AN INTERACTIVE TELECOMMUNICATIONS DEGREE WITH VISION FOR THE FUTURE

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ABSTRACT

This paper presents a new curriculum for the Internet and e-business that has been developed at University of Redlands in Southern California with first offering in 2000. The paper presents the new MSIT Degree in the context of the MSIS 2000 Model Curriculum (Gorgone et al., 2000). An important similarity is an element of integration, but how the integration is achieved is different. The paper discusses the MSIT in terms of the rapid change in the economy of advanced nations towards e-business and the rapidly growing skills/educational needs in these areas. Another section examines the students entering the MSIT program and their knowledge competencies. It finds that competencies overall are novice, but that entering students in IS/engineering employment are more knowledgeable across competencies than those having other jobs. On the other hand, company type and gender are not significant in distinguishing entering competencies. The paper addresses the aspirations and goals of the students entering the MSIT program and how those goals relate to prospective career change. Entering students desire to attain integration of areas, technical skills, improved competencies, and nearly all seek to enhance career opportunities. The paper concludes by examining what the key challenges are for the MSIT program and similar new Internet/e-business based degrees.

1.   A NEW DEGREE TO MEET E-BUSINESS TECHNOLOGY NEEDS

In April, 2000 the University of Redlands in Southern California introduced a new master's degree program, the Master of Science Degree Program in Interactive Telecommunications (MSIT), specifically designed to meet the growing demands for professionals who can lead the management of e-commerce initiatives and technical installations. Today the knowledge of these areas (interactive telecommunications) is not only important for technical experts but for the mainstream of managers in industry (Price Waterhouse Coopers, 1999). We feel the MSIT program is an innovative and contemporary program for students to enhance their

business career or start in a new career path in rapidly developing areas of change in telecommunications and electronic commerce (e-business).

The MSIT program joins a handful of emerging degree programs started in the last two years to address the expanding and rapidly changing needs for professionals who can meet the demands of e-commerce initiatives. At some schools in the United States, the needs for more expertise in e-commerce and telecommunications have been added on as specialty certificates or elective courses. To distinguish itself and also focus on the integration of the management and technical skills required to administer and create e-business initiatives, the MSIT program is a full degree program in its own right, not an elective or specialty area of an MBA or other degree program. As such, it integrates business, technology, and management subjects in a unique way, covering such key topics as telecommunications, information systems management, e-commerce, Web design and programming, interface design and human factors, telecommunications policy and regulations, and knowledge management.

A special segment of the MSIT program examines emerging technologies that are continuing to change in the field. This is a key feature of the program designed to keep it both current and forward thinking in its approach to the integration of technological, economic, communicative, and commercial expertise that are demanded in today's e-business operations (Price Waterhouse Coopers, 1999).

It was the developers' purpose in coining the term "interactive telecommunications" for the degree to distinguish the MSIT program as being more than a program in e-commerce or e-business—but a program that defines an emerging and more expansive field. Interactive telecommunications, as defined for purposes of the program, is a true integration of new telecommunications and information systems technologies, commerce, management, and communication that defines e-business in the broadest sense.

2.   COMPARING THE MSIT CURRICULUM TO THE MSIS 2000 MODEL

In understanding the relevance and forward-looking nature of the MSIT degree program at the University of Redlands, a comparison with the *MSIS 2000 Model Curriculum and Guidelines for Graduate Degree Programs in Information Systems* is revealing. The MSIS 2000 model curriculum, released in late 1999, is the latest report from the work of information systems curricula task groups that began in the early 1970s and has continued for almost 30 years.

MSIS 2000 is the second collaborative effort between the Association of Computing Machinery (ACM) and the Association for Information Systems (AIS). Both organizations have a worldwide membership. ACM has both professional and academic members in the broad field of computing. Through its Education Board, it supports a wide range of curriculum development including computer science, information systems, and software engineering. AIS, organized in 1994, is composed of faculty members in information systems. The partnership of ACM and AIS, therefore, combines the breadth of interest of ACM and the information systems interest of AIS. All of the members of the MSIS 2000 task group belong to both organizations. The earlier IS '97 national model undergraduate curriculum was influential worldwide in the late 1990s (Davis et al., 1997; Pick and Schenk, 1996).

Despite the fact that ACM and AIS are worldwide organizations, MSIS 2000 does not represent a universal model curriculum. It does not seek to amend the curriculum to meet the requirements of different educational systems around the world. Instead, the model curriculum is based on the typical graduate degree structure in USA and Canadian universities. Like the MSIT degree program, the MSIS 2000 is a model for a Master's Degree program specifically in the information systems field and not a concentration or option in an MBA program.

The MSIS 2000 model curriculum parallels many objectives and course design criteria employed in the University of Redlands MSIT program. However, the MSIT program at Redlands differs in ways that the curriculum developers feel are significant given the documented need for professionals with integrated theoretical and practical skills in telecommunications, e-commerce, and Web content development.

2.1.　　Specific Similarities Among the Two Curricula

In the MSIS 2000 curriculum model, career tracks are isolated into areas of electives, such as Academia, Consulting, Data Management, Decision Making, Managing the IS Function, Project Management, Electronic Commerce, Systems Analysis and Design, Technology Management, Human Factors, and other suggested course specializations. The MSIT program takes a different approach to professional demands by focusing on multiple career possibilities, emphasizing telecommunications, knowledge management, Web content development, e-commerce, project management, human factors issues (interface design), and technology management in one degree program, in addition to core information systems competencies.

At the end of the program, it is anticipated that MSIT students will have the knowledge to move into careers involving the management and development of a wide range of e-commerce initiatives including Web programming, information and knowledge management for Web-enabled applications, project management in e-business, technical management of telecommunications infrastructure associated with e-business, and related areas. The choice of career will largely be determined by the capstone project completed by the student as the last course in the program. This capstone project will both integrate the knowledge gained through the program and focus the student on an area related to his or her career aspirations.

In this way, the Redlands MSIT approach moves away from the notion of a generalist degree in information systems toward a more flexible degree with a focus on new and upcoming technologies and business skills as used and demanded today in e-business and Web-enabled enterprises. Further, the integration of theory, practical application, business issues, global policy, technical skills, and resource management are emphasized in the design of each course in the program—rather than added on at the end as electives or as a single integration course. This allows students to gain a broad knowledge in all the areas relevant to the development and management of e-business and interactive telecommunications applications.

2.2.　　A Comparison of the Course Structure

The following tables clarify the similarities and differences in the overall approach of the MSIS 2000 model curriculum and the MSIT degree program from the University of Redlands (adapted from Gorgone et al., 2000).

Core IS Courses (may be waived with proper background)	Required Sequence	Integration Throughout the Program	Key Aspects of Courses
	TCOM 614 Telecommunications		All required sequence courses emphasize integration of theory, practical application, technical skill, management of technologies and resources, economic issues, global impact, strategic issues, and integration of technologies and applications within framework of enterprise management and social milieu/consequences
ISYS 317T Introduction to Object Oriented Programming Technique (Visual Basic or Java)			
MGT 691T Information Technology			
	TCOM 621 Programming Languages for Telecommunications		
	TCOM 611 Telecommunications Policy		
	TCOM 622 User Interface Design (and Human Factors)		
	TCOM 660 Knowledge Management and Telecommunications Strategy		
	TCOM 633 Telecommunications Infrastructure		
	TCOM 640 Electronic Commerce		
	TCOM 651 Development of Information Servers		
	TCOM 654 Management of Telecommunications Resources		
	TCOM 663 Emerging Technologies		
	TCOM 664 Telecommunications Project / Practicum –The integrative capstone project that culminates the degree program		
6 units	33 units		

Table 1: *University of Redlands MSIT curriculum*

2.3.   The MSIS 2000 Model Curriculum

In the MSIS 2000 model curriculum, a well-prepared student would take 15 units of core courses, 3 units of integration, and 12 units in a career track. For students with no IT/IS or business preparation, a program as long as 60 units could be provided. Note that this program assumes a business background or traditional business courses. In the MSIT program these business skills are integrated in the core sequence of the curriculum as they specifically relate to e-business.

For those that might consider the lack of these traditional courses a weakness in the program, it is important to realize that many of the MSIT students at the University of Redlands already have business degrees or strong practical experience in business as working professionals. Thus, these business courses seem redundant or unnecessary given the overall focus of the University of Redlands MSIT degree program. Further, the most germane issues in marketing, accounting, and organizational behaviour as they apply to e-business and interactive telecommunications are integrated in the required courses of the MSIT program.

IS Foundations	Business Foundations	IS Core	Integration a separate course	Career Electives
Fundamentals of IS	Financial Accounting	Data Management		Tracks with multiple courses (representative)
		Analysis, Modeling and Design		Consulting
IT Hardware and Software	Marketing (Customer Focus)			Decision Making
		Data Communications and Networking		Electronic Commerce
Programming, Data and Object Structures				Enterprise Resource Planning
	Organizational Behavior	Project and Change Management		Globalization
				Human Factors
		IT Policy and Strategy		Knowledge Management
				Managing the IS Function
				Project Management
				Systems Analysis and Design
				Technology Management
				Telecommunications
Pre/Co-requisite		Required		Elective sequence
9 – 12 units	9 units	15 units	3 units	12 units

Table 2: The MSIS 2000 model curriculum

The courses shown in bold in the table above have strong content similarities to the overall core and prerequisite courses in the MSIS 2000 model curriculum. In the MSIT program, a well-prepared student (with an IS background) could waive the ISYS 691T information systems course and the ISYS 317T programming course.

The rest of the MSIT curriculum is a connected whole that demands sequential exposure to the entire program since each course builds on the next to provide total exposure to the integration of the field of interactive telecommunications, information systems, knowledge management, and content communication as used in e-business in the broadest sense. The TCOM 664 capstone course integrates information and technology from all the courses and emphasizes real-world project management, application design, and implementation focused on the students' career aspirations in areas of technology management, content development, and/or interactive Web application design in a commercial or educational interactive application.

3. THE COMPETENCIES. GOALS, AND ASPIRATIONS OF STUDENTS ENTERING THE MSIT PROGRAM: ASSESSMENT INFORMATION TO GUIDE THE PROGRAM

In order to better understand the knowledge levels, goals, and career motivations of students entering the MSIT Program, a complete assessment was done of their knowledge competencies, backgrounds, and career aspirations. The results of this assessment are very useful in deepening the understanding of the MSIT program and how it can confront its key challenges.

Since the MSIT is a new program, it will be another year and a half before the first graduates can be surveyed to find out their end competencies and assess the changes over the full degree course. However, such a challenge is also present for the few other Masters programs in these new areas that have been established; in most cases they have been launched in the past year and a half.

This section of the paper seeks to answer the following questions regarding students' knowledge, goals, and career motivation:

1. What are the knowledge/competency levels of students entering the MSIT in key curricular areas?

2. How strongly are the general and specific knowledge/competencies associated with each other?

3. What are the curricular goals, degree expectations, career motivations, and career expectations of students entering the MSIT program?

4. How do the assessment results vary by technology versus non-technology organization; by IS/Engineering versus non-IS/Engineering jobs; and by gender?

A survey of entering students provides answers to these questions that will be focused and discussed in terms of the new curriculum. Further, the conclusions to this analysis will contribute to the final section of this paper on the challenges facing MSIT and similar e-business degrees.

The survey was conducted in fall of 2000 for all of the 60 entering students in the MSIT program. 50 complete surveys were returned, for a response rate of 83 percent. The very high response rate assures that there is not a significant non-response problem. The survey has Likert scale (5 category) questions for 28 MSIT curricular objectives that were categorized into those on Informational Content (referred to as "Content"), Technology, Interactive Elements ("Interactivity"), and the Convergence of Content, Technology, and Interactivity ("Integration"). The levels of response varied from 1 ("None") to 3 ("Novice") to 5 ("Expert").

3.1. What are the Knowledge/Competency Levels of Students Entering the MSIT in Key Curricular Areas?

Table 3 presents the detailed results for knowledge competency levels of entering students.

It is evident that MSIT students have the moderate technological knowledge/competency, with a rating at just about the novice level (3.1). Slightly under the novice level are knowledge/competencies in informational content (2.8), interactive elements (2.4), and convergence (2.7). The overall average is 2.8, which is somewhat below novice level. This result implies that the students entering such a new, cutting edge program do not know a great deal about the subject matter. This is plausible, since the world wide web, for instance is only eight years old and large scale e-business about four years old (Price Waterhouse Coopers, 1999). The standard deviation is 1.14, which implies a wide range of knowledge competencies, but almost no responses at either extremes of none or expert.

Looking the specific knowledge competencies areas (see Table 3), it is evident that some of the strongest knowledge areas are for specific networking and telecommunications technologies and their impacts. This may reflect the huge increase in the internet and web in the economy over the past 3-4 years and the widespread knowledge that is available to business and the public (Price Waterhouse Coopers, 1999). The areas of technology that demonstrate weaker knowledge are constructing intranets/communication systems and understanding network security. However, these are knowledge areas where it is more difficult for average business people and professionals to gain experience. The interactive elements have lowest average experience, with the areas of designing user interfaces and applications of real time environments as the weakest knowledge content areas. Although today, more and more people in the U.S. are gaining simple knowledge of the world wide web including web utilization and web posting, much fewer of them understand the intricacies of real time environments and user interfaces. The specific content areas of convergence (integration) show novice understanding, with somewhat more about the economic, social, and historical aspects. This may again reflect the widespread public reporting and information flow in the 1990s about integrated aspects of telecommunications and e business.

In summary, the knowledge/competencies of students entering the MSIT are novice in level. There is quite a lot of variety in the knowledge, as shown by 30-60 percent coefficients of variation. There is some variety in

specific content areas, with the highest knowledge of the fundamentals/impacts of telecommunications and the lowest knowledge of more intricate web design.

Knowledge/Competency	Mean	S.D.	Coeff. of Variation
Informational Content Area			
Understand relevant politics and government policy	2.84	1.09	38
Develop content for interactive server	2.82	1.12	40
Sensitivity to policy trends	2.80	1.07	38
Analyze utilize of information servers	2.78	1.25	45
Evaluate resources for IT applications	2.74	1.21	44
Content Summary Index	2.80	0.90	32
Technological Requirements			
Impact of networks	3.88	0.77	20
Fundamental telecomm technologies	3.54	0.89	25
Emerging telecomm technologies	3.34	0.89	27
Understand networking software	3.00	1.18	39
Local area networks	2.96	1.32	45
Program database transactions	2.84	1.20	42
Manage a network	2.82	1.42	50
Constructing enterprise intranets/communication systems	2.68	1.28	48
Understand/analyze network security	2.66	1.24	47
Technological Summary Index	3.08	0.97	31
Interactive Elements			
Explain interactive telecommunications	2.90	1.07	37
Social/cultural implications of interactive telecomm	2.68	1.17	44
Understand utility of key interactive technologies	2.58	1.16	45
Analyze social norms of cyber environments	2.50	1.09	44
Object oriented programming in interface design	2.30	1.23	53
Design modern user interfaces	2.22	1.17	53
Apply interactions in real time environments	1.86	1.11	60
Interactive Summary Index	2.43	0.91	37
Convergence of Content, Technology, Interactivity			
Understand economic and social consequences	3.18	1.04	33
Historical perspective	3.10	0.95	31
knowledge management and strategic management	2.58	1.14	44
Interface design issues in telecomm	2.56	1.23	48
Organizational learning	2.56	1.18	46
Web programming tools	2.50	1.28	51
Incorporating multimedia into websites	2.46	1.20	49
E Commerce	2.46	1.15	47
Convergence Summary Index	2.67	0.93	35
Overall Average	2.76	1.14	42

Table 3: *Knowledge competencies of students entering the MSIT program*
Note: Scale varies from 1 (None) to 3 (Novice) to 5 (Expert)

3.2 How Strongly are the General and Specific Knowledge/Competencies Associated with Each Other?

It is important to ask if the knowledge/competencies are strongly related to each other. This is approached by examining first the relationship of the four content areas. As seen in Table 4, all four of them are highly intercorrelated. This confirms that entering students are consistently strong in all the general areas or consistently weak in those areas. This corresponds to similar associations across knowledge areas noted for undergraduates in a program in IS for working adult students (Pick and Kim, 2000).

	Content	Technology	Interactivity	Convergence
Content	1.00			
Technology	0.63**	1.00		
Interactivity	0.67**	0.74**	1.00	
Convergence	0.67**	0.66**	0.84**	1.00

** significant at 0.01

Table 4: Correlation Matrix for Major Knowledge/Competencies Areas

We further analyzed the associations of attributes within each of the four major competency areas. For Technology, Interactivity, and Integration, there were strong and consistent intercorrelations. This implies that the specific knowledge/competencies are associated for a given entering student.

For the Content area, most of the specific knowledge/competency areas were associated, but they were weaker than for the other three major areas. The specific competency with the weakest associations was "analyze/utilize information servers." It may be that his competency is more specialized and hence has weaker associations within Content.

To summarize, the general and specific knowledge/competencies are strong associated with each other for a given entering student. This is true both between major knowledge/competency areas, and between the areas.

3.3 What are the Curricular Goals, Degree Expectations, Career Motivations, and Career Expectations of Students Entering the MSIT Program?

The survey section on student goals and motivations for the MSIT program indicates that the students matriculating the program have very strong and distinctive reasons for entry. As seen in Table 3, the most important reason for entering the program was to achieve "*integration* of management skills, content development, and technical skills." This response, in almost total agreement, demonstrates that the students are more concerned about a medley of knowledge and skills than specific ones. We assume that the entering students realize that telecommunications, the virtual world, and e-business represent integrated phenomena. Hence, they are seeking the capability to have an integrated and diverse work skill set.

An area of good, but not total, agreement is the importance of gaining technical skills in the MSIT. The new technologies of this curriculum have gone beyond traditional IS curricula, so that gaining of new skills is valued. This is buttressed by the good agreement that the "MSIT gives competencies more relevant than current skills."

As seen in Table 5 also, students are in near total agreement that finishing the MSIT will enhance career opportunities. However, they seem divided and less in agreement on whether the MSIT will lead to promotion in their current job or lead to a change of careers. This may reflect the dynamic nature of the subject matter and the field, so that career opportunities are in flux both inside and outside the students' organizations. Although they appreciate that the MSIT will help their careers, they are quite uncertain of just how this will take place, i.e. whether in their present organization or externally.

Question	Mean	S.D.	Coeff. of Variation
Integration is a main reason for enrolling in MSIT	4.46	0.84	19
The main reason to enroll in MSIT was to gain technical skills	4.00	0.78	20
As result of MSIT, will remain in current career	3.30	1.37	42
As result of MSIT program, will change to different career	3.00	1.36	45
MSIT program gives competencies more relevent than current skills	4.18	0.87	21
Finishing MSIT will enhance career opportunities	4.66	0.56	12
Obtaining Masters is more important than specific skills from MSIT	2.46	1.01	41
Creating quality content for web sites is the major enrollment reason	3.68	1.06	29
I may be promoted in current job by finishing MSIT	2.90	1.30	45
I will likely change careers from finishing MSIT	3.00	1.34	45
Management content of MSIT is more important than technical skills	3.10	1.07	35
Technical content of MSIT is more important than management skills	3.58	0.95	27

Table 5: *Curricular Goals, Degree of Students Entering the MSIT Program*

3.4 How do the Assessment Results Vary by Technology versus Non-Technology Organization; by IS/Engineering versus Non-IS/Engineering Jobs; and By Gender?

We sought to determine if the findings were influenced by whether students were working in technology organizations; by whether they were in IS/Engineering jobs; or by their gender.

The differences were analyzed by t tests comparison of means. The results indicate that there were no differences for any attribute by whether entering students worked in technology versus non-technology organizations. We ascribe this to the variety of jobs in these organizations, i.e. a technology firm may have a variety of technical versus non-technical jobs, and likewise a "non-technology" company. This characteristic does not distinguish the knowledge/competencies or motivations/career goals of the entering students.

For gender, likewise, t tests comparing means revealed no significant differences, with one exception. Women cited as more important than men the following question, "Learning to create quality information and content for interactive web sites is a major reasons why I decided to enroll in the MSIT program." Women may value this more because they are more likely to be involved in creating the content for web sites, or they are more likely to anticipate themselves in such a job role.

Knowledge/competency areas	t	Significance
Content	3.516	0.001
Technology	4.378	0.000
Interactivity	4.531	0.000
Convergence	2.862	0.006
Career goals		
As result of MSIT, will remain in Current Career	3.208	0.002
As result of MSIT, will change to Different Career	-2.461	0.018
Masters more important than specific MSIT skills	2.317	0.025

Table 6: *Significant T-Test differences between IS/engineering jobholders and non-IS/engineering jobholders*

The largest amount of t-test difference was for students currently employed in IS/Engineering versus non-IS/Engineering jobs. The t-test results are shown in Table 6. They demonstrate that students with IS/Engineering jobs are higher on all the four major competency areas. In addition to having higher competencies, they were stronger in agreeing they would remain in their current career and weaker on changing to a different career. This is logical since their careers are already somewhat aligned with the MSIT skills, where non-IS/Engineering jobs are less aligned. Finally, the IS/Engineering jobholders had higher agreement that the Masters Degree was more important than MSIT skills. This may be due to many of them already possessing a lot of the skills; hence, what they are seeking is credentialing and authentication of existing skills.

4. KEY CHALLENGES FOR THE MSIT PROGRAM

Based on the results of the survey of the first students enrolled in the MSIT program at the University of Redlands, some key challenges are already apparent. First among these are the challenges of providing adequate technical resources in terms of server hardware and enterprise-level software to provide students will real-world experience in use of the more current and evolving technologies in the field of interactive telecommunications and e-business. To this end, the directors of the MSIT program are talking with key technology companies to develop working partnerships to gain access to the technologies as grants or at greatly reduced costs that will allow a wider range of technologies to be supported in the program.

4.1 The Need for Ongoing Faculty Development

In tandem with the challenge of providing access to current technologies to keep up with the rapid change in interactive telecommunications and e-business goes the additional challenge of keeping the faculty trained and up-to-date in the theory, application, and real-world implementation of these evolving technologies. Already the faculty at the University of Redlands have begun a robust schedule of all-day and weekend technology and training workshops for both full-time and adjunct MSIT faculty. We expect these training programs will continue to evolve with increased use of online training, participation in key industry conferences, and expanded use of corporate sponsored training and internships/consulting projects to augment the traditional classroom sessions that have already been started by the full-time MSIT faculty.

4.2 Pedagogical Challenges

A further pedagogical challenge exists because of the intentionally diverse backgrounds of the students admitted to the program. Similar challenges have been noted for undergraduate IS degrees involving working adult students (Pick and Kim, 2000). In the initial course designs this diversity was assumed, with activities in the courses that take advantage of students with specific strengths while augmenting student skills where background is lacking. Interestingly, the technical people are not always at an advantage in the program. In developing content and communications or working on management plans, as opposed to technical implementations, the students with humanities and business backgrounds may fare better. So—course design with the diversity of student skill levels and experiences in mind is imperative. This suggests using activities that allow students with strengths to help facilitate those students with weaknesses—and this in turn helps build the teamwork and group process skills that are a desired outcome for graduates of the program.

The survey of students entering the program substantiates that the students are entering the program with diverse technological, content development, and management experience. We hypothesize that students will progress most rapidly and expand their knowledge most significantly in those areas where they lack knowledge and skills on entering the program. Although we don't anticipate that all students will exit the program with the same overall expertise, we do hypothesize that all graduates will improve in all program areas and gain minimum competencies in all four of the key program areas under assessment (technology,

content, interactivity, and integration). This hypothesis will verified or refuted through the ongoing research that will be conducted as students proceed through the program.

For any school undertaking a program in new and rapidly evolving discipline, a major challenge involves access to relevant academic support materials (textbooks, case studies, and simulations). Given the rapidity of changes in the Internet and e-business, some of these materials need to be created dynamically with each course iteration. For this purpose, great emphasis is placed on the use of the Web as a resource for delivering these materials. Because the information and technologies are literally evolving as the program is taking place, it has also been imperative to involve actual practitioners with management and technical roles in e-enterprises and technology companies as resources to provide real-time case presentations of technological, commercial, and content development scenarios for the courses.

The survey results indicate that 90% of the entering students selected the MSIT program for the *integration* of management skills, content development, and technical information inherent in the curriculum design. The final challenge for the program, therefore, is to make good on the promises made to our students to develop graduates with forward-thinking, cutting-edge technical, management, and interactive telecommunications skills. Along with this is a need to gain recognition for the forward thinking design of the MSIT program through the accomplishments of the program graduates that will help serve their long-term career goals and also as models for future program matriculants.

5.   CONCLUSION: OPPORTUNITIES AND THREATS

The MSIT Program presents many opportunties. Industry in the U.S. and other advanced nations is moving rapidly in the direction of adopting e-business and contemporary telecommunications approaches. There are opportunities for students to update their knowledge and skills to the cutting edge. This serves to make them more marketable, more able, and more understanding as managers and technical specialists of the sweeping changes taking place. For IT faculty, the program encourages/forces them to update their faculty capabilities to match the business world. This is a necessary step that eventually all IT faculty will have to take, so it is good to be "pulled" by the curriculum. For the university, the rolling out of the curriculum in its first year has pushed the university's technology services unit to improve its own capability and technical support knowledge of servers, web-based applications, and user support. A school of business benefits by the "trickle down" effect to other curricula. For instance, already in revising for a new undergraduate curriculum, some of the web, internet and e-business content has been put into a draft curriculum. MBA curricular developers are thinking about an e-commerce course in the next round.

The MSIT program has received the respect and supprt of regional industry. The corporate advisory committee has led in these connections, and has fostered stronger bonds between the IS Program and businesses. This is a plus for all parties.

These many advantages are offset by weaknesses and threats. The high student demand for the program has put pressure on IT faculty hiring. This has been difficult in recent years because of a "buyers market." This implies even more pressure on existing IT faculty to upgrade their skills in these areas, a perhaps uncomfortable process for some, but one that will benefit them.

An offset is the recent economic and technology slowdown the U.S., which has been beneficial in producing a hiring pool of talented part-time faculty to teach some courses.

Another threat is that the content of the MSIT degree will become outmoded and not sought after. This has happened in the past with "fads" in academic IT. For instance, in the U.S., some masters programs were developed historically in systems management, but eventually were dropped. However, one advantage to the MSIT degree is that it emphasizes telecommunications more broadly than some e-commerce degrees. Telecommunications degrees have endured over several decades, but subject to the constraint of deficits of qualfied faculty.

Another side of this is the rapid movement in the areas of the internet, web, and e-busienss. This puts pressure on the degree program to stay up-to-date, a pressure that every IS program feels, but maybe more so

here because of the rapidity of change. The curriculum may have to be revised more frequently, and some courses may need major upgrading every year (an example is the course in "emerging technologies.") Business school administrators will need to recognize this need and provide means for IT faculty to attend cutting edge seminars and conferences.

A factor that has been present in different ways from the inception of the MSIT Program has been threats felt by other university parties. This is a combination of resitance to change, genuine concern about capability to deploy the program, and felt-threats to resources. This can be partly mitigated by intense effort to communicate "cross-functionally" with other parties and try to involve them in some "ownership" of the program.

The curricular process continues to take place, and the first graduates will not apppear until spring of 2002. It is our intention to continue to monitor and assess the students as they progress through the program and become alumni. Further, with the help of our corporate advisory committee, we will implement an ongoing assessment of industry trends, the overall curriculum, faculty skills, and measurable outcomes of the program. The goal in these assessment activities is threefold:

1. To assure that the intended integrated outcomes and knowledge levels are indeed being achieved

2. To verify that the curriculum, course designs, and instruction are continuously of high quality and currency and that they are quickly adapted when necessary to achieve desired outcomes

3. To assure that the program continues to meet industry needs for professionals who are proficient in the most important technologies, management areas, and content development skills required to support the rapidly evolving e-business and interactive telecommunications arena.

It remains our vision in developing this program that meeting the third goal calls for more than generalists with information technology degrees. The MSIT degree at the University of Redlands is a program for today and the future of information technology where e-commerce, interactive telecommunications, and global content are integrated, as they should be. It is our hope that other schools examine the approach and consider similar approaches for their forward-thinking technology degree programs. At the same time, some downsides and disadvantages need to be weighed. In some cases these new degree programs may be redesigns of current MSIS degrees. In other cases, they may be programs that create totally new programs, as the MSIT does. In either case, we feel it is imperative that more attention be paid to the rapidity of technological change in information systems degrees and the new, more expansive demands being placed on professionals in the global marketplace of e-business.

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