



UNIVERSITI PUTRA MALAYSIA

**AN EXPLORATORY STUDY ON
E-COMMERCE SYSTEM IN BANKING SECTOR: INTERNAL
AUDITOR'S PERCEPTION ON RISK AND CONTROL ENVIRONMENT**

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**AN EXPLORATORY STUDY ON E-COMMERCE SYSTEM
IN BANKING SECTOR: INTERNAL AUDITOR'S
PERCEPTION ON RISK AND CONTROL ENVIRONMENT**

BY:

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DECLARATION

I, hereby declared that:

- This study is done by myself with reference to the authors work mentioned in bibliography and the text,
- This study has not been submitted for any other degree at UPM or other institutions.

Signature: _____

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Date: 24 September 2001

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List of Abbreviation

AICPA	American Institute of Certified Public Accountant
APS	Auditing Procedure Study
ATM	Automated Teller Machine
CICA	Canadian Institute of Chartered Accountant
CPA	Certified Public Accountant
CA	Chartered Accountant
CIS	Computer Information System
EDI	Electronic Data Interchange
EDP	Electronic Data Processing
IAPC	International Audit Practice Committee
IIA	Institute of Internal Auditors
IT	Information Technology
SAC	System Auditability and Control



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirements for the degree of Master of Business Administration.

ABSTRACT

AN EXPLORATORY STUDY ON E-COMMERCE SYSTEM IN BANKING INSTITUTION : INTERNAL AUDITOR'S PERCEPTION ON RISK AND CONTROL ENVIRONMENT

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September 2001

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In the development of Electronic Commerce in Malaysia, the banking sectors have already prepared and implemented the Internet Banking , which also known as virtual banking transaction for customers. The biggest challenge in electronic commerce implementation is to overcome the issues of security control, customer identification and account verification for online transaction. Despite of the growth of internet banking, lack of adequate legal framework especially for auditors and lack of security control will hamper the continued progress of this evolutionary process.

Therefore, this study has been conducted to examine the internal auditor's perception, in general, on the risks, auditing problems and security measurement concerning with e-commerce or the internet banking transaction.

This is an exploratory study which was conducted on the 16 domestic banks in Malaysia, including commercial banks and finance banks. The sample was chosen by using the non probability sampling specifically on the judgment sampling. The specific location is the Klang Valley area in the state of Selangor. The data was

collected through personal interview, a developed questionnaires and various sources of journals and publications.

From the data analysis, all the respondents agreed that the two most important perceived risk by internal auditors are security risk for unauthorization and computer fraud. The downtime computer system and electronic payment systems were ranked as the two most common problem with auditing e-commerce. Relating to e-commerce implementation , the most important factor perceived on control measurement are security control and integrity control. This finding suggest that a better security improvement should be taken by the banks with a very tight IT security policy. The increase in security awareness especially in banking sector will minimize the potential fraud and losses and indirectly improve the customers trust and confidence in using the bank products..

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ABSTRAK

SATU KAJIAN EXPLORATORY MENGENAI ELEKTRONIK DAGANG DALAM INSITUSI BANK: PERSEPSI JURUAUDIT DALAM TERHADAP RISIKO DAN KAWALAN PERSEKITARAN.

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Di dalam perkembangan Elektronik Dagang di Malaysia, sektor pengurusan bank sudah bersedia melaksanakan Internet Bank , untuk pelanggan yang juga dikenali sebagai transaksi urusan bank maya. Cabaran yang terbesar di dalam pelaksanaan Elektronik Dagang ini ialah cara mengatasi isu keselamatan mengawal, pengecaman pelanggan dan pengesahan untuk transaksi secara “ online”. Dalam perkembangan internet bank , kurangnya peraturan dan prosedur sah untuk juruaudit dan kekurangan kawalan keselamatan akan menghalang kemajuan yang berterusan dalam proses evolusi ini.

Oleh itu, kajian ini telah dijalankan untuk meneliti pandangan dan persepsi juru audit dalaman, umumnya, tentang risiko , masalah audit dan langkah-langkah keselamatan tentang audit dalam Elektronik Dagang atau transaksi internet bank.

Kajian ini adalah suatu penyelidikan berbentuk “exploratory” di mana 16 buah bank tempatan di Malaysia, termasuk bank perdagangan dan bank pembiayaan telah terpilih sebagai responden. Sampel dipilihkan bukan secara kebarangkalian tetapi khusus kepada sampel penilaian. Lokasi kajian ialah khusus di kawasan Lembah Klang di negeri Selangor. Data dikumpulkan melalui temuramah peribadi, penggunaan soal selidik dan berbagai-bagai sumber jurnal dan penerbitan.



Hasil daripada analisis, semua responden bersetuju bahawa dua risiko paling penting dalam persepsi juruaudit dalaman adalah risiko keselamatan dari transaksi yang tidak diiktiraf dan penipuan melalui komputer. Masalah kerosakan sistem komputer dan pembayaran secara elektronik adalah dua masalah utama dalam audit Elektronik Dagang. Merujuk kepada ukuran kawalan dalam pelaksanaan elektronik dagang, dua factor utama kawalan ialah kawalan keselamatan dan kawalan kombinasi. Daripada kajian ini dicadangkan bahawa, kemajuan keselamatan yang lebih baik disyorkan kepada bank dengan menyediakan suatu dasar yang lebih ketat mengenai keselamatan informasi teknologi. Peningkatan kesedaran keselamatan terutama di sektor pengurusan bank akan meminimalkan potensi penipuan dan kehilangan di mana secara tidak langsung akan meningkatkan kepercayaan dan keyakinan pelanggan dalam menggunakan produk bank.



CHAPTER ONE

1.0 INTRODUCTION

Since the introduction of the first commercial computer in 1951, the computer technology have been unprecedented steady advances until today. There is usually a lag of several years between the introduction of new technology and man's ability to exploit it. This is in fact very true in the area of business's use of computer and it is also true of the audit profession's ability to audit computer based management information systems effectively (Dawley,1983).

In this millennium year, we have seen changes in the computer information system drastically. Accurate, timely and reliably information is crucial to the smooth operation of the business. New technology has increased the processing speed, data storage and processing capacity of computer systems by a factor of over one hundred and this will continue in future as if no diminishing rate.¹ These phenomenon has increased the public interest to have an independent assessment of the information. Auditors must have an understanding of how this information is generated, manipulated, stored,

¹ See Industry Survey(New York: Standards & Poor's Corp. 1979), pp 12-22 ; and Richard F. Kubi. " Training Problems Associated with EDP Auditing and Opportunities for Improvement." in EDP Audit Symposium – 1978 Proceedings. ed. Joseph L. Sardinas, Jr. (Amherst : University of Massachusets. 1978). pp. 7-8.



accessed, summarized and reported , so that they have the basis for providing reasonable assurances for reliable and accurate information.

Doing business on the web is becoming part of the business marketing strategy since e-commerce provides operational efficiency, cost-cutting, effective communication and increasing sales. E-commerce offers efficiencies for retailers in the form of increased market access and information, and decreased operating and procurement cost. Among the benefits to consumers are price competition, customization of products, expanded information on goods and services, increased choice of products and greater shopping convenience.

Electronic commerce is defined as a new way of doing business using computer and telecommunications networks (Kalakota & Whinston, 1996).

A more detail definition of E-commerce is :

... " the application of information and communications technology from its point of origin to its endpoint along any portion of the entire value system of business processes conducted electronically in combination with manual processes designed to enable the accomplishment of (or a part of) a business goal."

(Wigand ,1997)

E-commerce become the catalyst for enhancements and efficiency which include: selling products and processing orders, tracking customers' buying habits, presenting customers and prospects with product catalogues and inventory information; providing message databases for offsite salespeople and staff ; and processing purchase orders and invoices from suppliers. (Attaway, 2000) On the other hand, e-commerce

also give the new exposure to the organization which arise to the need for different controls

1.1 THE BACKGROUND OF THE STUDY

E- Commerce or Internet banking offers a new marketing platforms for banks to market its products at a potential cost saving However, globalization brings new competitive threat to banking institution in Malaysia Many commercial banks in Malaysia has implemented Internet Banking or doing business to business or business to customers starting this millennium year To name a few are Maybank Berhad , Bumiputra Commerce Berhad . Hong Leong Bank and others Some banks have recently launched the web sites and internet banking in early 2001 which include RHB Bank, Public Bank and Bank Muamalat Some studies have shown that the problem of effectively auditing electronic data processing (EDP) systems is shared by internal and external auditors (Dawley 1983) The study by The Institute of Internal Auditors (IIA) sponsored by Stanford Research Institute on Systems Auditability & Control (SAC) found that, many auditors were auditing computer based systems as if the computer did not exist The study also identify the need for auditors to attend fundamental and advanced data processing courses when they were charged with the responsibility of auditing computer based systems ²

The computer manufacturers began designing and building the computers in an integrated manner where these multiprogramming machines incorporated the

Stanford Research Institute Systems Auditability and Control Study Data Processing Audit Practices Report Altamonte Springs Institute of Internal Auditors 1977 p 7



multiprogramming technology, making them extremely complicated and sophisticated systems. Therefore, the auditing impact was to increase the difficulty of understanding the system, to provide more system software in which to conceal unauthorized code, to create greater difficulty in assessing the use of data processing resources and to introduce the problem of program and data security as a result of the multiple processors with multiple, concurrent job streams. Finally, advances in peripheral computer equipment such as audio, optical character recognition, point of sale, cathode ray tube, mouse, scanner and compact disk also inevitably have impact on auditing which relates to control. Unauthorized use becomes the problem because these devices are frequently located in uncontrolled area.

1.2 THE PROBLEM STATEMENT

The Bank Negara Malaysia (BNM), the Central Bank of Malaysia has made an announcement on 12th April 1999 that the locals bank were allowed to operate the Internet Banking services subject to its approval.

One of the biggest challenges in the development of electronic commerce has been for banks and merchants to overcome the issues of customer identification and account verification for online purchases. While the credit card systems have a process in place to verify and authorize transactions, the Internet poses challenges for merchants to not only validate that funds are available in an account, but to positively identify that the customer is in fact authorized to use that account for purchases (Denny, 1998).

Electronic commerce is now thought to hold the promise of a new commercial revolution by offering an inexpensive and direct way to exchange information and to sell or buy products and services. This revolution in the market place has set in motion a revolution in the banking sector for the provision of a payment system that is compatible with the demands of the electronic marketplace banking business in Malaysia too has been undergoing tremendous changes since achieving independence in 1957. The first step in the evolutionary process was the gradual deregulation of the financial sector, which commenced in the 1970's. Then, in the 1980's the introduction of Automated Teller Machines (ATM's) can be considered as the first and most visible piece of evidence of the emerging electronic banking in Malaysia. This was then followed by the introduction of telebanking and later on PC-banking in the 1990's. The next imminent step in this evolutionary process inevitably appears to be Internet-banking. However, according to Suganti et. al (2000) there are several issues including the lack of adequate legal framework and security of electronic transactions, which tend to hamper the continued progress of this evolutionary process.

The security issue in e-commerce and particularly on internet banking is still the main concern of all business including the customers and other stakeholders. Osborne (1998) pointed out that there is a little published articles or guides on the audit of the Information Technology security function, including internet banking. Prior to this research, there is no similar study which tackle the risk and security issues from internal auditors point of view in the Malaysian bank. Therefore, this study is to survey the internal auditors perception on risk, problem and control measures which is vital before, during and after the implementation of e-commerce transaction.

1.3 THE OBJECTIVE OF THE STUDY

1.3.1 The general objective

This study is to examine the internal auditors perception , generally on the risk and security issues , together with the problems associated with auditing e-commerce or internet banking

1.3.2 The Specific objectives:

- 1 To highlight the differences of internal auditors' perception on risk issue in e-commerce transaction
- 2 To examine the important factor of internal auditor's perceived risks in e-commerce business
- 3 To identify the common problem associated with auditing e-commerce in banking sector
- 4 To examine the control measurement taken by the local banks in order to safeguard the e-commerce or internet banking operation

1.3.3 The research question

The research question include

- 1 What are the internal auditors perception on the risk issues in implementing e-commerce?
- 2 What are the problems associated with auditing e-commerce system?
- 3 How important the control measurement for e-commerce?

1.4 THE SIGNIFICANCE OF THE STUDY.

Since the emergence of e-commerce business and internet banking in Malaysia, there is a little empirical research conducted on the effect of e-commerce risk from internal auditors point of view. It is our concern that this study will reveal certain implications and considerations for both management and internal auditors to take into account while dealing with e-commerce systems in their organizations. The development of e-commerce or internet banking in Malaysia is still considered at the infancy stage, which is vulnerable to system errors and human errors. The following discussion in this finding will help bank management and auditors to provide strategies in order to alleviate those risks associated with e-commerce. This finding will also improve the future auditing process and internal auditors' skills and professional judgment while exercising the auditing. An error created by a faulty system can be damaging to the financial well-being of a company. To keep pace with the electronic revolution in business, internal auditors must also be driven to acquire an understanding of new technologies; and they must develop audit approaches that ensure the organization's *e-commerce* objectives are achieved in a controlled manner.

CHAPTER TWO

2.0 ELECTRONIC COMMERCE AND INTERNAL AUDIT

Electronic commerce ("e-commerce") includes all commercial activities performed through various electronic sources such as the Internet, IT networks, ATM machines, and (Electronic Data Interchange) EDI, and one of its distinct characteristics is the use of computers to perform the transactions. Currently, e-commerce is aimed at optimizing the Internet as the tool to convey these transactions.

The benefits of successful e-commerce implementation in an organization include:

- reduced transaction costs and greater productivity
- service availability 24 hours a day, 7 days a week
- opportunities for fundamental reform of how organizations and their supply chains communicate and work with business
- opportunities for local business to grow and compete in the global marketplace

The banking industry has a distinct difference from most other industries in that its business is very international. but products and services are broadly similar. Therefore banks assume basically the same risks, varying only in degree. Yet, internal auditing practices and methodologies vary widely between one bank to another, often depending on the depth of experience of auditors and internal practices.



2.1 Auditing and the risk factors

The internal auditors basic functions are advising or consulting the firm , which is an independent appraisal function established within a bank to examine and evaluate its internal control systems. The internal auditors should be authorized and have a duty to disclose information to the supervisory authorities .

Audit risk is defined as: "... *The risk that the auditor may unknowingly fail to modify his/her opinion regarding financial statements that are materially misstated.* (Wallace. 1995) *It is also the risk that auditor will draw an invalid conclusion from the audit procedure by means of unqualified opinion or by qualifying unnecessarily.* " (Adams .1990)

Business risk is the risk that the author will suffer loss or injury to his or her professional practice due to litigation or adverse publicity in connection with an audit. Exposure to business risk is always present whether or not an auditor conducts the audit in accordance with generally accepted auditing standards. Thus, auditors need more evidence during the auditing process due to increased business risk .*Under generally accepted auditing standards, the auditor cannot decide to gather less evidence as a result of auditing a client with minimal business risk.* The accounting standard defines audit risk as " *the probability that the audited financial statements contain a significant error or misstatement*".

The following are risks that should be considered by the internal auditor when auditing e-commerce activities within their organizations.

2.1.1 Fraud

Fraud is a highly publicized risk in an e-commerce environment. Because of its global impact, fraud can be either perpetrated by a staff member within the firewalls or by anonymous parties in a foreign country using the Web as a tool. Examples of fraudulent activities include:

- unauthorized movement of money such as payment to fictitious suppliers located in jurisdictions where recovery of money will be difficult
- misrepresentation of company tenderers
- corruption of the electronic ordering or invoicing
- duplication of payment
- denying an order was placed
- denying an order was received
- denying receipt of goods
- denying that payment was received
- falsely declaring that a payment was made

2.1.2 Loss of privacy/confidentiality

For e-commerce to be successful, information about an organization or individual needs to be made available to other participants in the trading community. However, people are becoming increasingly concerned at the amount of information required and the degree of security the holder of the information applies to the data. If providers of

information are not confident that their information is properly protected, they may be unwilling to provide it. Public confidence may then well be adversely impacted if information is accessed without due authorization. Information at risk may include:

- services and prices, which are not normally provided to the general public
- cost structures — particularly relating to tenders
- catalogues such as technical details, prices or discounts offered
- individual's information such as name, address, contact details, previous purchase, services provided, activity (such as criminal or medical)
- separation between restricted and public information (Some information should be shared between specific parties only and any exposures to outside parties would cause significant harm, e.g., medical records, prisoners records, and personnel files.)

Risks may also be caused by:

- malicious activity from a virus attack or hacking
- interception of transactions by unauthorized persons
- unauthorized viewing or corruption of data
- data or reports not archived or disposed of correctly
- access to information about services and prices
- access to cost structures of tenderers
- competitors' access to catalogues, unauthorized viewing, corruption of data
- separation between private and public information

2.1.3 Lack of authentication

Lack of authentication refers to unauthorized persons/ parties performing a transaction.

Proper authentication is a critical component of an e-commerce transaction as once the

party has been accepted in the system, a legally binding transaction process has begun.

The risk will therefore involve creating liability for a party. Because paper-based

controls are limited to allow reconciliation, the authentication process may very well

accept the unauthorized party indefinitely and go undetected. Risks may result from:

- creation of fictitious suppliers ("masquerade") For example, an agency believes it is dealing with its supplier when in fact it's dealing with a hacker in a foreign jurisdiction.
- unauthorized ordering or approving of a transaction
- corruption of list of agreed suppliers
- corruption of list of signatories

2.1.4 Repudiation

The system shows that a transaction took place, but one of the parties now denies it (in other words, they **repudiate** the transaction). Given that paper trails are limited, how

does a party prove irrefutably that the transaction (buying or selling) has effectively

taken place? (In other words, **non-repudiation**.) Risks will therefore include:

- invalid contracts
- suppliers not being paid for goods and services delivered
- agencies not receiving services / goods already paid for

2.1.5 Corruption of data

This refers to issues of data integrity. The commonly held view is that risks involve activities that can be performed remotely through web resources. The reality, however, is that almost all corruptions are conducted **WITHIN** the system. A significant impact of corrupting the data is that contracts may become invalid.

Examples of malicious activities performed by disgruntled staff, suppliers, clients, and hackers include:

- ❑ amending catalogues without authorization (advertising, reporting, approval)
- ❑ tampering with the ordering process
- ❑ interrupting the recording of transactions
- ❑ disrupting online tendering
- ❑ destruction of audit trail

2.1.6 Business interruptions

Business interruptions are considered a key risk; if companies cannot promptly and adequately resume business after a crisis, there may be legal liabilities because services / goods were not delivered or payments were not made.

A graphic example of this is a small company that had been eagerly awaiting payment for goods delivered under a 30-day payment agreement. As the other organization is about to release payment, a major interruption occurs and it cannot resume accounts payable facilities for a lengthy period. In the meantime, the small company is forced to close down due to a cash flow crisis. The small company pursues legal action against