

# INTERNATIONAL INFORMATION SYSTEMS AND TECHNOLOGY: COURSE DEVELOPMENT AND IMPLEMENTATION

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*ABSTRACT : The focus of this paper is on the development and implementation of a stand alone course in International Information Systems and Technology. Although this alternative means for internationalizing the Information Systems (IS) curriculum may not be appropriate for all business programs, it may prove to be a beneficial curriculum option for programs with specialized degrees in information systems. A model course outline is developed that identifies key themes and topic areas to be included in the course. This basic outline provides a structural foundation that allows for flexibility in planning and designing curriculum content. The paper discusses how this outline may be modified to fit the curriculum objectives and overall internationalization plan for varied business school programs.*

*Implementation issues may play a significant role in the eventual success of new curriculum initiatives. The appropriateness of a stand alone international IS course as compared to other curriculum alternatives is discussed in the context of unique business school characteristics. Political, economic, and demographic factors will play a role in this decision making process. Innovative teaching alternatives that may have merit for a course of this nature and implications for course enhancements that may add educational value to the course such as an overseas field study component and relevant internships are discussed.*

*KEYWORDS: International Business Education, Information Systems Curriculum, Global Information Technology*

## INTRODUCTION

It is now imperative that business school curriculum respond to the demands of a business environment that has become increasingly international in focus. A global marketplace requires that business students be educated with a broader base of knowledge in both the international dimensions of business as well as the liberal arts. This changing environment demands a global mindset and a new orientation to curriculum design and implementation.

Internationalization of the Information Systems (IS) curriculum is currently receiving increased attention by academicians in the field. There is a heightened demand for curriculum material that addresses international issues relevant to information systems and technology. Although extensive international curriculum resources have been developed for other business functional areas (e.g., marketing, accounting, finance, management) very little international

curriculum material has been developed and implemented for the IS area. There is a clear need to address this dimension of curriculum design if we are to provide a relevant and dynamic business education for students.

The approach for internationalizing the business school curriculum varies considerably by school. An appropriate strategy for one school may not fit the overall goals and objectives of another program. It is imperative that plans for

internationalizing the IS curriculum be consistent with the overall business school internationalization plan. Although a separate course in international IS would not be appropriate for all programs, this alternative may provide a beneficial curriculum enhancement for programs with an IS major at either or both the undergraduate and graduate levels. The suitability of a separate elective in international IS would more likely fit with programs that offer other specialized international business courses (e.g., international marketing, international finance, international accounting). Although the emphasis of this paper is on the design and implementation of a stand alone course, the discussions that follow may also prove helpful in efforts to incorporate international content in existing courses.

**COURSE DEVELOPMENT ISSUES**

In the following sections a model course outline is developed for a stand alone course that focuses on the international dimensions of information systems and technology. Several alternative titles have evolved for courses that address this domain of knowledge including: Global Information Technology Management, Global Information Systems and Technology Issues, Information Systems in International Business, and Information Technology and the Multinational Corporation. Texts for this course are currently limited and target a variety of audiences (1,2,3). Text selection will depend on the course level, student backgrounds, and objectives of the course.

Although course development in this area has been oriented primarily toward the information systems major, curriculum content may also be appropriate for students of international business. A basic topic outline for this course is presented in Table 1. This outline provides a basic structure and flexible framework from which specific curriculum content may be developed and enhanced. The outline also provides a foundation from which to discuss developmental issues and specific course design options.

**Setting the Stage for the Course**

Establishing an understanding of student backgrounds is a necessary prerequisite for a course of this nature. Prerequisites identified for the course and the course level will set necessary minimal limits on student background preparation upon entering the course. Prerequisite limitations will depend on the program under consideration and will be dictated by a number of factors such as the number of students, the diversity and availability of

programs of study (i.e., information systems major, international business major) and degrees offered (i.e., Undergraduate, M.B.A., Masters in International Business, Ph.D.).

In some cases, the course may be an elective not only for IS students but also for international business students and others with an interest in the topic. The course may be open to both advanced undergraduate and graduate students. The diversity of the class makeup will dictate to

**Table 1: INTERNATIONAL INFORMATION SYSTEMS AND TECHNOLOGY STRUCTURAL TOPIC OUTLINE**

- I. Setting the Stage for Global Information Systems
  - The Changing International Business Environment
  - The Role of Information Systems and Technology in the Evolving Global Marketplace
- II. The International Business Environment
  - Evolution of the Multinational Enterprise
  - The International Management Environment
- III. The Role of the IS Function in an International Setting
  - Linking the IS Function with its International Environment
  - Perspectives of Developed and Less Developed Countries
- IV. International Organizational Characteristics and the IS Function
  - International Organizational Factors and Influences
  - Multinational Service Versus Manufacturing
- V. The Technological Dimensions
  - Transnational Flows of Data and Information
  - Global Communication Networks and Connectivity Issues
- VI. The Managerial Dimensions
  - Planning and Implementing Global Information Systems
  - Strategic Implications of Information Technology
- VII. Emerging International IS and Technology Issues

a large degree the focus of course content and the necessary level of foundation material required. A heterogeneous student populace demands greater sensitivity on the part of the professor in terms of responding to a variety of backgrounds and interest levels. A homogeneous class of graduate level IS majors, for example, will dictate a different approach than a mixed class of international business and information systems students. The level of balance between international business versus information systems perspectives in the course should be established early on. This orientation will be reflected in supplementary readings, cases, projects/papers/assignments, and class discussions.

It is also necessary to capitalize on the strengths of the class participants in ways that minimize the disadvantages that sometimes result from a diversity of backgrounds. Students with expertise in some aspects of international business or information systems should be encouraged to actively contribute to specific class discussions. Students with foreign backgrounds or those with international business work experience may also contribute valuable insights through class discussions. The flow of course material may be influenced by this student driven orientation and be formally integrated into the course material. Sensitivity to these issues upfront will affect the degree of success in course implementation.

#### **Establishing the Course Theme**

Before beginning the prepared course material, it is imperative that the significance of the course theme be well established. As the course evolves, major topics can be related back to this overriding theme. In this course, the theme revolves around two major forces transforming business today: the impact of information technology on the operations of the firm and globalization of the marketplace. The combined influence and dynamic nature of these two forces on business today is tremendous. The major topics for the course reflect the reality of this impact. Figure 1 is provided to emphasize the theme's significance.

Figure 1: THE COURSE THEME

## *The Impact of Information Technology and Globalization of the Marketplace*

Supplementary readings that reinforce and interface these two dimensions of the course theme are a necessary prerequisite. A blend of articles that emphasize both the information systems and international business perspectives in the context of this broad overview are appropriate. Publications such as Harvard Business Review, Sloan Management Review, Fortune, Computer World, and the Wall Street Journal are excellent sources for these readings. An introductory set of supplementary readings including articles (e.g., 4,5,6,7,8), newspaper clippings (e.g, 9), and briefings (e.g., 10) provide a basis from which to set the stage for the course and direct class discussions. It is necessary that this collection of readings be periodically updated. Class interactions may be more productive when students are assigned responsibility for leading the discussion of particular articles. This background will provide the impetus for thinking about issues to follow in a more focused international context.

part of the students. Considerable flexibility is built into the course model at this stage of development. The background and level of understanding of the students as well as the interests of the faculty teaching the course will play a role in the evolution and focus of course material at this stage. Student and faculty experiences in various parts of the world may provide relevant background for class interaction.

The depth of coverage of basic international business concepts will depend on initial student background. IS students who have not taken a course in international business will need more specific guidance and introductory foundation. The unique aspects of operating internationally should be emphasized as a starting point from which to proceed. An abundance of faculty resource materials that provide essential international business concepts are available. Leading introductory international business texts (e.g.,11) or supplements to provide insights from a broad perspective (e.g., 12) may be the most valuable resources.

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#### **The International Business Environment**

The course design as presented in Table 1 assumes very little previous international business background on the

#### **The Role of the IS Function in This International Setting**

It is appropriate that the international business setting be described initially from the general perspective of the international manager. In this context, relevant international issues specific to the political, cultural, legal and economic dimensions of the international operating environment can be discussed. The breath and depth of this coverage will depend on faculty preferences, student backgrounds, and the orientation of the course.

From this broad foundation, a conceptual model linking the IS function to its international business operating

**Table 2: RELEVANT TECHNOLOGICAL ISSUES**

Integration of Technology  
International Telecommunications Standards  
Transborder Data Flow Restrictions  
International Implications of Electronic Data Interchange  
Postal Telephone and Telegraph Monopolies  
Price and Quality of Telecommunications  
Telecommunications Infrastructure  
Integrated Services Digital Networks (ISDN)  
Telecommunication Deregulation  
Vendor Selection and Support  
Data Security

**Table 3: RELEVANT MANAGERIAL ISSUES**

Educating Senior Personnel  
Planning for International Information Systems  
Use of Information Technology for Global Competitive Advantage  
End User Computing  
Language Barriers  
Cultural Constraints  
Software Development  
Global Network Management

environment can be developed in the context of the previous discussions. A model developed by Deans and Ricks (13) provides a means by which to define the external environmental influences on the IS function. Specifically, this external environment is composed of foreign, international, and domestic components. An array of cultural, legal, political, economic and technological characteristics that may directly influence the IS function can be incorporated in the context of this model. This general overview provides the foundation for a more focused examination of international IS issues later in the course.

#### **International Organizational Characteristics and the IS Function**

At this point in the course a more focused examination of the multinational organization and specific international organizational characteristics will provide the background for a better understanding of the relationship between these factors and specific IS issues. The number of foreign subsidiaries, location of foreign subsidiaries, multinationality (i.e., number of countries in which the firm operates) and international experience are examples of moderating variables that are important

in evaluating the significance of international IS issues.

Other organizational characteristics may also play a part in determining the significance of these issues. The firms international data processing operations (i.e., centralized, decentralized, distributed) and the firm's organizational structure (i.e., international division, geographic area, functional area, product area, matrix) may play an important role in determining the degree of information technology support required and the impact of international IS considerations (14).

The international operating environment and characteristics of the multinational firm provide the necessary foundation from which to proceed in the study of more specific international IS issues. IS research findings support the contention that corporations tend to proceed through various stages in the acquisition, diffusion, and management of information technology. In the initial phases the focus is on learning to use the technology.

Later, as the firm gains experience in the use of the technology, managerial and control issues become more significant (15). Based on this supporting literature, the course is structured to focus on the technological infrastructure and global connectivity concerns as a prerequisite to the discussion of managerial issues.

#### **Technological Dimensions**

A discussion of international technological issues may be approached from several perspectives. Two relevant themes that emerge include issues relevant to the flow of data and information across national borders and those related to global communication networks and connectivity. An array of issues might be incorporated into the discussions at this stage of the course. A representative list of pertinent technological issues are presented in Table 2. The issues of significance will vary over time.

Transborder data flows (TBDF) and international implications of electronic data interchange (EDI) are topics of particular relevance for the multinational firm.

International telecommunications standards are playing an important role in efforts to move toward worldwide communication. Movement toward the use of technologies such as Integrated Services Digital Networks (ISDN) will depend largely on trends in the establishment of worldwide standards. Lack of international standards, the proliferation of products and vendors, and the rapid changes in technology contribute to the difficulty of integrating information technology across national borders.

The Postal, Telephone and Telegraph (PTT) companies in other countries may pose particular obstacles for multinational corporations. Price and quality of telecommunications is directly linked to the PTT issue and may vary considerably from one country to another. The available telecommunications infrastructure may limit the available alternatives especially in developing countries. The size of the local market may dictate the number of available vendors and the quality of the service that is provided. Movement toward deregulation of telecommunications both in the U.S. and outside will influence these concerns.

Establishing an international or global network with communication capabilities without regard for geographical boundaries is difficult at best. An array of unique issues including legal restrictions, government regulations, cultural barriers and increased data security concerns contribute to the difficulty of setting up global information systems and worldwide communication networks.

### Managerial Dimensions

It is necessary that the student be exposed to basic technological issues before incorporating these dimensions into discussions related to managing information technology on a global scale. The managerial dimensions may then be merged with the previous discussion of technological issues. A set of relevant international IS managerial issues are presented in Table 3. Again, this list of issues is not intended to be exhaustive but rather representative of important issues

that might be incorporated into the course material. The issues of significance will likely vary over time.

Two major managerial themes from which an array of relevant issues can be discussed include planning and implementing global information systems and strategic implications of information technology. Global network management and information technology management issues may also be incorporated into the discussions. The instructor is afforded much flexibility in the approach for incorporating these issues and the emphasis on particular issues.

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From a managerial perspective, many specific issues complicate the transfer and infusion of information technology internationally. End-user computing issues are more complex in the context of an international business environment. Control and communication issues are particularly complex. Language barriers and cultural constraints are more pronounced in some parts of the world. Work ethics, different accounting systems, reporting requirements, legal and governmental restrictions all complicate data gathering and reporting processes and determine the degree to which software applications might be standardized.

### Emerging International IS and Technology Issues

Since both information systems and international business represent two very

dynamic areas of business it is impossible to rely entirely on text material and research articles for the most current trends and information. The course theme and major topics can be reemphasized through the discussion of relevant emerging issues. These issues may relate to topics such as the emergence of free markets in Eastern Europe. The integration and compatibility of the firm's information systems and technology to match varied markets in the firm's portfolio of operations might be integrated into this discussion. The emphasis of course material should be open at this stage and reflect the expertise and interests of the class and faculty. Newspaper clippings, general weekly business publications (e.g., Business Week, Forbes) and weekly IS and IB publications may be appropriate sources of information and possible assigned readings.

Concluding the course from this perspective impresses upon the students the evolving nature of these topics. The objective is to heighten the awareness of issues relevant to the role of information systems and technology in an evolving international business environment so as to provide a foundation for continued learning and interest.

### COURSE IMPLEMENTATION ISSUES

#### Institutional Implications

Implementation of a stand alone course in International Information Systems and Technology may require academic justification that may be met by administrative, faculty and political barriers. It is necessary up front to have a strategy in place that identifies the most appropriate means for internationalizing the IS curriculum. This plan should fit with the overall goals of the business school curriculum and its current internationalization objectives. If the business school curriculum currently places very little emphasis on the international dimensions of other functional areas and little resource allocation is dedicated to this objective, it is not likely that a separate course in international IS will be approved or even appropriate.

The approach taken should match the internationalization objectives of the overall curriculum. Infusion of international topics into the introductory MIS course or incorporating international dimensions into several courses in the curriculum may be a more appropriate alternative for some programs. For programs with a major in information systems, a combination of these options that includes offering an elective course in international IS as well as incorporating international content in other IS courses may be a workable plan. This option would reach a broader spectrum of students.

However, better coordination in curriculum design is necessary. Any option that includes a separate International IS course requires faculty expertise in international business. These tradeoffs can only be evaluated in the context of each individual business school program. The composition and size of the student body, the background of the students, the degree programs offered (i.e., undergraduate, masters, Ph.D.), and the existence of specialized majors in information systems and international business will play a significant role in the decision making process.

### Innovative Teaching Alternatives

New courses that have not yet been established in the curriculum provide the professor with greater flexibility in the design and teaching approach. As the course content evolves over time the teaching approach may also vary as a result of experimentation. A team teaching approach may be one effective option for some programs.

An ideal faculty team might be comprised of faculty from both the international business and information systems areas. This alternative assumes availability of faculty expertise and resources. A modification of this approach might involve incorporating lectures of other faculty having expertise in various areas covered in the course. This would require collaboration, compensation, and a willingness on the part of all parties to participate.

An alternative that may have merit for semester programs involves offering the course as a half credit elective. The course may complement other half credit electives in international business or other areas. This approach allows more students the opportunity to take the course as well as greater flexibility in scheduling. This option also provides a means for offering teaching load reductions that would not otherwise be possible. It should be recognized that courses of this nature may not always fit the traditional mold for course implementation. Changes in our traditional educational processes may warrant consideration.

An array of creative approaches for student projects, research papers and other learning experiences are appropriate for this course. Incorporating a real world dimension by means of speakers from the business community and practical observation through plant site visits can add substantial educational value to the course. The degree to which these real world dimensions might be incorporated will depend on available resources both from within and in the surrounding business community.

Additional curriculum enhancements may be appropriate as the course establishes credibility. An overseas field study component that is implemented independently or in conjunction with an already established study tour program for another functional area may be incorporated as an additional credit option. Student internships that focus on relevant IS work related experiences provide added educational value. In a tight job market this option might provide an increase in job employment statistics for the school. Curriculum enhancements must be evaluated from the perspective of the overall business school curriculum plan as well as reflect resource availability.

### CONCLUSIONS

This discussion has provided the IS academician with a structured framework from which to develop a specialized course in International Information Systems and Technology. Although this approach for

internationalizing the IS curriculum may not be appropriate for all business programs, some aspects of the discussion may be relevant for other alternative approaches. The framework presented in this paper provides the professor with considerable discretion in course development, topic coverage and the degree to which curriculum enhancements might be implemented. A dynamic and rapidly changing business environment dictates the need for such innovative educational approaches and opportunities for students.

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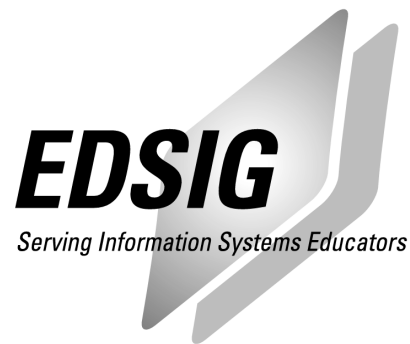
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*Dr. Deans developed a course in Global Information Systems Issues that was implemented for the first time during Spring semester 1992. She also teaches a curriculum development seminar on Global Information Systems and Technology Issues in the Faculty Development in International Business Program at the University of South Carolina.*



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