

2000

## Examining the impact of Internet electronic commerce on commercial organizations in Saudi Arabia

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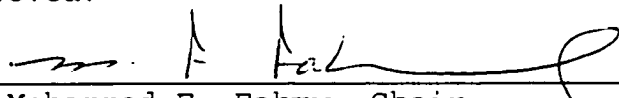
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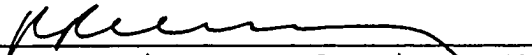
EXAMINING THE IMPACT OF INTERNET ELECTRONIC COMMERCE  
ON COMMERCIAL ORGANIZATIONS  
IN SAUDI ARABIA


A Dissertation  
Submitted  
In Partial Fulfillment  
of the Requirements for the Degree  
Doctoral of Industrial Technology

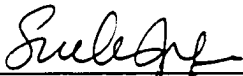
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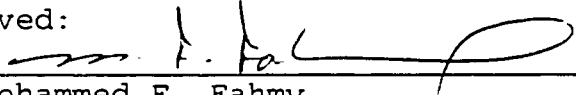
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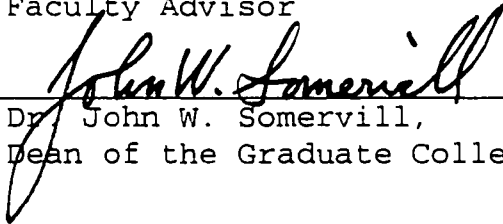
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EXAMINING THE IMPACT OF INTERNET ELECTRONIC COMMERCE  
ON COMMERCIAL ORGANIZATIONS  
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An Abstract of a Dissertation  
Submitted  
In Partial Fulfillment  
of the Requirements for the Degree  
Doctoral of Industrial Technology

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## ABSTRACT

Saudi Arabia is undergoing tremendous change in both infrastructure and economics, which is helping the Internet to flourish in the region. Although growth of electronic commerce (EC) is slow, it is becoming increasingly global. Businesses worldwide are engaging in this commercial evolution.

The purpose of this study was to provide consumers and commercial organizations in Saudi Arabia with practical information regarding electronic commerce. It attempted to explore the perspectives of Internet users, information technology (IT) professionals, business owners, and managers of online businesses in Saudi Arabia.

Two survey instruments were used to gather data for this study. The first survey instrument consisted of 37 questions and was sent to 80 randomly selected Internet users in Saudi Arabia. A total of 45 (56.25%) questionnaires were returned. The second survey consisted of 21 questions and was sent to 80 randomly selected IT professionals, managers, and business owners. A total of 49 (61.22%) questionnaires were returned.

The questionnaire was posted on the Web, <http://www.geocities.com/ksaecommerce/Surveys/default.htm>, and e-



mails were sent to the study group after the review of the pilot study. Consistent with the statistical analyses discussed in chapter III, analysis of the data was undertaken using the Statistical Package for Social Sciences (SPSS) computer program.

The results of the study indicated that, the awareness, perceptions, and attitudes of the consumers, IT professionals, managers, and business owners' toward shopping on-line depended on such factors as level of security and fraud. There appears to be a positive relationship between the level of security and attitude toward using the Internet for shopping. In addition, the research revealed some barriers related to electronic commerce from the consumer's point of view: Although online transactions are convenient, timely delivery in Saudi Arabia is costly and inefficient. Improvements in Internet and EC technologies will continue to increase productivity, providing that commercial organizations in Saudi Arabia are willing to adapt new business models to capture advances in technology.

The major recommendations of this study are as follows:

- (a) The private sector and universities should take a roles in educating people to benefit from the Internet;
- (b)

financial sector must coordinate with information technology companies to increase customers confidence in electronic commerce; (c) an updated telecommunication infrastructure is needed in Saudi Arabia; and (d) the Saudi government, represented by the Ministry of Commerce and other competent bodies, should be committed to introducing and widely using electronic commerce. At the same time, the government should take necessary procedures to prevent the misuse of electronic commerce.

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My thanks goes first and foremost to almighty God for his help and guidance. I would also like to acknowledge my beloved parents who nurtured me through childhood and instilled in me the desire to seek knowledge.

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had initially realized. They have high standing among that rare breed of professors who always place their students as their first priority.

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## CHAPTER I

## INTRODUCTION

Electronic commerce (EC) has been one of the most exciting applications of information technology (IT) in this decade. From its early range of online buying and selling of goods, EC has come a long way in just a few years. Because EC is so rapidly changing, it is not easy to give an accurate definition of the term electronic commerce. A report of the European Union (1997) defines EC as technology for change. According to this report, a specific area of EC is electronic trading, in which a supplier provides goods or services to a customer in return for payment. Amor (1999) defines electronic commerce as any form of economic activity conducted via electronic connections. Clark and Westland (1999) argue that electronic business (EB) comes before EC and can be defined as the conduct of business with the assistance of telecommunications and telecommunications-based tools.

Kalakota and Whinston (1999) identified a number of definitions for EC, often depending on the perspective. From a communications perspective, EC

is the delivery of information, products, services, or payment via telephone lines, computer networks, or any other electronic means. From a business process perspective, EC is the application of technology toward the automation of business transaction and workflow. From a services perspective, EC is a tool that addresses the desire of firms, consumers, and management to cut service costs while improving the quality of goods and increasing the speed of services delivery. From an online perspective, EC provides the capability of buying and selling products and information on the Internet.

Bill Gates (1994), chairman and chief executive officer of Microsoft Corporation, stated that:

We are crossing a technology threshold that will forever change the way we learn, work, socialize, and shop. It will affect all of us and businesses of every type in ways far more pervasive than most people recognize.

The Saudi Arabian government is exerting efforts to introduce and facilitate EC in its society. The government is also attempting efforts to create favorable environments for competition and to develop domestic electronic commerce markets based

on the principle of encouraging the private sector to lead the initiative and intervening only when necessary.

Commercial organizations in Saudi Arabia that proactively pursue EC approaches have the potential for, among other things, expanding markets, increasing sales, raising customer satisfaction, strengthening distributor and supplier relationships, and improving public image. The list is limited only by the innovation of the enterprise. Kamel (1999) pointed out that although domestic electronic commerce markets are in initial stages, companies large and small throughout Saudi Arabia are starting up virtual businesses, developing new markets, and carving out opportunities within existing markets. Information technology is no longer a luxury, but a basis for the socioeconomic development of a country that should be advanced; otherwise possible opportunities will be lost.

Saudi Arabia is undergoing tremendous change in both infrastructure and economics, which is helping the Internet to flourish in the region. Although the growth of electronic commerce is slow, it is

becoming increasingly global. Businesses worldwide are engaging in this commercial evolution. Also, as technology for infrastructure and reliable electronic commerce transactions continues to improve, more businesses will join this trend of electronic commerce. Brown (2000) pointed out that it is obvious that Saudi Arabia's presence in the electronic marketplace will become stronger as the telecommunications infrastructure continues to improve. Saudi Arabia's future in this new market paradigm is definitely promising. Al-Yousuf (1999) pointed out that the future looks very bright for EC in Saudi Arabia, but government and organizations need to move in quickly. According to Brown (2000), general manager of Commerce One Middle East, Saudi Arabia is a major global trading zone, and a number of thriving import and export markets exist there.

#### Statement of Problem

Benjamin and Yates (1991) pointed out that as IT has improved in cost performance, it has continually brought change to business processes, and further, that "to be successful, IT must be coordinated with its organizational context" (p.12).

This study attempts to explore the perspectives of owners, managers, and customers of online business in Saudi Arabia. The goal is that the findings will help reduce information gaps in future organizational endeavors, uncover previously undiscovered attributes of IT, and construct a framework to support future research and provide consumers and commercial organizations in Saudi Arabia with practical information regarding electronic commerce. Furthermore, by understanding Internet electronic commerce may help to strengthen the link to the retail aspect of electronic commerce as well as consumer perspective.

#### Statement of Purpose

The Arab International Telecommunications Conference in 1999 in Beirut concluded that, although electronic commerce in Saudi Arabia and the Arab world is facing many challenges, it has enormous potential for Saudi trade and industry if both government and private sectors pull together to support electronic commerce.

Electronic commerce has its own unique set of business issues and challenges in Saudi Arabia, including security, electronic payments, communication infrastructure, government regulation, consumers' awareness, barriers, and social impact. Each of these areas needs to be investigated and researched.

The purpose of this study is to provide consumers and commercial organizations in Saudi Arabia with practical information regarding electronic commerce. It attempts to explore the perspectives of Internet users, information technology professionals, business owners, and managers of online businesses in Saudi Arabia.

#### Statement of Need

The number of Internet subscribers in Saudi Arabia has grown by more than 160% since the service was launched in 1999. According to Commerce Minister Bin Jaafar (1999), the Kingdom now stands among the top five Arab countries in terms of Internet growth. Consumers in Saudi Arabia have spent an estimated \$25 million on online purchases



from businesses outside of the country in the past 3-years, according to DITnet (2000).

The Internet in Saudi Arabia has not yet fully evolved into an environment where all sorts of businesses can directly profit from selling products and services over the network. This does not mean that Saudi businesses will not make money on the Internet, but that electronic commerce will not fully develop until businesses fully understand how it is going to impact their organization, along with how their current strategies and business models will complement customer needs.

It will take some time before the market in this region fully develops, but once it does, the companies that see the potential now and take advantage of it will have advantages being first that will allow them to extend their customer base beyond current geographical boundaries. Therefore, the goal of this research is to help develop an EC strategy for the government and businesses that focuses on how to encourage widespread Internet use in the region, while taking into account

psychological and other factors affecting regional consumers.

### Research Questions

The following questions were formulated as the basis of this research:

1. What do consumers in Saudi Arabia use the Internet for?

2. What is the influence of income level on frequency of Internet shopping?

3. Why do/do not consumers in Saudi Arabia purchase products/services over the Internet?

4. What are consumers' levels of familiarity with the Internet and EC in Saudi Arabia?

5. What are consumers' opinions of Internet-based shopping?

6. To what extent are IT professionals, managements, and business owners informed of EC benefits?

7. What are the factors affecting the willingness of IT professionals, managers, and owners to adopt EC?

8. What are the primary business objectives of EC strategies in Saudi Arabia's commercial organizations?

9. How are Saudi Arabia's commercial organizations ready for EC?

10. What measures do commercial organizations use to evaluate the success of EC?

#### Assumptions

The study was conducted in view of the following assumptions:

1. The questionnaires were answered truthfully and objectively.

2. The questionnaire was appropriately designed to elicit the information needed for research data analysis.

3. The instrument and statistical procedures were adequate to measure the significance of perceived factors or variables.

4. The person who answered the questionnaire was the most appropriate staff member within the organization.

### Limitations

The study was conducted in view of the following limitations:

1. The questionnaire depended upon self-reported data as well as subjective opinion.
2. The study was limited to commercial organizations in Saudi Arabia.
3. Because of Saudi Arabian culture, most of those who responded to the survey were male.
4. Due to the management system in Saudi Arabia, most companies keep their data confidential, so the validity and reliability of information could not be confirmed.
5. The use of the Internet is still evolving in the region. Therefore, there is a lack of experienced users.
6. Any conclusions drawn must recognize that the focus of this study was Saudi Arabian behaviors; therefore the conclusions may not be able widely generalizable.
7. This research is based on an e-mail survey, and therefore a selection bias might have affected the findings. Only online respondents participated

in the study. Therefore, the self-selection bias may limit the generalizability of the findings.

### Data Analysis

The process of data analysis included, but was not is limited to, the following statistical measures:

1. Conducted frequency distributions to analyze demographic data and opinion items from the questionnaire
2. Calculated the mean score using a scale composed of numerical codes with options assigned to each item
3. Conducted a chi-square to identify any significant differences between users' income levels and numbers of times products were purchased per month from an online vender

### Definitions

The following terms are defined to clarify their use in the context of the study:

E-mail: Electronic mail message, usually text, sent from one person to another via computer.

Internet: The vast collection of interconnected networks that all use the TCP/IP protocols and that evolved from the ARPANET of the late 60s and early 70s.

Transmission Control Protocol (TCP): A mean by which two hosts can establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent.

Mailing list: A (usually automated) system that allows people to send e-mail to one address, whereupon their message is copied and sent to all of the other subscribers to the mail list. In this way, people who have many different kinds of e-mail access can participate in discussion together.

Internet Protocol (IP): A unique number used to represent every single computer in a network. All the computers on the Internet have a unique IP address. To the Internet, a given server's IP address is given in terms of numbers and dots, in the format 000.000.000.0. Humans are not as good as computers at remembering numbers, so IP numeric

addresses also have a more easy-to-use textual representation (e.g., [www.uni.edu](http://www.uni.edu) or [www.saudi.com](http://www.saudi.com)).

**Internet Services Provider (ISP):** An institution that provides access to the Internet in some form, usually for money.

**Electronic Business (EB):** Online and traditional business activities that use Internet technologies to support communication, collaboration, service, and trade.

**Electronic Commerce (EC):** Any transactions conducted using digital means, including business-to-business transactions and sales of merchandise or information products to consumers. Though the term originally meant selling things online, it has evolved to mean conducting business online in a more general sense, including customer service functions, sales, marketing, public relations, advertising, and as on.

**Transaction:** The end point of a customer's shopping visit. Typically, transactions take customers shopping basket contents and their registration details and enclose these in encrypted form inside an electronic envelope. Additionally,

transaction sequencing and validation information (if appropriate) are included. Usually the encrypted transaction information is passed on to the merchant for further processing.

ARPANET (Advanced Research Projects Agency Network): The network that became the basis for the Internet. It was funded mainly by U.S. military sources and consisted of a number of individual computers connected by leased lines and using a packet-switching scheme.

Authentication: The process of verifying the identity of the party at the other end of your Internet connection. Server authentications allow clients to verify that they are communicating directly with, for example, bank, and not a malicious third party. Client authentication is the process by which the server verifies the identity of the client (or consumers).

Certificate Authority: An entity with the authority to issue public keys, along with a certificate of positive identification associating the owner with the key.



Encryption: The transformation of data into a format that can be safely transmitted, without fear of anyone intercepting and reading the message. Once encrypted, data must be decrypted using the decryption key to be read. The keys used for encryption and decryption are usually kept secret to further ensure privacy.

Filtering Router: A connection to both the outside Internet and an organization's internal network whose purpose is to check the source and destination network addresses on each network packet and determine whether or not to let the packet through.

Firewalls: A means to control traffic between outside and inside a network and provide a single point where access controls and auditing can be imposed. Using proxy software, they erect a wall between internal and external computers. If an outside host wants to contact an internal computer, the host actually communicates with the firewall, and the firewall communicates to the internal computer.

HTTPS (HyperText Transport Protocol): HTTP running under Netscape's Secure Sockets Layer, SSL.

Public Key Cryptography: A technique that uses a pair of keys, one public (or distributed), one private (or secret) for encryption and decryption. Data encrypted using the public key can only be decrypted with the private key, and vice versa.

Session Key: An encryption code used to protect data as they travel across the Internet. It is called a session key because it is generated at the beginning of a communications session for use during that specific transaction.

Smart Card: A read-only floppy containing an encrypted password and/or private key. The use of smart cards makes it much more difficult for an intruder to steal or observe a customer's password.

Conseil Europeen pour le Recherche Nucleaire in French (CERN): European Laboratory for Particle Physics a research laboratory headquartered in Geneva, Switzerland, and funded by many different countries. It is known for pioneering work in developing the World Wide Web portion of the Internet.

Gopher: A system that pre-dates the World Wide Web for organizing and displaying files on Internet servers.

Wide Area Information Server (WAIS): A program for finding documents on the Internet. WAIS is rather primitive in its search capabilities

File Transfer Protocol (FTP): The protocol used on the Internet for sending files

Internet Services Unit (ISU): A department of King Abdulaziz City for Science & Technology (KACST) responsible for providing Internet service in the Kingdom of Saudi Arabia, in cooperation with Saudi Telecom Company (STC) and Internet service providers from the private sector

RSA: A public-key cryptosystem that offers both encryption and digital signatures (authentication). Ron Rivest, Adi Shamir, and Leonard Adleman developed RSA in 1977; RSA stands for the first letter in each of its inventors' last names.

#### Summary and Description of Chapters

In summary, this study is designed to provide consumers and commercial organizations in Saudi Arabia with practical information regarding

electronic commerce. It attempts to explore the perspectives of IT professionals, business owners, managers, and customers of online business in Saudi Arabia. The results of this study will be used to reduce information gaps in future organizational endeavors, to uncover previously undiscovered attributes of IT, and to construct a framework to support future research on IT.

Chapter II is comprised of a review of relevant literature. It provides a background on research in Internet electronic commerce.

The methodology used for the research in the study is described in details in chapter III.

Chapter V presents the data presentations and analysis.

Chapter VI consists of the finding and discussion, the conclusions of the study, recommendations, and suggestions for future research. The conclusions and recommendations of the researcher are based on the literature and the results of this study.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

Introduction

Internet EC involves more than just the online buying and selling of goods and services. Business management and consumers in Saudi Arabia and around the world are presented with exciting scenarios of the future of electronic business at every juncture. The Internet is one of the computer-related communication technologies people use to process their daily work. However, this technology is revolutionizing the way we work and play (Comer, 1995). The opportunities for EC appear limitless and yet within everyone's grasp. Therefore, we need to understand what the Internet is, how it comes into our life, and what it can do for us. To many, the Internet is still a confusing term.

Consumers can afford the time to learn to purchase products over the Internet (e-commerce), but for a company to survive and stay competitive within the EC environment, its message cannot be viewed as wasting the consumer's time; rather it must augment consumer convenience. Colony (1995)

reported that the Internet removes many barriers to communication between customers and employees by eliminating the obstacles created by geography, time zone, and location, creating a smooth business environment.

This chapter also explores these issues and describes the Internet, EC, open issues in electronic commerce, and the status of Internet EC in Saudi Arabia among others.

#### The Internet

In its early days, the Internet was primarily used to exchange information by e-mail. Other applications (e.g., Gopher, WAIS, FTP) gradually became available. In 1989, Tim Berners-Lee at CERN proposed a collaborative project for researchers across the European continent. The project proposal outlined a system of using hypertext mechanisms to exchange information among the members of CERN. The primitive WWW application was text-based. There was no intention to transmit audio, video, or image files.

In 1993, the first graphical WWW browser, Mosaic, was released by the National Center for

Supercomputing Applications (NCSA). This browser made the Web accessible to ordinary Internet users with low-end computers. Almost overnight, a mass market was created for Internet information.

### The Internet Timeline

The Internet timeline shows a concise view of the Internet history.

- 1962 Paul Baran, RAND: "On Distributed Communications Network" Packet switching networks; no single outage point
- 1967 ACM Symposium on Operating Principles--Plan presented for a packet-switching network
- 1968 Network presentation to the Advanced Research Projects Agency (ARPA)
- 1969 ARPAnet Commissioned by DoD for research into networking.
- 1972 International Conference on Computer Communications with demonstration of ARPAnet between 40 machines organized by Bob Kahn.  
  
Internetworking Working Group (INWG) created to address need for establishing agreed-upon protocols.  
  
Ray Tomlinson of BBN invents e-mail program to send messages across a distributed network.
- 1973 First international connections to the ARPANET: University College of London (England) and Royal Radar Establishment (Norway).

Bob Metcalfe's Harvard PhD Thesis outlines idea for Ethernet.

- 1974 Vint Cerf and Bob Kahn publish "A Protocol for Packet Network Internetworking" which specified in detail the design of a Transmission Control Program (TCP).
- 1979 Meeting between U of Wisconsin, DARPA, NSF, and computer scientists from many universities to establish a Computer Science Department research computer network. USENET established using UUCP between Duke and UNC by Tom Truscott and Steve Bellovin.
- 1981 BITNET, the "Because It's Time NETwork," started as a Cooperative network at the City University of New York. Provides e-mail and listserv servers to distribute information. Unlike USENET, where client software is needed, e-mail is the only tool necessary.
- 1982 INWG establishes the Transmission Control Protocol (TCP) and Internet Protocol (IP), as the protocol suite, commonly known as TCP/IP, for ARPAnet This leads to one of the first definitions of an "internet" as a connected set of networks, specifically those using TCP/IP and "Internet" as connected TCP/IP internets.
- DoD declares TCP/IP suite to be standard for DoD.
- 1983 Name server developed at U of Wisconsin, no longer requiring users to know the exact path to other Systems.
- CSNET/ARPAnet gateway put in place.
- Desktop workstations come into being, many with Berkeley UNIX, which includes IP networking software.



EARN (European Academic and Research Network) established, very similar to BITNET.

1985 First wide-area network, GulfNet, was created in Saudi Arabia by the King Abdulaziz City for Science and Technology (KACST) and IBM.

1986 ARPAnet bureaucracy keeps it from being used to interconnect centers; NSFnet comes into being with the aid of NASA and DOE. This allows an explosion of connections, especially from universities.

1989 A Saudi Arabia national X.25 packet-switching network, al-Waseet "Carrier", was procured from Siemens (FRG).

Number of hosts breaks 100,000. NSF backbone upgraded to T1 (1.544Mbps). First relay between a commercial electronic mail carrier (CompuServe) and the Internet.

1991 WAIS released by Thinking Machines Corporation; Gopher released by the University of Minnesota & U.S. High-Performance Computing Act (Gore I) establishes the National Research and Education Network (NREN).

1992 Internet Society is chartered. World Wide Web released by CERN.

1993 InterNIC created by NSF to provide specific Internet services.

Directory and database (AT&T), Registration (Network Solutions, Inc.), Information (General Atomics/CERFnet).

United Nations and World Bank come on-line. Businesses and media started to take notice of the Internet.

Mosaic takes the Internet by storm; WWW proliferates at a 341,634% annual growth rate of service traffic. Gopher's growth is 997%.

- 1994 As fiber optic networks became more common on university and research center campuses, LANs started migrating to the Internet Protocol, establishing internal e-mail and ftp capabilities in Saudi Arabia.

Communities begin to wire up directly to the Internet.

Shopping malls and mass junk mailings arrive on the Internet.

- 1995 The Saudi authorities decided to migrate GulfNet to the Internet Protocol to create "an information super highway connecting academic institutions, research centers, and public libraries in Saudi Arabia," and proposed to call the network SaudiNet.

Sun launches JAVA on May 23.

RealAudio, an audio streaming technology, lets the Net hear in near real-time.

Traditional online dial-up systems (CompuServe and America Online) begin to provide Internet access.

- 1996 Saudi Arabia confines Internet access to universities and hospitals.

In January, KACST implemented a pilot project whereby some dial-up connections were made available to KACST staff and faculty at the King Saud University (KSU).

Internet phones catch the attention of US telecommunication companies who ask the US Congress to ban the technology (which has been around for years).

1997 In May, KACST of Saudi Arabia implemented the first phase of the National Library Network, linking KACST's public network with the Internet via a router and the microwave link to KFSHRC and KACST's internal LAN to the public network with an isolation router. The American Registry for Internet Numbers (ARIN) is established to handle administration and registration of IP numbers to the geographical areas currently handled by Network Solutions (InterNIC), starting March 1998.

1998 Network Solutions registers its 2 millionth domain on 4 May.

Compaq pays US\$3.3million for altavista.com.

E-Commerce, E-Auctions, and Portals come into sight.

1999 Internet access becomes available to the Saudi Arabian (.sa) public.

First Internet Bank of Indiana, the first full-service bank available only on the Net, opens for business on 22 February.

Free computers are all the rage (as long as you sign a long term contract for Net service).

Business.com is sold for US\$7.5million.

2000 The US timekeeper (USNO) and a few other time services around the world report the New Year as 19100 on 1 Jan.

Several EC sites, portals and news outlets (MBCE, Yahoo, Amazon.com, EBay, Buy.com, CNN, eTrade and ZDNet) in Saudi Arabia and around the world were hit by computer hackers.

### Electronic Commerce (EC)

EC is a vision for bringing a whole range of services into the information age on a global scale. In the past two decades, financial and business-to-business processes, from order processing to electronic funds transfer, have been automated and are now routinely handled by computer. EC is more than just handling the part of business transactions electronically, or just putting up a storefront on the World Wide Web (WWW). EC is a new way of doing business. It requires a better understanding of the buyer-seller relationship. It requires a different way of thinking. Also, online commerce seems destined to turbo charge business and alters the dynamics of many markets. It will accelerate the pace at which individuals and organizations connect, communicate, negotiate, and transact. This new opportunity can bring the entire process of managing the full range of business transactions online.

Today, many corporations see the possibilities for improving their businesses even further and are embracing the Internet as a way to achieve this change. Every business in the world can become

accessible to every other business or consumer via computer. According to Kamil (1999), the growth of the Internet shopping in the Arab world and in Saudi Arabia particularly is very impressive despite the fact that online market forms only a fraction of the value of conventional retail market in the region.

Linthicum (1997) indicates that electronic commerce, the selling and buying of goods over the Internet, is growing at a steady pace. While the Web transactions still make up only a small percentage of total sales today, businesses seeking to expand their markets are establishing storefront on the Internet.

One measure of the excitement over EC is the June 12, 1995 issue of Business Week that contains a projection of the role of EC in the future. Business Week estimates that EC sales will approach \$3 trillion dollars by 2005. This anticipation might be overly optimistic, but it indicates that EC is being taken seriously.

According to Tygar (1995), J.C. Penney, a retailer with a reputation for not being especially high-tech, sold directly to customers \$17 million

dollars worth of goods over computer networks. MacClaren (1995) reports that in the 1993, there were fewer than 100 so-called Web sites (academic, corporate, individual) worldwide. Today there are at least 1,917,808 millions Web sites worldwide and it is estimated that the number is growing 213,188 pages per day as shown in Table 1.

Table 1

A Snapshot of the Internet Size

Categories	1999 Total	Estimated growth per day 1998-1999
World Population	5,996,708,634	213,188
Web Pages	1,500,000,000	1,917,808
Devices accessing the Web	221,100,000	196,164
Worldwide Internet Users	196,100,000	147,671
Hosts	72,398,092	79,913
Domain Names	8,100,000	12,981

Note. From The Industry Standard, (p.148) by George V. Hulme, (1999).

Arensman (1998) states that for the year 2001, analysts expect an explosion of business-to-business (b-to-b) commerce on the Web. Internet Arab World (IAW) predicted that Saudi Arabia Internet EC is set for a 10-fold increase in the next five years with transactions between companies expected to rise from about \$21.5 million in 2000 to \$108 million in 2005.

#### Internet Electronic Commerce (EC) Advantages

Since the commercialization of the Internet in 1991, businesses have become the fastest growing segment of the Internet (Ellsworth & Ellsworth, 1994). Linking Saudi Arabia businesses to the Internet offers unprecedented potential for expanding markets, reducing costs, and improving profit margins, at the price of a small budget. According to Verity (1995), the Internet can serve as an interactive channel for direct communication and data exchange with customers, suppliers, distributors, product developers, financial brokers, information providers, and with all parties involved in a given business venture. MacClaren (1998) reported that there are practical considerations that argue for a web site. Some of those factors

are: A firm can save money by not having to print and mail brochures, the facilitation and release of time-sensitive information, and the enhanced ability to accumulate valuable sales leads. Businesses and government in Saudi Arabia are willing to adopt the Internet as a business strategy for business performance improvement for many reasons (Al-Alefani, 1999), to name some:

1. Lower the cost of obtaining materials: The Internet provides fast, reliable connections to business resources around the world. Commercial organizations in Saudi Arabia can communicate with vendors in any location without incurring additional communication costs.

2. Faster and more flexible delivery: Through the Internet, commercial organizations in Saudi Arabia can connect timely with suppliers to facilitate their ordering and delivery to reduce stockpiled inventory.

3. Improved reliability and performance: Product Support over the Internet significantly reduces the time lost due to system performance problems.



4. International reach: The Internet can promote a business' global awareness, save in telecommunications costs, and improve its connections to business partners and customers.

5. Flexible and effective information based activities: The Internet can facilitate business partnerships and joint ventures, shorten development time, and distribute resources more broadly all over the world.

6. Increased productivity: The Internet can give commercial organizations in Saudi Arabia flexible work arrangement and allow the use of virtual teams based on expertise, not location, to facilitate more effective deployment of human resources.

7. Increased market share: Commercial organizations in Saudi Arabia can use the Internet as a powerful tool for market research and to establish new markets and customer interest in the latest products.

8. Lower cost margin: The Internet provides commercial organizations in Saudi Arabia multiple contact points to its customers with no incremental

cost, as well as a low-cost distribution channel for its products.

9. Enhanced consumers' satisfaction: The Internet provides commercial organizations in Saudi Arabia an easy channel for consumers to respond to their products and enables businesses to provide detailed product information, announcement of new offerings, and other public relations material to consumers.

#### Internet Banking

The Internet's explosive growth has initiated considerable activity in the financial services industry. For this industry, the Internet serve as a new vehicle for transmitting financial information, comparable to the invention of the telegraph 150 years ago and its use for transmitting financial information. Although computer networks only transport financial information, many predict radical changes including the "dissolution of geographic markets into virtual financial systems" and the "loss of national independence." These predictions are simplistic and are not based on analyzing this issue in a national approach. However, the facts are (a) financial services are

information commodities and (b) public computer networks offer a fast, cheap way to trade information. Public computer networks can radically improve efficiency and competition in the financial services sector. LaMay (1999) reported that to increase efficiency and competition rely on three characteristics of these networks:

1. Marginal costs of selling financial information over computer networks are small, in fact, typically negligible compared with the more traditional information channels.

2. Public computer networks are essentially borderless, giving rise to the cross border provision of financial services.

3. Setup costs to establish financial services businesses on a public computer network are small, which increases the contestability of financial services markets. Considering these characteristics, public computer networks would affect banking competition and banking regulation in Saudi Arabia. While the small setup costs and the cross border provision of financial services would spur competition, it is the Internet's borderless

nature that could pose a major challenge for the regulation and supervision of financial intermediaries. Saudi Arabian Solutions (1999c) stated that customers are increasingly going to have access through the Internet to banking products offered outside the Kingdom; the customer's expectations are going to be broadened by technology.

The retail sector in Saudi Arabia, so far, has been less affected by telecommunication technology than have other financial sectors and the mass retail market has remained largely a national business. In contrast, large corporate banking is already international and the cross border provision of financial services in these markets is the rule rather than the exception. The prospect of an international mass retail market for financial services is a likely candidate for public concern and intervention because regulatory efforts are often directed toward protecting small depositors.

The emergence of financial service providers on the Internet is more recent. Security First Network Bank in Atlanta, Georgia, was the first bank to use

the Internet as its main channel for offering traditional financial services, such as transaction accounts in October 18, 1995 according to usadata.com (1996). According to Baltensperger and Dermine (1997) the Web has initiated many activities in the financial services industry; in December 1996, more than 1,490 banking institutions were providing financial information on it. There is also a growing demand for online financial services. For example, Wells Fargo in San Francisco increased its online banking base from 20,000 to 270,000 users in 18 months according to Bhattacharaya and Thakor (1997).

Because banking on the Internet is so new, no systematic research on Internet-based financial services and their economic implications is available. Existing literature consists entirely of unreliable evidence from individual companies, usually in trade journal articles with no empirical basis (Kalakota, 1996). Analysis of network banks and their regulation must start with identifying the characteristics distinguishing network banking from traditional banking.

The irrelevance of physical location is based on the fact that marginal costs of providing financial services on a public computer network are not related to a customer's location; more importantly, customer's marginal costs for obtaining financial services are independent of the bank's location. In contrast, the "traditional" retail bank's location is an important (cost) factor for bank customers and banks. In traditional banking a customer's marginal costs for obtaining financial services increase with distance to his bank. Consequently, traditional banks compete for location and (over) invest in branches and ATM-systems to collect deposits Neven (1990). The Kingdom's financial institutions are now forced to deal with more demanding customers, commonly with other bank accounts around the world (Saudi Arabian Solutions, 1999a).

The irrelevance of the physical location has two implications. First, it enables cross border trade of financial services in the retail market. Without legal restrictions, agents can shop for financial services anywhere on this planet as long as the network bank has access to a local ATM network to

obtain cash. However, the emergence of electronic money, respectively digital cash, could even remove this requirement. White (1996) has stressed this fact: What strikes me as the most exciting potential development to come from the new payment technologies is that, as they lower the cost of wiring money from \$20 to 2 cents or less per transaction, they give ordinary small savers affordable access to offshore banking. With direct deposit of paychecks and with analog currency available at ATMs whenever we want it, many of us no longer need to visit our bank in person. Second, Internet banks can move their physical location without changing their relation to their customers. In particular, they can move their business across nations "overnight." Thus, network banks can react faster than traditional banks to changing economic conditions and regulatory requirements. For example, they can easily shift their production to low factor cost countries and nations with inexpensive regulatory regimes, taking into consideration that Saudi Arabia just open its doors for foreigner investors.

### Banking Regulation

Any attempt to understand the prudential regulation of banks requires examining the nature of financial intermediation, the potential for market failures, and the attempt to correct these failures through public intervention. The theory of financial intermediation stresses four functions of financial intermediaries (Dewatripont & Tirole, 1994)

(a). facilitating transactions, (b) portfolio management, (c) risk transformation, and (d) monitoring.

According to the first function, financial intermediaries facilitate transactions by organizing the payment system. They offer check clearing and payment products such as credit cards, debit cards, and travelers checks. The second function, portfolio management, refers to the management of diversified portfolios consisting of financial liabilities issued by firms and governments and sold to the public. The third function, risk transformation, refers to the transformation of risky assets issued by firms into fixed interest deposits demanded by households and to the transformation of illiquid



assets into liquid liabilities to provide liquidity insurance to households. The fourth function, monitoring, refers to monitoring activities of financial intermediaries, which reduces problems of moral hazard and asymmetric information in relation between firms and financiers (Hellwig, 1991).

It is commonly accepted that any banking regulation must rely on some form of market failure. If banks were only to offer transaction and portfolio management services, regulations would be unnecessary. Fama (1980) demonstrates that these two functions do not cause market failures. The potential for market failures is associated with the third and fourth functions. Particularly, it is the financing of illiquid assets with short-term deposits and the potential of bank runs that create a need for public intervention and the establishment of a safety net to guarantee the stability of the financial system (Baltensperger & Dermine, 1997).

Diamond and Dybvig's (1983) were the first to model bank runs. Their model suggests an equilibrium in which all depositors try to close their accounts, forcing the bank to sell illiquid assets, resulting

in the failure of the otherwise solvent bank. The interesting aspect of their model is that there is no underlying real reason for the bank run: the illiquid asset is a completely safe investment. It is the expectation about the behavior of other depositors that drives the behavior of any individual. In the bank run equilibrium, these expectations are fulfilled.

A related type of market failure stresses the "contagious" nature of bank runs (Baltensperger & Dermine, 1997). A bank failure can trigger a run on other solvent banks when bank customers of the solvent bank assume that the values of banks assets are highly correlated with each other. In most countries there exists public deposit insurance or a lender-of-last-resort agency to prevent bank runs. Deposit insurance makes deposits risk-free, thereby eliminating the incentive for early withdrawals.

An additional basis for market failures is asymmetric information between banks and their depositors. Banks are better informed about the quality of their loans and the security of their assets than depositors are. Depositors can improve

their information by monitoring banks; monitoring bank solvency, however, is expensive and requires skills small depositors may not have. In addition, information about bank solvency has the characteristic of a public good. This view is emphasized in Dewatripont and Tirole (1992):

One neglected, although certainly quantitatively important, feature of banks is] the dispersed nature of the debt-holders or depositors. Small depositors typically have no time or expertise to perform the monitoring and control that the optimal governance structure requires. And even if they did, they would be tempted to free ride on each other's monitoring and exercise of control. (p. 17)

According to Dewatripont and Tirole (1992), when a bank is in trouble, bank managers and equity holders have an incentive to gamble for resurrection. As a consequence, debt holders of banks (i.e., depositors,) must take control when bank performance is bad because their incentives are to limit risk taking. A large number of small free-riding depositors, however, cannot perform this task, which suggests a role for public intervention. A public agency would have to regulate banks ex-ante by imposing capital requirements and limiting the growth of deposits. In addition, a public agency

would have to intervene ex post acting on behalf of small depositors in bad times.

#### Internet Activity in The Kingdom

The Internet became available in Saudi Arabia in 1999 through King Abdulaziz City for Science and Technology (KACST). Just before the introduction of the Internet, the Saudi Ministry Of Postal, Telegraph, and Telephone (MOPTT) hosted a service called Alwaseet. Many people used this network in the early days to connect to their Internet Service Providers (ISPs) overseas, which they already have an account with, if not they will have to request a joint service from Alwaseet. These joint services provided by Alwaseet were so costly and the connection speed was so low, that many started to dial in into their ISP by calling international to Bahrain. Mid 1997, Saudi Arabian government announced that the Internet would be available locally. This announcement came from The King Abdulaziz City for Science and Technology (KACST) after months of anticipation by the Saudi citizens. The science and technology city has set up a special unit which would supervise the whole process of

linking Saudi Arabia with the rest of the world through Internet services. Access to the Internet in Saudi Arabia, where religion plays a big role, has been delayed by worries about material considered offensive. In order to filter out material considered undesirable, above all pornography, the government has created a funnel through which all international websites have to be channeled. King Abdulaziz City for Science & Technology (KACST) has installed a system that will prevent users from viewing prohibited websites. This new Internet service began in December of 1999. The relatively new arrival of the Internet in Saudi Arabia has drawing a big number of users who pushed the annual growth to %160, the highest rate in the region. It is estimated that the number of Internet users in Saudi Arabia has reached 300,000 and rising. The King Abdulaziz Center for Science and Technology (KACST) and the Saudi Telecommunications Company (STC) has fixed the subscription rate for Internet services between 190 Saudi Riyal (US \$52) and 450 Saudi Riyals (US \$123) per month, which is one of the highest around the world and that will limit the

number of users in the kingdom. Jarrah (1999) stated that:

The higher rates and low standard of Internet services in Saudi Arabia as compared with the services in the neighboring countries will deny the national economy some important opportunities for growth that E-commerce and other online services can bring. (p. 21)

#### How the Internet Works in Saudi Arabia?

Internet service in KSA is organized into three main levels as illustrated in Figure 1.

##### First Level: International Link

This is the link that connects the National Backbone to the International Internet. The International link is operated by ISU and all international traffic to the Kingdom should go through this link.

##### Second Level: National Backbone

The Saudi Telecomm Company (STC) is developing a high-speed network connecting most parts of the Kingdom together. Currently, the main regions of the Kingdom are covered by this backbone with expansion planned for the remaining regions. ISU and all ISPs are connected to the National Backbone, which

carries Internet traffic inside the Kingdom, and to the International Link.

#### Third Level: ISPs

These are commercial companies that provide Internet access to the general public, government and private sector through dialup and leased lines. ISPs are connected to the National Backbone and to the International link at Internet Service Unit (ISU). They provide their subscribers access to these networks. In addition ISPs provide subscription accounting, customer support and other value added information services.

#### Electronic Commerce in The Kingdom

Since the introduction of the Internet in 1999, the Saudi business community is becoming increasingly aware of the value of EC. There are less than 10 companies that have implemented EC technology in Saudi Arabia. The list is expected to grow to about 30 companies by the end of 2000 or early 2001 according to the Saudi Ministry of Commerce. Most of these companies are commercial enterprises.

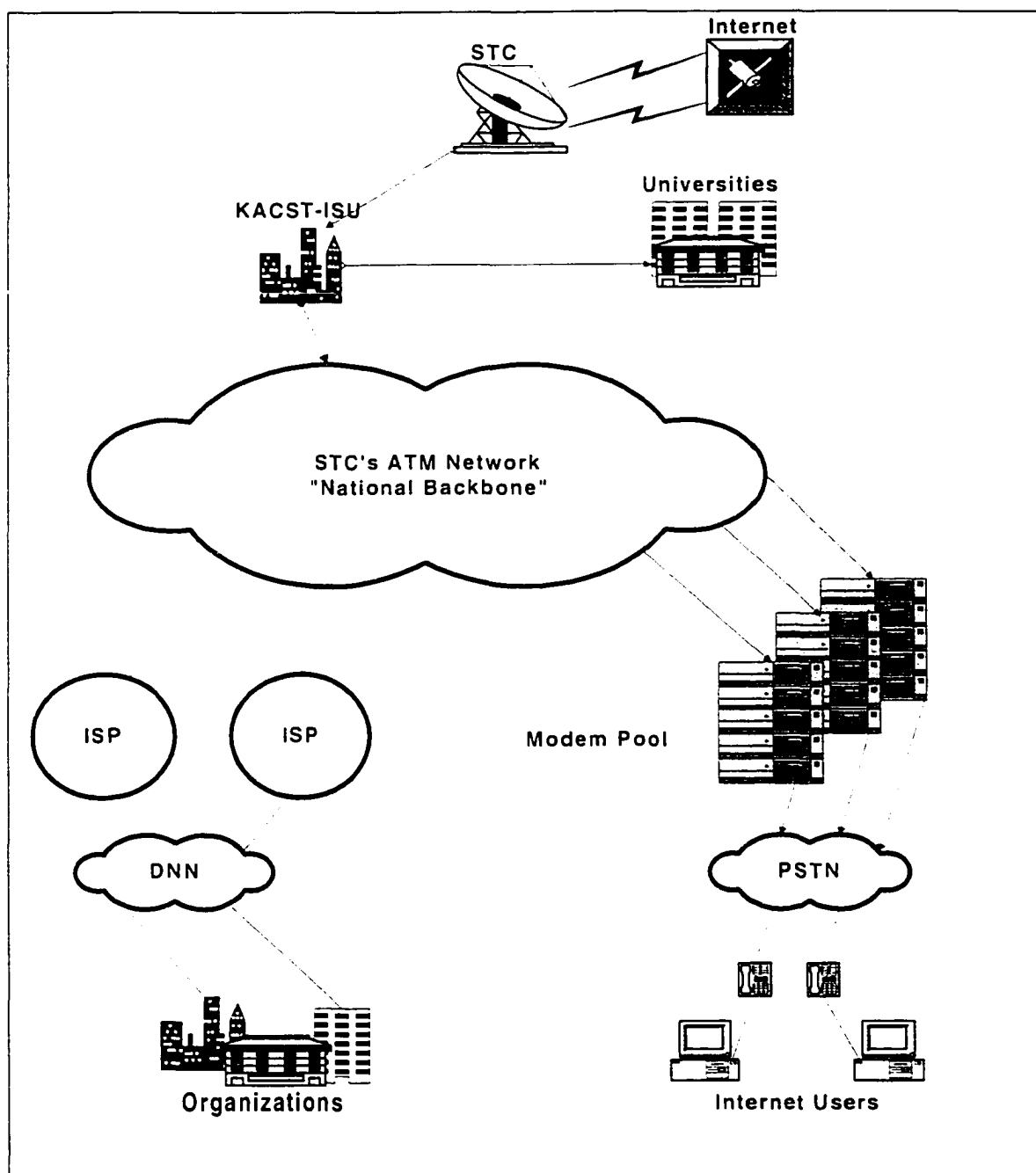


Figure 1. Internet network in Saudi Arabia. KACST (Al-Zoman, 1999).



The EC market in the Kingdom can be divided into two categories (a) Saudi trading partners (distributors and agents) of major international suppliers, and transportation companies and (b) major national companies that procure from a large number of local and international suppliers.

The presence of EC vendors is helping the companies to accelerate their efforts in adopting this crucial technology and redesigning operational procedures to maximize productivity. Saudi Arabia is a major market in the region and has a well-advanced commercial sector. Al-Ghamdi (1999) stated that the Saudi commercial community is already implementing EC in their commercial environment. Saudi commercial community soon will look to government institutions that participate in trade facilitation to have a supporting EC infrastructure to be able to process trade transactions electronically.

A study which was conducted in the Eastern Province of Saudi Arabia on Electronic Funds Transfer at Point of Sale (EFT/POS) reported advantages for Saudi retailers including reduction of paper work, reduction in exposure to losses

arising from bounced checks, guaranteed payment, carrying less cash, control over counter clerks, and most importantly, improved services to customers. Saudi consumers will benefit from having a convenient way to make payments for purchases without having to carry large sums of money or checkbooks. Saudi banks benefit by increasing the loyalty of retailers, for whom they have installed the Point Of Sale (POS) terminals, and from the fees paid by retailers for the service. In addition, by providing their customers with accessibility to funds at the point of purchase, the need for customers to visit banks or Automatic Teller Machines (ATM) for cash withdrawals is eliminated, thereby reducing the rush at banks and the likelihood of standing in long lines.

The following points highlight the major opportunities associated to Internet commercialization in Saudi Arabia:

1. Internet commercialization is a new model for cooperation between the public and private sectors in telecommunication. The government has played a catalytic role in raising awareness as well as

deployment of the infrastructure, while the private sector carries value-added services to the end users. More than 31 private sector ISPs have been established in Saudi Arabia in 1999, Table 2, which has created a new industry with new jobs and venture opportunities.

2. The Internet has opened a window for marketing information services in Saudi Arabia to the world.

3. The success of the government/private sector partnership in the commercialization of Internet services will push deregulation of other value-added services as well as communication services in the country. The communication infrastructure deployment is a promising area for private-sector participation.

4. A new opportunity has arisen for cooperation on a regional level in Internet connectivity. Saudi Arabia is qualified to play a significant role on the regional level as an Internet gateway to other countries in the region and in the world

Table 2

Internet Services Providers (ISPs)


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Internet Service Provider (ISP) Names	
1.	Sahara Network.
2.	Voice And Data Telecommunication Company.
3.	Al-Alamiah Internet and Communications Company.
4.	Global Advertising Co.
5.	National Group for Communications and Computers, NGC.
6.	Al-Faisaliah Internet Service, Modern Electronics, AwalNet.
7.	GulfNet KSA.
8.	Electronic Concepts, Ibtikar Electronics Co.
9.	Saudi Telecom Company.
10.	Saudi Oger.
11.	National Information Systems Co.
12.	Arabian Advanced Systems.
13.	Arabic Computer Systems Co.
14.	Dar Al Riyadh, Commercial Investment and Development Co.
15.	Shaheer Technics Inc.
16.	Saudi Internet Co., Saudi Online.

(table continues)

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Internet Service Provider (ISP) Names

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17. Muhammed Eisai' Electronics.
  18. Nour Trading Co.
  19. Jeraisy Computer and Communications Services.
  20. Al Jazirah Press.
  21. Digital Computer Systems Co.
  22. Jibal Advertising Co.
  23. Al Rajhi Saudi Group, Shabakah.
  24. Saudi Business Machines.
  25. National Engineering Services and Marketing
  26. Dallah Media Production.
  27. Arabnet, Ofoq Information Systems & Comm.
  28. International Computers Co.
  29. Samir Photographic Supplies.
  30. Khalil Bin Laden Telecom, TRInet.
  31. Arabian circle Est.
- 

5. Internet awareness and human resource development are also considered opportunities to educate the younger generation with the new technology of cyberspace.

### Barriers to Commercialization of the Web

The barriers to consumer and firm adoption impact critical mass (Oliver, Marwell, & Teixeira 1985). Accumulated industry experience and anecdotal evidence strongly support the contention that the primary barrier to consumer adoption of the Web as a commercial medium is ease of access. Convenience of access is at the core of the adoption of any technological application and determines its ultimate success (Gupta, 1995). In the context of the Web, ease of access is a multidimensional construct and includes high-speed access (the bandwidth problem), ease of finding a service provider, and the diffusion of the computer hardware /software/modem bundle into the home. The secondary barriers are ease of use, price, and risk, including such factors as privacy and security. Ease of use includes issues such as the user-friendliness of the software, ease of software installation, and the like. The marketplace will weed out even technically feasible Web applications if they prove too complicated for the average consumer to use (Seaman, 1995). Hence attempts to develop technology that is

user-friendly are as important as the development of the technology itself.

There is a great deal of concern regarding the security of financial information transmitted over the Internet and its impact on consumer willingness to buy or sell products (IITA, 1994). This limitation is critical to mass adoption of the Web, especially since surveys of Web users indicate that vendor reliability and security of financial transactions are important to users (Gupta, 1995). At this writing, such limitations impact consumer behavior on the Web: currently, the majority of consumers use the Web to browse or search much more than to actually purchase something (Booker 1995; Wintrob 1995).

The barriers to firm adoption arise from the Web measurement problem (Donaton, 1995a). Firms are unsure of the number of people on the Net and how many people use the Web and this uncertainty makes investment decisions difficult. In addition, there are no established criteria for judging the success of Web sites (Bellafante, 1995). Hence, researchers need to develop concepts to shape standards. Such

standards are critical to demonstrate the viability of the Web as a commercial medium, and provide mechanisms for measuring investment opportunities and business success.

The commercial success of a firm's Web site depends in part on accurate information on market potential and consumer needs (Donaton, 1995b). The Web provides multiple ways to reach a diverse and exciting set of markets. Determining the appropriate set of target market segments and evaluating the penetration of Web access technology in each market is the first step in developing an integrated marketing strategy. Because critical mass for interactive technologies is "all-or-none," (Markus, 1987), the Web will not be successful as a commercial medium until it achieves critical mass. An important first step in any marketing program is therefore the determination of how many people are on the Internet and what they are doing there (Hoffman & Novak, 1994). It is also necessary to define and estimate segments of Web behavior based on customer need. The economics of the Web can then



be examined for each specific case to determine if the return on investment meets financial targets. Some sites for example Pathfinder, Hotwired, and Internet Shopping Network are attempting to capture data to address the above objectives by providing the option for visitor "authentication." In this process, visitors may register as subscribers in order to use the site fully (e.g., to search for specific content or to make a purchase). This enables the marketer to use demographic data and information on new and repeat visit patterns to strengthen its (and sponsors') marketing programs on the site. Ultimately, marketers may build detailed databases and tailor marketing programs specifically to individual visitors or groups of visitors. In spite of big growth there are still a number of challenges that the Internet community in Saudi Arabia has to face:

1. The community is taking steps to establish a strong Internet society in the country in a partnership between the government, the private sector, and nongovernmental organizations as well as individual users. One of the major objectives is to

put a widely accepted code of ethics for the Internet in Saudi Arabia, an oriental society with conservative tradition.

2. The development and promotion of multilingual (Arabic/English) access for the various Internet services is one of the major technical and marketing challenges. It will give Internet services a new dimension of penetration in new geographical areas and new areas of applications like education and trade services. This will increase intra-country Internet traffic as well as international Internet traffic.

3. Legislative issues are also considered one of the most important challenges. Internet services have been commercially deployed while the legal framework and model for the government/private sector partnership are being worked out. This framework determines the responsibilities of the government in infrastructure deployment and the ISPs in providing value-added services. New legislation is needed to handle issues about Internet operation as well as the operation of public "cyber cafés" in the country.

4. Wide-scale up-to-date infrastructure deployment is another challenge.

5. The priorities of the government are mainly focusing on the deployment of basic telephone service all over the country. High-speed integrated networks are on the agenda but not yet implemented. Private-sector participation in the establishment of infrastructure will also be a new opportunity, as Saudi Arabia will have large bandwidth requirements for newly evolving multimedia applications.

6. The buildup of the Saudi Arabia Internet with its "infrastructure" and servers in different disciplines is one of the major challenges (Saudi Arabian Solutions, 1999b). The content buildup has always been considered a role of governmental organizations exclusively. The evolving private sector ISP participation in Web development and hosting introduces new challenges and new responsibilities for the validation and security of the contents.

7. The security of the Internet and Intranet is also considered one of the decisive issues that will affect the growth of the Internet in the country.

The Saudi Arabian society, although an evolving economy, has its own conservative traditions. The indecent material on the Internet has triggered a lot of debates and controversy among society groups of different ages. The Internet society is challenged with the assignment to find an acceptable model to reduce the public's access to Internet pornography within the framework of the code of ethics.

8. Internet commercialization is a first step toward the privatization and deregulation of communication services in the country. This is the first such government/private sector partnership and cooperation in this sector in Saudi Arabia. The success and maturity of this model's technical, business, social, and regulatory aspects will directly affect further deregulation of other basic and value-added services in that sector in the Kingdom.

#### Electronic Commerce and Security

According to Cangemi (1998) selling on the Internet is growing rapidly worldwide. Current

security issues are more complex as many new factors impact EC implementation

With the exploding popularity of the Internet and EC, security has become an important consideration. The trade press and popular media have made the public aware of malicious uneducated users who hack into government and corporate networks, stealing or altering data. "Internet Services Providers (ISP) in Kingdom of Saudi Arabia must realize that our market is made up of inexperienced users and we must educate them," (p. 17) said Martin, general manager, Tauseal (1999). The following are some of reasons security is needed:

1. Increased corporate presence on the Internet.
2. Companies online have increased rapidly.
3. The companies provide financial, service, and product information.
4. Companies are involved with online business transactions-both cash and credit payments, this presence brings about the concern over transaction security.

Dwyer (2000) stated that I couldn't emphasize enough how important it is that Saudi corporate and individual Internet users understand that hackers have begun to step up their efforts to glean information and take control of individual computers and network in the Kingdom. A short story to show the tremendous need for Internet security is what happened on August 17, 1995, when U. S. Prosecutors charged Vladimir Levin for tapping into Citibank more than 40 times and transferring at least \$10 million to other bank accounts.

There are a few security issues that a corporate has to consider:

1. Identity is the first security issue that arises. It can be resolved by using a method for proof of a customer's identity. This doesn't involve just authorizing a password. The user must provide evidence of his/her identity. This takes the form of an online driver's license or credit card.

2. Communications is the next security issue. Communication involves information that must be kept a secret. Only involved parties are made aware of the transaction and information exchanged.

3. Payment is another security issue. It is pertinent that credit card numbers and expiration dates not be accessible to anyone other than the user. Other corresponding parties can be involved in the transactions, but there must be assurance available for electronic cash advances from banks and from the user's account.

4. The final security issue is messages. Proof must exist that a message received by a party was indeed sent by its identified originator. The message cannot be modified. Services as such are termed non-repudiation and data integrity and are intended to protect the sender and receiver.

To ensure security some mechanisms need to be implemented, a firewall is one of these mechanisms, which is a software or hardware that a company implements to reduce unwanted criminals. Firewalls allow only those external users with specific characteristics to access a protected network or site. Insiders have full access. Outsiders have a selective access based on user names, passwords and Internet addresses. This establishes a barrier

between a corporate network (a secure network) and the external Internet (an untrusted network).

Firewall is a system designed to prevent unauthorized access to or from a private network. Firewalls can be implemented in both hardware and software, or a combination of both. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet, especially Intranets. All messages entering or leaving the Intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

#### Types of Online Transactions

There are four different types of online transactions according to Hellwig (1996):

1. Public data is the first online transaction. There are no security restrictions with public data. This data may be read by anyone, but should be protected from unauthorized modification.
2. Copyright data is the next online transaction. Copyright data is not a secret. The owner provides the data, but wishes to be paid for the data.



3. Confidential data is the third online transaction. Confidential data is a secret. The existence of the data is not a secret (i.e., bank account statements and personal files).

4. The final online transaction is secret data. Obviously this data is a secret! The data must be kept confidential at all times. It is necessary to monitor all login access.

#### Transaction Security

To ensure transaction security, the following measures have to be taken according to (Hellwig, 1996):

1. Secret-key encryption is a shared key for both encryption by the transmitter and decryption by the receiver. Only one key is needed to understand the coded message being sent.

2. Public-key encryption is another way to ensure Transaction security. Only one key is needed to encrypt the message and another different key is needed to decrypt the message.

3. A Smart Card is a read-only floppy containing an encrypted password and/or private key. The use of

smart cards makes it much more difficult for an intruder to steal or observe a customer's password.

4. Session key is an encryption code that is used to protect data as it travels across the Internet. It is called a session key because it is generated at the beginning of a communications session for use during that specific transaction.

5. Certificate authority that is an entity with the authority to issue public keys, along with a certificate of positive identification associating the owner with the key.

Kalakota and Whinston (1999) offered several methods that can provide security in the Web framework. These include the following:

1. Secure HTTP (S-HTTP) is a revision of HTTP that will enable the incorporation of various cryptographic messages formats such as Digital Signature Algorithm (DSA) and RSA standards into both the Web client and the server.

2. Security Socket Layer (SSL) uses the RSA algorithm to wrap security information around TCP/IP based protocols. This implementation while different from S-HTTP accomplishes the same task. The benefit of

SSL over S-HTTP is that it may support Telnet and FTP in a more efficient manner within the Internet services area. Because these three methods are currently working on different aspects and approaches to Internet security, it is likely that in the near future they will collaborate to develop a single standard. These new security standards will allow vendors to expand EC in a risk-reduced manner for users.

#### Requirements for Transaction Security

To conduct transaction of the web a few requirements have to be met according to (Hellwig, 1996):

1. The first requirement is privacy.

Transactions must be kept private and inviolable in the sense that prying eyes cannot understand the message content.

2. Confidentiality is the second requirement.

The traces of the transactions must be expunged from the public network. No intermediary should be allowed to hold copies of the data.

3. Integrity. Transaction must no be tampered or interfered with.

Business Changes Through the Introduction of  
the Internet

Communication and economic theorists have been discussing the movement away from an industrial age to an "information age," shifting the economic focus from capital to knowledge. This shift has profound implications for business as it involves moving away from capital to knowledge as an economic fuel. Where the industrial revolution depended on finite physical resources, information resources increase when shared, allowing for collaboration and creative enterprise (Halal, 1990). The link between technological and economic systems seems to be responsible for the change in the way that organizations are being structured, moving from an industrial hierarchical model to more biological, web-like organisms. Network computing is providing current examples of this phenomenon, with Intranets (internal networks) and the Internet creating the "information superhighway" that is altering the way business is done.

The Web makes it possible for small businesses to cost-effectively reach millions of people with as

much information as they can provide through company Web pages. Information can be constantly updated without the print and postage costs involved with using traditional print mediums. And unlike television and radio, information is available 24 hours a day, 365 days of the year. The Web offers an open market where a start-up is just as likely to succeed as a Fortune 500 company.

The Web is definitely changing the business world's relationship to geographic boundaries. Customers on the other side of the world can become new markets for even the smallest businesses through electronic networks. In addition to seeking new market locations and international on-line customers, the Internet also allows companies to monitor political and economic development in countries they are targeting for expansion (Cronin, 1994).

The type of messages business delivers through the Web differs from what is used in other mediums as well. 'In your face' advertising does not work on the Web because each electronic visitor can access

the type of information they want, when they want it.

Advertising in areas on the Internet where commerce is not the function will result in a flood of insulting electronic responses. an activity known as 'flaming.' Finally, the Web can be distinguished from other electronic mediums because the mind is being engaged, even while being entertained.

Unlike other mediums, Internet users are participants not audience members. It is up to businesses to attract participants to their Web sites by providing useful, updated information, rather than limiting content to product photographs and brochure-length presentations. Business must also respond to customer inquiries more quickly on the Web. Internet users are becoming used to instant response time and will no longer wait for several days for a message to be acknowledged (Cronin, 1994). Businesses who do not engage in ethical communications with their shareholders should start to recognize that through the Internet, their customers could locate one another and communicate

about corporate practices, creating a critical published text for others to view.

### The Internet Runs Wild

How the Internet can be used as a tool for business to control any concern for the environmental and social impacts the technology may have. Although privacy, copyright and ownership issues are slowly being addressed in the Kingdom through legislation and court actions, the Web's effectiveness has been limited to counting the number of times an on-line visitor 'hits' or enters a Web site or a particular Web page. Software does exist that counts the number of visitors, captures email addresses and tracks a visitor's movements throughout the site. Businesses are beginning to emerge that analyze this data into a form that a business or organization can use, however, their presence is still limited. Most hit information remains unprocessed and more in-depth studies of Web site content have not yet been conducted.

### Open Issues in Electronic Commerce

While EC is growing rapidly, there are several open issues that must be resolved if its full potential is to be realized. These include:

#### Globalization

Duke (1999) reported that global networks could make it as easy to do business with a company on the other side of the world as with one on the next street. However, the communication medium alone, while necessary, is far from sufficient. How do companies in different continents become aware of each other's existence, and the products and services that are offered or required? How can a company gain an understanding of the business traditions and conventions of some country on the opposite side of the globe, particularly when those conventions and traditions are often unwritten? And how can the linguistic and cultural diversity of a global user community best be respected and supported? These and related questions are all part of the road issue of globalization making truly global EC a practical reality.



### Contractual and Financial Issues

Suppose that a company in Saudi Arabia browses the electronic catalogue of an American company and places an electronic order for products that will be delivered electronically and for which payment will also be made electronically. Ginsberg (1998) raised several fundamental questions that as yet are unresolved. At precisely what point is a binding contract established between the companies? What is the legal status of this contract? What body has legal jurisdiction over the contract? Given differences in financial regulations and practices, how is payment made and confirmed? What taxes and customs charges apply to the products? How are these taxes and charges collected? Taking in consideration there are no taxes imposed in Saudi Arabia.

### Ownership

Albrecht (2000) noted that particularly for goods that can be distributed electronically, and hence can readily be copied, the issue of protecting copyright and intellectual property rights represents a major challenge.

### Privacy And Security

Krajewski (1999) pointed out that EC over open networks demands effective and trusted mechanisms for privacy and security. These mechanisms must provide for confidentiality, authentication (i.e. enabling each party in a transaction to ascertain with certainty the identity of the other party), and non-repudiation (i.e., ensuring that the parties to a transaction cannot subsequently deny their participation). Since the recognized privacy and security mechanisms depend upon certification by a trusted third party (such as a government body), global EC will require the establishment of a global certification system.

### Interconnectivity and Interoperability

Realizing the full potential of EC requires universal access every company and every consumer must be able to access all organizations offering products or services, regardless of geographical location or the specific networks to which those organizations are connected. This in turn demands universal standards for network interconnection and interoperation according to Krajewski (1999).

### Deployment

Arensman (1998) identified one factor that could limit the emergence of EC is lack of awareness and skills. There is a danger that many companies particularly Small and Medium Sized Enterprises (SMEs) could be left behind and placed at a disadvantage, simply through being unaware of the possibilities and opportunities.

### The Actors and Their Roles

Several of the open issues identified above must be resolved at a global level. Hence, the actors with responsibility for resolving the issues and promoting EC must include multinational bodies. Equally, there is a role for national governments in removing national barriers and ensuring fair competition, and for sector representatives in promoting awareness and best practice. Finally, there are obvious roles for technology suppliers, user companies and individual consumers in enabling, adopting and exploiting EC. The actors include all those shown in Table 3. Collectively, these actors must perform all the roles. Each actor has some

responsibility for several of the roles and, conversely, several actors share each role.

Table 3

Actors and Roles of Technology

Actors	Roles
Multi-national bodies	Foster the Information Society.
National governments	Ensure level playing field. Remove global barriers.
Sector representatives	Remove national barriers Promote awareness & Adoption.
Technology suppliers	Provide enabling Technologies. Reorganize the business
Companies	Adopt the technologies
Consumers	Grasp the opportunities

Summary

The review of related literature has identified several publications that point the need for additional studies in the Internet and EC in Saudi

Arabia. Electronic Commerce (EC) over the Internet is exploding into the marketplace and in the very near future could change forever the appearance of traditional commerce. This new marketplace offers a numerous opportunities for economic gain as well as providing an entirely new platform for fraud, which were talked about in a few articles. This is why commercial and government organizations, as well as individual consumers, must prepare for, and learn how to effectively deal with, this new way of conducting commerce. Despite a number of open issues yet to be resolved, EC is happening today and happening fast.

## CHAPTER III

### METHODOLOGY

#### Introduction

This chapter describes the research design, which includes an explanations of how the data collected and the conclusions relate to the researcher questions. It also discusses the methods used to conduct the analysis, the method of data collection, the variables to be measured, and the limitations confronted in doing the research.

#### Research Questions

The following questions repeated for convenience from chapter I, were formulated as the basis of this research:

1. What do consumers in Saudi Arabia use the Internet for?
2. What is the influence of income level on frequency of Internet shopping?
3. Why do/do not consumers in Saudi Arabia purchase products/services over the Internet?
4. What are consumers' levels of familiarity with the Internet and EC in Saudi Arabia?

5. What are consumers' opinions of Internet-based shopping?
6. To what extent are IT professionals, managements, and business' owners informed of EC benefits?
7. What are the factors affecting the willingness of IT professionals, managers, and owners to adopt EC?
8. What are the primary business objectives of EC strategies in Saudi Arabia's commercial organizations?
9. How are Saudi Arabia's commercial organizations ready for EC?
10. What measures do commercial organizations use to evaluate the success of EC?

#### Research Design

The research design reflects the structure of the research project and provides the means for collecting appropriate data to answer the research questions (Davis & Cosenza, 1993). Of the many possible alternatives, a descriptive research design was seen as having the greater capability for achieving this purpose.

Best (1981) stated that,

Descriptive research describes what is [Italian in original]. It involves the description, recording, analysis, and interpretation of conditions that exist. It involves some type of comparison or contrast and attempts to discover relationships between existing nonmanipulated variables. (p. 25)

Lang and Heiss (1984) further define descriptive research as "studies that seek to explain or predict. Variables and existing conditions are used with no manipulations" (pp. 176-177). Gay (1981) states that descriptive research involves collecting data to test hypotheses or answer questions concerning the current status of the subject of the study. Data for this type of research, relate Clover and Balsley (1984), can be collected by the use of mail or e-mail questionnaires.

#### The Population and Sampling

The population for this study consisted of two different groups: (a) Internet users in Saudi Arabia and (b) IT professionals, business owners and managers of banks and other IT organizations in Saudi Arabia.



In consultation with members of the University of Northern Iowa academic program committee, it was decided that a sample of between 100 and 150 subjects would be an adequate size for the population. A response rate of approximately 40% from Internet users and 30% from IT professionals, managers and owners was considered adequate if the sample was chosen randomly.

#### Research Instrumentation

A survey questionnaire technique was used in this study. The reasons for selecting this method as suggested by McClelland (1989) are as follows: (a) it can be completed in a simple and forthright manner in a short time, (b) it can be used for a large population with low cost, (c) it is a nonintrusive method, and (d) it can minimize bias. In addition, an electronic mail survey allows the researcher access to samples that might be hard to reach in person or by telephone (Fraenkel & Wallen, 1993).

As with any kind of mail survey instrument, it is necessary to gain a high response rate to be able to generalize the findings of the study to the

population being surveyed. If the non-respondents would have responded differently to a questionnaire than did the respondents, nonresponse bias may result.

The following suggestions by Babbie (1973) and Parasuraman (1991) were kept in mind when developing the questionnaire to ensure a good response rate:

1. The items must be clear.
2. The questionnaire should be in understandable and usable order.
3. The appearance of the questionnaire should be of high quality.
4. Follow-up letters, questionnaires, and phone calls should be used to improve the response rate.

Once these concerns were addressed, the researcher assembled the actual survey instrument. The 5-point Likert scale and yes/no questions were used in this questionnaire. Since survey instruments that deal with the exact topic were found, a questionnaire was adapted from these instruments to obtain the data needed for the study. This new survey questionnaire was created for Saudi Arabia's Internet users, IT professionals, business' owners,

and managers. The questionnaire was designed by the researcher according to the principles stated in Questionnaire: Design and Use (Berdie & Anderson, 1974).

Considering the nature of the research, two questionnaire instruments were designed. The first (referred to as Questionnaire A in Appendix A) was completed by Internet users in Saudi Arabia. This portion of the survey asked for information concerning gender, age, income, location, educational level, occupation, income, and Internet usage (location, cost, hours spent online, items purchased online, type of products/services purchased, concerns, types of payment, advantages of shopping online, willingness to buy online products). It also asked for Internet users' opinions of Internet-based vendors compared with vendors in other forms of shopping.

The second portion of the survey instrument (referred to as Questionnaire B in Appendix B) was completed by IT professionals, managers, and owners of commercial organizations in the Kingdom. This portion of the survey asked for information

concerning the organizations, including the following:

1. The status of electronic commerce
2. If the organizations have an EC plan in place
3. How long the EC plan has been operational
4. Whether or not electronic commerce will be the primary transaction medium in the future
5. Customer demand for electronic commerce services
6. The primary business objectives of the electronic commerce strategy
7. Percentage of IT budget allocated to electronic commerce
8. Justification for electronic commerce investment
9. Types of electronic commerce involvement
10. Barriers to electronic commerce developments.
11. Technical infrastructure changes made to meet electronic commerce requirements
12. How managers foresee changes to support electronic commerce

13. Measure used to assess the success of  
electronic commerce initiatives in an organization

Validity of the Instrument

In the broad sense, validity is defined by Lang and Heiss (1984) as "the degree to which a procedure or device does what it claims to do" (p. 187). Best (1981) states that the only measure of validity available to survey instrument is established by submitting the instrument to the scrutiny and considered judgment of subject-matter specialists. The following panel of experts was consulted to measure the validity of instruments used in this study:

Dr. Mohammed F. Fahmy  
Professor and Department Head of Industrial  
Technology  
University of Northern Iowa, USA

Dr. Sue A. Joslyn, school of Health, Physical  
Education and Leisure Services  
Associate Professor  
University of Northern Iowa, USA

Dr. Abdulkader A. Alfantookh  
General Manager, Saudi Online  
Saudi Arabia

Dr. Badr H. Al-badr  
CIO, Al Alamiah Internet  
Saudi Arabia

Fahad A. Al-Jarbou  
Technical Manager, Saudi Analyst House for  
Information Systems,  
Saudi Arabia

#### Pilot Study

Before administrating any survey, a pilot test of the questionnaire should be conducted by any researcher to assure validity. Basically every questionnaire could be changed in some way to make it easier for the respondents to complete by decreasing ambiguity, making it clearer and easier to read (Fowler, 1984) and improving the validity of the questionnaire in order to obtain appropriate responses needed for the research. Therefore, the questionnaire was sent by electronic mail to three Internet users, three experienced IT professionals, and three commercial organization managers and owners in Saudi Arabia. These nine people were asked to answer all the questions on the questionnaire and give comments about the appropriateness and clarity of the questions.

Some modifications in the wording used and the format of the questionnaire were made according to the validators' suggestions. The modified questionnaire was shown to each of the five

validators for a second review after the revision to confirm the modification was appropriate. All of the five validators expressed their satisfaction about the new revision.

#### Data Collection

The initial questionnaire was posted on the Web, and e-mails were sent to the study sample after the review of the pilot study. Three steps followed in the data collection process. The procedures and timeline employed in this process are illustrated graphically in Figure 2. The electronic questionnaire was placed on-line at <http://www.geocities.com/ksaecommerce/Surveys/default.htm>

1. The first wave of electronic mailings, which included the location of the survey on the Web, an attachment copy of the survey in Arabic (see Appendixes A and B), and a cover letter were sent on June 12, 2000. The cover letter introduced the purpose of the study and assured the confidentiality of the individual responses.

2. The first follow-up began on June 20, 2000, eight days after the initial mailing, with a reminder of the survey location on the Web and an

additional copy of the Arabic questionnaire attachment to each subject who had not responded.

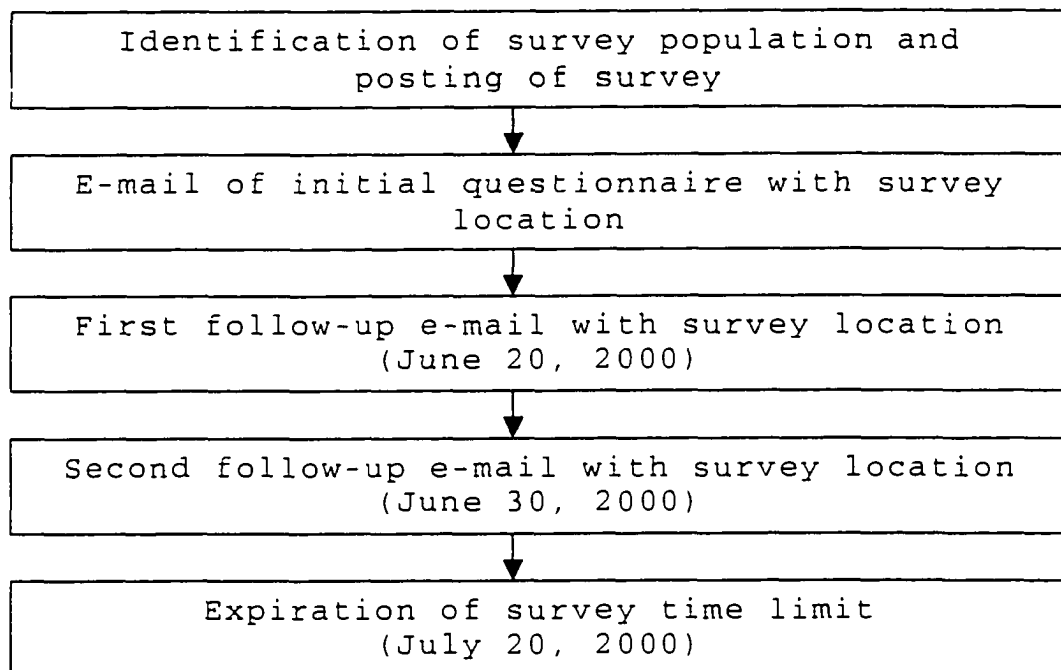


Figure 2. Data collection procedures flow chart.

3. The second follow-up began at the end of June 2000, 10 days after the second mailing, with a reminder of the survey location and an additional copy of the Arabic questionnaire attachment to each subject who had not returned the questionnaire at that time. The deadline for submitting the survey was July 20, 2000.



### Analysis of the Data

The data were subjected to statistical analysis and procedures, including descriptive statistics, chi-square, mean, and standard deviation analysis. The Statistical Package for Social Sciences (SPSS) computer program was used to accomplish the statistical analysis.

### Summary

This chapter has provided precise descriptions of the research questions, research design, and methods employed to select the survey population and sampling, procedures used in the design and development of the survey instrument, methods used to insure validity and reliability, pilot study, and methods to be used to analyze and display data.

## CHAPTER V

## DATA PRESENTATION AND ANALYSIS

Introduction

The purpose of this study is to provide consumers and commercial organizations in Saudi Arabia with practical information regarding electronic commerce (EC). The researcher attempts to explore the perception of Internet users, information technology (IT) professionals, business owners, and managers of online businesses in Saudi Arabia. The results of this study will be used to reduce information gaps in future organizational endeavors, to uncover previously undiscovered attributes of EC, and to increase awareness of EC to all parties involved. To achieve these goals, a questionnaire was posted on the World Wide Web at <http://www.geocities.com/ksaecommerce/Surveys/default.htm>, and e-mails were sent to the study sample after review of the pilot study. To avoid someone from submitting the survey more than one time a code was impeded into the survey to keep recording the IP addresses for the respondents. By recording the IP address I guaranteed the integrity

and validity of survey. Consistent with the statistical analyses discussed in chapter III, analysis of the data was undertaken using the Statistical Package for Social Sciences (SPSS) computer program.

#### Return Rate

The survey for electronic commerce consisted of two instruments. The first instrument (Survey A) consisted of 37 questions and was sent to 80 randomly selected Internet users in Saudi Arabia. A total of 45 (56.25%) questionnaires were returned. The second instrument (Survey B) consisted of 21 questions and was sent to 80 randomly selected IT professionals, managers, and business owners. A total of 49 (61.22%) questionnaires were returned. Eight additional questionnaires were returned after the survey time limit expired (July 20, 2000) and, therefore, were not included in this survey.

#### Demographic Information

Demographic data pertaining to respondents in this study (Survey A) were collected in order to achieve information regarding (a) gender, (b) age, (c) income, (d) location, (e) education level, (f)

job position, (g) cost of Internet access, and (h) Internet access location.

As illustrated in Table 4, the greatest proportion of respondents was male (82.2%).

Table 4

Gender Distribution of Respondents

Gender	<u>n</u>	%
Male	37	82.0
Female	8	18.0

Table 5 reports the age of the respondents in six-year increments, starting with the category of under 16 years of age. Only 2.2% of this sample of Saudi Arabia's Internet users was under the age of 16 years. Internet users aged 25-34 years represent the largest category (66.7%).

Table 6 summarizes the respondents' level of income. Of the 45 respondents, 2.2% declined to disclose their income. Internet users with an income level under 3,000 Riyals per month represented 17.8% of all respondents. Approximately

40% of the respondents reported an income level of more than 10,000 Riyals per month.

Table 5

Age Distribution of Respondents

Age	<u>n</u>	%
Under 16	1	2.0
16 to 24	7	16.0
25 to 34	30	67.0
35 to 44	6	13.0
45 to 54	1	2.0
Over 55	--	--

Table 6

Income Level Distribution of Respondents

Level of income (in Riyals)	<u>n</u>	%
Did not disclose	1	2.0
Under 3,000	8	18.0
3,000 to 5,000	6	13.0
5,000 to 7,000	2	5.0
7,000 to 10,000	10	22.0
Over 10,000	18	40.0

In Table 7, the respondents' geographic distribution is organized into five major locations and is presented from highest to lowest percentage value. Twenty-one (46.7%) of the respondents live in Riyadh, the capital of Saudi Arabia, 9 (20%) are from Jeddah, the second largest city, and 8 (17.8%) respondents reported being from other cities.

Table 7

Geographic Distribution of Respondents

Location	<u>n</u>	%
Riyadh	21	47.0
Jeddah	9	20.0
Other	8	17.0
Damam	3	7.0
Alqwiyyah	3	7.0
Makkah	1	2.0

In Table 8, the respondents' education level is presented from highest to lowest percentage value. The majority of Internet users in this sample hold a

four-year college degree (42.2%), and 31.1% of the respondents have a Master degree.

Table 8

Education level Distribution of Respondents

Education level	<u>n</u>	%
College graduate (4 year)	19	42.0
Master's degree (MS)	14	31.0
Some college	7	16.0
High school or equivalent	4	9.0
Other	1	2.0

Table 9 reports the level of employment of the respondents. The majority of respondents are managers (40%), and only 2.2% are in the writer/editor category.

The location of the respondents' Internet access is presented in Table 10. Respondents could indicate more than one location. The highest ranked location is home, with 66.7%. About 64.7% access the Internet from work. Subject could select more than one response, so percentages do not add up to 100%.

Table 9

Job Position Distribution of Respondents

Position	<u>n</u>	%
Manager	18	40.0
Technical	13	28.9
Student	8	17.8
Other	3	6.7
Academic	2	4.4
Writer/Editor	1	2.2

Table 10

Internet Access Location of Respondents

Ranking	Access location	Yes		No	
		<u>n</u>	%	<u>n</u>	%
1	Home	30	66.7	15	33.3
2	Work	29	64.7	16	35.6
3	Internet café	4	8.9	41	91.1
4	School	3	6.7	42	93.3
5	Other	3	6.7	42	93.3

Research Question 1

The first research question was: For what do consumers in Saudi Arabia use the Internet? To



answer this question, Items 13 and 16 of Survey A were analyzed. Responses are summarized in Tables 11 and 12, from highest to lowest percentage values. Each item is accompanied by the number of responses (n) and percentage value. As shown, the majority of respondents use the Internet for e-mail (93.3%) and personal research (68.9%).

Table 11

Type of Internet Usage in Saudi Arabia

Rank-order	Type of Internet usage	Yes		No	
		<u>n</u>	%	<u>n</u>	%
1	E-mail	42	93.3	3	6.7
2	Research (personal)	31	68.9	14	31.1
3	Research (work)	29	64.4	16	35.6
4	Product information	29	64.4	16	35.6
5	Entertainment	24	53.3	21	46.7
6	Chat	22	48.9	23	51.1
7	Shopping	9	20.0	36	80.0
8	Other	7	15.6	38	84.4

As shown in Table 12, the most important product/service purchased over the Internet was

identified as magazines/books ( $\underline{n} = 15$ ; 33.3%)  
 followed by computer software ( $\underline{n} = 13$ ; 28.9%).

Table 12

Type of Products/Services Purchased Over the Internet

Rank-order	Product/service	Yes		No	
		<u>n</u>	%	<u>n</u>	%
1	Magazines/books	15	33.3	30	66.7
2	Computer software	13	28.9	32	71.1
3	Travel	10	22.2	35	77.8
4	Computer hardware	9	20.0	36	80.0
5	Information services	8	17.8	37	82.2
6	Sporting goods	4	8.9	41	91.1
7	Compact discs/tapes/ videos	4	8.9	41	91.1
8	Other	4	8.9	41	91.1
9	Clothing	2	4.4	43	95.6
10	Home furnishings/ appliances	2	4.4	43	95.6
11	Jewelry	2	4.4	43	95.6
12	Gadget	2	4.4	43	95.6
13	Toys	--	--	--	--

Research Question 2

The second research question was: What is the effect of income level on frequency of Internet shopping? To answer this question, Items 3 and 15 of Survey A were analyzed. The results are listed in Table 13 and rank-ordered from highest to lowest percentage value. The number of responses and percentage value accompanies each item. The majority of the respondents (53.3%) did not purchase products previously while 46.7% purchased one or more product.

Table 13

Numbers of Times Products Purchased Per Month

Rank-order	Number of times	<u>n</u>	%
1	Not at All	24	53.3
2	1 to 3 times	14	31.1
3	4 to 6 times	4	8.9
4	7 to 9 times	2	4.4
5	10 + times	1	2.2

Note.  $X^2 (20, N = 45) = 19.122, p > .05.$

### Research Question #3

The third research question was: Why do/do not consumers purchase products/services over the Internet? In order to answer this question, Items 18 and 23 through 27 of the Survey A were analyzed. These are listed in Table 14 accompanied by frequency distribution of responses, mean, and standard deviation. Over half of the respondents thought the most important factor was security with response of 77.8% strongly agree or agree, 15.6% neutral, and (6.6%) disagree or strongly disagree. The mean score was 1.80 for the same group, which indicated that it is in between strongly agree and agree. Another 60% of respondents disagree or strongly disagree that because they don't have a credit card is a reasons not purchasing online.

### Research Question 4

The fourth research question was: What are consumers' levels of familiarity with the Internet and EC in Saudi Arabia? To answer this question, Items 9, 12, and 20 of Survey A were analyzed. The results are shown in Tables 15, 16, and 17, rank-ordered from highest to lowest percentage values.

Table 14

Factors Effecting Consumers Online Purchases

Factors	SA	A	N	D	SD
	%	%	%	%	%
Security is a problem $\underline{M} = 1.80$ $\underline{SD} = 1.01$	51.1	26.7	15.6	4.4	2.2
Need assistance with order $\underline{M} = 3.22$ $\underline{SD} = 1.13$	2.2	28.9	31.1	20.0	17.8
Faster/easier to purchase locally $\underline{M} = 2.69$ $\underline{SD} = 1.29$	17.8	33.3	26.7	6.7	15.6
Generally uncomfotable with the idea $\underline{M} = 3.16$ $\underline{SD} = 1.30$	15.6	15.6	20.0	35.6	13.3
Don't have a credit card $\underline{M} = 3.58$ $\underline{SD} = 1.60$	17.8	13.3	8.9	13.3	46.7
Prefer ordering by phone $\underline{M} = 3.47$ $\underline{SD} = 1.31$	6.7	20.0	24.4	17.8	31.1
Fearful of receiving unsolicited e-mails $\underline{M} = 3.00$ $\underline{SD} = 1.28$	13.3	24.4	26.7	20.0	15.6
Dislike the available payment methods $\underline{M} = 3.36$ $\underline{SD} = 1.23$	6.7	20.0	26.7	24.4	22.2

(table continues)

Factors	SA	A	N	D	SD
	%	%	%	%	%
Shopping over the Internet would be expensive since it would require me to pay for access to the Internet	4.4	26.7	20.0	40.0	8.9
$\underline{M}$ = 3.22					
$\underline{SD}$ = 1.08					
Shopping over the Internet would allow me to have better item selection in my shopping	11.1	53.3	22.2	13.3	--
$\underline{M}$ = 2.38					
$\underline{SD}$ = 0.86					
Shopping over the Internet would allow me to get better prices.	13.3	55.6	15.6	15.6	13.3
$\underline{M}$ = 2.36					
$\underline{SD}$ = 0.96					

Note. SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree,  $\underline{M}$  = Mean,  $\underline{SD}$  = Standard Deviation,  $\underline{N}$  = 45.

Each is accompanied by number and percentage value of responses. Among the respondents, 33.3% have been using the Internet for 1 to 3 years, compared with 8.9% who have been using the Internet for 1 to 3 months.

Table 15

Length of Time as a Member of an Online Community

Time period	<u>n</u>	%
1 to 3 years	15	33.4
More than 4 years	11	24.4
3 to 12 months	9	20.0
Less than 1 month	6	13.3
1 to 3 months	4	8.9

Further analysis of the data in Table 16 identifies the amount of time respondents spend online weekly. As shown 57.8% of the respondents spend 16 or more hours online, 15.6% spend 1 to 5 hours, and 2.2% of the respondents spend less than one hour online. The rest used other payment methods as reported in the table.

As Table 17 shows, 60% of the respondents use their credit cards to purchase products and services from the Internet.

Table 16

Weekly Hours Online

Amount of time	<u>n</u>	%
16 + hours	26	57.8
1 to 5 hours	7	15.6
11 to 15 hours	6	13.3
6 to 10 hours	5	11.1
Less than 1 hour	1	2.2

Table 17

Payment Methods Distribution

Payment Methods	Yes		No	
	<u>n</u>	%	<u>n</u>	%
Credit card	27	60.0	18	40.0
Debit/check card	4	8.9	41	91.1
Digital cash	4	8.9	41	91.1
Sent a check to the company	6	13.3	39	86.7
Made payment with cash on delivery	4	8.9	41	91.1
Other	1	2.2	41	91.1



### Research Question 5

The fifth research question was: What are the consumers' opinions of Internet-based shopping? To answer this question, Items 28 through 37 of the Survey A were analyzed. The result presented in Table 18, accompanied by mean response and standard deviation. The percentage of the respondents who agreed that "it is easier to find an Internet-based vendor that sells the item I wish to purchase" is 64.5%, compared with 13.3% for respondents who disagree. The majority of the respondents were generally positive in their expectations. The mean score for consumers' expedition are in the area between 2.02 and 3.38. As seen from the table 79.8% of the respondents reported they strongly agree or agree that it is easier to compare similar items between different Internet-based vendors compared to only 6.7% who disagree or strongly disagree.

Table 18

Consumer Expectations

Consumers expectations	SA	A	N	D	SD
	%	%	%	%	%
It is easier to find an Internet-based vendor that sells the item I wish to purchase M = 2.38 <u>SD</u> = 0.96	15.6	48.9	22.2	11.1	2.2
I can quickly gather information about products and services I wish to purchase from Internet-based vendors M = 2.11 <u>SD</u> = 0.91	24.4	51.1	13.3	11.1	--
Internet-based vendors deliver orders/ services in a more timely manner M = 2.51 <u>SD</u> = 0.92	11.1	40.0	40.0	4.4	4.4
It is easier to place orders with Internet-based vendors M = 2.36 <u>SD</u> = 0.80	8.9	57.8	22.2	11.1	--
Internet-based vendors provide better customer service and after-sales support M = 2.60 <u>SD</u> = 0.96	11.1	40.0	26.7	22.2	--

(table continues)

	SA	A	N	D	SD
	%	%	%	%	%
Consumers expectations					
Placing an order for an item takes less time with Internet-based vendors	20.0	44.4	13.3	22.2	--
$\underline{M}$ = 2.38					
$\underline{SD}$ = 1.05					
I can gather more information from Internet-based vendors about an item I want to purchase	22.2	53.3	11.1	11.1	2.2
$\underline{M}$ = 2.18					
$\underline{SD}$ = 0.98					
Returns and refunds are easier with Internet-based vendors	11.1	35.6	24.4	22.2	6.7
$\underline{M}$ = 2.78					
$\underline{SD}$ = 1.13					
Internet-based vendors are better at providing me easy access to the opinions of experts about products I wish to purchase	13.3	60.0	15.6	8.9	2.2
$\underline{M}$ = 2.27					
$\underline{SD}$ = 0.89					
It is easier to compare similar items between different Internet-based vendors	24.2	55.6	13.3	6.7	--
$\underline{M}$ = 2.02					
$\underline{SD}$ = 0.81					

Note. SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree,  $\underline{M}$  = Mean;  $\underline{SD}$  = Standard Deviations,  $\underline{N}$  = 45

Research Question 6

The sixth research question was: To what extent are information technology (IT) professionals, senior managers, and business owners informed of EC benefits? To answer this question, Items 1, 3, 6, and 9 of the Survey B were analyzed. The results reported in Tables 19, 20, and 21 rank-ordered from highest to lowest percentage value. For each item, the number of responses and percentage value are given. As shown in Table 19, 38.8% of the respondents' companies have EC in place. The same percentage does not have EC in place.

Table 19

Electronic Commerce in Place

EC in place	<u>n</u>	%
Yes	19	38.8
No	19	38.8
Plan to in the future	11	22.4

As shown in Table 20, 65.3% of managers believe that EC is the primary transaction medium of the future.

Table 20

Perceptions of EC as the Primary Transaction Medium of the Future

EC and the future	n	%
Yes, in the near future	32	65.3
Yes, in the distance future	15	30.6
No	2	4.1

Table 21 shows that 85.7% of managers agree that EC is a means of transforming their business, and 69.4% of the respondents are confident that the senior management of their companies is sufficiently well informed to meet the challenges of EC.

Table 21

EC and Management's Understanding (N = 49)

Factors	SA	A	N	D	SD
	%	%	%	%	%
Do you see EC as a means of transforming your business?	18.4	67.3	12.2	--	12.2
I am confident that the senior management of my company is well informed to meet EC challenges of?	26.5	42.9	16.3	10.2	4.1

Note. SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree.

Research Question 7

The seventh research question was: What are the factors affecting the willingness of IT professionals, managers, and owners to adopt EC? To answer this question, Items 10, 15, and 16 of Survey B were analyzed. The results are presented in Tables 22 and 23, rank-ordered from highest to lowest yes percentage value. Each is accompanied by the number of responses, percentage value. The most important factor was found to be security/fraud (Yes 75.5%).

Table 22

Barriers to EC Development in Saudi Arabia (N = 49)

Barriers	Yes		No	
	<u>n</u>	%	<u>n</u>	%
Security/fraud	37	75.5	12	24.5
Bandwidth/systems performance	27	55.1	22	44.9
Lack of skills	24	49.0	25	51.0
Cost	20	40.8	29	59.2
Lack of executive sponsorship	15	30.6	34	69.4
Higher priority development	11	22.4	38	77.6
Provider fear	10	20.4	39	79.6
Other	5	10.2	44	89.8

The data reported in Table 23 show that 79.6% of respondents agreed that the lack of tele-infrastructure in Saudi Arabia is a problem.

Research Question 8

The eighth research question was: What are the primary business objectives of EC strategies in Saudi Arabian commercial organizations? To answer this question, Items 11 and 13 of the Survey B were analyzed. The results are reported in Tables 24 and 25, rank-ordered from highest to lowest percentage

Table 23

EC Inhibitors in Saudi Arabia (N = 49)

Inhibitors	SA	A	N	D
	%	%	%	%
Telecommunications infrastructure in the Saudi Arabia is a serious inhibitor to my company's EC plans	46.9	32.7	10.2	10.2
<u>M</u> = 1.84				
<u>SD</u> = 0.99				
Lack of consumer understanding in Saudi Arabia is a serious inhibitor to my company's EC plans.	34.7	44.9	10.2	10.2
<u>M</u> = 1.96				
<u>SD</u> = 0.93				

Note. SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, and SD = Strongly Disagree, M = Mean, SD = Standard deviation.

value. Each is accompanied by number of responses and percentage value. As Table 24 shows, the most important primary business objective stated was to increase revenue (39.8%) followed by improving customer services (32.7%).



Table 24

Primary Business Objectives

Objectives	<u>N</u>	%
Increased revenue	19	38.8
Improved customer service	16	32.7
Cost reduction	6	12.2
New sales channel	5	10.2
Customer loyalty	2	4.1
Other	1	2.2

In regards to justification of EC investment (Table 25) 49% of the respondents took into account that EC investment must generate immediate positive financial return compared with 51% who did not think this was a justification for EC investment.

Table 25

Justification of EC Investment

Reasons	Yes		No	
	<u>n</u>	%	<u>n</u>	%
The investment must generate immediate positive financial return	24	49.0	25	51.0
EC is a strategy very important; it is the future and we must invest to get experience	38	77.6	11	22.4
Competitive pressures require my company to invest in EC initiatives.	31	63.3	18	36.7
My customers expect my company to provide an EC capability	32	65.3	17	34.7
Other	3	6.1	46	93.9

Research Question 9

The ninth research question was: How are Saudi Arabia's commercial organizations ready for EC? To answer this question, Items 12 and 17 of survey B were analyzed. The results are presented in Tables 26 and 27. Table 26 shows that 63.3% of the companies have implemented technical infrastructure changes to support EC by installing servers compared

to 18.4% who have not implemented any technical infrastructure changes. Of the 49 respondents 34.7%

Table 26

Technical Infrastructure Changes to Support EC  
(N= 49)

Changes	Yes		No	
	<u>n</u>	%	<u>n</u>	%
Servers have been/will be added	31	63.3	18	36.7
PCs have been/will be added	27	55.1	22	44.9
Network computers have been/will be added	25	51.0	24	49.0
Legacy data are/will be accessed	14	28.6	35	71.4
Bandwidth has been/will be added	20	40.8	29	59.2
Nothing has changed	9	18.4	40	81.6
Other	4	8.2	45	91.8

had not allocated any funds for EC, and 4.1% reported that more than 50% of their budget is allocated for EC (Table 27).

Table 27

Budget Allocation to EC

<u>% of budget</u>	<u>n</u>	<u>%</u>
None	17	34.7
1 to 25%	24	49.0
26 to 50%	6	12.2
More than 50%	2	4.1

Research Question #10

The 10th research question was: What measures do commercial organizations use to evaluate the success of EC? To answer this question, Item 18 of the Survey B was analyzed. The results are given in Table 28, rank-ordered from highest to lowest yes percentage value. As shown from the table, the number of transaction (67.3%) was the most frequent measure used by commercial organizations to evaluate the success of EC. Other highly rated measures that were reported, were: number of hits, rating of the customer satisfaction, and cost saving.

Table 28

Measures of Evaluating EC Success (N = 49)

Measures	Yes		No	
	<u>n</u>	%	<u>n</u>	%
Number of transactions	33	67.3	16	32.7
Number of hits/visitors	27	55.1	22	44.9
Customer satisfaction rating	27	55.1	22	44.9
Cost saving	25	51.0	24	49.0
Total value of goods sold over the Internet	23	46.9	26	53.1
Revenue per transaction	19	38.8	30	61.2
Customer retention statistics	10	20.4	39	79.6
None	3	6.1	46	93.9
Other	1	2.0	48	98.0

Summary

This chapter analyzed and presented data gathered from the cluster sample of 45 Internet users and the sample of 49 IT professionals, managers, and business' owners in Saudi Arabia. The data were presented in tables and discussed briefly.

## CHAPTER 5

## SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMANDTIONS

Introduction

The basis of any research study is to identify a problem: collect, report, and analyze data; draw conclusions from the findings; and then make recommendations based upon those conclusions (Clover & Balsley, 1984). No research can be truly conclusive without constant revision and scrutiny. This study was designed to provide consumers and commercial organizations in Saudi Arabia with practical information regarding electronic commerce (EC). Taken into consideration that response rate was low perhaps because most Internet users in Saudi Arabia are computer illiterate or possibly they do not see the importance of this survey. The researcher explored the perceptions of Internet users, information technology (IT) professionals, business owners, and managers of online business in Saudi Arabia. This chapter discusses this findings, present the conclusions of the study, gives recommendations, and offers suggestions for future research.

### Findings and Discussion

The research questions for this study are used as a framework for summarizing and discussing the findings.

The first research question was: What do consumers in Saudi Arabia use the Internet for? The majority of Internet users use the Internet for e-mail ( $n = 40$ ; 93.3%). This shows that most respondents are less familiar with other uses of the Internet besides e-mail, and that is because the Internet was only introduced in Saudi Arabia in early 1999. Another reason why this number is high may be because of the importance of e-mail and how e-mail simplifies communications between individuals. The results from those 93.3% of respondents who use e-mail were encouraging to commercial organizations in Saudi Arabia, since it may indicate receptiveness EC.

The results of the study indicates a promising level of respondents shopping online (20%), when one takes into considerations the risks associated with shopping online, as acknowledged by ITTA (1994). ITTA stated that there is a great deal of concern

regarding the security of financial information transmitted over the Internet and that this concern has an impact on consumer willingness to buy or sell products. The result of the study also shows that 64% of Internet users in Saudi Arabia use the Internet to find information about products. This result implies that Internet users in Saudi Arabia are aware of how easy finding information and comparing products on-line. This also may suggest that Internet users look for product information on the Internet and refer to the Web before making an actual purchase.

The second research question was: What is the effect of income level on frequency of Internet shopping? The result of chi-square test found no significant differences between respondents' income level and the number of times they purchased products online. The results may imply that respondents with high-level incomes are the majority of online consumers in Saudi Arabia, even though a large number of users have a low income, presumably students (17.8%) who either do not have credit cards or older people who have never heard of the



Internet. Another reason for this finding might be that Internet users do not purchase products/ services online because of vendor unreliability and insecurity of financial transactions as indicated in the review of literature by (Gupta, 1995). At this writing, such limitations impact consumer behavior on the Web: currently, the majority of consumers use the Internet to do e-mail, browse, or search much more than to actually purchase something (Booker 1995, Wintrob 1995). Such a limitation could be overcome by boosting requiring legal and technical tools, such as mechanisms for providing security, certification, privacy and redress, as well as education of users.

The third research question was: Why do/do not consumers in Saudi Arabia purchase products/services over the Internet? Lack of trust in payment security continues to be the most cited reason for inhibiting online purchasing. The largest proportion of respondents (77.8%) believed that security is a major problem. Dwyer (2000) stated how important it is that Saudi corporate and individual Internet users understand that hackers have begun to step up

their efforts to glean information and take control of individual computers and networks in the Kingdom. The researcher found that Internet users (68.9%) take into account that shopping online would allow them to get better prices. Thus, they understand the benefits of shopping online but still do not trust it enough, or may need to be educated about its benefits. However, 51.1% of all respondents considered that it is faster/easier to purchase locally. The results indicate that Internet users in Saudi Arabia are not satisfied with the services they are getting from local businesses. This suggests that the door is wide open for electronic commerce to gain a share of the market by providing better customer services as stated by review of the literature, particularly from the comments by Martin (1999).

The fourth research question was: What are the consumers' levels of familiarity with the Internet and electronic commerce in Saudi Arabia? Responses to this question confirmed that Internet use in Saudi Arabia is new and suggested also that the Internet will gain importance as an advertising

medium. About 42.2% of the respondents had used the Internet for less than one year (see Table 15); with the explosive growth of the Internet in Saudi Arabia the number of new users will increase awareness and Internet shopping. This provides substantial support for the claim that Internet users in Gulf countries, and especially Saudi Arabia, are increasing (Kamil, 1999.) Thoughts in this regard by (Kamil, 1999) indicated that the younger population of Saudi Arabia is much more computer literate and looks for technologically driven products. As this young population moves into the management cadre or takes over business responsibilities from their elders, electronic commerce will begin to realize its full potential. Another finding is that more than 60% of the respondents used credit cards as a payment method to purchase products online, compared with only 8.9% who used one of the most secured method a digital signature. This indicates that many respondents were unaware of alternative secured payments methods.

The fifth research question was: What are the consumers' opinions of Internet-based shopping?

A considerable proportion of respondents indicated that one of the main reasons they buy online is that they can gather information quickly about products and services they wish to purchase from Internet-based vendors (75.5%). When shopping online users can easily find all needed information about the product. Price competitions among online vendor should promote lower prices and thus more Internet purchases. Previous research suggests that the Internet provides consumers with information that allows for price comparisons (Zellweger, 1997). Alba (1997) states that the Internet increases price comparisons and intensifies competition among the online vendors who try to attract potential buyers.

Another 64.4% of the respondents who shop online suggested that placing an order for an item takes less time with Internet-based vendors. This result was particularly surprising, taking into consideration the limitations in the Saudi postal system are a constraint, home delivery and postal insurance are not available; only post office boxes are used. A large proportion of Internet users (79.8%) consider that it is easier to compare

similar items between different internet-based vendors when shopping on-line. This result suggest that the consumer will be getting a better prices by shopping on-line since the possibility of finding the right product with the right price is greater. This result will have its consequence on companies' competitiveness in Saudi Arabia and that will help prices to go down and quality of services to boost.

The sixth research question was: To what extent are IT professionals, senior management, and business owners informed of electronic commerce benefits? A considerable number of companies in Saudi Arabia reported having electronic commerce in place. This confirms previous research, which suggested more commercial organizations are finding out the benefits of online businesses. Those companies that are already established online presence are presumably supported by a solid business administration and a management familiar with electronic commerce can provide the organization with the efficiency and brainpower needed to maintain a profitable online store. A large proportion of managers (65.5%) believe that

electronic commerce will be the primary transaction medium of the future, indicating their awareness of EC's importance.

This study also explored how well management is informed to meet the challenges of electronic commerce. Results indicate that the majority of respondents reported that the management of their companies is well informed of electronic commerce challenges. This suggests that management is willing to adopt electronic commerce while taking into account the risk that comes with it.

The seventh research question was: What are the factors affecting the willingness of IT professionals, business' owners, and managers to adopt electronic commerce? The researcher found that more than 75% of the respondents reported security and fraud as two of the main concerns. With the increase of hackers and uneducated users in Saudi Arabia since the introduction of the Internet early 1999, security has become the main concern. This supports the analysis of the security and fraud issues that emerged from the review of literature; particularly from the comments by (Schell, 1996)

which suggests security and fraud issues are two of the factors that impact electronic commerce implementation.

Conversely, several respondents indicated bandwidth/systems performance as one of the main barriers to electronic commerce development in Saudi Arabia. This suggests that consumers in Saudi Arabia that find telecommunications services often are too expensive, bandwidth is too limited, and services are unavailable or unreliable. This finding also supports the argument that telecommunications infrastructure in Saudi Arabia is a serious inhibitor to commercial organization's electronic commerce plans.

The eighth research question was: What are the primary business objectives of EC strategies in Saudi Arabia's commercial organizations? Several respondents (38.85) suggested that increased revenue is one of their primary objectives. This finding indicated that methods of revenue generation for the most part are online advertising and online sales. At one time, the value of online advertising and the future of online sales, due to security concerns

were questioned. However, with the growth of the Internet, improved security measures of online commerce, and the expansion in the number and types of companies online and products available, the ability of the Internet to help businesses turn a profit has become clear. According to Forrester Research, in 1999 approximately 20 million online transactions were processed in Saudi Arabia.

Online sales allow businesses to make sales 24 hours a day, seven days a week, instead of limiting the customer to the organization's business hours that could be difficult if the customer and businesses are half a world apart. Many companies in Saudi Arabia can still have a phone number for ordering for those people who still are not comfortable giving sensitive information such as credit card numbers online. Furthermore, a considerable number of respondents indicated that improving customer service is the primary business objective of their company's strategy. Because the Web is designed as a communications tool, it is an ideal medium for customer/patron relations. Many companies are placing specifications, instructions,



manuals, technical support information, and trouble shooting knowledge bases on-line. These resources can often help customers enough to save them from having to contact the company directly, and even then the Internet can help. With the clarity and effective communication of a letter and almost the speed of a phone call but the convenience of being usable at any time of day, electronic mail is becoming an important tool for businesses to make it easier for customers to reach support. Companies are also starting to use e-mail to inform customers of problems, upgrades, updates, and fixes, as well as sending them information on new products and promotions, with perhaps a discount, meetings, seminars and training sessions, and sometimes even contests and give a ways. Almost two thirds of the respondents believe that competitive pressures require companies to invest in EC initiatives. A company that does not invest in EC will be left behind. A small company's quest for survival and growth is preconditioned on the development of electronic commerce. Management in the firms needs to look into the potential of alliances and

specialization as tools in increasing competitiveness against large firms. Another strategic option is establishing a presence in markets in remote geographical regions.

The ninth research question was: How are Saudi Arabia's commercial organizations ready for EC? The result was encouraging for those 63.3% who have allocated an electronic commerce fund that they have used to add servers, PCs, network computers, and other technologies to support electronic commerce implementations. This number strongly suggests that commercial organizations are starting to understand that electronic commerce provides a means of catching up with technology in industrialized nations. This finding also indicates that most commercial organizations are ready for electronic commerce if not already using it. However, the problem of relying on consumers' awareness needs to be addressed. This finding also indicates that commercial organizations are ready to explore new channels opened up by EC through which to market and sell products.

The tenth research question was: What measures do commercial organizations use to evaluate the success of EC? Commercial organizations that have adopted electronic commerce use the number of transactions to evaluate their electronic commerce success. Even though electronic commerce in Saudi Arabia is in its early stages, organizations that have implemented EC are hoping to gain profit in the near future, which may be surely optimistic, according to Groves (1999). Various other measures of successes factors were also mentioned, such as customer satisfaction rating, cost saving, total value of goods sold over the Internet, revenue per transaction, and customer retention statistics.

#### Conclusions

Not long ago electronic commerce was only an idea to many companies in Saudi Arabia. Now companies transfer information back and forth through electronic channels without a second thought. However, as companies get more acquainted with using the Internet as a method of conducting business. They may be able to realize the potential of buying and selling over electronic lines without

the fear of security violations and with the ability of establishing long-term relationships with vendors and customers with a click of a mouse button.

Consumers, IT professionals, managers, and business owners' awareness, perceptions and attitudes toward shopping via the Internet depend highly on such factors as level of security and fraud. There seems to be a direct relationship between the level of security and the attitude toward using the Internet for shopping. In Saudi Arabia, cultural factors may also have an effect on electronic shopping. One of these factors is that females do not drive cars and so may find it easier to shop through the Internet, given that women make up the majority of local shoppers in the Saudi Arabian market. In addition, the research uncovered some of the barriers related to electronic commerce from the consumer's point of view: while on-line transactions are convenient, immediate off-line delivery in Saudi Arabia is costly and inefficient. Improvements in Internet and EC technologies will increase productivity, allowing commercial

organizations in Saudi Arabia to adopt new business models to capture advances in technology.

Electronic commerce will lead to a difference in the way Saudi Arabia live their lives and accomplish their day-to-day work in Saudi Arabia. It will also fundamentally change the way business is conducted, goods and services are promoted, and business strategies are developed. EC invites consumers to surf the web to find the best deals and the best quality products. With increases in security measures, Internet connectivity, and familiarization with doing business over the Internet, businesses and consumers in Saudi Arabia will certainly take advantage of EC.

In addition, the research also revealed barriers related to electronic commerce from the companies' point of view. Companies need to incorporate EC into their current business strategies and use it for the actual benefits that can be created, rather than as technology for technology's sake.

In short, the research indicated that Internet commerce will flourish after certain problems, such

as security issues, have been resolved, and more consumers start using the Internet.

### Recommendations

Based on the findings and conclusions of this study, the following recommendations are offered:

1. Because Internet in Saudi Arabia is less than 3-years old, private sector and universities should take an active role in educating people regarding the benefits of it.

2. Information technology companies should work to increase customers' confidence in EC. Where governmental involvement is needed, its aim should be to support and enforce a predictable, minimalist, consistent, and simple legal environment for commerce.

3. Where government intervention is necessary, its role should be to ensure competition, protect intellectual property and privacy, prevent fraud, foster transparency, and facilitate dispute resolution, not to regulate

4. There should be more sites in Arab language from which to shop and overcome language barriers.

5. Updated telecommunication infrastructure is

needed in Saudi Arabia.

6. Well-known companies should be the leaders in starting EC marketing Saudi Arabia to give consumers more confidence and trust in EC.

#### Future Research

A number of recommendations for further research follow from the findings and conclusions of this research. Some of the more important of these are given below:

1. Since \$25 millions on-line purchased being spent on businesses outside of the country for the past 3-years, an interesting future research project could focus on a comparison of factors that affect online shopping versus those that affect more traditional forms of retailing in Saudi Arabia.

2. Further research into interaction between the development of Web pages business-to-consumer (b-to-c) electronic commerce is needed. This is of particular interest as the marketing processes of Internet-based selling mature in Saudi Arabia.

3. Further studies with larger samples and a wider geographic distribution are needed to generalize the findings to a larger population.

4. EC should be studied from the business point of view to explore the concerns and attitudes of businesses toward selling through the Net.



## REFERENCES

- Al-Alefani, S. N. (1999). Global advantages on the Internet. Journal of Management Systems, 16, 14-15.
- Al-Yousuf, M. (1999, May 18). New economy, old rules? PC Magazine Middle & Near East, 65, 21-22
- Al-Zoman, A. (1999). Internet network in Saudi Arabia. KACST.
- Alba, J. (1997). Interactive home shopping: Consumer, retailer and manufacturer incentives to participate in electronic marketplaces. Journal of Marketing, 61(3), 38-54.
- Albrecht, S. W. (2000). Electronic commerce: A manager's guide. Reading, MA: Addison Wesley Longman.
- Amor, D. (1999). The e-business (R) evolution. Englewood Cliffs, NJ: Prentice-Hall.
- Arensman, J. F. (1998). Management on the World Wide Web. Englewood Cliffs, NJ: Prentice-Hall.
- Babbie, E. R. (1973). History of research methods. Belmont, CA: Wadsworth Publishing.
- Baltensperger, B., & Dermine, J. (1997). European banking in the 1990s. Oxford: Basil Blackwell.
- Behery, F. (1998). Information technology in the Kingdom of Saudi Arabia [On-line]. Available: <http://www.american.edu/carmel/FB9122A/SAUDI.HTML> [04/25/2000]
- Bellafante, G. (1995, Spring). Strange sounds and sights. Time [Special issue: Welcome to cyberspace], pp.14-16.

- Benjamin, L., & Yates, K. (1991). Managing information technology: What managers need to know. Englewood Cliffs, NJ: Prentice-Hall.
- Berdie, D. R., & Anderson, A. F. (1974). Questionnaires: Design and use. Metuchen, NJ: Scarecrow.
- Best, J. W. (1981). Research in education. Englewood Cliffs, NJ: Prentice-Hall.
- Bhattacharaya, S., & Thakor, A. (1998). Contemporary banking theory. Journal of Financial Intermediation, 3, 2-50.
- Bin-Jaafar, O. (1999, January). Future of the economy and electronic commerce in the Kingdom. Al Rajhi Banking Magazine, 52, 21-33.
- Booker, E. (1995, February 20). Web users cruising for info, not purchases. Computerworld, 50, 28-29.
- Bottom, D. (1994, May 16). The 'net' gets raised. Industry Week, 22-25.
- Brown, R. (2000, April 23). E-commerce in the Arab world: An overview. Internet Arab World, 31, 41.
- Cangemi M. P. (1998). Securing electronic commerce. IS Audit Control Journal, 1, 12.
- Clark, T. K., & Westland, J. C. (1999). Global electronic commerce: Theory and case studies. Cambridge, MA: MIT Press.
- Clover, V. T., & Balsley, H. L. (1984). Business research methods (3<sup>rd</sup> ed.). Columbus, OH: Grid Publishing.
- Colony, G. F. (1995). Network strategy service: CIO meets the Internet. The Forrest Report, 12, 7-9.
- Comer, D. E. (1995). The Internet book. Englewood Cliffs, NJ: Prentice-Hall.

- Cronin, M. (1994). Doing business on the Internet: How the electronic highway is transforming American companies. New York: Van Nostrand Reinhold.
- Davis, D., & Cosenza, R.M. (1996). Business research for decision making(4th ed.). Belmont, CA: Wadsworth Publishing Company.
- Dewatripont, M., & Tirole, J. (1994). The prudential regulation of banks. Cambridge, MA: MIT Press.
- Diamond, D., & Dybvig, P. (1983). Bank runs, deposit insurance, and liquidity. Journal of Political Economy, 19, 401-19.
- DITnet (2000, March 12). Number of Internet users in Arab countries edges towards two million [On-line]. Available: [http://www.dit.net/itnews/me\\_internet/users.html](http://www.dit.net/itnews/me_internet/users.html) [4-22-2000]
- Donaton, S. (1995a, April 10). Pathfinder blazes a trail to ads. Advertising Age, 8, 19.
- Donaton, S. (1995b, April 3). Web news with a personal touch. Advertising Age, 8, 11.
- Duke C. R. (1999). The digital estate: Strategies for computing, surviving, and thriving in an internet-working world. New York: McGraw-Hill.
- Dwyer, P. (2000, January 20). Widespread Internet use before e-commerce, says expert. IT News, 6, 12. [Dubai: United Arab Emirates.]
- Ellsworth, J. H., & Ellsworth, E. V. (1994). The Internet business book. New York: John Wiley & Sons.
- European Union. (1997). Communication to the European parliament, the council, the economic and social committee and the committee of the regions [On-line]. Available: <http://ftp.cordis.lu/pub/esprit/docs/ecomcom.pdf> [5/25/2000]

- Fama, E. (1980). Banking in the theory of finance. Journal of Monetary Economics, 6, 39-57.
- Fowler, F. J. (1994). Survey research methods. Beverly Hills, CA: SAGE.
- Fraenkel, F. R., & Wallen, N. E. (1993). How to design and evaluate research in education. New York: McGraw-Hill.
- Gates, B. (1994). Information at your fingertips emerged [On-line]. Available: <http://www.microsoft.com/BillGates/speeches/industry&tech/iayf2005.htm> [5/29/2000]
- Gay, L. R. (1981). Educational research. Columbus, OH: Merrill publishing.
- Groves, K. (199). Beyond the website: Putting E-commerce to work for Canadian firms [On-line]. Available: <http://e-com.ic.gc.ca/using/en/Beyond4.html> [6/9/2000]
- Gupta, S. (1995). HERMES: A research project on the commercial uses of the World Wide Web [On-line]. Available: <http://www-personal.umich.edu/~sgupta/hermes> [6/5/2000]
- Ginsberg J. (1998). Going digital. Washington, DC: Brookings Institution Press and Cato Institute.
- Halal, W. E. (1990). Political economy in an information age: The convergence of a "new capitalism" and a "new socialism." Greenwich, CN: International and Comparative Corporation and Society Research JAI Press.
- Hellwig, M. (1996). Banking, financial intermediation and corporate finance. New York: Cambridge University Press.
- Hoffman, D. L., & Thomas, P. N. (1994, November). Wanted: Net.Census. Wired, pp. 2-11.

- IITA. (1994). Information infrastructure technology and applications: 1994 annual report [On-line]. Available: <http://www.hpcc.arc.nasa.gov/reports/annrep94/iita94.htm> [6/5/2000]
- Jarrah, F. (1999, November 14). Saudi telecom criticized for poor Internet services. DIT Online [On-line]. Available: <http://www.dit.net/ITnews/newsnov99/newsnov15.html> (5/27/2000)
- Kalakota, R., & Whinston, B. G. (1999). Electronic commerce: A manager's guide. Reading, MA: Addison-Wesley.
- Kamel, T. (1999, December). The Internet and the Middle East: Commerce brings region online. Middle East Executive Reports, 4, 12. Dubai, United Arab Emirates.
- Krajewski S. K. (1999). Building the corporate Intranet. New York: John Wiley & Sons.
- LaMay, C. (1991). Media and environment. Washington, DC: Island Press,
- Lang, G., & Heiss, G. D. (1984). A practical guide to research methods. New York: University Press of America.
- MacClaren, C. (1995, December 12). The web means business. PROMO, 5, 31.
- Markus, M. (1987). Toward a 'critical mass' theory of interactive media: Universal access, interdependence, and diffusion. Communication Research, 14, 491-511.
- McClelland, H. F. (1989). Training needs assessment data-gathering, methods: Part 1, Survey questionnaires. Journal of European Industrial Training, 18, 22-26.

- Neven, D. (1990). European banking in the 1990s. Oxford: Basil Blackwell.
- Nicholas J. B., & Bruce C. W. (1992, December 12). Information filtering and information retrieval: Two sides of the same coin. ACM Communications, 35, 26-38.
- Oliver, P., Marwell, G., & Teixeira, R. (1985). A theory of critical mass: Interdependence, group heterogeneity, and the production of collective action. American Journal of Sociology, 9, 552-556
- Othman, A. (1999). Improving the Internet. Saudi Arabian Solutions, p.9. Riyadh, Saudi Arabia: Information and Technology Publishing.
- Parasuraman, A. (1991). Marketing research. Reading, MA: Addison-Wesley.
- Saudi Arabian Solutions. (1999). A different playing field: How will Saudi's bank cope in the global marketplace? (Available from The Information and Technology Publishing Ltd, PO Box 61480 Suite 102, Al Hilal Building, Garhoud Road, Dubai, United Arab Emirates)
- Schell, R. (1996), Information security update Working paper presented to Black Forest Group, St. Andrews, Scotland.
- Seaman, R. (1995). The 1990s so far - what next?. Proceedings of Public transport technology in TransAdelaide, AITPM National Conference, Adelaide, ITS Australia, 8-9.
- Tygar, J. D. (1995, May 13). Atomicity in electronic commerce. Proceedings of the Fifth Annual CAM Symposium on Principles of Distributed Computing, 16. Reading, MA: ACM Press.
- Verity, J. (1995, November). The Internet: How it will change the way you do business. Business Week, 14, 80-88.

- Vives, X. (1991). Banking competition and European integration. In Giovannini & C. Mayer, (Eds.), European Financial Integration. (pp. 11-15). New York: Cambridge University Press.
- White, L. (1996). The future of money in the information age. Washington, DC: Cato Institute.
- Wintrob, S. (1995, April 12). Cyberspace consumers still just looking, not buying. Computing Canada 34, 21-28.
- Zellweger, P. (1997). Web-based sales: Defining the cognitive buyer. Electronic Markets, 7(3), 10-16.

APPENDIX A  
SURVEY INSTRUMENT A  
INTERNET USERS SURVEY  
(ENGLISH AND ARABIC VERSIONS)



Survey A  
Internet Users

1. Gender
  - Male
  - Female
  
2. Age Group
  - Under 16
  - 16 to 24
  - 25 to 34
  - 35 to 44
  - 45 to 54
  - 55 and Up
  
3. Please indicate your current income in Saudi Riyals (monthly)
  - Rather not say
  - Under 3,000 Riyals
  - 3,000 to 5,000 Riyals
  - 5,000 to 7,000 Riyals
  - 7,000 to 10,000 Riyals
  - Over 10,000 Riyals
  
4. Location
  - Riyadh
  - Jeddah
  - Damam
  - Makkah
  - Alqwiyyah
  - Other (Please Specify)
  
5. Indicate the highest level of education completed?
  - High School or equivalent
  - Vocational/Technical School (2 year)
  - Some College
  - College Graduate (4 year)
  - Master's Degree (MS)
  - Doctoral Degree (PhD)
  - Professional Degree (MD, JD, etc.)
  - Other (Please Specify)

6. Which of the titles below best describes your job position level?
- Executive
  - Manager
  - Technical
  - Academic
  - Writer/Editor
  - Student
  - Other (Please Specify)
7. Where do you most often access the Internet?
- Home
  - Work
  - School
  - Internet Café
  - Other (Please Specify)
8. How much are you paying for Internet access (monthly)?
- Free Access
  - Under 100 Riyals
  - 100 to 200 Riyals
  - 200 to 300 Riyals
  - Over 300 Riyals
9. How long have you been a member of the online community?
- Less than 1 month
  - 1 to 3 months
  - 3 to 12 months
  - 1 to 3 years
  - 4 + years
10. What Internet browser do you use? "Check all that apply"?
- Internet Explorer
  - Netscape
  - Tango
  - Sindbad
  - Other (Please Specify)
11. Do you believe there is enough Arabic content on the Internet?
- Yes
  - No

12. On a weekly basis, how many hours do you usually spend online?
- Less than 1 hour
  - 1 to 5 hours
  - 6 to 10 hours
  - 11 to 15 hours
  - 16 + hours
13. What do you use the Internet for? "Check all that apply"?
- Product Information
  - Shopping
  - Research (Personal)
  - Research (Work)
  - E-mail
  - Entertainment
  - Chat
  - Other (Please Specify)
14. Do you purchase products over the Internet?
- Yes
  - No (If NO, Skip to question 17)
15. If yes, then how many times do you purchase products in a month?
- 1 to 3 times
  - 4 to 6 times
  - 7 to 9 times
  - 10 + times
16. What type of products/services do you purchase through mail order services? "Check that apply"
- Computer Software
  - Magazines/Books
  - Clothing
  - Compact Discs/Tapes/Videos
  - Computer Hardware
  - Sporting Goods
  - Home Furnishings/Appliances
  - Jewelry
  - Information Services
  - Travel
  - Gadgets
  - Toys
  - Other (Please Specify)

17. In general, do you like or dislike Internet advertising?
- Like a lot
  - Like a little
  - Like some, dislike some
  - Dislike a little
  - Dislike a lot
  - Pay attention
  - Do not pay attention
18. Rate your level of agreement for each factor in why you do or do not purchase products/services over the Internet? Select from Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD).
- Security is a problem ( )
  - Need assistance with order ( )
  - Faster/easier to purchase locally ( )
  - Generally uncomfortable with the idea ( )
  - Don't have a credit card ( )
  - Prefer ordering by phone ( )
  - Fearful of receiving unsolicited e-mails ( )
  - Dislike the available payment methods (i.e. CyberCash, Credit Cards) ( )
  - Other (Please Specify)
19. Rate the level of importance of each factor for what you would expect from an online shopping environment. Select from Very Important (VA), Important (I), Neutral (N), Somewhat important (SI), and Not Important (NI)
- a. Convenience ( )
  - b. Confidentiality ( )
  - c. Selection ( )
  - d. Friendliness ( )
  - e. Delivery ( )
  - f. Knowledge ( )
  - g. Reputation ( )
  - h. Price ( )
  - i. Other (Please Specify)

20. Which payment methods do you use for purchasing products/services over the Internet? "Check all that apply"
- Credit Card
  - Debit/Check Card
  - Digital Cash
  - Sent a Check to the Company
  - Made Payment with Cash on Delivery
  - Other (Please Specify)

21. For future online shopping environments, what changes would you like to see take place?

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22. Does your company/school presently have a web site?
- Yes
  - No

In the following questions, rate your level of agreement by selecting the appropriate answer.

23. Shopping over the Internet would be expensive since it would require me to pay for access to the Internet.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
24. Shopping over the Internet would be very risky.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

25. Shopping over the Internet would allow me to have better item selection in my shopping. .
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
26. Shopping over the Internet would allow me to do my shopping more quickly.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
27. Shopping over the Internet would allow me to get better prices when shopping.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

In the following questions, I am interested in knowing your opinion of Internet-based shopping. For each of the following items, please indicate your level of agreement:

28. It is easier to find an Internet-based vendor that sells the item I wish to purchase.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
29. I can quickly gather information about products and services I wish to purchase from Internet-based vendors.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

30. Internet-based vendors (businesses) deliver orders/services in a better timely manner.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
31. It is easier to place orders with Internet-based vendors (businesses).
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
32. Internet-based vendors (businesses) provide better customer service and after-sales support.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
33. Placing an order for an item takes less time with Internet-based vendors (businesses).
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
34. I can gather more information from Internet-based vendors (businesses) about an item I want to purchase.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

35. Returns and refunds are easier with Internet-based vendors (businesses)?
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
36. Internet-based vendors (businesses) are better at providing me easy access to the opinions of experts about products I wish to purchase.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
37. It is easier to compare similar items between different Internet-based vendors (businesses).
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree



استبيان (أ)  
مستخدمي الإنترنت

1. الجنس
  - ذكر
  - أنثى
2. العمر
  - تحت 16
  - 16 إلى 24
  - 25 إلى 34
  - 35 إلى 44
  - 45 إلى 54
  - 55 و أعلى
3. الرجاء ذكر الدخل بالريال السعودي (الشهري)
  - أفضل عدم ذكره
  - تحت 3,000 ريال
  - 3,000 إلى 5,000 ريال
  - 5,000 إلى 7,000 ريال
  - 7,000 إلى 10,000 ريال
  - أعلى من 10,000 ريال
4. المكان
  - الرياض
  - جدة
  - الدمام
  - مكة
  - القويعية
  - أخرى (الرجاء تحديدها)
5. الرجاء ذكر أعلى مستوى تعليمي وصلت إليه
  - الثانوية أو ما يعادلها
  - معهد مهني/تقني (سنتين)
  - كلية ما
  - خريج جامعة /كلية ( 4 سنوات)
  - درجة الماجستير (MS)
  - درجة الدكتوراه (PhD)
  - درجة احتراف ( MD.JD, الخ )
  - أخرى (الرجاء تحديدها)

6. أي من العناوين التالية يصف مستوى مركز الوظيفة بشكل أفضل؟
- تنفيذي
  - إداري
  - تقني
  - أكاديمي
  - كاتب / محرر
  - طالب
  - أخرى (الرجاء التحديد)
7. من أين يكون اتصالك بالإنترنت غالباً؟
- البيت
  - العمل
  - المدرسة
  - مقهى إنترنت
  - أخرى (الرجاء تحديدها)
8. كم تدفع من أجل اتصالك بالإنترنت (شهرياً)؟
- اتصال مجاني
  - تحت 100 ريال
  - 100 إلى 200 ريال
  - 200 إلى 300 ريال
  - فوق 300 ريال
9. منذ متى و أنت تتصل بالإنترنت ؟
- أقل من 1 شهر
  - من 1 شهر إلى 3 شهور
  - من 3 إلى 12 شهر
  - من 1 إلى 3 سنوات
  - 4 سنوات فأكثر
10. ما هو متصفح الإنترنت الذي تستخدمه ؟
- مستكشف الإنترنت
  - نتسكيب
  - تايجو.
  - ساندباد
  - أخرى (الرجاء تحديدها)
11. في نظرك المواقع المكتوبة باللغة العربية كافية ؟
- نعم
  - لا
12. كم عدد الساعات التي تقضيها على الإنترنت أسبوعياً؟
- أقل من ساعة
  - من 1 ساعة إلى 5 ساعات
  - من 6 ساعة إلى 10 ساعات
  - من 11 ساعة إلى 15 ساعة
  - 16 ساعة فأكثر

13. لماذا تستخدم الإنترنت؟
- جلب معلومات عن المنتجات
  - التسوق
  - الأبحاث (شخصية)
  - الأبحاث (متعلقة بالعمل)
  - البريد الإلكتروني
  - الترفيه
  - الدردشة
  - أخرى (الرجاء تحديدها)
14. هل تشتري المنتجات عبر الإنترنت؟
- نعم
  - لا ( إذا كانت الإجابة بلا انتقل للسؤال 17)
15. كم عدد المرات التي قمت فيها بشراء منتجات عبر الإنترنت في الشهر؟
- 1 إلى 3 مرات
  - 4 إلى 6 مرات
  - 7 إلى 9 مرات
  - 10 مرات فأكثر
16. ما هو نوع المنتجات/ الخدمات التي تشتريها من خلال خدمات الطلب البريدي؟
- برامج كومبيوتر
  - مجلات/ كتب
  - ملابس
  - اسطوانات مدجة / أشرطة/ أفلام فيديو
  - أجهزة كومبيوتر
  - أدوات رياضية
  - أثاث وأدوات منزلية
  - مجوهرات
  - خدمات معلومات
  - سفر
  - أدوات
  - ألعاب
  - أخرى (الرجاء تحديدها)
17. بشكل عام، هل تعجبك أو لا تعجبك إعلانات الإنترنت؟
- تعجبني كثيرا
  - تعجبني قليلا
  - بعضها يعجبني و بعضها لا يعجبني
  - لا تعجبني قليلا
  - لا تعجبني كثيراً
  - أعيرها الانتباه
  - لا أعيرها الانتباه

18. قدر مستوى موافقتك على كل عامل من العوامل الآتية والتي بسببها لا تشتري المنتجات / الخدمات عن طريق الإنترنت؟  
 اختار من ما يلي : أوافق بشدة (1) ، موافق ( 2 ) ، محايد (3) ، غير موافق (4) ، غير موافق أبداً (5) .
- ( ) الأمن هو المشكلة
  - ( ) الحاجة للمساعدة عند الطلب
  - ( ) الشراء محلياً اسهل و أسرع
  - ( ) بشكل عام غير مرتاح للفكرة
  - ( ) ليس لدي بطاقة فيزا
  - ( ) أفضل الطلبد عن طريق الهاتف
  - ( ) اخوف من استقبال بريد إلكتروني غير جذاب
  - ( ) لا تعجبي طرق الدفع المتوفرة ( مثل بطاقات الفيزا ، دفع نقدي عن طريق الإنترنت.. )
  - ( ) أخرى ( الرجاء ذكرها )

19. قدر مستوى أهمية كل عامل من العوامل الآتية و التي تتوقعها من بيئة الشراء عن طريق الإنترنت؟  
 اختار من ما يلي : مهم جدا (1) ، مهم ( 2 ) ، محايد (3) ، غير مهم (4) ، غير مهم ابداً (5) .
- ( ) الملائمة
  - ( ) الموثوقية ( الخصوصية )
  - ( ) الاختيار (تعدد الاختيارات)
  - ( ) السهولة ( بالتعامل )
  - ( ) التوصيل
  - ( ) المعرفة
  - ( ) السمعة
  - ( ) السعر
  - ( ) أخرى ( الرجاء ذكرها )

20. أي طريقة للدفع تستخدم لشراء المنتجات / الخدمات عبر الإنترنت؟
- بطاقة فيزا
  - بطاقة دفع آجل
  - نقد إلكتروني
  - إرسال شيك للشركة
  - الدفع نقداً عند التسليم
  - أخرى (الرجاء تحديدها)

21. لبيانات الشراء المستقبلية، ما هي التغيرات التي تود أن تحدث؟
- 
- 
-

22. هل تمتلك شركتك/مدرستك حانيا موقعا على الشبكة؟  
 نعم  
 لا
23. التسوق عبر الإنترنت سيكون مكلفاً لأنه سيتطلب من الدفع للوصول للإنترنت.  
 موافق بشدة  
 موافق  
 محايد  
 غير موافق  
 غير موافق بشدة
24. التسوق عبر الإنترنت سيكون مخاطرة كبيرة.  
 موافق بشدة  
 موافق  
 محايد  
 غير موافق  
 غير موافق بشدة
25. التسوق عبر الإنترنت سيمكنني من الحصول على فرص اختيار افضل أثناء تسوقي  
 موافق بشدة  
 موافق  
 محايد  
 غير موافق  
 غير موافق بشدة
26. التسوق عبر الإنترنت يتيح لي القيام بعملية التسوق بسرعة أكبر.  
 موافق بشدة  
 موافق  
 محايد  
 غير موافق  
 غير موافق بشدة
27. التسوق عبر الإنترنت يتيح لي الحصول على أسعار أفضل عند التسوق  
 موافق بشدة  
 موافق  
 محايد  
 غير موافق  
 غير موافق بشدة

في الأسئلة التالية ، أنا مهتم بمعرفة وجهة نظرك عن البائعين المعتمدين على الإنترنت مقارنةً بغيرهم من البائعين الذين يعتمدون أشكال أخرى في التسويق. لكل من العناصر التالية الرجاء التعبير عن مدى موافقتك عليها

28. من الأسهل إيجاد بائع في الإنترنت يبيع ما أتمنى شرائه
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
29. أستطيع بسرعة جمع المعلومات عن المنتجات و الخدمات التي أسعى لشرائها من بائعي الإنترنت
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
30. بائعي الإنترنت يستغرقون وقتاً أطول في توصيل الطلبات / الخدمات
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
31. من الأسهل طلب الطلبيات من بائعي الإنترنت
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
32. بائعي الإنترنت يوفر خدمة أفضل لدعم ما بعد البيع
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
33. إجراء طلب شيء عن طريق بائعي الإنترنت يأخذ وقتاً أقل
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة

34. أستطيع جمع معلومات أكثر عن الشيء الذي أريد شراؤه من بائعي الإنترنت
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
35. الاسترجاع و إعادة المال أسهل مع بائعي الإنترنت
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
36. بائعي الإنترنت أفضل في تزويدي بوجهات نظر الخبراء حول المنتجات التي أريد شرائها
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
37. من الأسهل مقارنة أشياء متشابهة بين عدة بائعي انترنت مختلفين
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة

APPENDIX B

SURVEY INSTRUMENT B

IT PROFESSIONALS, BUSINESS' OWNERS, AND MANAGERS  
(ENGLISH AND ARABIC VERSIONS)



Survey BIT Professionals, Business' Owners, and Managers

1. Does your company have electronic commerce in place?
  - Yes
  - No
  - Plan to in the future
  
2. If YES, how long has it been operational?
  - 0-6 months
  - 7 months ~~--~~ 1 year
  - 1 ~~--~~ 2 years
  - Above 2 years

*Delete space*
  
3. Do you think electronic commerce will be the primary transaction medium in the future?
  - Yes, in the near future
  - Yes, in the distance future
  - No
  
4. To what extent are your customers or providers demanding electronic commerce services?
  - A little
  - A fair amount
  - Quite a lot
  - None
  
5. For your company today, to what extent do you agree that Electronic Commerce offers a real competitive advantage to your company?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

6. Do you see Electronic Commerce as a means of transforming your business?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
  
7. To what extent do you agree that companies that are going to enjoy long-term success will be those that have already begun to use Electronic Commerce?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
  
8. To what extent do you agree that it is better to wait and see how other companies' progress with their Electronic Commerce strategies before investing in it?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
  
9. I am confident that the senior management of my company is sufficiently well informed to meet the challenges of Electronic Commerce?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
  
10. Telecommunications infrastructure in the Saudi Arabia is a serious inhibitor to my company's Electronic Commerce plans?
  - Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

11. What are the primary business objectives of your electronic commerce strategy?
  - o Increased revenue
  - o Cost reduction
  - o Customer loyalty
  - o Improved customer service
  - o New sales channel
  - o Other (Please Specify)
  
12. What percentage of your IT budget is allocated to electronic commerce?
  - o None
  - o 0 to 25%
  - o 26 to 50 %
  - o More than 50%
  
13. How do you justify you electronic commerce investment? "Check all that apply"
  - o The investment must generate immediate positive financial return
  - o Electronic commerce is a strategic very important; it is the future and we must invest to get experience
  - o Competitive pressures require my company to invest in electronic commerce initiatives.
  - o My customers expect my company to provide an electronic commerce capability
  - o Other (Please specify)
  
14. In what types of electronic commerce are you involved?
  - o Information/data exchange
  - o Information gathering
  - o Online marketing
  - o Online customer service
  - o Sales to consumers
  - o Purchase from suppliers
  - o Other (Please Specify)

15. What are the main barriers to electronic commerce developments in your fund?
- Lack of skills
  - Costs
  - Higher priority development
  - Security/fraud
  - Bandwidth/systems performance
  - Provider fear
  - Lack of executive sponsorship
  - Other (Please Specify)
16. Lack of consumer understanding in the Middle East is a serious inhibitor to my company's Electronic Commerce plans.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
17. How has your technical infrastructure changed or how do you predict it changing to support electronic commerce?
- Servers have been/will be added
  - PCs have been/will be added
  - Network computers have been/will be added
  - Legacy data is/will be accessed
  - Bandwidth has been/will be added
  - Nothing has changed
  - Other (Please Specify)
18. What measure do you use to evaluate the success of your electronic commerce initiatives?
- Number of hits / visitors
  - Number of transactions
  - Total Value of goods sold over the Internet
  - Revenue per transaction
  - Cost saving
  - Customer satisfaction rating
  - Customer retention statistics
  - None
  - Other (Please Specify)

19. To date, how has your electronic commerce investment paid off?
- Not at all
  - We have decreased our costs
  - We have provided a better customer service
  - We have made a profit
  - We have not made a profit
  - We have not made a profit, but expect to within the next two years
  - I do not know
20. In five year's time, I expect my company to be far more reliant on Electronic Commerce than it is today.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
21. Electronic Commerce will help me source products in the future from more suppliers at better prices.
- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree

## استبيان (ب)

متخصصي تكنولوجيا المعلومات، المدراء، مالكي الشركات

1. هل لدى شركتك توجه للتجارة الإلكترونية ؟
  - نعم
  - لا
  - أخطط لهذا في المستقبل
2. إن كان الجواب بنعم ، منذ متى و هي تعمل؟
  - 0 - 6 أشهر
  - 7 أشهر إلى سنة
  - 1 - 2 سنتين
  - أكثر من سنتين
3. هل تعتقد أن التجارة الإلكترونية ستكون وسيلة التعامل الأساسية في المستقبل؟
  - نعم ، في المستقبل القريب
  - نعم ، في المستقبل البعيد
  - لا
4. إلى أي مدى زبائنكم و مزوديكم يطلبون خدمات التجارة الإلكترونية؟
  - قليلاً
  - بشكل معقول
  - بشكل كبير
  - أبداً
5. لشركتك اليوم، هل تعتقد أن التجارة الإلكترونية تضيف جو المنافسة ومنافعها
  - موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
6. هل ترى ان التجارة الإلكترونية وسيلة لتحويل شركتك للافضل ؟
  - موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة

7. الى أي مدى توافق على أن الشركات الناجحة هي الشركات التي بدئت باستخدام التجارة الإلكترونية ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
8. الى أي مدى ترى أن الصر و انتظار نتائج تطبيق التجارة الإلكترونية على الشركات الأخرى أفضل ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
9. أثق بأن أكبر المدراء في شركتي مدركون بما فيه الكفاية لمواجهة عقبات التجارة الإلكترونية ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
10. البنية التحتية للاتصالات السعودية تحول دون تطبيق خطط التجارة الإلكترونية في شركتك ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة
11. ماهي الأهداف التجارية الأولية لإستراتيجية التجارة الإلكترونية في شركتك ؟
- زيادة الأرباح والإيرادات
  - تخفيض التكلفة
  - ارضاء الزبائن
  - تطوير خدمات العملاء
  - وسائل أخرى للبيع
  - أخرى (الرجاء تحديدها)
12. ما هي النسبة المخصصة للتجارة الإلكترونية من ميزانيتك لتقنية المعلومات ؟
- لا شيء
  - 0 إلى 25%
  - 26 إلى 50%
  - أكثر من 50%

13. كيف تبرر استثمارك في التجارة الإلكترونية؟ (اختر بقدر ما \ هو ملائم)
- الاستثمار يجب أن يولد عائد اقتصادي إيجابي سريع
  - التجارة الإلكترونية هي استراتيجية ملحة ، فهي المستقبل و يجب أن نستثمر لكي تكون لدينا خبرة
  - ضغط المنافسة يتطلب من مؤسستي الاستثمار في الخطوات الأولى للتجارة الإلكترونية
  - زبائني يتوقعون من مؤسستي مقدرة على التجارة الإلكترونية
  - أخرى ( الرجاء تحديدها )
14. بأي نوع من أنواع التجارة الإلكترونية تعمل؟
- تبادل المعلومات و البيانات
  - جمع المعلومات
  - التسويق عن طريق الإنترنت
  - خدمة الزبائن عن طريق الإنترنت
  - البيع للمستهلكين
  - الشراء من المزودين
  - أخرى ( الرجاء تحديدها )
15. ما هي العوائق الأساسية لتطوير التجارة الإلكترونية في مؤسستك ؟
- الافتقار للمهارات
  - التكاليف
  - أسبقية تطوير أعلى
  - سعة الموجة/ و أداء الأنظمة
  - التخوف من المزود
  - الافتقار للكفالة التنفيذية
  - أخرى ( الرجاء تحديدها )
16. قلة الوعي لدى المستهلك في الشرق الأوسط تحول دون تطبيق خطط التجارة الإلكترونية في شركتك ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة



17. كيف ترى أن البنية التحتية لديك تغيرت أو كيف تتوقع أن تتغير لتدعم التجارة الإلكترونية؟
- الخادمتات تم / سيتم إضافتها
  - أجهزة الحاسب تم / سيتم إضافتها
  - شبكات الحاسب تم / سيتم إضافتها
  - البيانات الموروثة تم / سيتم الوصول إليها
  - سعة الموجة تم / سيتم إضافتها
  - أخرى ( الرجاء تحديدها )
  - لا شيء تغير / يتوقع أن يضاف.
18. ما هو المقياس الذي تستخدمه لتخمين نجاح مبادراتك في التجارة الإلكترونية؟
- عدد مرات الدخول / الزوار
  - عدد الصفقات
  - العدد الكلي للبيانات التي تم بيعها من خلال الإنترنت
  - العائد من كل صفقة
  - التكلفة الموفرة
  - مقدار رضا الزبون
  - إحصائيات الزبائن المكتسبين
  - لا يوجد مقياس
  - أخرى ( الرجاء تحديدها )
19. إلى الآن ، كيف كان المردود من استثمارك في التجارة الإلكترونية؟
- ليس هناك أي مردود
  - قللنا من تكاليفنا
  - قدمنا خدمة أفضل للزبون
  - حققنا ربح
  - لم نحقق ربح
  - لم نحقق ربح ولكن نتوقع ذلك خلال السنتين القادمة
  - لا أعرف
20. بعد خمس سنوات من الان اتوقع لشركتي الإعتماد على التجارة الإلكترونية أكثر من الان ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة

21. في المستقبل التجارة الإلكترونية سوف تساعدني على مقارنة أسعار منتجات الموزعين بالأسعار الأفضل ؟
- موافق بشدة
  - موافق
  - محايد
  - غير موافق
  - غير موافق بشدة