Education Review

Surviving and Thriving with Vision 2006: Information Technology in the Curriculum

To prepare graduates for the new roles envisioned in the American Health Information Management Association's Vision 2006, which places emphasis on information technology and the management of health information, a model curriculum has been developed for health information administration and health information technology programs in which information technology and information systems have been strengthened. With these new directions come the expense and problems of purchasing and maintaining computer systems necessitated by these changes. There can be great resistance on the part of deans and other individuals to authorize the procurement of the hardware and software needed to establish a computer laboratory. The article describes a cost-effective alternative. Key words: *academic programs, computer resources, health information management, information management, information technology, managed care, management information systems, model curriculum, Vision 2006*

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PEOPLE WHO manage information are critical to a health care organization. This applies directly to the health information management (HIM) professional, who is in a perfect position to capitalize on the information revolution currently evolving in the health care community. Realizing the need to define the health information profession in this changing environment, the board of directors of the American Health Information Management Association (AHIMA) began strategic thinking activities in January 1996.[1] The board's objective was to prepare a vision and concept for future practice in the field of HIM. From this emerged Vision 2006, which identified selected roles for health information professionals (see the box titled "Vision 2006 HIM Professional Roles").

With the continued development of the electronic patient record, all seven roles described in Vision 2006 contain a computer hardware and software component. For this reason, it is impera-

Top Health Inform Manage, 1998, 19(2), 88–94

Vision 2006 HIM Professional Roles

Role 1: Health Information Manager
The duties in this role involve overseeing HIM functions throughout an organization. Examples of these duties range from evaluation of patient demographic and clinical information to overseeing changes in the database of patient information as well as data quality and confidentiality issues.

Role 2: Security Officer
This role is responsible for the security of all electronically maintained information, including policy, risk analysis, system access and security, and orientation and background screening of employees.

Role 3: Research Analyst
Administrative decision support is necessary for an integrated health system, and the research analyst will be responsible for retrieving, analyzing, and condensing data into meaningful decision options for senior management by tracking trends, determining significant variances, and predicting potential future directions.

Role 4: Document and Repository Manager
With the movement toward the computer-based electronic patient record, it is necessary to have an individual responsible for establishing the process for electronic transfer of data, media, and documents and for coordinating the training of new users, issuing access authorization, and monitoring access to the system.

Role 5: Data Quality Manager
This person is responsible for the development of policies associated with maintenance of the data dictionary, identification of data requirements, and development of logical data models. This role ensures the accuracy, reliability, and completeness of data and sees to it that the collection of the data adheres to data definitions and guidelines.

Role 6: Patient Information Coordinator
This role involves the promotion of patient education. This includes assistance with enrollment forms, creation of smart cards, annual review of patient information, and patient education about rights to information and the coordination of the release of information and all pertinent legalities and guidelines for that release.

Role 7: Clinical Data Specialist
The clinical data specialist is responsible for revising, clarifying, and adding data. This includes validating the accuracy of the data, researching information about the efficacy of clinical protocols, and the preparation of reports on utilization, outcomes, and case mix for case management conferences.

tive that health information administration (HIA) programs incorporate computer-based information management into their curricula. This does not come without high cost. Computer hardware and software resources are required in addition to the personnel needed to maintain these resources. HIA programs must invest in, or obtain in some other manner, the computer resources needed to remain a viable program. Each HIA program must also maintain its customer base, with enough students coming through the doors to warrant continuation of the program. Whether programs remain in the traditional on-campus venue or the more modernistic distance education mode of educational delivery, investment in computer resources is essential for a program's long-term viability.[2,3]

For those programs that have visionary leaders as well as the requisite administrative and political connections and motivation, a well-designed computer laboratory, complete with hardware, software, and full-time laboratory managers, will become and remain a requirement. For those programs that lack one or more of the above resources, the program's survival may hinge on cooperation with other departments on campus that may be willing to share the cost of such an endeavor. An example of such cooperation is

described in this article, and it is hoped that the model described will provide food for thought for other programs in need of the expensive resources of technology.

BACKGROUND

One of the key operative phrases concerning this topic is *the business of health care*. It could be argued that for years health care was not operated as a typical business and that health care providers were not trained in the use of business techniques or concepts. This absence of knowledge historically has resulted from either a lack of time in the curriculum or a perceived lack of need. Before managed care, when a patient required a special treatment or drug, the cost of such treatment could be tacked onto the existing fees in the so-called fee-for-service structure: The patient paid what was necessary in a somewhat inelastic economic environment. With the advent of managed care, however, health care providers of all types are now forced to look at the expenses with more of a critical eye and operate in a more cost-effective manner. Herein lies the importance of the phrase *the business of health care*: We indeed need to incorporate the expenses of doing business into our everyday thought process. It only makes sense that perhaps the world of business could be looked to for a possible solution to some of the relatively new problems facing health care.

That same logic can be applied to the educational process. Business schools routinely address the issue of costly computer technology and the need for qualified personnel to staff the laboratories. As HIA programs evolve into their new model curricula, similar issues will be encountered. Although such relatively standard disciplines as accounting, management, finance, and marketing have been mainstays of a business education for quite some time and have certainly benefited the education of many health professionals in the current climate, many business schools have recently developed a management information systems (MIS) major, which concerns itself with the use of technology in the world of business. The MIS major is concerned with data entry, systems analysis and design, database management along with data warehousing and data mining, local area networks, telecommunications, user interface issues, and information security issues, among others. These areas of concern are also important to the HIM professional.

According to the model curriculum for baccalaureate degree programs, a heavy emphasis will be placed on information technology and information management skills.[4] In this model, various skills are assigned an expected competency rating on a scale from 1 to 5, with 1 representing an awareness and 5 representing skilled use. Two examples of this emphasis are readily apparent.

The first example is the information technology area, and the intent of this area is to introduce the major concepts of computer programming, computer architecture, operating systems, and application software. The core emphasizes the use of tools and techniques for the development of higher-level content in database processing, data communication technologies, and systems analysis. The various components in this critical area are assigned a competency level of 3 (concept) to 5 (skilled use) and include hardware and software concepts; networks and data communications; database management concepts along with data administration, structures, definitions, dictionary, modeling, and retrieval; data security; and mainframe operating systems. The business school MIS program is likely to have courses in its curriculum that would cover these components, especially in computer programming, data communications, and database management courses.

The second example is the health care information systems area, and its intent is to study the

clinical and business information applications in health care. Concepts, techniques, and tools associated with the systems development life cycle are included. The competency level for the various skills in this area are level 4 (detailed understanding) and include systems theory, planning, analysis, design, implementation, testing, and human factors and user interface design. These are all topics of importance to the MIS curriculum and are taught in most business schools, especially in the systems analysis and design course. If the business school is not health care focused, it is important for the HIM program to develop opportunities for the knowledge to be applied in health care.

These are but two examples, and there are a number of other topics and components that could also be outsourced elsewhere on campus if the required resources simply are not available to the HIA program.

HIM/MIS CERTIFICATE OPTIONS

If an HIA program has the resources, power, and control to establish its own laboratory and obtain appropriate faculty, that is a tremendous asset. For those programs that are unable to acquire these resources, however, cooperation with other entities on campus is a viable option.

At Saint Louis University, we have taken the first step toward providing the HIA graduate with a large dose of MIS by establishing a certificate in MIS to coincide with the bachelor's degree in HIM. In our model, the certificate does not replace the other health care knowledge skills taught in the department of HIM. The certificate program serves as a model of potential synergy between the two departments on campus.

In May 1994, the chair of the HIM department approached the school of business about creating a certificate in MIS to enhance the HIM curriculum in the area of information technology. Several meetings were held, and a certificate option was developed in conjunction with MIS and HIM faculty members. The courses making up the MIS certificate are listed in the box titled "MIS Certificate Courses." The certificate option allows the HIM degree candidate to finish her or his baccalaureate degree in the usual 4 years while interspersing MIS courses among the HIM courses as electives and additional courses (Figure 1). It is a 30-hour certificate and is functionally equivalent to the MIS courses that a regular MIS major in the business school would be required to take. The MIS faculty believe that this curriculum is essential to prepare today's MIS graduate to function in the evolving world of technology. As the world of health care takes on more of a business flare with the advent of managed care, these MIS skills will benefit the HIM professional as well.

Once again, what we describe here is in addition to the traditional HIM curriculum. The certificate option does not replace any of the coursework provided by the HIM department at the university. For programs that cannot obtain the required resources, however, outsourcing some of the resource-intensive coursework to other entities on campus could prove to be the only survival technique available. Even utilizing a portion of the courses listed in the box could help fill in gaps in the HIM curriculum if the required resources cannot be obtained within the HIA program.

In converse, the HIM department offers a certificate in HIM to degree-seeking students at the university (Table 1). This is not limited strictly to MIS majors but is helpful to finance, marketing, economics, accounting, management, and decision sciences majors as well.

The cooperative effort between the disciplines of HIM and MIS has resulted in advantages for both parties. The HIA program can now offer additional training in computer systems that provide added value to the education of the HIM

MIS Certificate Courses

Introduction to MIS
This course provides a solid foundation in the hardware and software issues related to personal computing. Coverage includes a general understanding of the various components that make up the personal computer (PC) with specific technical information that is necessary for comparing and evaluating PCs.

Program Development Techniques
This course is aimed at providing the student with an understanding of how to approach programming for business from a structured and object-oriented viewpoint. This is accomplished through the use of a programming language such as Java.

Introduction to Object-Oriented Programming
Object-oriented programming focuses on the organization of software as a collection of discrete objects that incorporate both data structures and the operations performed on those structures. This course teaches the basics of object-oriented programming as it applies to business, including class, inheritance, and encapsulation, through the use of a language such as C++ or Java.

Advanced Internet Technologies
The course enables the student rapidly to develop and deploy solutions to corporate intranets, extranets, and the Internet. Students will utilize visual development tools for hypertext mark-up language (html) and Java to aid in rapid application development.

Systems Analysis and Design
Systems analysis and design provides a general understanding of the systems development life cycle as well as other techniques, including prototyping.

Database
This course provides an overall understanding of database techniques, beginning with a study of the characteristics of relational database management systems and continuing with structured query language (SQL), entity-relationship diagrams, dependencies and normalization, and multiuser systems.

Data Communications
This course looks at the types of information used in the business environment and the implications in terms of communications along with the trend toward digital integration of historically stand-alone analog and digital technologies.

Client-Server
This course will focus on an area of distributed processing known as client-server computing. Client-server computing is emerging as the next common platform for business computing systems.

Multimedia
Multimedia focuses on capabilities in the newer software tools that allow for the use of additional media types. The traditional forms of information maintained in information systems include text, tables, and charts. With the advent of multimedia-capable systems, additional media types that include pictures, audio, animation, and video represent newer forms of computer-based information that can be created, stored, manipulated, and used to present a more complete information package.

Artificial Intelligence
This course explores artificial intelligence technologies, including artificial neural networks, expert systems, intelligent agents, and data mining.

students. Another potential advantage of interdepartmental collaboration is for increased student enrollment in the respective departments. The certificate options attract new customers to the programs. The upside therefore is that, as you ensure the survival of your program, you have the potential to attract even more students into your programs.

The disadvantages to a collaborative effort of this type can be minimized tremendously through the appropriate action. One disadvantage in our situation was when the MIS group revised the MIS curriculum for MIS business majors. The changes affected the structure of the certificate and made modifications more difficult. To prevent problems from arising, open communication

DEPARTMENT OF HEALTH INFORMATION MANAGEMENT
SAINT LOUIS UNIVERSITY

CURRICULUM PATTERN LEADING TO A
B.S. IN HEALTH INFORMATION MANAGEMENT/MANAGEMENT INFORMATION SYSTEMS

TOTAL SEMESTER HOURS: 129-130

FRESHMAN YEAR

FIRST SEMESTER		CREDIT HOURS	SECOND SEMESTER		CREDIT HOURS
---	Biology or other Science Elective	3-4	AN G100	Basic Human Anatomy	3
ENGA190	English Composition	3	B & A	Business Elective	3
MT A120	College Algebra	3	FPAA	Fine Arts Elective	3
PL A105	Intro to Philosophy	3	*MISB200	Intro to Microcomputing	3
PSYA101	General Psychology (or other Social Science)	3	TH A	Theology	3
		15-16			15

SOPHOMORE YEAR

B & A	Business Elective	3	DSCB207	Intro Business Stats	3
ENGA	Literature	3	HIMH310	Medico-Legal Aspects	3
HIMH370	Medical Terminology	3	*MISB320	Intro to Object Oriented Prog.	3
*MISB310	Program Develop. Techniques	3	*MISB410	Systems Analysis & Design	3
PY G254	Human Physiology	4	THA	Theological Studies	3
		16			15

JUNIOR YEAR

HIMH300	Intro to Health Info.	3	HIMH320	Health Care Statistics	3
HIMH350	Health Care Mgmt.	3	HIMH415	Quality Improvement	3
HIMH470	Fund of Clinical Medicine	3	*MISB415	Client-Server Computing	3
*MISB345	Advanced Internet Technologies	3	**MISB440	Multimedia	3
*MISB430	DataBase Mgmt Systems	3	PL A	Philosophy	3
SAHP	Health Care Delivery	2	PT G312	General Pathology	3
		18			18

SENIOR YEAR

HIMH330	Classification Systems I	3	HIMH430	Classification Systems II	3
HIMH450	Mgmt Human Resources	3	HIMH453	Professional Practice II	3
HIMH451	Productivity and Finance	3	HIMH461	Health Information Systems	3
HIMH452	Professional Practice	3	HIMH498	Senior Seminar	3
*MISB420	Artificial Intelligence	3	*MISB435	Data Commun. & Networking	3
		15	RM G375	Research Methods in HIM	18

*Required for Certificate A certificate in Management Information Systems is awarded upon completion of asterisked courses. 1/98

**Not offered until the 98-99 academic year.

Academic Year 97-98

Figure 1. HIM/MIS curriculum pattern.

Table 1. HIM certificate courses

Requirements	Credit hours
Introduction to MIS or Introduction to Computer Software (CS P100)	3
From the HIM department	
Introduction to Health Information	3
Medicolegal Aspects	3
Health Care Statistics	3
Health Care Management	3
Medical Terminology	3
Quality Improvement	3
Health Care Financial Management	3
Health Information Systems	3
	Total hours: 27

between the departments is a must. Ongoing communication with all affected entities goes a long way toward minimizing problems and alleviating potential disadvantages to the collaborative effort.

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One of the key components to the AHIMA model curricula is that the curricular content represents the direction in which the profession is headed, and both entry-level and experienced practitioners should have a solid foundation in the tools necessary to access and manage information.[5] These tools require an extensive laboratory, faculty, and other related resources. Because these tools and resources may be costly, HIA programs should consider aligning themselves with departments on campus that can augment their curriculum needs. In turn, the HIA program can offer curriculum content of use to other disciplines. The HIA program at Saint Louis University has chosen this approach to curriculum innovation and adaptation of the AHIMA model curriculum.

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