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Attitudes and perceptions regarding Internet-based electronic data interchange in a public organization in Saudi Arabia

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ATTITUDES AND PERCEPTIONS REGARDING INTERNET-BASED ELECTRONIC DATA INTERCHANGE IN A PUBLIC ORGANIZATION IN SAUDI ARABIA

A Dissertation

Submitted

in Partial Fulfillment

of the Requirements for the Degree

Doctor of Industrial Technology

Approved:

Dr. Mohammed F. Fahmy, Chair

Dr. Ali E. Kashef, Co- Chair

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May 2001

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Dean of the Graduate College

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ABSTRACT

This study examined the attitudes and perceptions of staff members and administrators in the General Directorate for Private Institutes & Centers (GDPI&C), Training institutes, and Centers in Saudi Arabia toward Internet-based Electronic Data Interchange (I-EDI) in a public organization. A survey was conducted of a group of GDPI&C members and randomly selected Institutes and Centers. The 339 respondents participated anonymously by providing demographic information and completing the attitudes and perceptions section of I-EDI questionnaire. The survey response rate was 82.6%.

An attitude survey was distributed to staff members, administrators, and faculty members in the Saudi Arabian GDPI&C, Training Institutes, and Centers. The study was designed to (a) measure the attitudes and perceptions of staff members, administrators, and faculty members in GDPI&C toward the use of computers, the Internet, and the implementation of I-EDI within the organization and (b) describe Institute/Center administrators', staff members', and faculty members' attitudes and perceptions toward the use of computers, the Internet, and the implementation of I-EDI. The study also examined the expectations of GDPI&C staff members/administrators/

faculty members and those of Institute and Center staff members, administrators, and faculty members regarding the potential benefits of implementing a new system (I-EDI).

It was found that the participants in GDPI&C, Training Institutes, and Centers across Saudi Arabia did understand and appreciate the value to the organization of I-EDI. It was also found that they did not hold significant fears about using computers and the Internet in the organization. It was further found that they would not be likely to fear the implementation of I-EDI in the organization. Based on these findings, it was concluded that implementation of I-EDI in GDPI&C, Training Institutes, and Centers across Saudi Arabia is a necessary project and that fears of personnel are unlikely to interfere with the implementation I-EDI.

It was recommended that the GDPI&C proceed to a stage of intensive planning for the implementation of I-EDI in the organization.

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TABLE OF CONTENTS

PAGE

PAGE

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

New developments in computer and communication technologies are rapidly advancing information technology (IT). Electronic Data Interchange (EDI) is a powerful business tool for exchanging business documents in a digital format. Computer-to-computer document processing reduces errors and converts hard-copy business documents to computer-readable formats more efficiently. The Utility Industry Group (UIG; 2000) lists further applications, including standardizing routine business transactions; handling inquiries; planning; purchasing; pricing; and processing order status, invoices, and payments. Additional capabilities in development cover such areas as specifications, production data, contracts, distribution, sales information, purchase order procurement, and financial transactions.

Because of their low cost and ease of use, Web-based forms of EDI are gaining popularity in small to medium-sized companies that want to communicate electronically with larger partners (Advanstar Communications, Inc., 2000; Kilbane, 1996). This makes I-EDI (Internet-based

electronic data interchange) a good choice for businesses with a low volume of transactions. In such organizations, EDI is often part of an extranet, a customer-only Web site that requires customers to have passwords to get access.

Despite its many advantages, however, I-EDI, like any new technology, carries with it potential risks. As Gallouedec-Genuys pointed out,

> New techniques always have economic and social consequences, and hence, political and ideological implications, which pose problems for society. Computerization has been no exception to this rule, particularly since its applications impinge on every field, and open up breathtaking prospects in every sector of society. (as cited in Al-Malaq, 1988, p. 1)

Internet-based EDI certainly has the potential to impact many facets of an organization's culture, including decision making, communication, and managerial control. Developed countries have been using this information technology revolution to their advantage for some time. Meuval has a message for those countries that have not yet caught up: "Because a new age is bursting on us, we had better adjust to conditions of living that are radically different from those of the past" (as cited in Al-Malaq, 1988, p. 1).

In the Kingdom of Saudi Arabia (KSA), Internet technology is a very recent development, having just been introduced in 1999 (Gardner, 2000). This research focuses on potential uses of the new technology for one of the most important government organizations in Saudi Arabia, General Directorate for Private Institutes & Centers (GDPI&C). GDPI&C was established because of the need for a specialized department to monitor the activities performed by Training Institutes and Centers. GDPI&C is now responsible for supervising over 350 Training Institutes and Centers throughout the country's private sector. So far, 86,000 trainees have completed programs through the Training Institutes and Centers.

The organization began in 1983 as a committee called the Secretariat of NTET. Later, due to the increasing responsibilities of this committee, it was replaced by the National Technical Education and Training Administration, which became an independent department responsible for the General Organization for Technical Education and Vocational Training (GOTEVT) in Saudi Arabia (GOTEVT, 1994). The increasing number of private Institutes and Centers in different parts of the Kingdom called for a specialized organization to supervise and control them. In 1983 the

Manpower Council decided to make the GOTEVT responsible for granting licenses for private technical Institutes and Centers, evaluating their curricula, and supervising their examinations.

GOTEVT (1994) lists the following objectives for the GDPI&C (see Appendix A for a listing of specific duties of the GDPI&C):

- Distribute the Institutes and Centers geographically and supervise their education and training programs.
- Serve local market requirements in the Kingdom by providing high quality technical education and vocational training without duplicating specialties among the Institutes and Centers; ensure that ownership, supervision, financing, etc. at these Institutes and Centers are Saudi-controlled enterprises.
- Evaluate the programs and curricula in the private Institutes and Centers, and make sure they will continue to play their role in the best manner.
- Increase private-sector participation in technical education and vocational training.

- Set performance standards for the Institutes' and Centers' education and training activities before the approval of their certificates (GOTEVT, 1994, p. 106-107).

Trainees can receive instruction at the Training Institutes and Centers in the areas listed as below.

- Automatic control
- Safety and industrial security
- Supervision of short courses
- Vocational/technical program
- Survey and architecture drawing
- Computer specialties
- Photography
- Shorthand
- Offices/clerical
- Telex
- Administrative training
- Industrial and chemical engineering
- Electrical and electronic maintenance
- Computer and mechanical maintenance
- Cement industrial
- Public relations
- Commercial subjects
- Aviation services

The GDPI&C is organized into three administrative levels under an overall Directorate (see Figure 1); under the Directorate are the departments of Administrative Affairs, Trainee Affairs, Research and Training Programs,

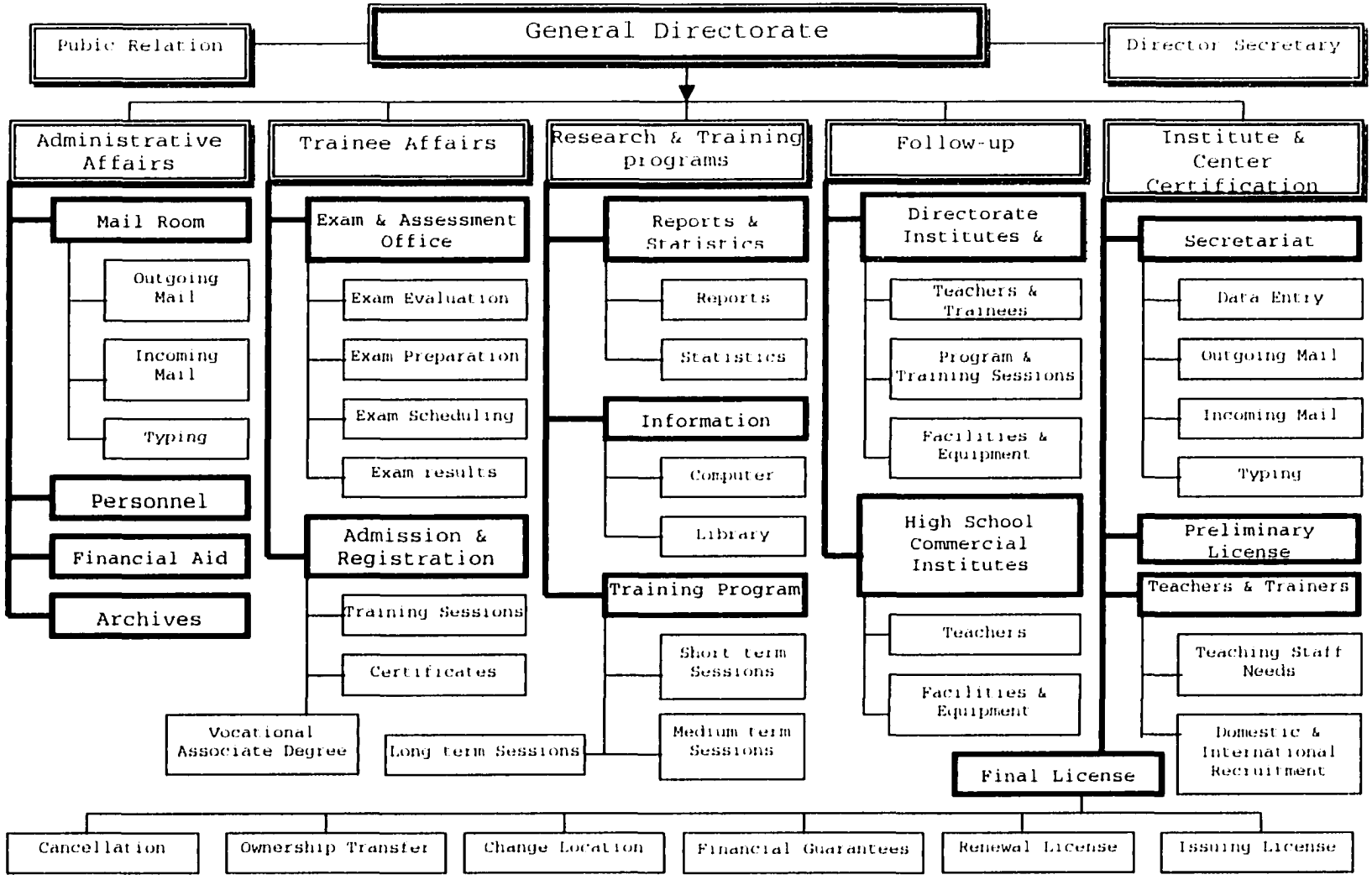

Figure 1. General Directorate for Private Institutes & Centers Organizational Chart

Follow-up, and Institute and Center Certification. Subsidiary to these departments are functional offices such as Personnel, Admission and Registration, and others indicated with a bold border on Figure 1, and these offices are further divided into smaller ones such as Incoming/Outgoing Mail, Exam Evaluation/Preparation/ Scheduling, etc. From its headquarters in Riyadh and a network of offices spread across Saudi Arabia, GOTEVT manages and supervises these GDPI&C activities.

Al-Malaq (1988) summarizes the nature of resistance and anxiety toward computers in organizations:

> Although computers are pervasive in the contemporary organizational environment, introduction of computers in organizational units where they have not before been used continues to generate fear, anxiety, and intimidation. In such an atmosphere, resistance to the proposed change may be anticipated. The best solution to such resistance is a comprehensive education program, which can allay both anxieties and intimidation. (p. 40)

AL-Malaq (1988) added that a range of factors, including system design, environmental conditions, prior learning, can influence the performance of users for whom computers are a new workplace tool. As commonplace as computers have become in many workplace cultures, these potential causes of technological fear and resistance are

still relevant wherever computers are not an already-established part of working conditions (Popovich, 1994).

Resistance and fear, then, are possible barriers to technological innovation in Saudi Arabia in the GDPI&C, Training Institutes, and Centers, where staff, administration, and faculty, who have always worked with a nonautomated system, would have to adapt to I-EDI as something completely new.

Statement of the Problem

This study attempted to determine attitudes and perceptions of staff members, administrators, and faculty members in GDPI&C, Training Institutes, and Centers in Saudi Arabia toward Internet-based Electronic Data Interchange (I-EDI) in the organization.

Purpose of the Study

The GDPI&C plays an extremely important role in the KSA in preparing a qualified workforce to build the country's economy. The discovery of oil in the KSA meant that Saudi citizens needed to take over responsibilities once delegated to foreign manpower. Therefore, one of the most important investments of the Saudi government is

utilizing its human resources effectively. This point was argued by King Abdul Aziz, who initiated the modern Kingdom's drive toward integrated nationwide training and development in the 1930s: "Technical and industrial progress in the Arabian Peninsula should agree with vocational education in the Arab World. . . . It is not good for any nation to depend on others to perform duties necessary for the life of its people" (as cited in GOTEVT, 1994, p. 19).

The purpose of this study was to help pave the way for GDPI&C today to reap the same rewards from technology that private businesses have experienced in other developed countries: reduced costs, faster turnaround, and better customer service. This in turn will help the Training Institutes and Centers better meet the standards set by the GOTEVT and serve the workforce they are training.

Significance of the Study

Jastaniah (1982) suggested the enormous significance of Saudi Arabia's efforts to capitalize on the technological revolution:

> Saudi Arabia is presently undertaking massive industrialization and technologicalization programs as evidenced by its three five-year plans. . . . The

> social, economic, and political transformation of developing countries like Saudi Arabia is inconceivable without massive technologicalization. (p. 1)

The GDPI&C's situation illustrates how great a challenge this may be for public-sector organizations. GDPI&C is facing problems at many levels of its administration as well as with Training Institute and Center services and operations. Problems include antiquated administrative systems; manual preparation and transfer of paper documents, which increases error and makes error detection difficult; high postage and handling costs; lack of paper storage; lack of on-line data storage; slow reporting speed; unautomated reconciliation; and unmanageable workload for staff members. GDPI&C is a functionally oriented organization based on information systems, but the GDPI&C process is suffering from inefficiencies, delays, excessive paper circulation, mostly human errors, and lack of access to information regarding the Institutes and Centers it supervises.

GDPI&C staff members are spending too much time on paper-flow issues and authorization processes. Due to insufficient information, staff members find it hard to generate reports and accomplish the services they are

supposed to provide. In addition, the GDPI&C has a hard time sending the students' grade reports to the Institutes and Centers at various sites throughout the country in a timely manner. The entire process needs significant reorganization to reduce the cost of delivering service and to make radical improvements to the quality of the services delivered.

The primary need for this research was to demonstrate which problems I-EDI can solve and to discover stumbling blocks to solving these problems by surveying workers on their receptiveness to the implementation of such a change. A survey of literature was expected to show that I-EDI has proven successful to other industries in solving problems such as those GDPI&C is experiencing. These problems include the following:

1. Staff members' stress and exhaustion from calling or receiving calls from the Institutes and Centers
2. Long process of authorization in the GDPI&C
3. Lack of communication between GDPI&C, Institutes, and Centers
4. Slow delivery of services
5. High cost of performing services

According to the UIG organization (2000),

> Traditionally all of this information is communicated on paper, often using preprinted forms. With the explosive growth of these paper-based exchanges and the amount of data associated with the manufacture and sale of new products and services, many organizations are forced to seek a more productive way to exchange this information.

The literature review showed the usefulness of I-EDI in a variety of sizes and types of organizations, including manufacturing, retailing, wholesale distribution, health care, financial institutions, and investment firms (American Institute of Certified Public Accountants Inc., 1999). According to the American Institute of Certified Public Accountants Inc., "the use of this technology has enabled many companies to achieve business efficiencies by employing just-in-time inventory management, responding more rapidly to changing the customer buying patterns, and lowering costs through the elimination of paper and its related processing activities"(p. 9).

GDPI&C is a moderately sized institution in an economic, social, and political climate that requires the organization to respond to local, regional, and national changes in a timely and relevant manner. To facilitate such responsiveness, GDPI&C leaders must utilize

information about all aspects of the organization and must change the way the GDPI&C community performs work, makes decisions, and plans for the future. The GDPI&C is a classical organization attempting to transform itself into a modern organization. To accomplish this transformation, the GDPI&C administration needs to plan actively for the implementation of essential infrastructure components that will provide a consistent direction guiding the GDPI&C into the new millennium.

Another strong justification for this research was that it would focus on the unique concerns of a public-sector organization providing services to educational institutions. The existing literature has a strong bias toward private-sector organizations. As Teo, Tan, and Wei (1997) pointed out:

> The use of IT for organizational transformation in the public sector has largely been neglected. While lessons drawn from studies using private-sector organizations are useful, these findings are not necessarily directly applicable to public-sector organizations that face different sets of issues, problems, and challenges. (p. 140)

Attempts to triangulate evidence of I-EDI's benefits with those from other perspectives (e.g., key trading partners, customers, and suppliers) are also necessary but

are severely lacking. The information generated in this study will be particularly valuable to other developing nations that are new to EDI technology.

Research Questions

In the investigation of the stated problem, answers to the following research questions were sought:

1. What is the self-reported knowledge and understanding of staff members, administrators, and faculty members regarding the potential of I-EDI in the organization?

2. What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI?

3. What are the perceived benefits of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI?

4. What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding computer and Internet technology?

5. What benefits do staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers perceive regarding computer and Internet technology?

Assumptions

This research was conducted under the following assumptions:

1. GDPI&C, Institutes, and Centers would be willing to provide accurate information to the researcher.

2. Both administrative and staff respondents would honestly provide information regarding their current system and their beliefs about the possibility of a new system.

3. Random selection of Institutes and Centers from the GDPI&C list would provide a fair representation of all the Institutes and Centers.

Limitations

The scope of the research was limited as follows:

1. The study included GDPI&C, but not the GOTEVT.

2. The study focused on the interchange between GDPI&C, Institutes, and Centers, but excluded internal GDPI&C processes.

3. The study included staff members, administrators, and faculty members in the organizations.

Definition of Terms

The following terms are used frequently in the study and are defined here as they are used in the context of this research.

EDI: An acronym for Electronic Data Interchange, "the computer-to-computer transfer of business information in a standard format between trading partners" (Marcella & Chan, 1993, p. 1). When fully integrated between the trading partners, EDI is an "application-to-application transfer of business documents between computers" (p. 1).

Internet: An umbrella term used to describe a collection of many separate worldwide networks connected together using a standardized set of communication protocols. "The Internet is a large collection of networks that are tied together so that many users can share their vast resources" (Williams, 1995, p. 9).

VAN: An acronym for Value Added Network, a VAN is an independent provider that offers storage, communication links, and forwarding service (referred to as a mailbox) for EDI transmissions between trading partners. Use of a VAN eliminates the need to establish electronic communication with each individual trading partner and is essential to the success of an EDI program. VAN is also

called a "third-party network" or "public network" (Marcella & Chan, 1993).

XML: An acronym for Extensible Markup Language, EXL "is a subset of the Standard Generalized Markup Language for creating custom HTML tags" ("New Web Site Technology Explained," 1997, p.82). A "subset of SGML (standard general markup language) and an emerging World Wide Web Consortium standard, EXL is an extensible markup language that offers the best alternative for Internet applications developers" (Levitt, 1997, p. 88).

Attitudes: Attitudes can be defined as a reaction, feeling, or emotion toward something with some degree of evaluative consistency. Ajzen and Fishbein defined attitude as "a person's evaluation of any psychological object" (as cited in Al-Malaq, 1988, p. 13).

Outline of Chapters

A review of literature relevant to this study follows in chapter 2. The review of literature describes the evolution of EDI; compares the advantages of traditional and Internet EDI; explores the impact of EDI on organizations of a variety of sizes and types; provides groundwork for the assumption that EDI can transform a

public-sector organization such as GDPI&C in Saudi Arabia; and explores the potential for difficulty among staff and administration of such an organization in accepting and utilizing a change of this nature. Chapter 3 fully explains the research procedures to be employed in developing the survey instrument, identifying participants, and using other methods of gathering the necessary data. Chapter 4 presents an analysis and interpretation of the survey data. Chapter 5 draws some conclusions from the findings reported in chapter 4 and makes some recommendations for further research and action on the part of the organizations surveyed.

CHAPTER 2

REVIEW OF LITERATURE

This exploration of literature first provides a historical overview of the technological revolution that created tools such as EDI, the Internet, and ultimately Internet-EDI. The literature review demonstrates the scope and nature of the impact these new information-exchange systems are having on private-sector organizations of many different types; it then focuses on the potential benefits of EDI in public-sector, specifically educational, operations. Finally, by illustrating the process of EDI implementation within organizations, a foundation is created for examining possible barriers to successful transition to EDI and utilization of the technology. Some of these potential barriers relate to unique cultural factors existing within the KSA.

The Revolution in Information Technology

Verity stated,

> Now, as the power and reach of these technologies skyrocket, the Information Revolution promises to touch and in some cases radically transform every aspect of life: our work and leisure, all manner of scientific techniques, and virtually every method for

> recording and transmitting knowledge. (as cited in Ware, Gebauer, Hartman, & Roldan, 1998, p. 1)

Information technology (IT) has already had far-reaching effects in everyday life, particularly business. Predictions of practitioners and researchers have largely come true, in that IT has been used to redesign business processes (Caron, Jarvenpaa, & Stoddard, 1994; Davenport, 1993; Hammer, 1990); alter organizational structures and boundaries (Cash & Konsynski, 1985; Jarillo, 1988; Johnston & Lawrence, 1988; Lucas & Baroudi, 1994); redefine industry structure and competition (Clemons, Reddi & Row, 1993; Johnston & Vitale, 1988); and support globalization of businesses (Jarvenpaa & Ives 1994; Levinson, 1994). Segers and Hendrickson (2000), assessing the current technological landscape, asserted the following:

> The effective integration of information technology (IT) into the core processes of business firms dominates the thoughts of nearly every organizational manager. The technology that only 15 years ago was simply back office administrative overhead, providing organizational efficiency by processing mountains of transactional data, has been revolutionized into the key ingredient determining a firm's strategic direction and defining its ability to compete in a geographically dispersed, global marketplace. (p. 431)

Currently, the Internet is leading the way in the transformation of communication, trade, and customer service technology. Having evolved from a specialized network for scientific and military applications, the Internet linked 20 to 40 million computer users worldwide by 1996 (Houser, Griffin, & Hage, 1996). Its growth was marked by expansion from a few research laboratories on the Advanced Research Projects Agency Network (ARPANET) scientific network to broader dissemination in universities and corporations, which led to the addition of applications such as e-mail, remote database access, and electronic bulletin boards (American Petroleum Institute, 2000). The American Petroleum Institute report estimated that Internet use grows by 12% per month (1998), a development largely fueled by the capabilities of the World Wide Web (WWW), the fastest growing of all Internet applications. The same report counted 15,000 WWW servers worldwide by 1995.

Venkatraman (1994) warned that while IT's potential impact on organizations is clear, it should not be perceived as a "magic bullet" or the sole "driver" for organizations attempting to improve their strategic advantage. The key is how organizations leverage the technology in ways appropriate to their own vision and the

current business climate and how organizations adapt to continual change. Although IT has become a powerful tool in organizational innovation, it has not been as fully exploited in all organizations and all locations around the globe as it could be (Dykeman, 1997). Helping organizations successfully utilize IT requires an in-depth understanding of IT-enabled organizational transformation, and as Wimmer, Townsend, and Chezum (2000) noted, a true understanding of IT's relationship to organizational productivity requires "examining IT's impact at the micro-level" (p. 408), within specific industries and among specific workers performing specific tasks.

Electronic Data Interchange (EDI)

EDI, or Electronic Data Interchange, has been available for over 30 years (Rassameethes, 1999), but it has been appreciated for its impact on business at large only since the middle of the 1980s, according to Korzeniowski (1989).

Definitions

Hill and Ferguson (1991) defined EDI as the "electronic transmission of business data between or within

firms in a structured computer processable data format which permits data to be transferred without re-keying from a computer supported business application in one location to a computer-business application in another location" (p. 12).

Cottier (2000) added that "many businesses choose EDI as a fast, inexpensive, and safe method of sending purchase orders, invoices, shipping notices, and other frequently used business documents." The wording of EDI definitions differs among authors; for example, Banerjee and Sriram (1995) described EDI as "an interorganizational information system that facilitates a link, especially between buyers and sellers, through automated computer-to-computer exchange of standard commercial documents between these organizations" (p. 29).

All definitions, however, emphasize three features that distinguish EDI: (a) the highly structured, standardized electronic format, (b) the ability to transfer machine-readable data among different locations and computer applications, and (c) users' freedom from having to translate or re-key documents (Back & Bell, 1994). Unlike other types of file transfer, EDI triggers the

necessary return communication or form, eliminating the need for manual response (Defense Logistics Agency, 1999).

Technical Components of EDI

EDI was slow to catch on because until the 1970s, there was no standardized system for its implementation and use. Such standards were developed by a subcommittee of the ANSI (American National Standards Institute) in 1993; currently, that standard, called ASC X.12, determines the format and content of EDI transactions in the United States and elsewhere. A second standard, EDIFACT, is the most popular protocol for international communication exchange and is preferred in Europe and Asia (Emmelhainz, 1993).

EDI technology appears to be relatively simple. As Emmelhainz (1993) pointed out, almost any hardware platform can support EDI, and small organizations can employ it with only a microcomputer and modem. EDI does require three forms of software: communication software (the facilitator for networked computer interaction among the trading partners), translator software (the translator of internal data formats to standard EDI format), and management software (the data-organizer/archiver). Message transmission also requires a communication network.

Organizations can choose among five options (Attaway, 1999):

1. Direct connection: Organization's trading partners can dial into its EDI system directly, a feasible option unless providing the service for too many trading partners makes the cost and manpower requirements prohibitive.

2. Federal Acquisition Computer Network (FACNET): Communication network for federal agencies to communicate with the registered vendors in the public domain. The flat fee charged for monthly service works well for high-volume transmitter, but not for smaller agencies with a lower volume of communications. FACNET is designed for specific types of messages and has been found to be inconsistently reliable.

3. Value-added networks (VANs): Traditionally one of the most popular and reliable communication network alternatives. A VAN is an "electronic mailbox service" (Emmelhainz, 1993, p. 103) provided by a third-party network. VANs eliminate the need for organizations to establish different types of computer connections with each individual trading partner or client, and they offer great flexibility of speed, protocol types, and security (US

Department of the Treasury Financial Management Service, 1996).

4. Value-added services: A network option that is similar to VANs but offering services such as training and consulting in addition. The service is more expensive than VANs, but a good option for organizations that need training in order to implement the system quickly.

5. Internet, which will be discussed in detail in the section Internet EDI.

In spite of the apparent simplicity of EDI technology, there are possible difficulties. VANs may present too big a financial burden to smaller organizations, and organizations can face technical complications with EDI. Kappelman, Richards, and Tsai (1995) further caution that without effective planning and full integration of EDI with other forms of information technology within an organization, EDI could turn out to be less beneficial than expected or even counterproductive.

Economic Impact of EDI

Suri (1998) identified warehousing, transportation, and retail as some of the earliest industries to utilize EDI, a trend driven by the industries' need for

standardized forms and the resulting cost savings. Health care, automotive, aerospace and defense, electronics, financial institutions, and other industries involving large budgets and large volumes of document exchange are utilizing EDI more and more (Cottier, 2000). According to Advanstar Communications, Inc. (2000), "Many government purchasing projects require EDI communication. It is a vital component of just-in-time systems used in manufacturing and warehouse management, efficient consumer response projects in the grocery industry and in healthcare's UPN initiative."

The current value of EDI commerce is estimated at approximately $130 billion per year. It is expected to double, to $260 billion, by the year 2000 (Baum, 1997). As of August 1996, a total number of 100,000 sites including both hubs (i.e., firms initiating the EDI network) and spokes (i.e., firms responding to the hubs' efforts) in North America were reported by The EDI Group, Ltd. (Hendon, Nath, & Hendon, 1998). The article "Internet Revives EDI" (2000) cited the Giga Information Group's estimate that EDI-employing organizations number 250,000. Dykeman (1997) reflected a cautious outlook for EDI when he wrote, "The way business is transacted via EDI has limited growth" (P.

37). He added, however, that "that could change: advantages of both electronic commerce (EC) and the Internet have added new value to EDI" (p. 37).

Benefits of EDI to Organizational Culture and Performance

Benefits that organizations attribute to EDI fall into three main categories: efficiency, cost-cutting, and customer service.

Efficiency involves several specific factors, the first being speed. Suri (1998) recalled when lead times were measured in weeks: "Today . . . lead times are measured in days . . . and companies compete on the basis of responsiveness" (p. 44). Lead times for some transactions are matters of only hours, minutes, or seconds. Ferguson, Hill, and Hansen (as cited in Hendon et al., 1998), found "quick response and access to information" (p. 58) ranked number one (47.1%) in a survey of 1,094 U.S. marketers. An example from the health care industry (Hansen, 1996) illustrated the type of reduction in speed achieved in a specific context. In this study, it was discovered that replacing paper-based claims with electronic claims saved hospitals 29 days and physicians 30 days in collecting accounts receivable, gaining hospitals

and doctors, respectively, 44% and 52% improvement in cash flow.

Efficiency also relates to reduction in manual labor, thanks to reduction in paper-processing, increased capacity of data storage and retrieval, and centralized monitoring and maintenance of transactions (Waller, 1999). Kirk (1993) cited an example of a company reporting a reduction in data entry staff from 700 to 7. Reduced manual labor and document translation decrease the chances for error. These features, according to Back and Bell (1994), translate to improved quality control and interdepartmental communication. Such benefits could be crucial to an organization such as the GDPI&C, which is currently doing business with thick paper files, blurred faxes, repetitious phone calls, and time-consuming meetings.

Scala and McGrath applied the Delphi technique, a special form of survey, to assess the advantages and disadvantages of EDI. One of the most disputed advantages, they found, is cost savings (as cited in Rassameethes, 1999). Several of the cost-reducing features of EDI may be balanced by increased cost in other areas. Cannon (1993) reported reduced administrative costs; faster processing, resulting in reduced inventories; reduced data entry needs,

which lowers personnel payrolls (Casper, 1995; Xerox Corporation, 2000); and substantial cuts in overall handling costs. Defense Logistics Agency offered some statistics to illustrate the financial benefits several companies experienced in one year of EDI utilization:

1. JC Penney Co. reported saving $1 million with EDI purchase orders.

2. The U.S. Treasury saved $60 million on postage.

3. The Petroleum Industry reduced administrative costs by 30%.

4. The Ford Motor Co. removed paper processes, eliminated invoices, and reduced procurement head count by 75% as a result of EDI and Business Process Improvement.

Other sources showed where cost savings may be offset by added expenses or increased unnecessarily. GE Global Exchange Services (2000) pointed out that integrating EDI into existing systems has often required organizations to redesign or add new software applications. Computer networks (VANs) have also required substantial investments. Yukins (1996) added that the greater the firm's burden of paperwork, the greater the benefits of moving to EDI. Finally, organizations cannot expect to gain the full cost-cutting benefits of the technology if they are unable to

fully capitalize on it with their trading partners or integrate the system into the organization's general business strategy (GE Global Exchange Services, 2000).

Less open to debate in the literature was the issue of customer service, which Maingot (1997) described as "the package of activities provided by the supplier" (p. 36). Because of the benefits already discussed, EDI improves this package of activities by reducing customer service staff time, improving communication, increasing quality through improved accuracy and consistency, and increasing customer goodwill by serving customers faster and better.

Internet EDI

What EDI can do, the Internet can do better. Internet commerce is growing far more rapidly than EDI commerce, and many analysts of technological trends predict a continuing explosion in business-to-business and business-to-consumer Internet transactions. A report by Forrester Research (Baum, 1997) predicted that business-to-business Internet commerce will reach $327 billion by the year 2002. Discussing EDI in the context of the mortgage origination process, Mink (1998) argued that EDI, coupled with this burgeoning Web technology, can "further minimize the role

of paper-shuffling, error-prone humans . . . and therefore increase profitability and productivity" (p.36). Market analyst Ken Vollmer (as cited in "Internet Revives EDI," 2000) predicted that "Internet e-commerce will drive the economic value of EDI transactions to $3.8 trillion in 2002" (p. 44).

Technical Components of I-EDI: Focus on Extensible Markup Language

Extensible Markup Language (XML) is the current "de facto standard for data communication in the software industry" affecting document creation, storage, and exchange "both on and off the Internet" (Microsoft Corporation, 2000). As an Internet application, according to Microsoft, it is rapidly replacing EDI systems across industries and may ultimately become the language for creating and storing almost all documents.

XML is not a standard in itself equivalent to ASC X.12 or EDIFACT. Rather, as Bryan (1998) explained, XML defines how companies can use their current standards to solve business problems. According to Microsoft's definition, XML describes both a type of data (XML documents) and the

manner of processing the data and is composed of the following components:

1. *Entities*: storage units containing "parsed" character data and markup language describing document storage layout and structure) and "unparsed" storage units.

2. *XML Processor*: software module used to read XML documents in conjunction with an application that tells the processor how to behave.

XML works by "tagging" data (MacSweeney, 1999), describing what the data contain so that they can be readily located by other systems looking for those data. A subset of Standard Generalized Markup Language (SGML), XML is a simplified way to use the Web to tag anything from text to images to programs, making it possible to manage and manipulate them (Walsh, 1998). Menezes (1999) described XML as a universal data format that provides the two requirements for enabling EDI over the Internet: interoperability and flexibility. Menezes (1999) cited predictions that XML, combined with Internet and sophisticated data storage systems, would create a "ubiquitous EDI" that could touch "every aspect of computing." Certainly it helps account for many of the

advantages of I-EDI discussed in the section Internet Advantages.

Features of XML include the following: compatibility with the Internet, SGML, and a range of other applications; ease of writing documents and programs to process documents; standard features (no "options"); clear, understandable documentation; concise design; relatively relaxed markup guidelines; and free distribution (Bray, Paoli, & Sperberg-McQueen, 1998). Some sources argued that the advantages of these features create the possibility that EDI will be replaced altogether; others supported the possibility that XML will "extend the life of EDI" (MacSweeney, 1998), allow organizations to use EDI to test XML (Messmer, 1998), or to integrate XML with EDI (Bryan, 1998). Bryan provided examples of ways XML can extend existing EDI applications or integrate with them.

Internet Advantages

SAA Consultants Ltd. (2000) noted that because of the extent to which the Internet has revolutionized the way organizations do business, it is imperative that organizations using EDI go a step further and create an infrastructure that supports e-business to remain

competitive in today's marketplace. The Internet creates a new model for trading, with which organizations can consolidate their existing EDI requirements and improve efficiency over VANs as a communications tool. Figure 2 illustrates the basic process of EDI over the Internet. The process is similar to VAN-based EDI, in that data from application programs usually must pass through a translation layer that formats the outgoing data into the appropriate EDI format, such as X12 or EDIFACT.

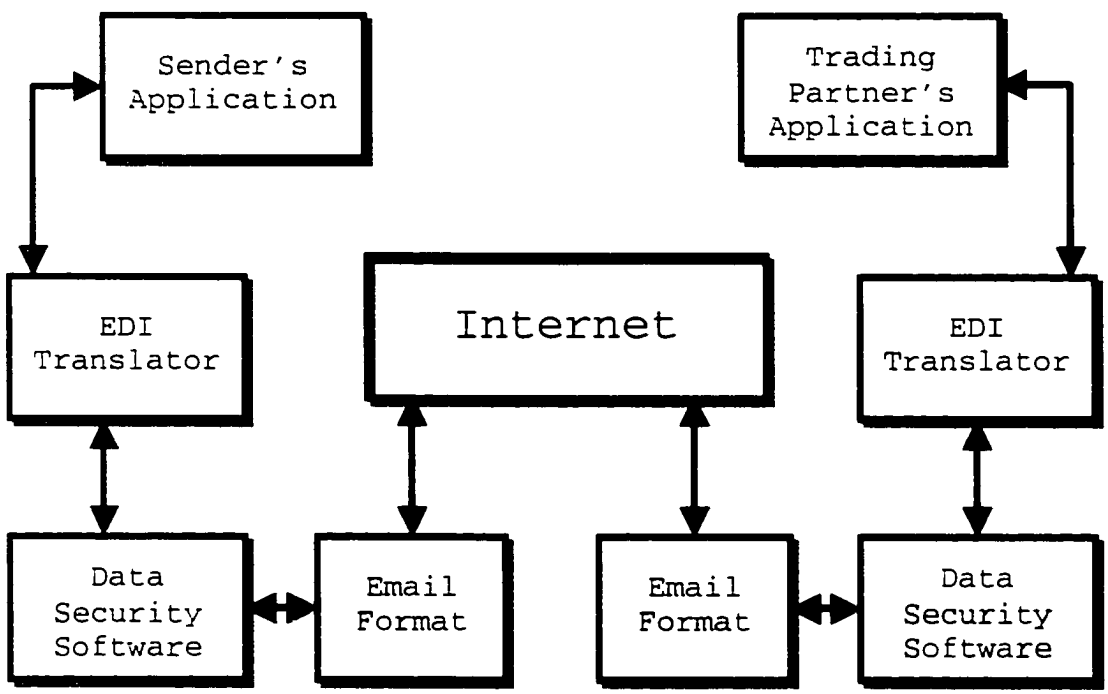

Figure 2. How EDI via the Internet works. (IBM Global Services, 2000)

Once formatted, the data must be encapsulated using MIMEs (Multipurpose Internet Mail Extensions). MIMEs consist of three parts, separate formats for identifying different EDI data types: EDIFACT, EDI-X12, and EDI-Consent. An additional stage is necessary to ensure privacy, data integrity, authentication, and nonrepudiation: encryption using PEM. The encryption operation is usually performed at the same time as encapsulation. Segev, Wan, and Beam (1995) described what happens next:

> The resulting data is wrapped into an RFC822 envelope, which is routed over the Internet using SMTP (Simple Mail Transport Protocol).
> On the receiving end, the reverse process applies. The data content is taken out of the envelope, and is then decrypted. The actual EDI content is extracted from the message body using MIME directives. This data is passed to the translator, which reformats it so that the recipient's application program can read it.

Zuckerman (1999) posited a scenario of "hybridization" of the two technologies, combined EDI and Internet. Hickey (1999) anticipated the eventual replacement of EDI systems altogether, though acknowledging that organizations with a large investment in EDI and established EDI communication with trading partners "are not going to just dump those system relationships simply because the web is pretty" (p. 33).

What substantive benefits does the Internet offer? According to Edwards (1999), "The Internet . . . makes EDI accessible to the companies previously shut out by the high start-up fees and complexity of implementing and maintaining the required systems" (p. 104). Cost savings was a recurring theme in the literature on Internet versus traditional EDI. Adams (1997) calculated that "Internet EDI transactions cost from one-half to one-tenth the price of VAN-based transactions, according to some studies" (p. 36). Larres (2000) cited a Texas Instruments estimate that Internet versus VAN is three times cheaper; Wilde (1997) estimated EDI via the Internet to be potentially 3 to 10 times cheaper than EDI via VANs. Edwards (1999) and Dunn (1998) both used this example: "According to Steven Bell, an analyst at Forrester Research in Cambridge, Mass., it costs about $50 to process a paper-based purchase order and about $2.50 to process the same order with EDI. Internet-based EDI can lower the cost to less than $1.25" (Dunn, 1998, p.74; Edwards, 1999, p. 104).

The cost savings can be largely explained by the fact that Internet EDI speeds communications with distributors and resellers and simplifies technology. Internet EDI can employ either intranets or extranets. An intranet is a

"closed, business-wide network" using TCP/IP standards (Centers for Research in Electronic Commerce, 2000; Morrison, 2000); an extranet is a private WAN (wide-area network) that uses public protocols with special security measures to maintain a "private network among private parties" (Centers for Research in Electronic Commerce, 2000; Morrison, 2000). In either case, initial installation costs are much lower for Internet services versus a VAN, several hundred versus several thousand dollars, according to Larres (2000). Ongoing expenses are also lower, since organizations pay for the volume of data transmitted via VAN, whereas the Internet allows for the transmission of huge amounts of data for the cost of an Internet provider fee. Larres (2000) called I-EDI "almost 'real-time' EDI." Werner (1999) offered the example of a company handling 125,000 messages monthly; that company could expect to pay between $50,000 and $100,000 per month for regular EDI transactions. Edwards (1999) and Dunn (1998) added the fact that the two systems require different amounts of expertise: "Novice users can implement Internet-based EDI with just a computer and an Internet connection, and the solution lets them fill out

simple forms without getting bogged down by complex EDI terminology" (Dunn, 1998, p. 74).

Besides reduced costs, there are additional advantages to I-EDI. These include faster document exchange ("Internet Revives EDI," 2000) and equalization of communication/trade opportunities: "All hosts on the Internet can communicate with one another as peers, and all of the communications protocols are "open"-standards are in the public domain, and the standardization process is open to anyone willing to put in the hard work to define them" (Harding, Drummond, & Shih, 1999, p. 5).

Hickey (1999) noted that these opportunities extend to smaller organizations that could not afford to exchange EDI messages through a VAN. Additionally, I-EDI offers greater variety in terms of the types of data that can be freely transmitted. Larres (2000), for example, cited technical and engineering drawings, presentations, graphics, sound, and video.

Just as EDI is not as simple as it may initially seem, however, neither is moving EDI to the Internet. Sources caution that I-EDI is not always cheaper in the long run, considering some recent developments. VANs are lowering rates to be competitive; organizations may feel the need to

make additional investments to ensure that Internet security equals that of traditional EDI formats; Internet services are more often included in VAN services, so that organizations do not necessarily have to choose one over the other or increase logistical support to try to capture the "cross-platform user-friendly" quality of the Internet (Curtis, 1996; Davis & Parsons, 1995/1996; Fox, 1996; Kilbane, 1996). Dugan (1998) argued that the Internet is best considered a replacement for only the network element of EDI: "Other business requirements could make Internet based EDI far less attractive. In our survey, security was the top requirement of EDI systems, beating out cost, implementation, and management" (p. 82).

So far, two primary approaches have emerged in making an EDI-to-Internet transition. They include the "proof of concept" approach in which organizations borrow the resources necessary to experiment with I-EDI resources and build confidence in the system (Segev, Porra, & Roldan, 1997) and full, up-front investment in the system, including "detailed, specific user requirements" (Segev et al., 1997). The authors offered contrasting case studies to assess the potential of each approach to successfully

recruit I-EDI trade partners and concluded that the appropriateness of each approach is situational.

EDI's Potential Benefit to Public-Sector Organizations

Gaps in the Research

Literature on IT-enabled business transformation is limited (Hammer, 1990; Venkatraman, 1994) in that it has a strong bias toward private-sector organizations. As Teo et al. (1997) pointed out,

> The use of IT for organizational transformation in the public sector has largely been neglected. While lessons drawn from studies using private-sector organizations are useful, these findings are not necessarily directly applicable to public-sector organizations that face different sets of issues, problems, and challenges. (p. 140).

In addition, attempts to triangulate evidence of I-EDI's benefits with those from other perspectives (e.g., key trading partners, customers, and suppliers) are necessary but lacking.

EDI in Educational Organizations

In 1996, Rezmierski wrote, "Colleges and universities are moving rapidly towards electronic data interchange. Nay, we are stampeding towards EDI" (p. 40).

Evolution of standards and applications. The application of EDI in offices of admission and registrars dates back to the mid-1980s and was largely pioneered by universities in Florida and Texas. Florida established the Florida Information Network to connect all state high schools and colleges (Carson, 1991); at about the same time, the University of Texas at Austin (UT) began its involvement in the local and national development of EDI standards for educational uses (Stones, 1997). EDI has been primarily applied to student transcripts, although another early EDI user, Georgia Institute of Technology, was accepting applications for electronic admissions by the late 1980s, for the purpose of "speeding the application process, reducing time spent in data entry, and also recruiting technically advanced applicants" (Rhinehart, 1996, p. 34).

By 1987, the American Association of Collegiate Registrars and Admissions Officers (AACRAO) had decided that a task force was needed to devise a national standard format for electronic transcript exchange. Out of the work of that group's task force emerged SPEEDE, the Standardization of Postsecondary Education Electronic Data Exchange (Carson, 1991). SPEEDE/ExPRESS is "a set of

record formats designed to facilitate the electronic transmission of administrative information of interest to education entities" (U.S. Department of Education's National Center for Education Statistics, 1997). The name SPEEDE emphasizes postsecondary users, but concurrent efforts have been under way to create a single national standard for all academic records. More and more high schools are also using EDI; according to Stewart (1994), approximately 75% of Florida high school seniors were attending high schools participating in EDI at the time of that report. In 1997, the state of California earmarked $5.7-$10 million to convert schools and county education offices to a system called California Information Services (www.cde.ca.gov/ftbranch/retdiv/demo/csis.htm as cited in U.S. Department of Education's National Center for Education Statistics, 1997), while the state universities and community colleges consolidated access to admissions, financial aid, and transfer information (www.otan.dni.us/certicc as cited in U.S. Department of Education's National Center for Education Statistics, 1997). SPEEDE was designed to be consistent with ANSI X12 to avoid duplication of labor in designing reliable standards, to conform to standards that are nationally and

internationally recognized, and to facilitate integration of academic and business applications of EDI (Carson, 1991).

Detailed literature describing the University of Texas at Austin's EDI evolution is available. UT's experience, because it assisted in defining national EDI educational formats (Stones, 1997), helps provide historical and technical perspective and explains the developments that have led to EDI's increasing popularity in educational settings. As of 1996, 459 institutions were involved in EDI at various stages of implementation. The University of Texas had processed over 40,000 transcripts using this method (Rhinehart, 1996), and over 140 other institutions had registered to use UT's Internet EDI Server (Stones, 1997).

The University of Texas's efforts began in 1995 when it "placed in service a dedicated UNIX machine to provide educational institutions a simple, convenient, secure mechanism for exchanging formatted educational documents-primarily transcripts-via multiple Internet protocols at no cost to users" (Stones, 1997, p. 41). This took place after extensive discussions and planning for potential obstacles with the help and endorsement of a technology committee of a

Texas association for collegiate registrars and admissions officers. UT's system was developed in the registrar's office using a combination of existing software free to nonprofit organizations, purchased software, and original programming, along with technical assistance from Internet resources, other universities, and EDI groups.

Initially the server, which consisted of e-mail software, FTP, and PGP (Pretty Good Privacy) encryption, functioned by accepting only ANSI ASC X12-compliant files, including MIME e-mail attachments and FTP files. For the sender, this entails the following procedures: register with the server; identify receipt medium; state delivery address and parameters and address for notification; prepare compliant files in appropriate delivery "envelopes" (if multiple recipients or different document types are involved). The recipient is responsible for unencryption, acknowledgment, translation, and processing of files (Stones, 1997).

UT eventually implemented the Texas Internet EDI Server, which simplified and streamlined SPEEDE/ExPress file transfer. This server is currently available for free to all K-12 and postsecondary educational institutions. A "registrant table" is kept to enable trouble-free exchange

with the member schools in the transfer protocol and delivery schedule of their choice; 200 institutions in 24 states were reported as members in 1997 (Reynolds, 1997). Observations at UT in evaluating the server yielded several insights that have helped in the improvement of the server. For example, FTP is superior to e-mail in the ability to attempt delivery repeatedly, provide the sender information about the status of the attempt, and confirm the success of the exchange, whereas e-mail notifications of delivery failure take longer, as well as varying in dependability among various mail services. Second, increasing popularity and multiplying sites complicated the overall network. Third, keeping the server free of charge has benefits that outweigh cost, including reduced paperwork and increased freedom to make changes. In addition, UT saves approximately $8,000 annually on VAN charges they would have to pay with traditional EDI (Reynolds, 1997).

Security issues. As discussed in the final section of this chapter, Perceptions of Internet Trustworthiness, security is a major concern for organizations currently employing EDI, and especially for those considering making a transition. Security is extremely important in educational settings because of obvious concerns about

students' privacy, which is protected under the Buckley Amendment of 1974 (Rhinehart, 1996). This act has been extended and interpreted to deal with EDI, since EDI was not specifically covered at the time. So far, security has been largely a matter of the honor system, the ethics and wisdom of individual users, as explained by Rezmierski (1996):

> University and college administrators will need to confirm their own purpose and direction in the stampede to electronic data interchange. They will need to stay the course, avoiding the enticements of secondary and inappropriate uses of data. They will surely seek to fulfill the responsibilities of their roles according to law, standards, and policies. . . . Insisting that they keep to the highest ethical ground, empowering individuals over institutions or corporations, and maintaining trust of their communities, will be the surest route to success. (p. 50)

Several features of the system take it beyond the use of individual self-control in ensuring security. One is the level of oversight involved in its development. State departments of education and national associations have been partners in translating local developments to broad and consistent standards. Features of the technology itself also enhance the security of the system, especially the acknowledgment function, or the notification of receipt.

For example, if a sending institution was to receive a notification that did not match what it had sent, the recipient computer could notify the sending computer of a possible security problem (Stewart, 1994). A recipient computer also in effect notifies a sending computer that delivery has not occurred when no acknowledgment of receipt is forthcoming. Stewart also pointed out that the system bypasses data entry errors while greatly increasing the speed of communication, the idea being to identify problems before a student complaint is necessary.

Expanding uses of EDI in education. EDI has been deemed secure enough that several new projects are expanding its use beyond transcript exchange. The U.S. Department of Education's EASI project allows students to apply for financial aid via the Internet, permitting "the various trading partners in the student aid delivery system to communicate via standard formats, much like the process already in place for commercial credit cards" (U.S. Department of Education's National Center for Education Statistics, 1997). In the pilot stage, when the cited article was published, the system allowed students to submit a digital signature and establish an annual line of

credit, and institutions to submit EDI invoices to request funds from the lending institutions.

In Iowa, a Project called EASIER (Electronic Access System for Iowa Education Records) grew out of a Department of Education advisory committee formed to explore the possibilities of SPEEDE/ExPress. EASIER is a

> collaborative effort involving the networking of Iowa's local school districts, education agencies, community colleges, Regents institutions, and the Department of Education. … its primary goal to develop and implement a system for collection of essential student information for state and federal reporting requirements and for policy development and research activities. (Alvoed, Tack, & Dallam, 1998, p. 14)

In 1998, 58% of 375 school districts were participating. EASIER is perceived as a means of reducing data overload, improving decision making, improving the speed and accuracy of communication among schools, and improving cooperation among the state, local communities, and institutions, thus improving schools in general (Iowa Department of Education, 2000). The University of Northern Iowa became the first public university in Iowa to officially implement the system after cooperating with the Des Moines school system in a five-year pilot program ("Transcripts movin' at light speed," 2000).

Online registration. Mead and Perkins (2000), referring to today's college students, asserted that "as the technical sophistication of our constituencies increases, so will the press for web-based services" (p. 8). On-line registration is another application that continues to expand, replacing the more complicated administrative student information systems with user-friendly visual feedback and access unrestricted by time or location. One of the earliest innovators in on-line registration was the Johnson Community College system with its campus and 15,000 students dispersed around the Kansas City area. The new system eliminated the need for students to drive a distance and wait in long registration lines (Allen, 2000). An AACRAO survey summarized by Allen provided a current snapshot of the variety of Internet services in higher education, beyond transcripts and registration:

> Of 334 institutions responding, 62% offered online class schedules, 71% offered online catalogs, 40% offered online instructor information, 29% offered online registration, 11% offered online payment processing, and 53% had an online registration office homepage. (Allen, 2000, p. 1)

Benefits to Educational Organizations

The anticipated benefits of projects such as EASIER help illuminate EDI's value to educational institutions in general. The reduction in paperwork improves efficiency and accuracy. This has tangible benefits to students in that it simplifies the transition from one institution to another and saves the student the mass mailings required to apply in traditional systems (Alvord et al., 1998). Students have a much shorter wait to receive an acceptance or rejection and fewer problems leading to complaints prompted by human errors. Stewart (1994) identified another benefit as the overall improvement in the placement process, which can translate to the greatest potential benefit to students of all: greater likelihood of meeting the target date for graduation. In the literature, these benefits seem to far outweigh any security concerns; security is consistently listed across the literature as a benefit rather than a liability of EDI.

For the institution, cost savings is a substantial benefit, and these savings may be achieved in several categories, including labor, supplies, and postage (U.S. Department of Education's National Center for Education Statistics, 1997). Labor may be the most significant of

the three, as Stones (1997) explained: "GPA calculations and evaluation of transfer courses into the receiving institution's course numbering system can be accomplished programmatically with no required data entry, potentially eliminating hundreds of hours of repetitive manual work" (p. 42).

Thus, the technology helps institutions meet increasing demands from students for better service while reducing resources at the same time (Stewart, 1994). The expansion of data exchanged efficiently, quickly, and accurately in turn allows institutions and specific programs to more accurately measure their own effectiveness.

EDI: The Process of Making the Transition

Kappelman et al. (1995) regarded EDI as more than a technological innovation: "It provides a new way of doing business . . . [that] can facilitate the reengineering of business processes as well" (p. 30). They argued that conversely, some reengineering of business practices is required in order for EDI to benefit the organization at all. Therefore, introduction of new technology such as EDI is a complex managerial process with several elements that

are essential, no matter what technical standards decision makers determine are right for the organization. Four implementation stages labeled by Kappelman et al. (1995) are outlined in the following sections: Planning; Analysis and Design; Construction and Installation; Operations. The authors argued that four watchwords must continually accompany each of the four stages: evaluation, education, improvement, and ongoing exploration of new opportunities. Argrawal (1995) added managerial commitment/enthusiasm, focus, and awareness of the big picture.

Planning

Planning first involves assessing current organizational conditions, including culture, structure, management practices, and the economic feasibility of making a change. Decision makers must also look outside the organization and consider its current relationships with trading partners. Kappelman et al. (1995) identified securing trading-partner cooperation as one of the greatest potential obstacles to successful EDI implementation. Therefore, close consultation with partners is essential before any final decisions are made. Choice of EDI system depends not only on the organization's needs, but also on

what is compatible with the operations of trading partners (e centre[UK], 1998). The planning phase ideally will produce several planning documents. First is a project proposal that summarizes relevant information about the organizational factors listed above and itemizes proposed changes, anticipated impacts, timetables, resources, costs, and expected benefits (Kappelman et al., 1995). E centre[UK] (1998) suggested a format for a second planning document, a Trading Partner Agreement, which can guide EDI relationships.

Analysis and Design

The analysis and design phase continues the planning stage in that a thorough study must be completed to determine which aspects of the organization demonstrate a need for EDI to fill and to identify the specific types of hardware and software that can best do the job. The organization should produce a detailed blueprint for all EDI hardware, software, network, and standards. This blueprint assists the organization in revising and improving the proposal created during the planning stage.

This stage involves not just technical decisions but also important psychological preparation and communication.

One step is to ensure the users participate in all levels of the transition because this involvement, according to Kappelman et al. (1995), "serves to reduce users' resistance to the implementation of EDI" (p. 30). Another is close communication with the trading partners to integrate applications and identify standards and formats (Kappelman et al., 1995). Abcede (1997) added that procedures should be communicated with at least "generic guidelines for information sharing and successful implementation" to "help outline what lies ahead. . . . It's a way to manage expectations" (p. 112).

Construction and Installation

The phase of construction or development and installation primarily involves the acquisition, customization, and testing of all equipment. Users, management, and trading partners work together to learn and adjust to the new system, often beginning with a pilot program. Training and communication also come into play here. According to Abcede (1997), communication is essential to make all players aware of their role in making the change happen. Communication also facilitates the transitional period many organizations experience "where

both electronic and paper documents are sent back and forth . . . a process akin to training wheels on a bicycle, offering a security blanket to . . . managers and suppliers" (p. 112).

Operations

More happens during the final phase, operations, than just letting EDI do its work. As Kappelman et al. (1995) noted, "As with any information system development project, problems will arise" (p. 32). Organizations can deal with this inevitability by gathering feedback from end users and trading partners and carefully observing operations. The authors offered GM as an example of successful EDI implementation, based on the company's promotion of EDI, continuing education opportunities, support to trading partners, and willingness to make changes as needed.

The Potential for Resistance to EDI

One source summarized EDI's potential as follows:

> Electronic Data Interchange . . . is one of the most exciting competitive tools in the modern business arena. It can be a major factor in developing new or more effective relationships with business and trading partners. [However,] although EDI has the potential to improve profitability, managerial efficiency, and bottom-line performance dramatically, many executives

> remain unaware of the impact it can have on their business. (Xerox Corporation, 2000)

A survey (Dugan, 1998) reported that the small suppliers of 31 large corporations resisted EDI implementation for the following reasons: high start-up costs (48.4%); difficulty with standards (48.4%); platform incompatibilities (35.5%); and difficulty justifying cost savings (32.2%). Because Internet EDI alleviates or eliminates many of these problems, the following sections focus on barriers that remain a possibility with I-EDI.

Some of those organizations already benefiting from traditional EDI may be waiting to learn more before making the transition to Internet EDI. According to Sliwa (2000), "The technology industry may be buzzing about XML and business-to-business marketplaces, but within large corporations, the old tried-and-true-electronic data interchange initiatives still rule" (p. 1). These organizations are waiting until XML standards are further refined to make a change, or they may feel that the mapping and integration work would be too difficult (Sliwa, 2000).

Lack of knowledge and experience with a technology is a potential barrier that is especially relevant to Saudi Arabia. Internet access is a relatively new phenomenon in

the country. Access is controlled by a government agency called the Internet Services Unit (ISU), which was created in 1998. It is responsible for all Internet-related concerns from licensing service providers to publicizing the technology to preparing policies and regulations governing Internet use throughout the KSA (King Abdulaziz City for Science & Technology, 1997). Although the Internet was just introduced to the Kingdom at large in 1999, the Saudi Embassy (2000) reported 160% subscription growth the first year, and plans are in place to increase available phone lines to continue to accommodate the growth of the number of subscribers.

Attitudes Toward Computers

Along with lack of familiarity as a possible barrier to the implementation of EDI comes fear. Most of the research related to attitudes toward technological change within organizations dealt with change from manual to automated systems (Saunders, 1991; Scharf & Ward, 1989). Thus, the literature was relevant to the situation of the KSA, where the technology is new, and in particular to the GDPI&C, where automation is lacking altogether. Although some of these studies were done in the 1980s before the

explosion in Internet technology, according to Popovich (1994),

> The lessons of what was written on changing to the first automated systems are still valid and usable on today's new generation of systems. The problems encountered before are now appearing again. The older literature should be looked at as a guide and/or a source to help overcome these problems while they are small, before they get out of hand. (p. 10)

Bronson, Pelz, and Trzcinski (1988) identified two opposite reactions to computerization, either of which could cause problems in the EDI design and implementation phases. The first possibility is the "Pandora's Box" attitude: employee fear, anger, and resistance. The Pandora's Box syndrome is likely to be experienced where there is "computer phobia," employees afraid to touch the computer for fear of making mistakes and dealing with lack of computer knowledge. The fear can also stem from the belief that computers will eventually replace them (technology will make their jobs unnecessary) or damage interpersonal relationships. Other authors have summarized employees' fears and found them to fit into three broad categories altogether: economic, psychological, and social (Brown, 1986; Kakabadse, 1987; Katz, 1978).

Several managerial strategies have been identified to deal effectively with employee fears of new technology. First, it is important to involve employees in planning for change, which can decrease resistance in proportion to the degree they are involved (Pennsylvania State University, 2000). Amba-Rao (1998) added that involvement in planning increases ego-involvement, which further increases commitment to the change. A study of 255 Canadian manufacturers also described the importance of direct employee participation in the implementation of technological change (Reshef, Stratton-Devine, & Bemmels, 1994). Fears can further be reduced if the changes are clearly and thoroughly explained through meetings (Moores, 1986) and daily communication with supervisors who model support for the change and enthusiasm for its benefits (Ackerman, 1986; Moores, 1986).

A key part of the planning process is preparing employees through training:

> Many people have a phobia about computers simply because they have no idea how a computer works. If a person, a book, or a class is able to convince them that they are not going to push the wrong series of buttons and initiate a nuclear attack . . . this can be half the battle. (Small Business Resource, Inc., 1998)

Any training must also be reinforced on the job. Other strategies reported to be effective in dealing with computer fears include dealing with the threat of job elimination. Managers can appeal to employee self-interest and emphasize that computer experience makes workers more, not less, valuable in the job market (Small Business Resource, Inc., 1998). Aba-Rao (1998) pointed out that markets are increasingly service oriented; learning a new system can only help employees adapt to further change in the future.

The opposite of the Pandora's Box effect is belief in the "Magic Box" (Bronson et al., 1988). This attitude is characterized by unrealistically optimistic expectations for computerization, the assumption that a new system will be completely "user-friendly" and easy to learn, and once implemented will solve every problem: "For staff members who are working with the existing manual system and all of its headaches, the temptation is great to embrace . . . advertisements and the panacea they offer" (Bronson et al., 1988, p. 20). Communication, training, and planning as outlined above can help balance high expectations with the realities of the work involved in accomplishing a transition to new technology effectively.

Several studies demonstrate that attitudes toward new computer systems, particularly those based on fear, improve over time (Bronson et al., 1988; Shaw, 1986). Significant facets of organizational culture may be dramatically affected by the introduction of I-EDI into the environment, including decision making, communication, and managerial control. Whatever the basis for resistance, any changes in an organization's environment that are perceived to change the way the organization "has always functioned" will have a major impact, possibly to the extent of affecting the organization's chances for survival (Riley & Lorenzi, 1996, p. 27).

Perceptions of Internet Trustworthiness

Another potential barrier to the adoption of I-EDI in particular is the issue of security. In developed nations where Internet commerce is thriving, the organizational theory literature is giving increasing intention to trust. Trust, according to Hart and Saunders (1998),

> will be increasingly important in the information systems literature as the use of intranets and the Internet continues to grow. While these technologies provide opportunities for improving coordination by facilitating more convenient and flexible information, they introduce vulnerabilities as outside parties gain

> increasing access to information formerly held secure within traditional organizational boundaries. Developing trust is an important way for firms to take advantage of the opportunities while mitigating the threat of vulnerabilities posed. (p. 108)

The issue of security may be particularly relevant where the Internet is a relatively new form of information exchange.

CHAPTER 3

METHODOLOGY

This chapter provides background information regarding the study populations, sample selection, development of the data collection instruments, and distribution and collection of the data. The chapter also provides background information regarding the selection and content validation of the data collection instruments as well as analysis of the data.

Research Questions

In the investigation of the stated problem, answers to the following research questions were sought:

1. What is the self-reported knowledge and understanding of staff members, administrators, and faculty members regarding the potential of I-EDI in the organization?

2. What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI?

3. What are the perceived benefits of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI?

4. What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding computer and Internet technology?

5. What benefits do staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers perceive in regard to computer and Internet technology?

Populations Selected for the Study and Sample Selection

Institutes and Centers in Saudi Arabia train anyone who wants to learn in all of the areas listed below.

- Automatic control
- Safety and industrial security
- Supervision of short courses
- Vocational/technical program
- Survey and architecture drawing
- Computer specialties
- Photography
- Telex
- Administrative training
- Industrial and chemical engineering
- Electrical and electronic maintenance
- Computer and mechanical maintenance
- Cement industrial
- Public relations

- Shorthand
- Commercial subjects
- Offices/clerical
- Aviation services

Institutes offer long-term instructional programs (up to two years in length), while Centers offer short-term instruction lasting a number of weeks or up to a maximum of six months. Institutes and Centers are located throughout the Kingdom of Saudi Arabia. General Directorate For Private Institutes & Centers is the supervising agency that monitors the Institutes and Centers; trainees can enroll in either the Institutes or Centers, or both.

Internet-Based Electronic Data Interchange is technology unfamiliar to the three populations on which this study is focused. The first population consisted of all staff members, administrators, and faculty members in 50 Institutes throughout the country. The second population consisted of all staff members, administrators, and faculty members in 50 Centers throughout the country. The Institutes and Centers were randomly selected from the GDPI&C list from Riyadh, KSA by "finger pointing" (selecting the names of 50 Training Institutes and 50 Centers on the list without looking). The third population consisted of all GDPI&C staff members, administrators, and

faculty members in the administrative and educational branches.

Research Design

The study was designed to (a) measure the attitudes and perceptions of staff members, administrators, and faculty members in GDPI&C toward computers, utilization of the Internet, and the implementation of I-EDI within the organization and (b) describe Training Institute/Center staff members', administrators', and faculty members' attitudes and perceptions toward computers, Internet technology, and the implementation of I-EDI. The study also examined the expectations of GDPI&C staff members, administrators, and faculty members and those of Training Institute and Center staff members, administrators, and faculty members regarding the potential benefits of implementing a new system (I-EDI).

Survey Advantages

Pinsonneault and Kraemer (1993) examined MIS (management information system) research and concluded that the method used most often was the mail questionnaire, used in 77% of the 122 studies they reviewed. The survey is

familiar in educational institutions and offers statistical strength as an information-gathering tool (Balsley & Clover, 1988, as cited in Teseng, 1995).

The survey method offers important logistical advantages. It makes contact with many organizations relatively easy and makes it possible for the researcher to gain access to population samples that might be impossible to attain in person or by telephone. Survey research costs less compared to other methods of collecting data, especially when large samples or geographic distances are involved, and it protects respondents' anonymity in providing sensitive information they might not be willing to provide to a researcher in another format (Elbaz, 1998). Besides being less intrusive and intimidating for respondents than face-to-face methods, a survey can be completed in a simple and straightforward manner in less time (McClelland, 1994). At the same time, the approach allows participants sufficient time to make thoughtful responses to the questionnaire (Fraenkel & Wallen, 1993).

The mail survey offers additional benefits besides logistical ones. Because responses can be gathered from a much larger group than personal interviews allow (Brusaw, Alred, & Oliu, 1987, as cited in Teseng, 1995),

generalizations can be made by surveying opinions among participants in a sample that is representative of a larger population (Olson, 1995). Researcher bias is therefore minimized.

Content Validation of the Survey

The instrument for this study (see Appendix B) is a survey consisting of two parts and was adapted by the researcher based on a survey created by Altmeyer (1982). See Appendix C for Altmeyer's original survey. The original survey was developed for use in a government human services agency, the Social Welfare Program of New York. Although the nature of the organization in that study differed from the educational organization under study here, like GDPI&C, it was a government organization introducing a major change in MIS technology, as reflected in Altmeyer's research hypotheses:

> Hypothesis 1: Uncertainty surrounding human service programs tends to be associated with a need to increase their capacity to process information through implementation of computerized management information systems (CMIS).
>
> Hypothesis 2: Centralization and formalization tend to occur with implementation of CMIS.

> Hypothesis 3: Managers tend to perceive CMIS as a managerial tool providing increased productivity, greater internal control and improved organizational effectiveness.
>
> Hypothesis 4: External factors tend to be associated with implementation of CMIS.
>
> Hypothesis 5: Personal attitudes and perceptions of public employees tend to be associated with implementation of CMIS. (pp. 84-85)

The content validity of the survey was established through pilot testing, revision, and a second pilot test (Altmeyer, 1982). For the purpose of this study, several changes have been made to the original survey to make the questions appropriate to the services provided by the organization, to clarify phrasing to improve translation, and to reflect the availability of technology that did not exist at the time Altmeyer developed her survey.

Fowler (1984) asserted that "every questionnaire should be pre-tested, no matter how skilled the researcher. Virtually every questionnaire could be changed in some way to make it easier for respondents and interviewees to meet the researcher's objective" (p. 103). The best method for pilot-testing a self-administered questionnaire is discussing it with respondents face to face after they fill out the questionnaire (Fowler, 1984).

A pilot study was conducted for the current study to ensure that use of the adapted instrument was appropriate. Usually the pilot test involves 5 to 10 people (Wiersma, 1991). The questionnaire for this study was sent to 9 individuals from the target population. Participants randomly selected to complete the questionnaire included 3 from GDPI&C, 3 from Institutes, and 3 from Centers.

Several issues were of concern in this pilot study. The survey was discussed with these individuals to get their impression about the instrument and any suggestions for strengthening its content or clarity. First, did the 45 questionnaire items solicit the information required? Second, did the respondents have enough time to complete the survey? Third, was the translation into Arabic satisfactory? Further questioning determined that participants' understanding of the items written in Arabic was correct. The respondents had enough time to complete the survey. Lastly, the response indicated that the 45 questionnaire items did solicit the information sought by the study.

Most of the questionnaire items applied to two or more of the five research questions investigated in this study. Questionnaire Items 7, 8, 11, and 44 were relevant to

Research Question Number 1; Questionnaire Items 6, 12, 13-14, 16-21, 29, and 40 to Number 2; Questionnaire Items 5, 9-10, 15, 22-28, 30-31, 38-39, 41, and 42 to Number 3; Items 32-35, 43, and 45 to Number 4; and Items 36 and 37 to Number 5. The relevance of specific questionnaire items to each of the five-research questions is summarized in Table 1.

The GDPI&C created two letters of permission to assist with the collection of the research data (see Appendix D). The letters were sent with the survey to encourage the Institutes and Centers to fill out the survey and return it. The first letter was sent to the Institutes and Centers located in Riyadh; the second was sent to those Training Institutes and Centers located outside of the Riyadh area. The researcher hand delivered, mailed, and faxed the questionnaire to each subject, sometimes providing verbal instructions about the research. If the respondent asked for a definition of I-EDI, a further explanation was given based on the definition provided in chapter 1 of this dissertation.

Table 1

Relevance of Specific Questionnaire Items to Specific Research Questions

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
5. I-EDI will be an important management tool.			X		
6. I do not really care what happens to this new I-EDI system.		X			
7. I am familiar with data exchange over the Internet.	X				
8. I do not know how I-EDI will benefit my agency (Center/Institute/ GDPI&C).	X				
9. I feel that it is necessary for GDPI&C administrators to get their hands on implementing I-EDI.			X		
10. I-EDI in the GDPI&C, Institutes, and Centers would make a positive contribution to our society.			X		

(table continues)

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
11. I understand the potential value of I-EDI.	X				
12. I feel that I-EDI will limit and structure our thinking about our services.		X			
13. I-EDI will assist the GDPI&C in dealing with rapid changes that are occurring in the world.		X			
14. I-EDI will emphasize technological requirements to the disadvantage of people.		X			
15. The impact of I-EDI will affect each and every employee in a positive way.			X		
16. I do not see any great advantage to implementing a new system.		X			

(table continues)

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
17. I am apprehensive about I-EDI.		X			
18. I am satisfied with the current system.		X			
19. I feel that changing to the new system will cause new problems.		X			
20. I-EDI is yet another example of undesirable control over the lives of people.		X			
21. Computers are not difficult, but I-EDI is complex.		X			
22. The inquiry feature of I-EDI will save a great deal of time.			X		
23. I-EDI delivers services more efficiently than traditional methods.			X		
24. The new system will reduce staff members' stress.			X		

(table continues)

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
25. It is reasonable to assume that the Department's error rate can be reduced by I-EDI.			X		
26. I-EDI will provide more equity in client treatment.			X		
27. I feel I-EDI will improve communication among GDPI&C branches and Institutes and Centers.			X		
28. Implementing I-EDI will help lower the cost of our activities.			X		
29. I-EDI is a secure method of exchanging data.		X			
30. The use of I-EDI will help reduce the time it takes to deliver services.			X		
31. The new system will help me do my work quickly.			X		

(table continues)

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
32. I feel computers are overrated and are not as helpful as they are made out to be.				X	
33. In the performance of my job, I must make use of computer-generated information and reports.				X	
34. I fear using the Internet.				X	
35. I fear using the computer.				X	
36. Computers are a very helpful tool.					X
37. I have adequate experience using computers.					X
38. The introduction of I-EDI will assist my agency in the clarification of its goals.			X		

(table continues)

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
39. I-EDI will provide a rationale for denial of services.			X		
40. GDPI&C is presently efficient in its delivery of service.		X			
41. Implementing I-EDI will improve our internal control.			X		
42. I-EDI will help administrators in the agency see our organization as a client-serving system.			X		
43. In the use of the Internet I consider myself to be					
a. expert.					
b. advanced.					
c. intermediate.					
d. a beginner.					
e. a novice.					
f. completely inexperienced.				X	

(table continues)

Questionnaire item	Research question: Understanding & knowledge of I-EDI	Fears of implementing I-EDI	Benefits of implementing I-EDI	Fears of computer & Internet	Benefits of computer & Internet
44. In the knowledge and understanding of I-EDI, I consider myself to be a. expert. b. advanced. c. intermediate. d. a beginner. e. a novice. f. completely inexperienced.	X				
45. In the use of the computer I consider myself to be a. expert. b. advanced. c. intermediate. d. a beginner. e. a novice. f. completely inexperienced.				X	

Data Collection

Because this study involved 50 Training Institutes and 50 Centers across a wide geographic area in Saudi Arabia, participants were given the option of completing either a mail survey or an electronic Internet survey (http://fp.uni.edu/alzumaia). After the dissertation advisory committee approved the questionnaire, a field trip to Saudi Arabia was made to distribute the survey to the participants. The mailings offered the participants the option of completing and returning the survey by mail or completing it on-line. The cover letter (in Arabic) included directions for accessing and completing both forms of the survey.

Data Collection Activities

The following steps were followed in the preparation, distribution, and collection of the questionnaire:

1. The pilot-tested questionnaire was submitted to the researcher's advisory committee for approval.

2. An introduction explaining the purpose of the survey and procedures for completing the questionnaire was prepared and submitted to the advisory committee.

3. An introductory cover letter from the GDPI&C Director was prepared to provide background about the researcher, who was employed by the GOTEVT, and to promote the cooperation of each individual Institute and Center in completing the survey questionnaire.

4. A copy of the cover letter, the questionnaire, and the introduction explaining the purpose and structure of the research was sent to the Graduate College of the University of Northern Iowa for review and approval by the Human Subjects Review Board.

5. The questionnaire and its introduction were translated into Arabic by professional translators selected by this researcher for the purpose of obtaining a questionnaire that had the same content validity in both the Arabic and the English versions and that it was free of any semantic or syntax errors.

6. A copy of the Arabic questionnaire was delivered by mail and fax, as well as hand delivered to Training Institutes and Centers to ensure higher response returns within the time frame allowed.

7. A period of one month was given each Training Institute and Center for completing the questionnaire.

8. The Arabic responses were translated into English by the researcher.

9. Both English and Arabic questionnaire facsimiles are shown in Appendix B.

Efforts to Ensure a High Return Rate

A great deal of effort was put into ensuring a high return rate for the questionnaire. These efforts included the researcher's personal deliveries of the questionnaire to 21 Centers and 14 Institutes in Riyadh. In addition, the researcher attained the cooperation of the GDPI&C in sending letters to the Institutes and Centers to urge their cooperation, to introduce participants to the questionnaire, and to guarantee their anonymity. The researcher verbally stressed to representatives of each Training Institute and Center the importance of the research for the institutions themselves and the society as a whole.

GDPI&C has many coordinators throughout the country outside the Riyadh area. Therefore, on October 11, 2000, the researcher mailed and faxed the survey to coordinators working with the GDPI&C to hand deliver the survey and urge the Institutes and Centers to respond to the questionnaire.

Follow-up calls were made to coordinators to ensure that they received the surveys and understood them clearly. In addition, the coordinators were asked to complete the surveys. The coordinators across Saudi Arabia were responsible for collecting the surveys from the Training Institutes and Centers and sending them to the researcher. The researcher made follow-up calls to the Institutes and Centers as well as frequent trips to Riyadh to encourage timely responses.

Response Rate

Responses from participants in GDPI&C, Institutes, and Centers in Riyadh were collected by the researcher personally. A total of 35 questionnaires from GDPI&C, 40 questionnaires from Institutes, and 74 from Centers in Riyadh were returned. The rate of total return from GDPI&C, Institutes, and Centers outside the Riyadh area is shown in Table 2. The total rate of return was 82.6%.

Table 2

Regional Breakdown of Total Returns (N = 339)

Region	GDPI&C		Institute		Center	
	n	%	n	%	n	%
Abah	1	2.13	36	25.53	13	8.61
Ahsa	0	0.00	0	0.00	7	4.64
Dammam	2	4.26	29	20.57	5	3.31
Jeddah	2	4.26	13	9.22	4	2.65
Madinah	1	2.13	4	2.84	2	1.32
Makkah	2	4.26	0	0.00	15	9.93
Qasem	2	4.26	11	7.80	16	10.60
Riyadh	37	78.72	40	28.37	74	49.01
Ta'if	0	0.00	5	3.55	12	7.95
Tabuk	0	0.00	3	2.13	3	1.99
Total	47		141		151	

Data Analysis

After the data were collected, they were entered into a computer file, and statistical analyses of the data were conducted using the Statistical Package for the Social Sciences (SPSS), a program available in the computer labs around campus at the University of Northern Iowa. A frequency distribution was used for all variables. The

information presented includes the absolute frequency and the relative frequency of all data.

CHAPTER 4

ANALYSIS OF DATA

The purpose of this study was to determine the attitudes and perceptions of staff members and administrators in GDPI&C, Training Institutes, and Centers toward the prospect of adapting to Internet-Based Electronic Data Interchange (I-EDI) in their organizations. The results of the research are presented in this chapter.

Descriptive statistics were chosen as the most appropriate way to analyze the questionnaire data. For each of the five research questions, means for all questionnaire items applicable to a specific question were calculated and then factored into the development of an overall result for each of the research questions.

Each of the five research questions was assessed within the context of the perceptions and attitudes of the members of the research population. Results related to each of the five research questions are presented separately in this section. Both textual explanations and tabular summaries of the results are included.

Study participants were asked demographic questions to determine the following: education level, major, position,

and agency. Participant demographics are presented in Table 3 below.

Table 3

Demographic Characteristics of Survey Respondents (N = 339)

Variable		Frequency	%
Level of education			
	Secondary school or equivalent	28	8.3
	Associate of arts degree	45	13.3
	Bachelor's degree	236	69.6
	Master of arts	18	5.3
	Doctorate	2	.6
	Other	10	2.9
Major			
	Business	83	24.5
	Computer	133	39.2
	Engineering	17	5.0
	Religion & Arabic	14	4.1
	Science	12	3.5
	Mechanical & electrical	9	2.7
	Medical	1	.3
	General	70	20.7
Position			
	Administrator	70	20.6
	Faculty	194	57.2
	Owner	18	5.3
	Staff member	51	15.0
	Other	6	1.8
Agency			
	GDPI&C	47	13.9
	Institute	141	41.6
	Center	151	44.5
	Other	0	0.0

For Questionnaire Items 5 through 42, participants were asked to respond to questions on a Likert scale offering five choices: 1 (*strongly agree*), 2 (*agree*), 3 (*no opinion/unsure*), 4 (*disagree*), and 5 (*strongly disagree*). For questionnaire items 43 to 45, participants were asked to indicate their level of computer- and I-EDI-related knowledge and skill by circling one of six choices on a Likert scale: 1 (*expert*), 2 (*advanced*), 3 (*intermediate*), 4 (*a beginner*), 5 (*a novice*), and 6 (*completely inexperienced*).

Research Question 1

Research Question 1 asked staff members, administrators, and faculty members to self-report their knowledge and understanding regarding the use of I-EDI in their respective organizations.

The mean values of Questionnaire Items 7 and 11 were 2.28 and 1.77 respectively, which indicated agreement (Table 4-1 reports descriptive statistics summaries for these questions). Agreement with the premise of these questions indicated understanding and knowledge of I-EDI.

Table 4-1

Responses to Questionnaire: Research Question 1 (N = 339)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	N	%	n	%	n	%	
7. I am familiar with data exchange over the Internet.	60	17.7	181	53.4	49	14.5	42	12.4	7	2.1	2.28
8. I do not know how I-EDI will benefit my agency (Center/ Institute/GDPI&C).	23	6.8	59	17.4	78	23.0	121	35.7	58	17.1	3.39
11. I understand the potential value of I-EDI.	138	40.7	152	44.8	38	11.2	11	3.2	0	0.0	1.77

Note. SA = *strongly agree* (1) A = *agree* (2) NO = *no opinion/unsure* (3) D = *disagree* (4) SD = *strongly disagree* (5).

The 3.39 mean value of Item 8, a *no opinion* response, doesn't affirm, but neither does it negate this conclusion. In addition, the mean value of Question 44 can be considered with this group of items. At 2.56, the response placed participants at the level of intermediate actual knowledge and understanding of I-EDI (see Table 4-2). Considered together, these items suggested that staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers know the potential value of I-EDI in their respective organizations.

Research Question 2

What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI in their own organizations?

The means of Questionnaire Items 6, 14, 16-17, and 21 were higher than 3.5, indicating disagreement with the premise of the items. Participants indicated agreement with Item 13 (mean 1.68). Disagreement on the group of five items and agreement with Item 13 indicate an absence of fears or negative regarding the implementation of I-EDI.

Table 4-2

Responses to Questionnaire: Research Question 1 (*N* = 339)

Questionnaire item	a		B		c		d		e		f		*M*
	n	%	n	%	n	%	n	%	n	%	n	%	
44. In the knowledge and understanding of I-EDI, I consider myself to be	28	8.3	169	49.9	88	26	39	11.5	7	2.1	8	2.4	2.56

Note. a. *expert* (1) b. *advanced* (2) c. *intermediate* (3) d. *a beginner* (4) e. *a novice* (5) f. *completely inexperienced* (6).

On the other hand, Questionnaire Items 12, 18-20, 29, and 40 produced mean values slightly above 3, which indicated a preference for *no opinion/unsure* regarding the implementation of I-EDI. Table 5 shows the statistical summary for these items. This result could be interpreted as casting some doubt on participants' confidence in the benefits of implementing the new system. However, as established in the results for Research Question 1, the participants possess at least intermediate knowledge of I-EDI; this familiarity with I-EDI lends support to the conclusion that the participants do not fear or otherwise oppose the transition to an I-EDI system.

Because the questions in this group, (12, 18-20, 29, and 40) involved a certain willingness to speculate about the future, the *no opinion* response can be interpreted to suggest a reluctance to state an opinion due to lack of adequate knowledge, not necessarily a fear of disagreeing, which would have been equivalent to confirming predictions of positive I-EDI results in the future.

Table 5

Responses to Questionnaire: Research Question 2 (N = 339)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	n	%	n	%	n	%	
6. I do not really care what happens to this new I-EDI system.	12	3.5	30	8.8	12	3.5	168	49.6	117	34.5	4.03
12. I feel that I-EDI will limit and structure our thinking about our services.	30	8.8	75	22.1	102	30.1	103	30.4	29	8.6	3.08
13. I-EDI will assist the GDPI&C in dealing with rapid changes that are occurring in the world.	158	46.6	147	43.4	24	7.1	5	1.5	5	1.5	1.68
14. I-EDI will emphasize technological requirements to the disadvantage of people.	17	5.0	36	10.6	71	20.9	157	46.3	58	17.1	3.60
16. I do not see any great advantage to implementing a new system.	12	3.5	25	7.4	43	12.7	158	46.6	101	29.8	3.92
17. I am apprehensive about I-EDI.	14	4.1	61	18.0	52	15.3	148	43.7	63	18.6	3.69

(table continues)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	n	%	n	%	n	%	
18. I am satisfied with the current system.	15	4.4	63	18.6	104	30.7	118	34.8	39	11.5	3.30
19. I feel that changing to the new system will cause new problems.	24	7.1	92	27.1	95	28.0	103	30.4	25	7.4	3.04
20. I-EDI is yet another example of undesirable control over the lives of people.	14	4.1	54	15.9	80	23.6	159	46.9	32	9.4	3.42
21. Computers are not difficult, but I-EDI is complex.	16	4.7	53	15.6	55	16.2	176	51.9	39	11.5	3.50
29. I-EDI is a secure method of exchanging data.	46	13.6	96	28.3	108	31.9	82	24.2	6	1.8	2.78
40. GDPI&C is presently efficient in its delivery of service.	49	14.5	136	40.1	116	34.2	32	9.1	7	2.1	2.44

Note. SA = *strongly agree* (1) A = *agree* (2) NO = *no opinion/unsure* (3) D = *disagree* (4) SD = *strongly disagree* (5).

Research Question 3

What benefits do staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers perceive regarding the implementation of I-EDI?

To answer this question, Survey Items 5, 9-10, 15, 22-28, 30-31, 38-39, 41, and 42 were analyzed. The mean values of these questions, except for Item 39, clustered nearest a 2 on the Likert scale, which represented agreement with the premises of the questions. Such agreement suggests an expectation of positive benefits among staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI. Table 6 shows the statistical summary for this question.

The mean value of Questionnaire Item 39 was 3.07, which fell nearest the *no opinion/unsure* option on the Likert scale. There are two possible explanations for this result. First is the wording of the question, "I-EDI will provide a rationale for denial of services." In English, the question is ambiguous. The researcher intended the question to suggest a positive I-EDI benefit: that I-EDI would automatically *prevent* unwanted or undesirable (or illegal) transactions.

Table 6

Responses to Questionnaire: Research Question 3 (N = 339)

Questionnaire item	SA		A		NO		D		SD		M
	n	%	n	%	n	%	n	%	n	%	
5. I-EDI will be an important management tool.	134	39.5	172	50.7	18	5.3	11	3.2	4	12	1.76
9. I feel that it is necessary for GDPI&C administrators to get their hands on implementing I-EDI.	175	51.6	131	38.6	21	6.2	9	2.7	3	.9	1.63
10. I-EDI in the GDPI&C, Institutes, and Centers would make a positive contribution to our society.	155	45.7	145	42.8	32	9.4	5	1.5	2	.6	1.68
15. The impact of I-EDI will affect each and every employee in a positive way.	104	30.7	183	54.0	37	10.9	10	2.9	5	1.5	1.91
22. The inquiry feature of I-EDI will save a great deal of time.	157	46.3	150	44.2	26	7.7	2	.6	4	1.2	1.66
23. I-EDI delivers services more efficiently than traditional methods.	167	49.3	143	42.2	19	5.6	6	1.8	2	.6	1.79

(table continues)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	n	%	n	%	n	%	
24. The new system will reduce staff members' stress.	56	16.5	168	49.6	91	26.8	21	6.2	3	.9	2.25
25. It is reasonable to assume that the Department's error rate can be reduced by I-EDI.	59	17.4	162	47.8	82	24.2	32	9.4	4	1.2	2.29
26. I-EDI will provide more equity in client treatment.	60	17.7	158	46.6	85	25.1	34	10.0	2	.6	2.29
27. I feel I-EDI will improve communication among GDPI&C branches and Institutes and Centers.	163	48.1	155	45.7	14	4.1	3	.9	4	1.2	1.61
28. Implementing I-EDI will help lower the cost of our activities.	106	31.3	169	49.9	50	14.7	10	2.9	4	1.2	1.93
30. The use of I-EDI will help reduce the time it takes to deliver services.	141	41.6	185	54.6	11	3.2	1	.3	1	.3	1.65
31. The new system will help me do my work quickly.	133	39.2	171	50.4	24	7.1	8	2.4	3	.9	1.75

(table continues)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	n	%	n	%	n	%	
38. The introduction of I-EDI will assist my agency in the clarification of its goals.	117	34.5	176	51.9	36	10.6	7	2.1	3	.9	1.83
39. I-EDI will provide a rationale for denial of services.	18	5.3	46	13.6	177	52.2	90	26.5	8	2.4	3.07
41. Implementing I-EDI will improve our internal control.	63	18.6	192	56.6	59	17.4	21	6.2	4	1.2	2.15
42. I-EDI will help administrators in the agency see our organization as a client-serving system.	63	18.6	218	64.3	47	13.9	10	2.9	1	.3	2.02

Note. SA = *strongly agree* (1) A = *agree* (2) NO = *no opinion/unsure* (3) D = *disagree* (4) SD = *strongly disagree* (5).

The wording as written in English, however, suggests a negative feature: the *denial* of services to deserving parties. If the ambiguity existed in the Arabic translation, agreement or disagreement would have been based on readers' perception of the premise as a positive or negative. If readers' interpretations were split in these directions, it could explain the mean falling in the middle of the Likert scale.

Another factor to consider as a possible explanation is that the survey response rate was highest among faculty (57%) versus administrators (20.6%) and staff (15%). Faculty may have had a different reaction to "denial of services" than the latter two groups, who would be more familiar with policies and clerical procedures and the need to screen transactions and deny some them. Thus, possibly because of the way the questionnaire item was phrased, item 39 neither supports nor refutes participants' perception of positive benefits from I-EDI.

Research Question 4

What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding computer and Internet technology?

To answer this question, Items 32 to 35, 43, and 45 were analyzed. The mean values of Questionnaire Items 32 and 34-35 were 3.72 or higher, which placed them closest to *disagree* on the Likert scale. Because these items suggested negative feelings and fear toward computers and Internet technology, the *disagree* response indicated an absence of fear. In addition, the mean value of Questionnaire Item 33 was 2.28, which represented agreement on the scale. *Agree* responses to Item 33 indicated that participants are already using computers in performing their jobs. Table 7-1 shows the statistical summary for Questions 32-35.

The responses to this group of items, considered together with those to Items 43 and 45, support the conclusion that fear of neither computer nor Internet technology is likely to play a significant role in the adoption of I-EDI in GDPI&C, Institutes, and Centers. The mean value of Question 43 was 2.81 and the mean for 45 was 2.27, which on the Likert scale represented *intermediate* Internet expertise and *advanced* computer expertise, respectively (Table 7-2 shows the statistical summary for items 43 and 45).

Table 7-1

Responses to Questionnaire: Research Question 4 (N = 339)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	n	%	n	%	n	%	
32. I feel computers are overrated and are not as helpful as they are made out to be.	12	3.5	43	12.7	55	16.2	146	43.1	83	24.5	3.72
33. In the performance of my job, I must make use of computer-generated information and reports.	68	20.1	171	50.4	43	12.7	52	15.3	5	1.5	2.28
34. I fear using the Internet.	10	2.9	34	10.0	35	10.3	163	48.1	97	28.6	3.89
35. I fear using the computer.	10	2.9	11	3.2	17	5.0	118	34.8	182	53.7	4.35

Note. SA = *strongly agree* (1) A = *agree* (2) NO = *no opinion/unsure* (3) D = *disagree* (4) SD = *strongly disagree* (5).

Table 7-2

Responses to Questionnaire: Research Question 4 (N = 339)

Questionnaire item	a		b		c		d		e		f		*M*
	n	%	n	%	n	%	n	%	n	%	n	%	
43. In the use of the Internet I consider myself to be a. expert. b. advanced. c. intermediate. d. a beginner. e. a novice. f. completely inexperienced.	18	5.3	133	39.2	113	33.3	52	15.3	15	4.4	8	2.4	2.81
45. In the use of the computer I consider myself to be a. expert. b. Advanced. c. intermediate. d. a beginner. e. a novice. f. completely inexperienced.	67	19.8	157	46.3	79	23.3	31	9.1	2	.6	3	.9	2.27

Note. a. *expert* (1) b. *advanced* (2) c. *intermediate* (3) d. *a beginner* (4) e. *a novice* (5) f. *completely inexperienced* (6).

These two groups of questions were designed to provide a profile of participants' actual knowledge and expertise with related technologies and to ensure consistency in participants' responses by asking them to consider the technology from two directions, one expressing positives and one expressing negatives.

Research Question 5

What benefits do staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers perceive regarding computer and Internet technology?

To answer this question, Items 36 and 37 of the questionnaire were analyzed. The mean values of these items fell closest to 2 on the Likert scale, which represented *agreement* with the premise of the questionnaire items. This response indicated beliefs that both computer and Internet technology are helpful among staff members, administrators, and faculty members in General Directorate For Private Institutes & Centers, Training Institutes, and Centers. Table 8 shows the statistical summary for these items.

Table 8

Responses to Questionnaire: Research Question 5 (N = 339)

Questionnaire item	SA		A		NO		D		SD		*M*
	n	%	n	%	n	%	n	%	n	%	
36. Computers are a very helpful tool.	215	63.4	95	28.0	8	2.4	13	3.8	8	2.4	1.54
37. I have adequate experience using computer.	143	42.2	138	40.7	29	8.6	27	8.0	2	.6	1.84

Note. SA = *strongly agree* (1) A = *agree* (2) NO = *no opinion/unsure* (3) D = *disagree* (4) SD = *strongly disagree* (5).

When the survey responses are considered as a whole, the research indicated an overall attitude of receptiveness to the idea of I-EDI in the GDPI&C, Institutes, and Centers. Although some items did not directly support such a conclusion, no item revealed a significant challenge to that conclusion.

CHAPTER 5

SUMMARY, RECOMMENDATIONS, AND CONCLUSION

The purpose of this study was to determine what attitudes and perceptions staff members, administrators, and faculty members in GDPI&C, Training Institutes, and Centers hold toward the prospect of adapting to Internet-based Electronic Data Interchange (I-EDI) in their organizations. In pursuit of the study purpose, the following five research questions were formulated:

1. What is the self-reported knowledge and understanding of staff members, administrators, and faculty members regarding the potential of I-EDI in the organization?

2. What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI?

3. What are the perceived benefits of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding implementation of I-EDI?

4. What are the perceived fears of staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers regarding computer and Internet technology?

5. What benefits do staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers perceive regarding computer and Internet technology?

Descriptive statistics were chosen as the most appropriate way to analyze the questionnaire data and profile the likely approaches of the members of the research subjects toward I-EDI adoption by the General Directorate for Private Institutes & Centers (GDPI&C), Institutes, and Centers across Saudi Arabia. For each of the five research questions, response means for all questionnaire items applicable to a specific question were calculated and then factored into the development of an overall result for each of the research questions.

Summary of Results

Research Question 1 asked staff members, administrators, and faculty members to self-report their knowledge and understanding regarding the potential adaptation of I-EDI in the organization. Participants reported themselves to be at the level of *intermediate* knowledge and understanding of I-EDI through Item 44. This, along with their agreement with the premise of Questionnaire Items 7, 8, 11, and 44, indicated an

understanding and knowledge of I-EDI and its benefits to organizations in general.

Research Question 2 asked whether staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers hold any fears about the implementation of I-EDI. Disagreement with the premises of Questionnaire Items 6, 14, 16, 17, and 21 indicated absence of fears toward implementing I-EDI. Questionnaire Items 12, 19, 20, 29, and 40 resulted in mean values of 3, which indicated a preference for *no opinion/unsure* regarding some of the implications of the implementation of I-EDI for the organizations' future. This result is understandable in light of the participants' lack of deep knowledge and experience with I-EDI. Though they could not commit decisively to specific positive expectations for the future, their lack of deep knowledge did not lead them to express any significant negative expectations. Participants indicated *agreement* with Item 13 (mean 1.68). Disagreement on the group of five items and agreement with Item 13 indicate an absence of fears regarding the implementation of I-EDI.

Research Question 3 asked staff members, administrators, and faculty members in GDPI&C, Institutes,

and Centers about the potential benefits of I-EDI implementation. Agreement with the premises of these questionnaire items suggested high expectation of positive benefits among staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers.

Research Question 4 asked staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers about their fears toward computer and Internet technology. Results indicated an absence of fear of computer and Internet technology among participants, who indicated that these technologies are already familiar to them as work tools.

Research Question 5 asked for staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers to express their opinions about the benefits of computer and Internet technology. Agreement with the premise of the questionnaire items related to this research question indicated beliefs that both computer and Internet technology are helpful tools for staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers.

Recommendations

The survey showed that staff members, administrators, and faculty members possess a positive attitude about their current use of computer/Internet technologies and possess positive perceptions about what the future will bring after the implementation of I-EDI, about which they are already relatively knowledgeable. The participants held no fears toward the implementation of I-EDI or the expanded use of computer and Internet technology. They believe that I-EDI should be implemented to take advantage of its benefits. Therefore, the study results suggest that the General Directorate for Private Institutes & Centers is ready to proceed immediately to a stage of intensive planning for the implementation of Internet-Based Electronic Data Interchange between GDPI&C, Training Institutes, and Centers across Saudi Arabia.

I-EDI implementation can positively impact all organizational functions and relationships among GDPI&C, Institutes, and Centers, provided that top administrators clearly and consistently communicate their support during the transition to I-EDI technology. The literature on I-EDI is consistent in identifying supportive administrative communication as the single most important

factor in ensuring successful I-EDI implementation. Therefore, the researcher recommends that one person be assigned to serve as I-EDI coordinator on either a temporary full-time or permanent full-time basis to lead I-EDI implementation efforts for the GDPI&C, Institutes, and Centers. This person should be familiar with all related technologies.

It is further recommended that GDPI&C, Institutes, and Centers offer orientation sessions and classes for all staff members, administrators, and faculty members so that they can learn about I-EDI.

Finally, before the implementation of I-EDI takes place, Institutes and Centers should pledge their commitment to help ensure the success of the new systems. They should then assist in planning system specifications, which will facilitate the operationalization and implementation of Internet EDI.

Recommendations for Further Study

It is recommended, based on the results of this study, that additional studies be conducted in the following areas:

1. A similar study should be conducted with other four-year academic institutes using the same problem statement and research questions, to determine what attitudes and perceptions these universities have regarding I-EDI.

2. A study should be conducted to measure attitudes toward I-EDI after the implementation of the I-EDI system.

3. The study should be replicated for Institutes and Centers supervised by the Presidency of Girls' Education as well as private schools supervised by the Ministry of Education in Saudi Arabia. Training Institutes and Centers for women are separate entities from the Institutes and Centers involved in the present study.

4. A similar study should be conducted with private Training Institutes and Centers in countries such as Egypt and other Gulf States such as Kuwait to validate the results of this study. These countries have government-run technical education and vocational training organizations similar to Saudi Arabia's. Therefore, a similar study should be conducted.

5. A research should be conducted to study the organization during different stages of the I-EDI adoption process. This way, the changes in the organization as well

as the administrators' perceptions can be studied during different stages of the adoption process.

6. A study should be conducted using alternative methods to measure attitudes and perceptions that are not reflected in the current study.

7. A study should be conducted to measure the diffusion of I-EDI among organizations: industries, businesses, and institutions in Saudi Arabia.

8. Another study should be conducted to examine the influence of I-EDI diffusion among organizations: industries, businesses, and institutions in Saudi Arabia.

Conclusion

The Saudi standard of living has been improving steadily over the past several decades. A revolution in information technology is taking place in the private sector. Although public-sector agencies have lagged behind and are troubled by inefficient office procedures and inadequate customer service, this study suggests that staff and administrators in the organizations surveyed are open to the revolution and welcome technological change and improvement in their own organizations. Therefore, the study indicates that the implementation of I-EDI in GDPI&C,

Training Institutes, and Centers across Saudi Arabia is a feasible project.

As chapter 2 demonstrated, I-EDI is a means of eliminating or reducing paper and data redundancy from all processes and also a means to enhance data availability and usability. It would not be an overstatement to say that most reporting requirements could be satisfied just by bringing technology that already exists into the organization; there is no apparent need to create new technology to match the situation of the organization. An existing technology can, hence, bring new life to the General Directorate for Private Institutes & Centers, Training Institutes, and Centers across the kingdom of Saudi Arabia as well as to businesses in that region.

The purpose of the study was to help pave the way for General Directorate for Private Institutes & Centers today to reap the same rewards from technology that private businesses have experienced in other developed countries. This in turn will help the Training Institutes and Centers better meet the standards set by the GOTEVT and serve the workforce they are training, to the benefit of the educational preparation and economic health of the nation at large.

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APPENDIX A

Duties of the General Directorate for Private Centers & Institutes

Duties of the General Directorate for

Private Centers & Institutes

1. Answer all questions regarding the Institutes.
2. Receive applications from potential private Institutes and Centers.
3. Study applications and make sure all required conditions are met before issuing preliminary licenses.
4. Study curricula and training programs and instructor qualifications; review all curricula and training programs, and make necessary decisions regarding approval.
5. Study development of curricula and training programs and prepare technical reports.
6. Prepare final examinations for all GOTEVT courses.
7. Coordinate final examinations for Institutes and National Centers.
8. Supervise examination papers for all training courses, and report their final results
9. Coordinate with department representatives outside Riyadh regarding Institutes and Centers in the different parts of the Kingdom.
10. Check files and prepare the required reports for the type of courses to be given licenses.
11. Check and register certificates of the present Institutes and Centers

12. Propose development plans to organize private education and training.

13. Prepare final licenses and submit them to H.E. the Governor.

14. Supervise the application of rules that organize private technical Institutes and Centers, and propose development of these rules according to the national development and labor market requirements.

APPENDIX B

(English and Arabic Surveys)

Dear Participant:

Enclosed is a questionnaire that invites you to provide information about technology in your workplace. By participating in the survey, you will play a part in paving the way for a public organization in Saudi Arabia, GDPI&C, to reap the same rewards from technology that private businesses have experienced in other developed countries. The information you provide will be used to complete a doctoral dissertation that will evaluate attitudes and perceptions toward the implementation of Internet-Based Electronic Data Interchange (I-EDI) in the GDPI&C. The results of this survey will be presented to the General Organization for Technical Education and Vocational Training (GOTEVT) in Saudi Arabia for its future use.

This questionnaire is also available to you online (http://ftp.uni.edu/alzumaia) as well. You may choose what is convenience to you just make sure choose either one of the two option.

Please complete the survey as honestly and completely as possible, and be sure to answer both parts. The first part requests some demographic information; the second part asks you to consider some statements regarding I-EDI, computers, and Internet technology. Detailed instructions for completing the survey by mail and online appear on the respective instruments. In making your responses as accurate as possible, you are participating in building a greater country.

Your responses are totally confidential and anonymous. For that reason, the name of your organization and any of its members are not requested. *Please submit your responses within two weeks to facilitate a timely compilation of the results. If you have any questions or comments regarding this survey, please feel free to email me (survey1421@yahoo.com) or call (054106303).*

Thank you for your cooperation and effort in this matter.

Sincerely,

Part I

Demographic Information

Responses are completely confidential.

1. Educational attainment (please check highest level attained):

   ☐ Secondary school or equivalent ☐ Master of arts

   ☐ Associate of arts degree ☐ Doctorate

   ☐ Bachelor's Degree ☐ Other

2. Academic major in College: _____

3. Position you hold at work:

   ☐ Administrator ☐ Staff member

   ☐ Faculty ☐ Other

   ☐ Owner

4. Type of agency in which you work (specify departmental assignment if it applies):

   ☐ GDPI&C (_____)

   ☐ Institute (_____)

   ☐ Center (_____)

   ☐ Other (_____)

Continue next page

Part II

Attitudes about Internet-Based Electronic Data Interchange (I-EDI)
Please circle the number that best fits your situation.

Questionnaire item	Strongly agree	Agree	No opinion/unsure	Disagree	Strongly disagree
5. I-EDI will be an important management tool.	1	2	3	4	5
6. I do not really care what happens to this new I-EDI system.	1	2	3	4	5
7. I am familiar with data exchange over the Internet.	1	2	3	4	5
8. I do not know how I-EDI will benefit my agency (center/institute/GDPI&C).	1	2	3	4	5
9. I feel that it is necessary for GDPI&C administrations to get their hands on implementing I-EDI.	1	2	3	4	5
10. I-EDI in the GDPI&C, Institutes, and Centers would make a positive contribution to our society.	1	2	3	4	5
11. I understand the potential value of I-EDI.	1	2	3	4	5
12. I feel that I-EDI will limit and structure our thinking about our services.	1	2	3	4	5
13. I-EDI will assist the GDPI&C in dealing with rapid changes that are occurring in the world.	1	2	3	4	5
14. I-EDI will emphasize technological requirements to the disadvantage of people.	1	2	3	4	5

Continue next page

Questionnaire item	Strongly agree	Agree	No opinion/unsure	Disagree	Strongly disagree
15. The impact of I-EDI will affect each and every employee in a positive way.	1	2	3	4	5
16. I do not see any great advantage to implementing a new system.	1	2	3	4	5
17. I am apprehensive about I-1EDI.	1	2	3	4	5
18. I am satisfied with the current system.	1	2	3	4	5
19. I feel that changing to the new system will cause new problems.	1	2	3	4	5
20. I-EDI is yet another example of undesirable control over the lives of people.	1	2	3	4	5
21. Computers are not difficult, but I-EDI is complex.	1	2	3	4	5
22. The inquiry feature of I-EDI will save a great deal of time.	1	2	3	4	5
23. I-EDI delivers services more efficiently than traditional methods.	1	2	3	4	5
24. The new system will reduce staff members' stress.	1	2	3	4	5
25. It is reasonable to assume that the Department's error rate can be reduced by I-EDI.	1	2	3	4	5
26. I-EDI will provide more equity in client treatment.	1	2	3	4	5
27. I feel I-EDI will improve communication among GDPI&C branches, Institutes and Centers.	1	2	3	4	5

Continue next page

Questionnaire item	Strongly agree	Agree	No opinion/unsure	Disagree	Strongly disagree
28. Implementing I-EDI will help lower the cost of our activities.	1	2	3	4	5
29. I-EDI is a secure method of exchanging data.	1	2	3	4	5
30. The use of I-EDI will help reduce the time it takes to deliver services.	1	2	3	4	5
31. The new system will help me do my work quickly.	1	2	3	4	5
32. I feel computers are overrated and are not as helpful as they are made out to be.	1	2	3	4	5
33. In the performance of my job, I must make use of computer-generated information and reports.	1	2	3	4	5
34. I fear using the Internet.	1	2	3	4	5
35. I fear using the computer.	1	2	3	4	5
36. Computers are a very helpful tool.	1	2	3	4	5
37. I have adequate experience using computers.	1	2	3	4	5
38. The introduction of I-EDI will assist my agency in the clarification of its goals.	1	2	3	4	5
39. I-EDI will provide a rationale for denial of services.	1	2	3	4	5
40. GDPI&C is presently efficient in its delivery of service.	1	2	3	4	5

Continue next page

Questionnaire item	Strongly agree	Agree	No opinion/unsure	Disagree	Strongly disagree
41. Implementing I-EDI will improve our internal control.	1	2	3	4	5
42. I-EDI will help administrators in the agency see our organization as a client- serving system.	1	2	3	4	5

Please circle the letter that best fits your situation.

Questionnaire item	Expert.	Advanced.	Intermediate	A beginner	A novice	Completely Inexperienced
43. In the use of the Internet I consider myself to be	1	2	3	4	5	6
44. In the knowledge and understanding of I-EDI, I consider myself to be	1	2	3	4	5	6
45. In the use of the computer I consider myself to be	1	2	3	4	5	6

Thank you for your participation in this study.

بسم الله الرحمن الرحيم

أخي الكريم / وفقه الله

السلام عليكم ورحمة الله وبركاته

أود إفادتكم أني أحد مبتعثي المؤسسة العامة للتعليم الفني والتدريب المهني لدراسة الدكتوراه في الولايات المتحدة الأمريكية ، والاستبانة المرفقة جزء من الإعداد لرسالة الدكتوراه عن "الاتجاهات والمفاهيم المتعلقة بتبادل البيانات الإلكترونية عبر شبكة الإنترنت في المؤسسات العامة بالمملكة العربية السعودية".

أرجو التفضل بتعبئة الاستبانة بعناية ودقة حيث ان تعاونكم جزء أساسي في إنجاح هذه الرسالة ، كما أن الإجابات ستحاط بالسرية التامة ولن تستخدم لغير أغراض البحث العلمي .

و يمكنكم تعبئة الأستبانة أيضا عن طريق الإنترنت على العنوان التالي:
http://fp.uni.edu/alzumaia

شاكرين لكم اهتمامكم وتقديركم

وتقبلوا أطيب تحياتي ،،،

الباحث/ عبدالرحمن بن صالح الزميع

ملاحظة:

ترسل الردود علي عنوان الإدارة العامة للمعاهد و المراكز الأهلية ص . ب . 27192 الرياض الرمز البريدي 11417 .

في حالة وجود تساؤل أرجو ا لاتصال على الباحث جوال: 054106303 أو البريد الإلكتروني survey1421@yahoo.com

الاتجاهات والمفاهيم المتعلقة بتبادل البيانات الإلكترونية عبر شبكة الإنترنت في المؤسسات العامة بالمملكة العربية السعودية

الجزء الأول
المعلومات العامة

ستحاط الإجابات بالسرية التامة :

١. التحصيل العلمي:

☐ المرحلة الثانوية أو ما يعادلها ☐ ماجستير

☐ دبلوم بعد الثانوي ☐ دكتوراه

☐ بكالوريوس ☐ غيره

٢. مجال الدراسة (التخصص) : .....

٣. المنصب الحالي في موقع العمل :

☐ مدير أو رئيس قسم ☐ موظف

☐ مدرس ☐ غيره

☐ مالك المعهد / المركز

٤. أسم الجهة التي تعمل بها (حدد القسم إن وجد)

☐ الإدارة العامة للمعاهد و المراكز الأهلية (القسم .....)

☐ معهد ..... (القسم .....)

☐ مركز .....(القسم .....)

☐ غيره .....(القسم .....)

الجزء الثاني

الاتجاهات والمفاهيم المتعلقة بتبادل البيانات الإلكترونية عبر شبكة الإنترنت

أرجو وضع دائرة على الإجابة المناسبة كما تراها .	موافق بشدة	موافق	لا تعليق/ غير متأكد	غير موافق	غير موافق بشدة
٥. يشكل تبادل البيانات الإلكترونية عبر شبكة الإنترنت أداة مهمة في العمل الإداري .	١	٢	٣	٤	٥
٦. لا يهمني معرفة ما يستجد في مجال تبادل البيانات الإلكترونية عبر شبكة الإنترنت .	١	٢	٣	٤	٥
٧. إن تبادل البيانات عبر شبكة الإنترنت أمر مألوف لديّ .	١	٢	٣	٤	٥
٨. لا أعرف مدى استفادة الجهة التي أعمل بها من تبادل البيانات الإلكترونية عبر شبكة الإنترنت .	١	٢	٣	٤	٥
٩. أشعر أنه من الضروري للإدارة العامة للتعليم والتدريب الفني الأهلي تطبيق تبادل البيانات الإلكترونية عبر شبكة الإنترنت .	١	٢	٣	٤	٥
١٠. سيكون لتبادل البيانات الإلكترونية عبر شبكة الإنترنت مردوداً إيجابياً على مجتمعنا إذا طبق في الإدارة العامة للمعاهد و المراكز الأهلية والمعاهد والمراكز الأهلية .	١	٢	٣	٤	٥
١١. أدرك القيمة الحقيقية لتبادل البيانات الإلكترونية عبر شبكة الإنترنت.	١	٢	٣	٤	٥
١٢. أعتقد أن تبادل البيانات الإلكترونية عبر شبكة الإنترنت سيحصر تفكيرنا حول الخدمات التي نقدمها.	١	٢	٣	٤	٥
١٣. سوف يساعد تبادل البيانات الإلكترونية عبر شبكة الإنترنت الإدارة العامة للمعاهد و المراكز الأهلية على التعامل مع المتغيرات السريعة التي تحدث في العالم .	١	٢	٣	٤	٥

أرجو وضع دائرة على الإجابة المناسبة كما تراها .	موافق بشدة	موافق	لا تعليق/ غير متأكد	غير موافق	غير موافق بشدة
١٤. تبادل البيانات الإلكترونية عبر شبكة الإنترنت سيضع منظمات تقنية على الناس هي في غير صالحهم.	١	٢	٣	٤	٥
١٥. سيكون لتبادل البيانات الإلكترونية عبر شبكة الإنترنت تأثير إيجابي على كل موظف .	١	٢	٣	٤	٥
١٦. لا أعرف ميزة تذكر عند تطبيق تبادل البيانات الإلكترونية عبر شبكة الإنترنت.	١	٢	٣	٤	٥
١٧. إنني خائف وقلق من تبادل البيانات الإلكترونية عبر شبكة الإنترنت.	١	٢	٣	٤	٥
١٨. إنني مقتنع وراضي عن النظام الحالي.	١	٢	٣	٤	٥
١٩. أشعر أن التحول إلى النظام الجديد سوف يتسبب في بروز مشاكل جديدة .	١	٢	٣	٤	٥
٢٠. يمثل تبادل البيانات الإلكترونية عبر شبكة الإنترنت نموذجاً لأسلوب التحكم غير المرغوب في حياة الناس.	١	٢	٣	٤	٥
٢١. الحواسيب الآلية ليس صعبة الفهم إلا أن نظام تبادل البيانات الإلكترونية عبر شبكة الإنترنت معقد.	١	٢	٣	٤	٥
٢٢. إن ميزة الاستعلام التي يتحلى بها نظام تبادل البيانات الإلكترونية عبر شبكة الإنترنت سوف توفر قدراً كبيراً من الوقت.	١	٢	٣	٤	٥
٢٣. يقدم نظام تبادل البيانات الإلكترونية عبر شبكة الإنترنت خدمات بشكل أكثر فعالية مقارنة بالأساليب التقليدية.	١	٢	٣	٤	٥
٢٤. يساعد تبادل البيانات الإلكترونية عبر شبكة الإنترنت على تقليل حالة التوتر التي تصيب العاملين في أي مجال.	١	٢	٣	٤	٥

أرجو وضع دائرة على الإجابة المناسبة كما تراها .	موافق بشدة	موافق	لا تعليق/ غير متأكد	غير موافق	غير موافق بشدة
٢٥. من المنطقي القول بأن أخطاء الإدارة ستتناقص عند تطبيق تبادل البيانات الإلكترونية عبر شبكة الإنترنت.	١	٢	٣	٤	٥
٢٦. يوفر تبادل البيانات الإلكترونية عبر شبكة الإنترنت أنصافاً وعدالة عند التعامل مع العملاء .	١	٢	٣	٤	٥
٢٧. أشعر أن تبادل البيانات الإلكترونية عبر شبكة الإنترنت سيحسن من عملية الاتصال بين فروع الإدارة العامة للمعاهد و المراكز الأهلية والمعاهد والمراكز الأهلية .	١	٢	٣	٤	٥
٢٨. سيساعد تبادل البيانات الإلكترونية عبر شبكة الإنترنت على خفض التكاليف المالية للعمل .	١	٢	٣	٤	٥
٢٩. يمثل تبادل البيانات الإلكترونية عبر شبكة الإنترنت طريقة مأمونة .	١	٢	٣	٤	٥
٣٠. استخدام تبادل البيانات الإلكترونية عبر شبكة الإنترنت يساعد في تقليل الوقت المستغرق لتقديم الخدمات .	١	٢	٣	٤	٥
٣١. يساعد تبادل البيانات الإلكترونية عبر شبكة الإنترنت في أداء العمل بسرعة .	١	٢	٣	٤	٥
٣٢. أشعر أن هنالك مبالغة في التعويل على الحاسبات الآلية وأنها لا تحقق تلك الفائدة المرجوة .	١	٢	٣	٤	٥
٣٣. يجب عليّ لتأدية عملي استخدام المعلومات والتقارير التي يوفرها الحاسب الآلي .	١	٢	٣	٤	٥
٣٤. إنني أخوف من استخدام شبكة الإنترنت .	١	٢	٣	٤	٥
٣٥. إنني أخوف من استخدام الحاسب الآلي .	١	٢	٣	٤	٥

أرجو وضع دائرة على الإجابة المناسبة كما تراها .	موافق بشدة	موافق	لا تعليق/ غير متأكد	غير موافق	غير موافق بشدة
٣٦. يمثل الحاسب الآلي أحد الأدوات المفيدة .	١	٢	٣	٤	٥
٣٧. لدي خبرة كافية لاستخدام الحاسب الآلي .	١	٢	٣	٤	٥
٣٨. سوف يساعد إدخال نظام تبادل البيانات الإلكترونية عبر شبكة الإنترنت مؤسستي على شرح وتوضيح أهدافها .	١	٢	٣	٤	٥
٣٩. يوفر تبادل البيانات الإلكترونية عبر شبكة الإنترنت قاعدة منطقية لرفض الخدمات .	١	٢	٣	٤	٥
٤٠. تعتبر الإدارة العامة للمعاهد و المراكز الأهلية حالياً مؤهلة لتقديم الخدمات .	١	٢	٣	٤	٥
٤١. إن تطبيق تبادل البيانات الإلكترونية عبر شبكة الإنترنت سوف يحسن من أسلوب أو طريقة المراقبة الداخلية .	١	٢	٣	٤	٥
٤٢. سيساعد تبادل البيانات الإلكترونية عبر شبكة الإنترنت على النظر إلى الإدارة العامة للمعاهد و المراكز الأهلية كجهاز لتقديم الخدمات .	١	٢	٣	٤	٥

٤٣. حينما استخدم شبكة الإنترنت اعتبر نفسي:

(١) خبيراً	(٢) متقدم المستوى	(٣) متوسط المستوى
(٤) مبتدئاً	(٥) دون المبتدئ	(٦) عديم الخبرة تماماً

٤٤. حيـــنما أكـــون على دراية ومعرفة بنظام تبادل البيانات الإلكترونية عبر شبكة الإنترنت أعتبر نفسي:

(١) خبيراً	(٢) متقدم المستوى	(٣) متوسط المستوى
(٤) مبتدئاً	(٥) دون المبتدئ	(٦) عديم الخبرة تماماً

٤٥. عندما استخدم الحاسب الآلي أعتبر نفسي:

(١) خبيراً	(٢) متقدم المستوى	(٣) متوسط المستوى
(٤) مبتدئاً	(٥) دون المبتدئ	(٦) عديم الخبرة تماماً

مع جزيل الشكر لمساهمتك في هذه الدراسة

APPENDIX C

Altmeyer's Instrument

THE IMPACT OF COMPUTERIZED MANAGEMENT INFORMATION SYSTEMS

PART A: ORGANIZATIONAL CONTEXT

For the following set of statements, write the number which best describes your overall judgment about the statement. Please remember your input is vital regardless of where your county is in the implementation process.

1 = strongly disagree
2 = moderately disagree
3 = mildly disagree
4 = not sure, no opinion
5 = mildly agree
6 = moderately agree
7 = strongly agree

__ 1. I perceive the Computerized Management Information system (MIS) will affect the way I do my job.

__ 2. I feel that my job will have more clerical components to it due to the computerized MIS.

__ 3. I am apprehensive about the new computerized MIS.

__ 4. The primary goal of my agency is accountability for public expenditures.

__ 5. My work is influenced by fellow employees and internal social groups.

__ 6. My workload will be increased under the two systems we must use for awhile and I am afraid I cannot keep up while the new WMS is installed.

__ 7. I have used a computer terminal before.

__ 8. I do not see any great advantage to the new system yet.

__ 9. My prior experience with DSS computerized MIS has been positive.

__ 10. I feel computers are overrated and are not of as much help as they are made out to be.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 11. Introduction of a computerized management information system sometime assists an agency in clarification of goals. Do you feel that this will happen in you agency?

__ 12. Computerized MIS will force DSS to make policy decisions on a more rational and systematic basis.

__ 13. Agency personnel will be better able to understand the flow of clients through the various units of the agency.

__ 14. The computerized MIS will help administrators in the agency see DSS as a client-serving system.

__ 15. The positive contribution of computerized MIS in our society has been enormous.

__ 16. A computerized MIS assists in more efficient delivery of human services.

__ 17 Computerized MIS will be an important management tool.

__ 18. Often computerized MIS have the potential to threaten the autonomy of workers in DSS.

__ 19. Computerized MIS will assist my organization in coping with the rapid changes that are occurring in DSS.

__ 20. DSS computer printouts are easy to read.

__ 21. Computerized MIS will place emphasis on technological requirements to the disadvantage of clients.

__ 22. Our DSS is very well organized.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 23. Computerized MIS may dehumanize Departments of Social Services.

__ 24. Our DSS is efficient in its delivery of services at present.

__ 25. Computerized MIS, on the other hand, may provide more equity in client treatment.

__ 26. Computerized MIS will help larger counties more than they will help smaller counties.

__ 27. Computerized MIS either will or have caused reorganizations in my work unit.

__ 28. Power shifts tend to occur when computerized MIS are introduced; generally power is shifted upward.

__ 29. Computerized MIS will provide a rationale based on the law for denial of service if a client is ineligible.

__ 30. Most social workers feel that with a computerized management information system the technocrats not the humanists are winning.

__ 31. Human service agencies should have efficiency as their top goal.

__ 32. Computers are not difficult, but DSS programs are complex.

__ 33. New York State DSS will benefit the most from the computerized MIS.

__ 34. Computerized MIS will improve our internal control.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 35. Examiners may be permitted a greater role in client counseling as the computer will do the budget logic.

__ 36. It is reasonable to assume that the Department's client eligibility error rate can be reduced by the computerized MIS.

__ 37. The inquiry feature of the computerized MIS will save a great deal of time.

__ 38. Training designed to build confidence in our ability to use the computerized MIS would be helpful particularly if it revamped the expectations of my supervisors.

__ 39. The computerized MIS may assist my department in becoming more integrated that is, various units may have to work more closely with on another.

__ 40. Caseworkers in our agency regard the computerized MIS as technically oriented and not client centered.

__ 41. The state DSS will be able to increase control over county DSS through the computerized MIS by technical training on forms.

__ 42. The introduction of A computerized MIS can be a powerful catalyst in achieving better inter-organizational cooperation.

__ 43. I do not really can what happens to this new computerized MIS system as I do not feel a new system will make a difference in working conditions.

__ 44. A computerized MIS will not help my agency become more efficient in the delivery of human service.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 45. I feel the computerized MIS will overly limit structure and constrain decision making about social services.

__ 46. I spend more than half my time on paperwork rather than on client-centered work.

__ 47. The computerized MIS is yet another undesirable control over lives of clients.

__ 48. Client needs and services are being chopped to fit computerized MIS systems.

__ 49. I feel it is necessary for social workers to get their hands on computerized MIS. Computer staff controls the computerized MIS, and social workers should have more control and voice in the system.

__ 50. My department's top management has seen this computerized MIS coming and has taken steps to plan for successful implementation.

__ 51. My department's top management has attempted to take steps to ease the transition by using local computerized processing services.

__ 52. Our local computerized MIS experience has been satisfactory.

__ 53. A tighter economy places greater stress on a Department of Social Services. A computerized MIS may help us to become more efficient.

__ 54. The WMS coordinator serves effectively as a liaison between program and computer people.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 55. Compared to people in similar positions, I am satisfied with my present position.

__ 56. I feel that I am making progress toward the personal career goals which I set for myself in my present position.

__ 57. I frequently participate in the decisions on the adoption of new programs.

__ 58. A person who wants to make his own decisions would be quickly discouraged around here.

__ 59. There can be little action taken around here until a supervisor approves a decision.

__ 60. I frequently participate in the decisions on the implementation of new policies.

__ 61. It seems that new programs or services are continually being added to our work group.

__ 62. In my work unit, open confrontation or differences of opinion are encouraged.

__ 63. I am able to obtain reference material, such as journals and reports, which I may need for assisting my work performance.

__ 64. The purposes and goals of my organization are frequently at odds with those of other state agencies.

__ 65. To be effective in my position one must have quite a bit of political savvy.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 66. I identify more with the organization I work for than with any profession or scientific field.

__ 67. This is an exciting place to work.

__ 68. I rarely find that I am involved in "office politics."

__ 69. The primary goal of my agency is delivery of client services.

__ 70. I frequently examine data or statistics as part of my job.

__ 71. If I needed additional academic training for knowledge my department would support me.

__ 72. The purposes and goals of my organization are frequently at odds with those of certain federal agencies.

__ 73. It seems that I often am provided too little information to do my job.

__ 74. Based upon comparison with other individuals in similar positions in government, I am adequately compensated for the work I perform.

__ 75. I feel that someone in my position must be very aware of political developments outside the organization.

__ 76. In the performance of my job, I must make use of computer-generated information and reports.

__ 77. My work unit is unlikely to be abolished in the next five years.

PLEASE TURN OVER >

1 = strongly disagree	**5 = mildly agree**
2 = moderately disagree	**6 = moderately agree**
3 = mildly disagree	**7 = strongly agree**
4 = not sure, no opinion	

__ 78. The purposes and goals of my organization are frequently at odds with those of organized interest groups.

__ 79. My agency is likely to undergo a major reorganization soon.

__ 80. There is such rapid turnover in entry level positions that this organization sometimes seems to be a "revolving door."

__ 81. My work is influenced by public opinion, business associations, chambers of commerce, community groups or other social groups from outside the organization.

__ 82. Overall, I feel that the legislature understands the purposes and goals of my organization.

__ 83. The goals of my unit are clearly set forth.

__ 84. I feel that during the next 5 years the basic duties of my unit will remain the same.

PART B: BIOGRAPHICAL INFORMATION-Reponses are confidential.

__ 85. Sex: ____ male = 1, female = 2

__ 86. Date of birth: _____

__ 87. Highest degree which you have received:

(1) ___ Associate (2) ___ Bachelors (3) ___ Masters
(4) ___ Ph.D (5) Other (please specify): _____

__ 88. Major field of highest degree: _____

PLEASE TURN OVER >

__ 89. Year highest degree was conferred: _____

__ 90. Present job title and classification unit: _____

_____

__ 91. Salary: _____

APPENDIX D

Permission Letters

General Directorate For Private
Institutes & Centers
Administrative affairs

Date: 15/8/1421

Memorandum

To: GDPI&C's members/Training Institutes/Centers
Riyadh Area

Dear/

Attached to this memorandum is a questionnaire prepared by Mr. Abdulrahman Al-zumaia for his dissertation is "Attitudes and Perceptions Regarding Internet Based Electronic Data Interchange in a Public Organization in Saudi Arabia." He would like the staff members, administrators, and faculty members in GDPI&C, Institutes, and Centers to complete it.

We would appreciate it if you would then return the surveys to the General Directorate for Private Institutes & Centers, address P.O Box 27192, Riyadh 11417, by December 1, 2000.

Sincerely,

General Director
General Directorate For Private
Institutes & Centers

General Directorate For Private
Institutes & Centers
Administrative affairs

Date: 15/8/1421

Memorandum

To: Coordinators/Training Institutes/Centers
Outside Riyadh Area

Dear/

Attached to this memorandum is a questionnaire prepared by Mr. Abdulrahman Al-zumaia for his dissertation, "Attitudes and Perceptions Regarding Internet Based Electronic Data Interchange in a Public Organization Saudi Arabia." He would like Coordinators, owners, staff members, administrators, and faculty members of Institutes and Centers to complete it.

We hope that you will send the surveys to all Training Institutes and Centers under your supervision. We would appreciate it if you would then return the surveys to the General Directorate for Private Institutes & Centers, address P.O Box 27192, Riyadh 11417, by December 1, 2000.

Sincerely,

General Director
General Directorate For Private
Institutes & Centers

بسم الله الرحمن الرحيم

المملكة العربية السعودية
المؤسسة العامة للتعليم الفني والتدريب المهني
الإدارة العامة للمعاهد والمراكز الأهلية
الشئون الإدارية

الرقـــم :
التـــاريخ :
المشفوعات :

تعميم لموظفي الإدارة والمعاهد والمراكز الأهلية بمنطقة الرياض

المكرم / المحترم

السلام عليكم ورحمة الله وبركاته

ارفق لكم بطيه الاستبانة المقدمة من الباحث / عبدالرحمن بن صالح الزميع والتـــي موضوعها (الاتجاهات والمفاهيم المتعلقة بتبادل البيانات الإلكترونية عبر شبكة الإنـترنت في المؤسسات العامة بالمملكة العربية السعودية) والذي يرغب بتعبئتـــها مـــن جميـــع موظفي الإدارة وأصحاب ومدراء المعاهد والمراكز الأهلية والعاملين فيها .

نأمل الإطلاع على هذه الاستبانة وتعبئتها من الجميع بكل دقة ، ومن ثم بعثها لـــلإدارة العامة للمعاهد والمراكز الأهلية صندوق بريد رقم (٢٧١٩٢) الرمز البريدي (١١٤١٧) وذلك في موعد أقصاه ١٤٢١/٩/٦هـــ .

مقدرين لكم اهتمامكم وتعاونكم .

وتقبلوا تحياتي ...

مدير عام

الإدارة العامة للمعاهد والمراكز الأهلية

إبراهيم بن عبدالله الشثري

ص . ب ٧٨٢٣ - الرياض ١١٤٧٢ شارع عمر بن الخطاب - تلفون : ٤٠٨٢٧٣١ - ٤٠٥٢٧٧٠ - فاكس : ٤٠٦٥٨٧٦ - تلكس : ٤٠٣٢٥٧

بسم الله الرحمن الرحيم

المملكة العربية السعودية
المؤسسة العامة للتعليم الفني والتدريب المهني
الإدارة العامة للمعاهد والمراكز الأهلية
الشئون الإدارية

الرقـــم :
التـــاريخ :
المشفوعات :

تعميم لمنسقي الإدارة
والمعاهد والمراكز الأهلية خارج منطقة الرياض

المكرم منسق الإدارة العامة للمعاهد والمراكز الأهلية المحترم

السلام عليكم ورحمة الله وبركاته

ارفق لكم بطيه الاستبانة المقدمة من الباحث / عبدالرحمن بن صالح الزميع والتـــي موضوعها (الاتجاهات والمفاهيم المتعلقة بتبادل البيانات الإلكترونية عبر شبكة الإنـترنت في المؤسسات العامة بالمملكة العربية السعودية) والذي يرغب بتعبئتـــها مـــن جميـــع موظفي فروع الإدارة وأصحاب ومدراء المعاهد والمراكز الأهلية والعاملين فيها .

نأمل الإطلاع على هذه الاستبانة وتعميمها على جميع المعاهد والمراكز الأهلية التـــي تحت إشرافكم لتعبئتها من الجميع بكل دقة ، ومن ثـــم بعثـــها لـــلإدارة العامـــة للمعـــاهد والمراكز الأهلية صندوق بريد رقم (٢٧١٩٢) الرمز الـــبريدي (١١٤١٧) وذلـــك فـــي موعد أقصاه ١٤٢١/٩/٦هـــ .

مقدرين لكم اهتمامكم وتعاونكم .

وتقبلوا تحياتي ،،،

مدير عام

الإدارة العامة للمعاهد والمراكز الأهلية

إبراهيم بن عبد الله الشثري

ص . ب ٧٨٢٣ - الرياض ١١٤٧٢ - شارع عمر بن الخطاب - تلفون : ٤٠٨٢٧٢١ - ٤٠٥٢٧٧٠ - فاكس : ٤٠٦٥٨٧٦ - تلكس : ٤٠٣٢٥٧

APPENDIX E

Letter of Approval

Kingdom of Saudi Arabia
General Organization for Technical
Education Vocational Training
General Directorate Of
Research & Development

Number: 26091/29/1
Date: 14 January 2001

Dear director of Saudi Arabian mission, United States:

We are happy to inform you that Mr. Abdulrahman Al-zumaia has obtained the data he needs, and he visited the sites necessary for his dissertation. Mr. Al-zumaia stayed from October 7, 2000 to January 7, 2001.

Sincerely,

Voice Governor
Research & Development

Dr. Ali Nasser Al-Ghafis

إدارة التدريب والإبتعاث

١/٢٩/٢٦٠٩
١٤٢١/١٠/٢٠هـ

رسالة هاتفية

الموضوع/ بتأن المبتعث/ عبد الرحمن بن صالح الزميع

المحترم سعادة الملحق الثقافي بأمريكا

السلام عليكم ورحمة الله وبركاته .

نفيد سعادتكم بأن المبتعث/عبد الرحمن بن صالح الزميع (٣٦٤٥٣-٨٤) قد أنهى رحلته العلمية إلى المملكة ، و قام بجمع البيانات المطلوبة و اللازمة لإتمام بحثه لمرحلة الدكتوراه، و ذلك في الفترة من ٢٠٠٠/١٠/٠٧م . و حتى ٢٠٠١/١/٠٧م

آمل الاطلاع و إكمال اللازم

وتقبلوا تحياتي ...

نائب المحافظ للبحوث والتطوير

علي بن ناصر الغفيص

صورة للإدارة العامة للشؤون الإدارية و المالية
صورة للإدارة العامة للتطوير (البعثات) مع الأسف
صورة للاتصالات