?

The economic realities of the coming century will see the culmination of what some have called the "third Industrial Revolution."[1] Although it emerged almost immediately following the second World War, this revolution has gained intensity during the past decade. In fact, it has pervaded most major sectors of the economy to some degree. In the next millennium we certainly will witness its final stages.

The third industrial revolution, interpreters argue, is the "final stage of a great shift in economic paradigms, marked by the transition from renewable to nonrenewable sources of energy and from biological to mechanical sources of power."[2] In particular, this revolution is the shift from economies based on natural resources and physical labor to ones based on knowledge and communication-intellectual capital. Another appropriate name for this new economic paradigm is "the knowledge economy."[3]

Coupled with the notion of a "knowledge economy" are the related ideas of the "knowledge company" and the "knowledge worker." Companies and organizations today are becoming increasingly more "information intensive." In fact, it's hard to think of a thriving company today that does not rely heavily on information technology.

This isn't the case just because computers and information technologies are ubiquitous. The ways organizations use their data and information are also evolving. Author Tom Stewart observes that information technology clearly makes it possible to add series of rows and columns of numbers faster and enhance the speed of other accounting type tasks, but "a corporation becomes a true knowledge company when it becomes aware of and involved in the 'deeper level,' where information is pursued for its own intrinsic value and not simply to automate or report on other activities."[4]

Knowledge is Power...and Commerce

One of these "other activities" will be the establishment of repositories and warehouses to store an organization's data. Data at the corporate level will have a fundamental impact on decision-making activities of managers. But data at the corporate level is usually the most difficult to bring together in an assessable system.

A second activity will be the "mining" of these corporate data and information resources for details that can lead to competitive business strategies. These details may be at the customer level or at the business process level.

Third, Stewart suggests that a knowledge company will make "a business out of knowledge itself."[5] Knowledge companies will become knowledge vendors.

These activities, however, do not just happen. They are envisioned by senior managers of organizations and intentionally carried out by a new breed of employees, appropriately called "knowledge workers." These workers are empowered by technology; their raw materials are data and information. They perform problem identification and solving tasks, and they broker their solutions for the strategic advantage of the organization.[6]

While the "third Industrial Revolution" can be seen in the economy generally, it has made itself particularly visible in the healthcare sector. Although healthcare is often behind other sectors of the economy in adopting new business cultures, during the last decade capitation, managed care, benchmarking, quality management, rapid technological change, and new customer pressures have thrust a culture of change-if not, in some instances, chaos-upon the industry. These changes have created demands for solutions such as convenient service-and information.[7]

The Origin of Decision Support

The activities associated with the knowledge organization described encompass many of the facets of decision support. In fact, Ralph Sprague and Hugh Watson, editors of *Decision Support for Management*, believe that decision support today is at the intersection of the kinds of activities described above and the more traditional activities associated with information systems, such as handling of data and transaction processing.[8]

Decision support in healthcare has evolved in a similar manner as in other businesses. During the 1950s and 1960s, computer technology was primarily used for electronic data processing in most businesses. Computer systems automated transactions and stored records of transactions. Such systems included payroll systems and billing systems.

In healthcare similar systems (hospital information systems) were in place.[9] By the 1970s, organizations began to realize that periodic reporting from the transaction processing systems could be helpful to managers, so management information systems (MISs) were developed. The purpose of these systems were to provide managers with regular "snapshots" of organizational operations at various levels through computer-generated reports.

Similarly, such systems were developed for healthcare to report on the routine operations of the facility. These sometimes have been designated as health management information systems (HMISs). The goal of both HISs and HMISs was to improve routine processing and reporting in a healthcare organization. These systems automated patient registration and administration, helped maintain pharmacy inventories, and handled billing and accounting operations. They were not generally used to assist in improving the human decision-making process.

One notable exception to these systems during this same period was the medical diagnostic decision support system.[10] These systems were rooted in the application of the then-new field of artificial intelligence (AI), when medical informatics researchers during the 1960s and 1970s began investigating the use of artificial intelligence in medicine to support clinical decision making.

Early on, it was hoped that a system could generate a patient's diagnosis (when provided with pertinent clinical symptoms and medical history) as well as an explanation of the reasoning used to arrive at the diagnosis. (Author R.A. Miller provides a cogent review of this literature; the interested reader is referred to his work for further discussion.)

But it is interesting to note that despite their 25-year history, these systems have had little success " ...in making an impact on the practice of medicine."[11] As one expert summarized: "The history of artificial intelligence in medicine is a mixed one of impressive creativity coupled with limited successes, small gains, and in the case of of Engle,[12] cynical resignation."[13]

Creating a New Breed of Analyst

By the late 1970s and early 1980s, it was clear that a new type of system was needed. Managers needed assistance with semi-structured or "ad hoc" problems. These were problems that arose unexpectedly and needed immediate attention-not allowing for a month of specialized programming to address the problem.

Second, managers needed assistance with decision making-they didn't need to be replaced. Some AI researchers had initially dreamed of creating so-called "expert systems" that could literally replace humans in the decision-making loop. However, by the mid-1980s, such dreams had come to an end and more humble goals were accepted.

Third, there was a need for systems that could help both administrative and clinical decision makers perform insightful analyses of complex problems themselves, rather than relying on a single information systems department.[14]

With these needs in mind, Joseph Tan, editor of *Health Decision Support Systems*, offered the following definition of a health decision support system: "an interactive, user-controlled system (usually computer-based software) that is designed specifically to facilitate the decision maker (i.e., health administrator or clinician) in using data, models, and knowledge elements to solve semi-structured (i.e., non-routine and non-repetitive) and complex decision problems."[15] This admittedly broad definition illustrates the varied facets of decision support systems and the decision support process.

Current topics in healthcare decision support include data warehouses, data repositories, database concepts such as online analytical processing (OLAP), relational online analytical processing (ROLAP), multidimensional online analytical processing (MOLAP), and data mining.

Sprague and Watson note that since decision support systems and their role in the organization are not built into the traditional system development framework, a "new breed of analysts evolved to work with decision makers" is needed.[16]

These members of the new breed of analyst must be the knowledge workers of the new millennium.

What Does a Research/Decision Support Analyst Do?

Data integration and analysis are commonly associated with decision support systems in the healthcare environment. Each activity plays a unique role.

Today's information comes from many sources and is derived from many components. Data sources can include electronic files, Internet sources, and local, community, state, and institutional collection points. This diverse data needs, in short, to be integrated.

The integration process may require computer skills with knowledge of database software and other statistical software packages. Within these repository systems, data may need to be manipulated and interfaced with different database management systems to be analyzed by those who make business decisions.

Not only does data need to be integrated, it needs to be complete and accurate. Attention to the quality of data is an important component of this integration. A knowledge worker must be concerned with the integrity of the data and the accurate management of study parameters, skills that HIM professionals possess.

Once the data is integrated, it needs to be stored where it can be easily accessed by professionals who perform analyses. These storage places have become known as data warehouses or repositories.

With the focus on the computer-based patient record (CPR), HIM professionals are well acquainted with these data storage systems. In fact, many HIM professionals are already involved with the design for these warehouses or repositories. These storage systems provide access to data for both administrative and clinical decision makers, allowing them to perform more insightful analyses of complex problems. HIM professionals in this area may find themselves establishing procedures for tracking, maintaining, and managing algorithms to monitor the validity of information and keeping detailed knowledge of the collection process.

Some experts believe that in terms of what it can bring to the health of the public, the whole science of outcomes is vastly underestimated. Management information systems, while of great assistance to the world at large, are just now being built for public health information systems. Those responsible for the integrity of the data and the safe and proper management of study parameters need strong skill sets. Here, HIM professionals must find new ways to demonstrate their value to employers by expanding their roles as analysts of data. Doubtlessly, they will see more opportunities to put their skills to use as the importance of data quality is recognized and opportunities beyond traditional settings grow.

Decision support analysts turn data into information during the analysis activity. They recognize trends, use statistics to find more information, and make connections between raw data and real-life circumstances. They also present and explain their analyses to others. In this process, problems can be identified and solutions found. Public health policy can be made and

translated into better patient care. As a research/decision support analyst, an HIM professional will be called to analyze data on a broader scale than that encompassed by the health information department.

The industry is seeking skilled persons with vision. There is a definite need for research/decision support analysts, but HIM professionals may need to hone some of their skills to meet the need. Important skills include experience with relational databases and languages such as SAS and SQL. It's also important to be able to create and manage relational databases. A background in finance, patient care, and outcomes/assessment is also helpful.

The Road to a New Role

AHIMA's Research/Decision Support Analyst Task Force conducted a survey of Association members to determine which were already in research/decision support roles. The results were very encouraging. Members are currently involved in this important role in a variety of organizations, such as healthcare systems, government, software vendors, and pharmaceutical research and contract review organizations.

Their major responsibilities include management of data for studies, including assuring data quality, reporting and analyzing data, and integrating data from different sources.

In these roles, skills that they find valuable and helpful include the ability to manage and analyze data, use a computer, interpret clinical data, communicate with different levels of staff, and make presentations.

Almost all respondents in these roles indicated that their HIM education gave them the foundation to succeed. They also built these skills through on-the-job experience.

HIM professionals are poised to assume these roles. How can you get started? If you are interested in this type of work, survey respondents suggest that you might present some unsolicited analyses to your supervisor. This will not only demonstrate your ability to manipulate data but could demonstrate that valuable data is going to waste in your organization. Even if a position does not exist now in decision support, it may be created in the future. All that remains is to take the first step.

Notes

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3. Stewart, Tom. *Intellectual Capital: The New Wealth of Organizations*. New York: Doubleday, 1997, p. 6.
4. *Ibid.*, p. 22.
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6. *Ibid,* p. 41.
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