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Issues in International Information Systems: A Case Study of a Non-U.S.-Based Multinational Corporation

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Introduction

Information system managers in multinational corporations (MNCs) face many difficult issues in their efforts to internationalize their organizations' information systems. Security of data transmitted between distant business locations, integration of technologies in different countries, and differences in protocol standards around the world are just a few of the issues that international IS managers must address. The importance of these issues to IS managers may vary depending on such factors as the type of business, its home country, and the countries in which it operates. This paper examines the question of whether one of these factors, the home country of the business, could have an impact on the importance placed on certain international information system issues by IS managers. As a preliminary investigation into this question, this paper presents a case study of how IS managers in a non-U.S.-based MNC view several important issues in international information systems, and compares their views with those reported in the literature from IS managers at U.S.-based MNCs. While a single case study cannot provide an answer to the question, it may give insights that might aid future research.

International Information System Issues

Deans and Ricks (1991) and Deans et. al. (1991) report on a survey of IS managers at 121 U.S.-based MNCs. One of their results is a ranking of the importance of 32 issues faced by international IS managers. In this paper we examine their top six issues: (1) educating senior personnel, (2) data security, (3) integration of technologies, (4 tie) end-user computing, (4 tie) price and quality of telecommunications, and (6) international protocol standards. We also examine two other issues commonly reported in the literature: transborder data flow restrictions (23rd in the survey) and international information system organization (not ranked in the survey). A brief discussion of these issues follows.

Educating Senior Personnel. Senior personnel must be educated about the potential contribution of IS so that they can play an active role in the implementation of their corporation's international information system, and so that they can show system benefits to their foreign subsidiaries.

Data Security. Data security is especially important to organizations that transmit large volumes of sensitive data. A balance must be maintained, however, between data security and data availability (Deans and Ricks, 1991). As more companies connect to the Internet, this issue is compounded by the increased potential for unauthorized users to bypass the business's security systems.

Integration of Technologies. Integration of technologies on an international scale can be difficult for businesses trying to globalize their information systems. As a first step, companies must standardize on software for functions such as e-mail, spreadsheets, and word processing.

End-User Computing. Support for end-user computing is important for all companies but critical for companies that build and use international information systems. It is difficult to provide such support across national borders.

Price and Quality of Telecommunications. The high price of telecommunications results in part from the high cost of telephone service in some countries and from slower data transfer speeds. The quality of telecommunications services in developing countries is often worse than it is in the U.S., and may be so inferior that it discourages the establishment of international information systems (Steinbart and Nath, 1992).

International Protocol Standards. International protocol standards are important for connecting to external entities, such as customers and suppliers. By using common standards, companies can have a wider choice of trading partners. Without uniform communications standards, multiple products are needed to handle all the communication protocols used by a company's subsidiaries (Karimi and Konsynski, 1991).

Transborder Data Flow Restrictions. Transborder data flow restrictions is a recurring issue in the literature (Kane and Ricks, 1988; Steinbart and Nath, 1992). Some studies found that transborder data flow restrictions was not a significant issue, but that it may become one in the future. It was included in this paper's analysis because of its potential significance to MNCs.

International IS Organization. International IS organization and its alignment with international business strategy is another recurring issue in the literature. International businesses may follow a multinational, global, international, or transnational strategy; and may have decentralized, centralized, distributed, or integrated international information systems (Ives and Jarvenpaa, 1991; Karimi and Konsynski, 1991). This issue was included in this paper's analysis because of its prominence in the literature.

Case Study

ABC Co. (a fictitious name) is a large, non-U.S.-based MNC with natural resource interests worldwide. This study focuses on IS issues affecting one group in ABC with multiple operating divisions at sites on several continents. Interviews were held with top IS personnel in this group to determine the importance of the eight international IS issues to ABC. The following is a summary of the case study findings.

Educating Senior Personnel. While some senior personnel at ABC are knowledgeable about IS benefits, many remain unfamiliar with information technology and systems. Consequently, the value of IS is not always understood at ABC. Thus, educating senior personnel is currently viewed as a major issue. This issue may be resolving itself as senior personnel are gradually replaced by IS-knowledgeable managers. In the future, this issue may be less significant.

Data Security. Data security has not been an important issue for ABC in the past, but it is believed that with the increasing use of networks it will become a major issue. Three areas where data security is expected to be an issue are finance, trade secrets, and personnel information. Data security has already caused some problems for ABC in finance and exploration. In finance, data security has been a problem when issuing letters of credit due to authentication questions. To solve this problem, data encryption is now used to send letters of credit. In exploration, timing is important and secure data transmission is essential. The security of the Internet is a serious concern, so critical data is sent by other means. As one step toward improving Internet security, ABC is building fire walls in an attempt to prevent unauthorized access to its systems.

Integration of Technologies. Previously, the IS departments at ABC's foreign operations were run with little influence from corporate headquarters. As a result, different entities used different hardware and software for word processing, spreadsheets, and e-mail. Problems arose when employees tried to transfer documents between different machines running different or incompatible programs. To solve this problem, ABC has decided to use the Microsoft suite of products, including MS-Mail. ABC has also decided to standardize the way new hardware is configured. These hardware and software standardization initiatives are a first step

toward integration of technologies at ABC. Although a major problem for ABC in the past, this issue is being addressed initially by this standardization and is expected to be less of a problem in the future.

End-User Computing. Support for end-user computing at international sites is a challenge for ABC. Most of these sites are too small to have their own IS support group, and training classes generally are not available. Expatriates are encouraged to get the training they need before going overseas, or to "learn on the job." Locals hired for positions requiring computer skills must "learn on the job." ABC has partially addressed this issue by contracting with a commercial service to provide a multi-lingual global help desk line. ABC also anticipates that as software and hardware become more "user friendly" and as a more computer-literate generation enters the work force, this issue will decline in importance. Thus, although currently a major issue for ABC, it will be less significant in the future.

Price and Quality of Telecommunications. ABC considers this issue to be a major problem both currently and in the future. Quality of communication is a serious problem because of high noise levels on lines in some countries. Other problems are host-government limitations of the number and availability of lines, and lack of service by major carriers such as AT&T and MCI. Some of these problems are being addressed by technology that is more tolerant to line noise and by satellite communication. The high price of data communication is a problem yet to be solved.

International Protocol Standards. This issue is of major importance to ABC. The company uses EDI to communicate with many of its suppliers. In the past, there have been disagreements over which EDI carrier/standards to use, resulting in very expensive connections. ABC is now moving toward using the Internet to communicate with other businesses, thus somewhat lessening the importance of this issue. Still, ABC feels that this is only one step toward standardization. Other communications areas, such as video conferencing, continue to lack international standards. Until significant progress is made toward setting international protocol standards, this issue will continue to be of significance to ABC.

Transborder Data Flow Restrictions. ABC has operations worldwide, many of which are in third world countries. In some of these countries, transborder data flow restrictions have been a problem for the company in the past. One country insisted that ABC use only nationals to do its data processing, and that the processing be done in the host country rather than transmitting the data to the company's home country for processing. To address this problem, ABC set up a complete data processing center and trained citizens of the host country to run it. Other countries regulate telecommunications across their borders. This problem is not serious for ABC because the volume of data that ABC transmits over national borders is not large. Thus, although this issue has been significant in the past, it is viewed now and in the future as being of minor importance.

International IS Organization. Historically, ABC's IS operations most closely resembled decentralized systems, a characteristic of businesses that follow a multinational strategy. ABC is moving toward integrated IS operations, a characteristic of businesses that follow the transnational strategy. The first step toward this goal is an ABC project designed to establish worldwide software and hardware standards, and to link all ABC sites worldwide with e-mail. ABC is also focusing on worldwide integration of its support systems (e.g., human resources) while customizing its core systems (e.g., process control) on a site basis. ABC's significant efforts at integrating its IS operations indicate that the company considers this to be a major issue. It will continue to be important in the future because of the time and effort required to make the transition from decentralized to integrated systems.

Conclusion

The case study indicates that the important international IS issues identified in the literature are issues of varying importance for ABC. Table 1 summarizes ABC's current and future view of the eight issues, and gives the ranking of these issues from the Deans et. al. survey of U.S.-based MNCs. Although no ranking of the issues was obtained from personnel at ABC, the table shows that ABC views the top six issues as being of major importance either currently or in the future or both. The company views the seventh issue,

transborder flow restrictions (ranked 23rd), as being of minor importance both currently and in the future. Thus, the views of ABC, a non-U.S.-based MNC, are similar to those of the survey respondents. (The eighth issue, international IS organization, was not ranked in the survey.)

A single case study cannot provide a conclusive answer to the question of whether the home country of an MNC has an impact on the importance placed on these international information system issues. In the case of ABC, it would appear as if there is little impact. ABC's home country is, however, a highly developed nation. A thorough survey of MNCs from a range of nations may provide a better understanding of this question.

References

References are available upon request from the second author.

Table 1. Summary of issues

Issue	Deans et. al. ranking	ABC's view of issue	
		Current	Future
Educating senior personnel	1	Major	Minor
Data security	2	Minor	Major
Integration of technologies	3	Major	Minor
End-user computing	4 (tie)	Major	Minor
Price and quality of telecommunications	4 (tie)	Major	Major
International protocol standards	6	Major	Major
Transborder data flow restrictions	23	Minor	Minor
International IS organization	Not ranked	Major	Major

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