

Developing a Management Information Systems (MIS) Curriculum: Perspectives From MIS Practitioners

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The demand for business professionals with knowledge of information technology has been projected to increase as organizations seek to improve their competitive positions in the global marketplace (Prabhakar, Litecky, & Arnett, 1995). Management information systems (MIS) is one of the few interdisciplinary fields of study in business that integrate knowledge of information technology with business. These programs provide students with a foundation in the functional areas of business and information technology, enabling graduates to pursue jobs in public and private organizations. MIS graduates have been employed as systems analysts, application development specialists, database administrators, end-users' consultants, and information specialists. The advent of information technology in the business world has catapulted the demand for MIS graduates in the job market. Almost all projections of the demand for MIS graduates indicate a double-digit percentage increase per year for the next 5 years. The U.S. Commerce Department (1998) has estimated that more than 1.3 million high-tech workers will be needed in the next decade. This will increase the demand for computer scientists, systems analysts, and engineers by 177%. The U.S. Bureau of Labor Statistics (1993) reported that the occupations with the strongest growth rates between the years

ABSTRACT. The demand for management information systems (MIS) graduates has increased recently because the MIS degree tends to integrate knowledge of computer technology with business skills. MIS program directors must constantly update their programs to keep pace with the rapid rates of change in the information systems sector. In this study, the author discusses the process and results of the development of an undergraduate MIS program grounded in the industry's expectations and reflecting the perspectives of a select group of individuals from major organizations that employ MIS graduates. Results show that employers are looking for individuals with a strong systems orientation and a good understanding of an integrative business value-chain.

1992 and 2005 would be systems analysis (110%) and computer engineering (112%). This growth rate translates into 737,000 new employment opportunities in these job categories during the 13-year period. Coincidentally, the current supply of MIS graduates is not adequate to meet the increasing market demand. The U.S. Commerce Department (1998) stated that an average of 95,000 new computer scientists, systems analysts, and programmers will be needed every year over the next 9 years, but U.S. universities are producing only about one fourth that number of graduates. Along with the increasing demand for MIS graduates, the market is increasingly expecting

additional knowledge, skills, and abilities from these graduates. Understanding the capabilities considered important by MIS employers can help MIS educators better develop MIS programs that will prepare future graduates to cope with the fast-changing profession.

In this study, I attempted to address the imminent shortage of MIS graduates by reporting on the development of a new MIS program that incorporates the viewpoints of MIS practitioners. As the timely use of information technology becomes a competitive advantage, companies are faced with a need for professionals who can combine their knowledge and skills in information technology with the needs of the various business disciplines. There are three primary fields of study that prepare graduates for the information systems (IS) profession: computer science (CS), management information systems (MIS), and office systems management (OSM). CS involves the design of computer architecture, programming languages, algorithms and data structures, operating systems, software engineering, databases and information retrieval, and artificial intelligence and robotics (Denning et al., 1989). MIS entails the development of appropriate business processes that incorporate modern-day information technologies to help organizations successfully achieve their over-

all mission. The goal of MIS is to ensure that accurate and appropriate information is in the right form and available to decisionmakers in a timely fashion (David & Olson, 1985). OSM includes tools that relate to the efficient and effective use of information technologies in an office or small work group. The OSM departments oversee introduction of technological changes in the office and train end users to use these systems effectively.

Regan and O'Connor (1994) studied the relationships among the three information technology (IT) fields of study and found a significant overlap. As shown in Figure 1, microcomputer applications and networking technologies were common in all three areas. The only distinction found was the following: Both CS and MIS emphasize systems development of hardware and software, whereas OSM emphasizes systems use and implementation. Too often, there are disagreements among faculty in all three areas, especially

between the CS and the MIS faculty. Many of these disagreements center on "turf protection." Regan and O'Connor concluded that faculty in all three IT areas of study stand to gain much through collaboration and sharing of resources. In this study, I propose an MIS curriculum that a group of us at the Harrison College of Business, Southeast Missouri State University, developed with considerable input from the computer science faculty. A number of MIS and CS courses were cross-listed to be taught by faculty members from either the CS or the MIS department. This is a relationship that hardly exists among CS and MIS programs elsewhere in the country.

Schools of business are constantly revising their programs of study in MIS to stay abreast of the changes in information technology. A number of researchers have evaluated the structure of MIS programs that would prepare MIS graduates for the new millennium. In Table 1, I present the results of previ-

ous surveys of undergraduate MIS programs. More than half of the schools surveyed offered courses in database management systems concepts, data communication, COBOL, decision support systems, computer concepts, systems analysis and design, management of information systems, and information systems projects (Maier & Gambill, 1996). In addition, a large percentage of the schools (44.2%) offered courses in data/file structure, microcomputer applications, and C++. A survey of MIS academicians indicated that whereas the Internet and client/server architectures have become prominent, mainframe operating systems have declined in importance (Gill & Hu, 1999). That study also revealed that relational databases, systems analysis and design, telecommunications, computer networking, and COBOL programming language were among the top courses offered in MIS programs. According to projections for the future, demand for COBOL programming language, decision support systems, expert systems, and artificial intelligence will decline over the next 5 years. The strong emphasis on client/server, distributed processes, Internet technology, and multimedia applications can be attributed to new developments in telecommunications, networking, and the growing electronic business (Shah & Martin, 1997). According to *Computerworld* ("The Top IS Jobs," 1998), the information technology skills sought most by organizations are networking (18%), Oracle (16%), C and C++ (12%), Windows NT (11%), and COBOL (10%). In the area of networking, the demand for Ethernet specialists headed the list, followed by the demand for networking managers and Novell NetWare specialists.

A large number of graduates with MIS degrees most likely would find jobs as systems analysts. The position description includes the translation of business problems and requirements into information requirements and systems (Laudon & Laudon, 1998). The systems analyst works closely with the programmer and often acts as a liaison between the programmer and the customer. The position requires individuals who are adept at using both technical

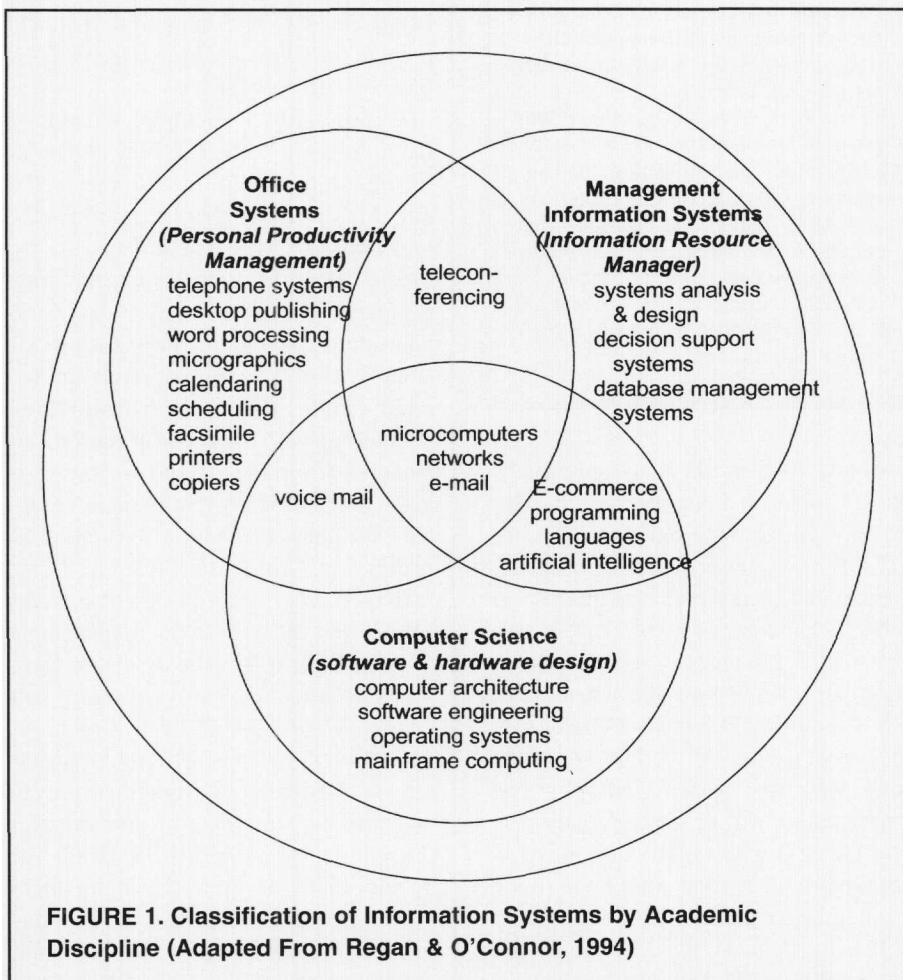


FIGURE 1. Classification of Information Systems by Academic Discipline (Adapted From Regan & O'Connor, 1994)

TABLE 1. Results From Surveys of Undergraduate Management Information Systems (MIS) Programs

Top 10 courses (% of programs offering) (Maier & Gambill, 1996)	Top 10 courses currently (Gill & Hu, 1999)	Top 10 courses in the next 5 years (Gill & Hu, 1999)	Top 10 courses currently (Shah & Martin, 1997)	Top 10 courses in the next 5 years (Shah & Martin, 1997)
Database (90.7%)	Relational Database	Internet Technologies and Usage	Systems Development Life Cycle (100%)	Data Communication (100%)
Data Communications (81.4%)	Systems Analysis/Structured Analysis	Computer Networking	Database (100%)	Database (98.7%)
COBOL I (72.1%)	Data Management (e.g., Data Modeling)	Client/Server Application Development	Structured Programming (93.2%)	Object-Oriented Programming (94.1%)
DSS/ES/ESS/Neural Networks (63.1%)	Telecommunications	Windows Application Development	Data Communication (89.6%)	Client/Server (94.1%)
COBOL II (60.5%)	Computer Networking	Distributed Processing	Case Tools (72.68%)	Case Tools (91%)
Computer Concepts (60.5%)	Internet Technologies and Usage	Fourth-Generation Languages	Data Structure (68.6%)	Systems Development Life Cycle (89.9%)
Systems Analysis and Design (60.5%)	Client/Server Application Development	IS case studies in emerging technologies	End-User Computing (68.1%)	Internet (84.5%)
Management of IS (58.1%)	End User Applications (e.g., spreadsheets, DBMS)	Telecommunications	4GL (60.6%)	Structured Programming (81.3%)
IS Projects (51.2%)	Programming in at least one 3 GL (e.g., COBOL, C)	Emerging Information Technologies	Prototyping (56.9%)	Multi-Media (78.9%)
Data/File Structures (44.2%)	IS case studies emphasizing implementation issues	IS case studies emphasizing ethical issues	Internet (54.3%)	Prototyping (78.1%)

skills and business knowledge. Systems analysts were in the top three professions with the fastest growth, highest pay, and lowest unemployment ("The Top IS Jobs," 1998).

According to *The Wall Street Journal* ("High-Tech Firms," 1998), an average of 95,000 new computer scientists, systems analysts, and programmers will be needed every year over the next 10 years, but U.S. universities are producing only about one quarter of that number of graduates. To meet this challenge, MIS programs throughout the country are being expanded and new programs are being created to meet the shortfalls in the number of qualified MIS graduates. The literature is replete with studies of academic surveys dealing with the content of an MIS curriculum. Although these studies provide useful information on standardization across the country, they fall short of incorporating the viewpoints of MIS

practitioners who are employers of MIS graduates. Leitheiser (1992) found that differences in perceptions between MIS professionals and academics often inhibit the ability of educational institutions to produce MIS graduates with the requisite skills and knowledge. For the present study, I followed a nontraditional approach of conducting interviews with key MIS employers to determine the skills, knowledge, and abilities that they would like to see in graduates of a state-of-the-art MIS program. Although the findings may not be supported empirically, they provide helpful information for institutions that are either developing new programs or revising their existing programs in MIS.

Method

My assistants and I developed the MIS program through a two-phased

approach. The first phase involved extensive review of the literature and current programs in MIS across the country. We conducted this phase through the Internet and some personal telephone conversations with a randomly chosen group of chairpersons of MIS or related programs in the country. The management faculty then drew up its first draft of the MIS curriculum at the regional university. A leading MIS endowed professor (consultant) was hired to review the draft and make recommendations. The consultant spent an entire day visiting with university faculty and staff, including the provost, the dean, and computer science and management faculty members. The draft was revised substantially based on the recommendations. One of the consultant's major recommendations was to leverage the new MIS program on the already established computer science

program at the university. This phase was completed within 6 months.

The second phase of the development process involved distributing the draft proposal to MIS employers located in the immediate metropolitan areas. In all, 14 companies were selected based on their involvement in information technology. Five copies of the draft proposal were sent to each company. Appointments were made for us to visit each of the 14 companies to discuss the MIS draft proposal. At seven of the responding companies, my assistants and I interviewed one representative for each company; four companies had two representatives each; and the remaining three companies had three representatives each. A total of 24 MIS practitioners provided input into the development process (see Table 2). The positions of the respondents included director of information systems, systems analyst, manager of business systems, and human resource manager. To give the companies enough time to review the information, we conducted the interviews at least 3 weeks after the drafts were mailed to the companies. The following questions were posed to the respondents:

- What do you consider the key strengths of the proposal?
- What do you consider the key weaknesses of the proposal?
- What are the top 10 skills and knowledge areas that you would like to see in an MIS program?
- Would you recommend some niche areas for an undergraduate program in MIS, and if so, what would those be?

Six weeks after the interviews were completed, I invited each respondent to attend a career day at my university's campus for a follow-up interview. Copies of the revised draft proposals, which incorporated respondents' feedback from the earlier site interviews, were distributed to those in attendance. Fifteen individuals representing 12 companies attended the second phase of our information gathering, which included a 3-hour brainstorming session under the auspices of the dean. At this session, we refined previous drafts and developed the final MIS program of study.

Results

Using the results of this study, the faculty developed a state-of-the-art MIS program. Rather than going with the conventional mail-in survey approach, we decided on face-to-face interviews and the subsequent brainstorming session because they allowed the MIS professionals to share their viewpoints honestly and openly about current and future trends in the MIS profession and curriculum. This would not have been possible otherwise. Furthermore, engaging the participants in group sessions provided the brainstorming opportunities that would not be found in the conventional mail-in survey method. Although the number of respondents in this study was insufficient to permit generalization of the results, the findings do provide a glimpse of the types of skills and abilities and areas of knowledge expected from graduates of an MIS program. The findings are consistent with the Association of Information Technology (IS '97) guidelines for the information systems undergraduate curriculum. The curriculum developed in MIS provides a unique combination of managerial skills and technical know-how in telecommunications and systems integration, data access and management, and managerial decision support. The curriculum emphasizes the

role of the IS professional as systems integrator by providing graduates with knowledge of integrated business processes, applications systems, and technology. In Table 3, I present the technical aspect of the new MIS program. The business core requirements are provided in Figure 2.

Knowledge of the Business Process

Business practitioners from across the country have criticized university business programs for producing graduates who are not prepared to deal with the rapidly changing and competitive world of business. The MIS curriculum, which provides a business degree, is not exempt from this criticism. Much of the criticism comes from the fact that most business programs are designed from a functional perspective deprived of an integrative framework. Although modern-day business practices are moving into a more integrative business framework, academic business programs are not keeping up. This has resulted in the education of business graduates who view business processes from a functional perspective rather than from the more current, integrative perspective. During the on-site and career-day interviews, the business practitioners expressed the desire for graduates who, when analyzing business problems, understand interfunctional perspectives. Employers are looking actively for students who have a more integrative learning experience with a disciplinary depth in such areas as accounting, marketing, management, finance, and information technology. Employers are also looking for graduates with good communications and people skills. The desire for MIS graduates with sound business-oriented knowledge and skills was rated among the most important expectations or demands by the MIS professionals sampled in this study. Although technical-oriented skills were considered important, business-oriented skills were considered more important in hiring MIS graduates. In the words of one practitioner, "We can train our new MIS hire on the technical skills, but it is very difficult to teach him or her interpersonal and communication skills." Employers apparently are looking for

TABLE 2. Listing of Companies and Number of Representatives From Each

Company	No. of MIS Professionals
A. G. Edwards	1
Andersen Consulting	3
Arthur Andersen	2
Biokyowa	1
Boeing	3
Deloitte & Touche	1
EDS	1
Edward Jones	2
Laclead Gas	1
Leggett & Pratt	2
State Farm Insurance	1
SSE	2
Solutia	1
Union Pacific	3
Total	24

individuals with in-depth knowledge of different facets of the business and ability to see the big picture. The MIS graduates should be able to work with a company's clients, understand their needs, and be able to develop information systems that would solve the clients' problems.

The key strength of the proposed MIS curriculum, in the respondents' view, was that it placed the general body of business knowledge in the business

core. The listening, observation, and communication skills were seen as being highly critical to working with clients from diverse backgrounds. MIS students should be able to translate the skills acquired through the business core into business applications that would serve the customers' needs. The respondents also expected MIS students to have a systems orientation, which translates into knowledge of the business value chain and an understanding

of how each segment of the operation is related to the entire business. MIS graduates should have knowledge of customer systems development and application software development and implementation.

Knowledge of systems from the perspective of systems analysis and design was considered very important. The practical experience provided through internships, practica, and cooperative programs in the MIS area was consid-

TABLE 3. Proposed Management Information Systems (MIS) Curriculum

MIS courses	Subject matter
Introduction to Microcomputer Applications	This course enables students to improve their skills as knowledge workers through effective and efficient use of microcomputer applications. The emphasis is on productivity concepts and how to achieve them through functions and features in computer software.
Management Information Systems	This course provides an introduction to systems and development concepts, information technology, and application software. It explains how information is used in organizations and how it enables improvement in quality, timeliness, and competitive advantage.
Required courses (18 hours)	
Visual Basic Programming	This course provides an understanding of algorithm development, programming, computer concepts, and the design and application of data and file structures.
COBOL Programming	This course survey of structured computer programming uses COBOL.
Telecommunication Management	This course provides an in-depth knowledge of data communications requirements including networking and telecommunications technologies, hardware, and software. Emphasis is placed on network applications in organizations.
Business Systems Analysis and Design	This course provides an understanding of the system selection and development process. It emphasizes the factors for effective communication and integration with users and user systems. Use of data-modeling tools and the development and adherence to systems life cycle standards are highlighted.
Business Database Systems	This course covers information systems design and implementation within a database management system environment. Students will demonstrate their mastery of the design process by designing and constructing a physical system using databases (SQL and ORACLE) to implement systems requirements.
Systems Implementation and Practice	A capstone field experience that builds on systems analysis and design methodologies for the design and implementation of a computer-based information system. Special emphasis is placed on the use of modern technologies for rapid systems developments.
Elective courses (sample list)	
Advanced Visual Basic Programming	This course covers advanced topics in Visual Basic that include database manipulations, Internet applications, error handling, and active controls.
Network Support Systems	This technical overview of Local Area Network (LAN) systems includes a theoretical framework and hands-on experience with networking technology.
Integrated Decision Support Systems	This course involves use of information systems technologies to support decisionmaking. Topics include decision support systems, expert systems, and executive support systems.
Project Management in IS	This course covers the factors necessary for successful management of system development or enhancement projects. Both technical and behavioral aspects of project management are discussed. The focus is on the management of development for enterprise-level systems.
Accounting Information Systems	This course analyzes the role of accounting information systems within an organization operating environment and the effect of computers on these systems.
Technical Application for Multi Media	This course highlights use of computer hardware and software that integrate digital computer files to develop multimedia-based applications.
Web-Design for E-Commerce	This course focuses on developing Web presence using Web-centered technologies. Topics include HTML and XML programming, security, scripting language, and database connectivity.

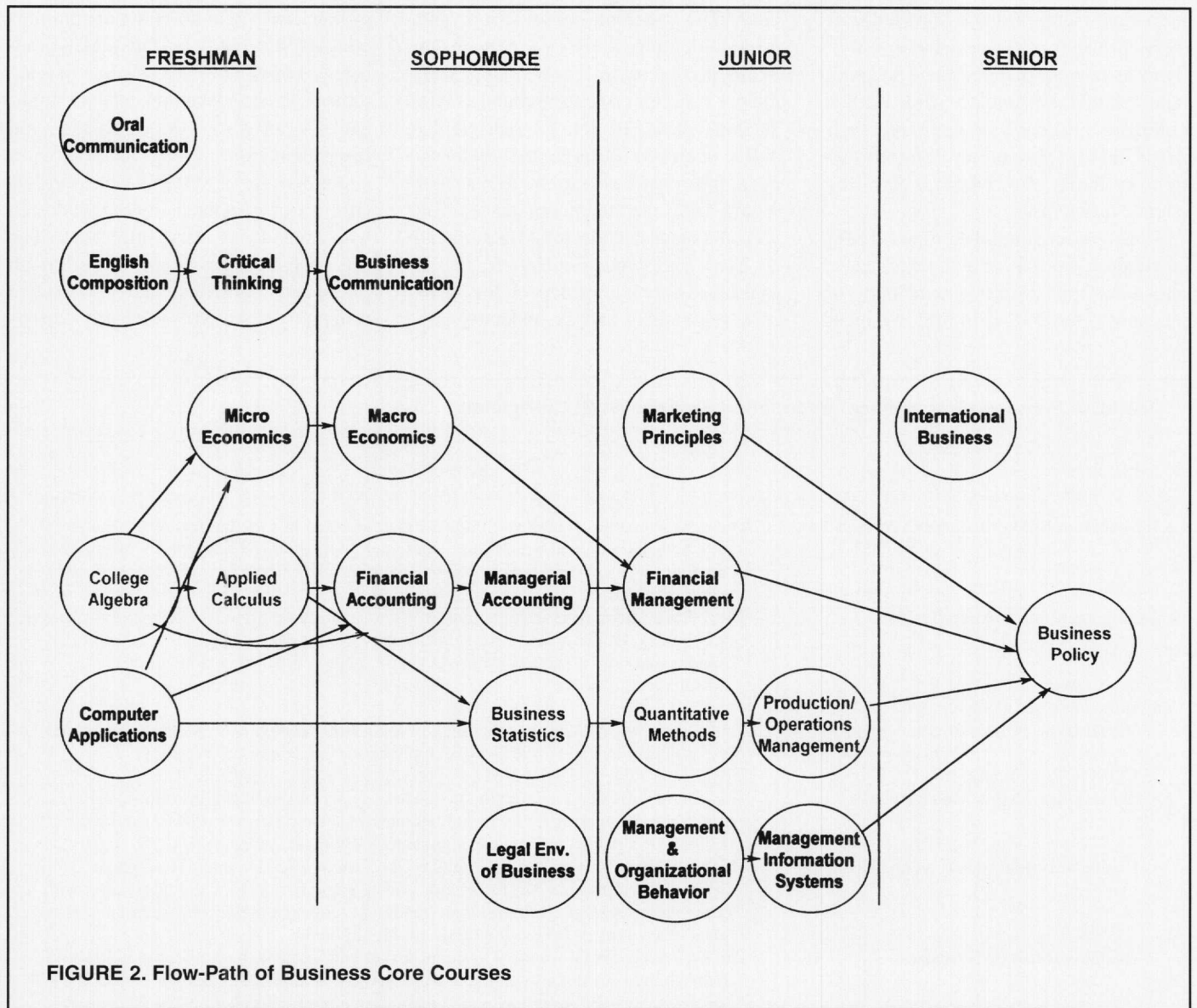


FIGURE 2. Flow-Path of Business Core Courses

ered highly desirable in an MIS curriculum. With the magnitude of changes occurring daily in the MIS profession, it is imperative that MIS programs develop partnerships with the business community (Gonzenback, 1998). The 10 most critical skills identified by the MIS practitioners for an MIS curriculum were problem-solving, analytical, interpersonal communications, cost/benefits analysis, technological, programming languages, database management, group dynamics, application development, and process orientation. There was an overwhelming consensus among the practitioners that project management from a systems development viewpoint should be infused into the MIS curriculum.

Programming Skills

The business practitioners were consistent in stating that business students with an MIS degree must have a solid knowledge of programming skills. Although employers do not expect their MIS hires to be programmers, they should have a minimum level of programming skills. Without agreeing on any particular programming language, the respondents agreed that a general knowledge of programming logic and thought process with a reasonable proficiency in at least one programming language was necessary. Respondents from most companies indicated that there are in-house training opportunities available for the development of various pro-

gramming skills if there are programming deficiencies in the new MIS hires. One of the respondents indicated that "MIS graduates should have the aptitude to reason logically and the fundamental programming logic that is normally taught in a first level programming course." When pressed with the question of identifying one programming language that should be incorporated into the MIS curriculum, the majority of the respondents indicated a preference for object-oriented programming (C++) centered on client/server architecture and Java programming used in Web-enabled and e-commerce applications. The third most preferred programming language was Visual Basic.

The practitioners noted the trend in the profession to use third-party vendors to develop source codes for system applications. Programming skills are now being looked upon as commodity items that could be readily sourced from third-party vendors. Furthermore, the life cycles of these programming languages are so short that companies are constantly looking for new and innovative ways of solving business problems. In the words of one of the practitioners, "Programming shops now abound all over and the key decision faced by MIS professionals is to determine which of these vendors possesses the technical expertise that would meet the company's needs."

The respondents were divided on the number of programming courses that should be required in the MIS curriculum. The majority of the practitioners indicated that at least one language should be required in the curriculum with preference given to C++ and Java. Fifteen of the 24 practitioners (62.5%) expressed the need for COBOL programming in the MIS curriculum. Although the literature seems to suggest that COBOL programming is a thing of the past, over 70% of systems software in companies are still retained in mainframe computers that are mostly written in COBOL language. Some companies view COBOL as a legacy language that will be around for a long time (Prabhakar, Litecky, & Arnett, 1995). A recent estimate has shown that at least 75% of the computer programs used in major corporations were written in third-generation languages (Martin, Brown, DeHayes, Hoffer, & Perkins, 1998). The information technology field seemed to be moving away from COBOL 10 years ago, but today COBOL programmers are in great demand, not just to repair the "millennium bug" but to convert mainframe programs and applications into newer technologies (Hick, 1998). The need to build a COBOL-structured procedure into the MIS program as a second language was unanimously endorsed by the practitioners.

Niche Areas

The practitioners were asked whether business schools with MIS programs should develop niche areas (concentra-

tions) in their undergraduate MIS curriculums. Although MIS concentrations are found mostly in graduate level MIS programs, a number of undergraduate MIS programs are looking seriously at this programming option. The majority of the practitioners were in favor of it. Suggested niche areas included e-commerce and e-business, Internet/intranet application developments, database administration, business systems analysis, networking administration, and systems programming. The niche areas allow MIS students to specialize in areas that would include technical skills drawn from the following areas: GUI front ends, object-oriented programming, client/server networks, distributed processes, and specific programming skills such as JavaPowerBuilder, Oracle, SQL, Visual Basic, and C++. The niche areas would also allow institutions offering MIS programs to better use their resources by focusing on specific specialty areas.

Recommendations

In this article, I described the development of an undergraduate MIS curriculum that would provide the requisite skills, knowledge, and abilities to better prepare current and future students for the challenges that lie ahead. The proposed curriculum was developed through a nonconventional approach entailing one-on-one interviews with MIS practitioners from major companies. Although the results may not be empirically driven, they provide implications for educational institutions that either have MIS programs or are considering developing them. MIS curriculums across the nation must be revised continually to meet the challenging needs of the Information Age economy. Modern-day MIS programs must provide students with a strong background in program analysis and design techniques and an in-depth understanding of computer technology and applications that afford students the opportunity to apply the knowledge through realistic IS projects focused on business problems. In addition to the technical skills, MIS curriculums should focus on developing interpersonal and business skills. Writing, speaking, persuading, socializ-

ing with others, and understanding others' emotional needs are all important to success as an MIS professional. These are not necessarily new findings, but they do tend to reaffirm previously held beliefs and perceptions. In his 1990 mail survey of MIS managers' perceptions, Leitheiser (1992) concluded that managerial and interpersonal skills were found to be more important than technical skills in developing systems analysts. MIS graduates should build their knowledge of information technology on an already-established integrative business knowledge.

Although the respondents in this study perceived business and interpersonal skills as more desirable than technical skills, they considered the latter essential to a successful MIS curriculum. The business practitioners recommended placing significant emphasis on areas such as C++, Visual Basic and Java programming skills, systems analysis, operating systems, databases, telecommunications, networks (LAN and WAN), and business communication. The ability to design and code in structured procedural language, debug existing nonfunctional COBOL language with various debugging tools, and implement and test changes to existing programs was considered highly desirable by the practitioners. The understanding of the business flow diagram from a systems perspective was highlighted as an area that needs to be incorporated into the MIS curriculum.

To produce MIS graduates who are on the cutting edge of technology and who can understand the business value chain concepts, MIS programs should be forward looking and aspire to stay abreast of the current trends in the industry. MIS educators should continue to develop and strengthen relationships with business and industry to improve curriculums across all business disciplines.

REFERENCES

- David, G. B., & Olson, M. H. (1985). *Management information systems* (2nd ed.). New York: McGraw-Hill.
- Davis, G. B., Gorgone, J., J., Couger, D., Feinstein, D., & Longenecker, H., Jr. (1997). *IS '97 model curriculum and guidelines for undergraduate degree in information systems*. ACM, AIS, and AITP. New York: Association for Computing Machinery-Association for International Technical Professionals.

Denning, P. J., Comer, D., Gries, D., Mulder, M., Tucker, A., Turner, J., & Young, P. (1989). Computing as a discipline. *Computer*, February, 63-69.

Gill, G. T., & Hu, Q. (1999). The evolving undergraduate information systems education: A survey of U.S. institutions. *Journal of Education for Business*, 74(5), 289-295.

Gonzenbach, N. M. (1998). Developing an information systems curriculum with input from business and industry. *Office Systems Research Journal*, 16(1), 9-14.

Hick, B. (1998, October 12). This consultant did COBOL when COBOL wasn't cool. *St. Louis Post-Dispatch*, BP3.

High-tech firms added 200,000 jobs last year. (1998, May 19). *Wall Street Journal*, p. B10.

Laudon, K. C., & Laudon, J. P. (1998). *Management information systems* (5th ed.). Englewood Cliffs, NJ: Prentice Hall.

Leitheiser, R. L. (1992). MIS skills for the 1990s: A survey of MIS managers' perceptions. *Journal of Management Information Systems*, 9(1), 69-91.

Maier, J. L., & Stanley, G. (1996). A descriptive study of CIS/MIS graduate school curriculums. *Journal of Computer Information Systems*, Fall, 26-29.

Martin, E. W., Brown, C. V., DeHayes, D. W., Hoffer, J. A., & Perkins, W. C. (1998). *Managing information technology: What managers need to know* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Prabhakar, B. K., Litecky, C. R., & Arnett, K.

(1995). MIS job market—Boom times ahead! *Journal of Systems Management*, January/February, 1(46), 24-29.

Regan, E., & O'Connor, B. (1994). *End-user information systems: Perspectives for managers and information systems professionals*. New York: Prentice-Hall/MacMillan.

Shah, V., & Martin, R. (1997). Future changes in the computer information systems curriculum. *Journal of Computer Information Systems*, Spring, 74-78.

The top IS jobs for 1998. (1998). *ComputerWorld*, 11(1), 5.

U.S. Bureau of Labor Statistics. (1993). *Occupational Outlook Quarterly*, Fall, 47.

U.S. Commerce Department. (1998, January 15). *Financial Times*.

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