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THE STUDY OF END USER COMPUTING SATISFACTION FOR
MARA COMPUTERISED ACCOUNTING SYSTEM
AT THE MARA STATE OFFICES

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PERPUSTAKAAN
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THE STUDY OF END USER COMPUTING SATISFACTION FOR MARA
COMPUTERISED ACCOUNTING SYSTEM AT THE MARA STATE OFFICES

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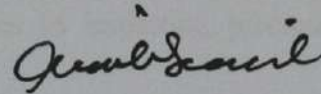
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DECLARATION

I hereby declare that the work in this project paper is my own except for quotations and summaries which have been duly acknowledged.

11 Jun 2010



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Bismillahirrahmanirohim

In the name of Allah, the Most Gracious and Merciful for all His worldly blessing.

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Having left university from my education for Association of Certified Chartered Accountant (ACCA) in the year 1992, which is more than 15 years ago, I soon realized that I am ignorant in many aspects of current approaches to decision making particularly pertaining to organizational management, leadership, marketing and financial management. Special thank you for the Management of MARA for their noble effort in promoting and executing this MBA UKM-MARA programme in the right direction so as to increase the knowledge-based employees and empowering human capital development inline with MARA Corporate Strategic Planning 2006-2011 road map.

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Despite referring to many authors, bulletin, journals and own personal experiences in preparing this study, there is always room for further improvements. I am open and welcome for comments and suggestions or questions.

ABSTRACT

This study seeks to investigate the effectiveness of MARA Computerised Accounting Systems (CAS) and its impact to the individual job performance, using the End User Computing Satisfaction (EUCS) developed by Doll and Tokzadeh (1998). MARA has deployed its CAS which are Payment and Collection Systems to the MARA State Offices since 2006. The systems were developed internally using internal resources. The systems should be able to help the employees and management at the MARA centres to use the accounting information to plan for the annual budget and expenditure purposes, enhance their accounting functions, and add information value. The automated CAS should be able to speed up the process of updating the financial transactions, generate financial reporting on a timely basis and enhance internal control. The research was conducted using a set of questionnaire consist of five factors; content, accuracy, format, ease of use and timeliness to measure end-users' satisfaction. This study is analyzed using SPSS Version 16 with factor analysis, descriptive analysis and multiple regressions. Overall, this study indicates that the end-users are moderately satisfied with MARA Computerised Accounting System (CAS). The results show that ease of use and accuracy has a significant effect on end-users' satisfaction. It is also noted end user's satisfaction of using the CAS has a positive relationship to individual job performance. Therefore, the empirical results of this study can provide support for the Doll and Tokzadeh model (1988), which related to the factors contributing end-users' satisfaction toward accounting system.

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CHAPTER I

INTRODUCTION

1.0 INTRODUCTION

The annual worldwide spending on information and communication technology (ICT) is expected to continue increasing over the years eventhough there is a worldwide economic crisis happening. By 2010, the International Data Corporation (IDC) expects the total expenditure on ICT to reach US\$1.48 trillion (IDC 2007). It shows that the implementation of any ICT project does not come cheap. Many organizations has embarked on multi-million ICT projects and later when deployments only discover that their end-users are disssatisfied with the information system. In a complex environments, the low level of satisfaction of end-users are likely to impact their job performance. Ensuring efficient and effective use of information system resources and at the same time increasing their levels of satisfaction and improving their job performance will probably be more challenging than before.

Generally, any implementation of new system development may cause inconvenience and dissatisfaction to employees and will impact their job performance and productivity. Eventhough the information systems were built with easy accessibility and internal control features, without proper training and skills on computer usage, the end-users computing may find the new tasks difficult and the information generated not to their expected results.

However, reason being the presure to cut costs, make more production and distribution of goods at a more cost effective, growth in turnover and profitability or to improve the productivity of their employees (Brynjolfsson 1996; Brynjolfsson &

Yang 1997), organisations must continue to invest in ICT capabilities. Other organisations continue to wonder if their ICT spending is justified (Farbey, Land & Target 1992) and whether their information systems are effective (Delone & McLean 1992). However, many organizations still experience the performance gains they expect do not match with their ICT investments (Brynjolfsson et al., 1997; Schrage, 1997). A greater number of information systems failures are still emerging. A questionnaire-based survey was carried out in 2006 in the USA indicated that only 62% of software projects were considered successful (Verner et al. 2006). It is also noted that employees often find it difficult to adapt to the rapid change of technologies being adopted by their organizations.

The evaluation of ICT investments and information system success and its effectiveness such as the high capital investments and low productivity returns therefore still remains a major concern for the management of the organisations and researchers (Brynjolfsson 1993). Since the beginning of 1980s, many researchers have conducted survey in information system fields highlighting the tremendous development and importance of end-user computing world. In fact, the growth of end-user computing is one of the significant phenomena in the management of information system world until nowadays.

Consequently, the implementation of computerised accounting system (CAS) as part of the ICT investments is crucial as it is believed that CAS can enhance the business performance and productivity (Ilias, Yashoa & Abd Razak 2007). However, there seems a lack of information system research on the effectiveness of the CAS implemented in the public sectors, particularly in MARA. Generally, there are differences between the accounting system practices in the public sectors and that of private companies. Hence, the applications of the computerised accounting system in these organisations may also differ from one to another. For instance, the private organisation utilises the general ledger system and the accounting principles based on accrual basis. Whereas, most of the public organisations still employ vote accounting system, which mostly their accounting system are based on cash basis. The implementation of CAS for the public organisations enable the management to improve decision making, internal controls and financial informations well as

enabling the financial reporting and statements being produced on a standardised format and timely basis to the stakeholders. As the volume of financial data transactions increases, which may be impossible to compile if done manually, CAS is unavoidable and has become mandatory. Moreover, the ICT spending of the public sector organisations are for the citizens, using taxpayers money, particularly to increase the public accountability and efficiency of service delivery systems. Whereas, for the private organisations, the use of CAS will enable them to evaluate business performance, company profitability and to estimate future earnings. Therefore, the successful implementation of the CAS through the the level of satisfaction of end-user computing should give an impact to the performance of organisation and the employees regardless whether the organisation is in private or public sector.

It is also noted that during the implementation of any new computerised system or application, it is important to get the employees involved in the development and training to improve the interaction between employees and the new technology. However, once the new systems have gone into production or have been rolled out or deployed to end-users, the management must rely on ICT system support to solve temporary problems, to help integrate technology into work methods and procedures, and to rectify shortfalls in policy, system performance or infrastructure that may interfere with the employee performance.

However, the measurement of information system effectiveness has proven to be difficult (Seddon and Yip 2002). There are broad literatures in the area of measurement of information system success particularly the end-user computing. Focusing on the evaluation of end-user computing, many researchers have attempted to capture the overall evaluation that end-users have regarding the use of information system, their satisfaction as well as the most immediate factors that contribute to user satisfaction. A number of models have been proposed in attempts to define IS success and identify the various causes of success. An important instrument that is frequently used to assess user satisfaction is the End-User Computing Satisfaction (EUCS) survey developed by Doll and Torkzadeh (1988).

The purpose of this study is to examine the end-user computing satisfaction components of the MARA Computerised Accounting Systems and their impact with the individual performance. It is important that MARA evaluate the existing computerised accounting system before deploying to other MARA centres or embarking on a new computerised accounting system development.

1.1 BACKGROUND

1.1.1 Majlis Amanah Rakyat (MARA)

Majlis Amanah Rakyat (MARA) is an agency under the purview of the Ministry of Regional and Rural Development (KKLW), entrusted with the responsibility to promote, stimulate, facilitate and undertake economic and social development of the Bumiputera particularly in the rural areas. To achieve its corporate mission and vision, the organization is segmented into three main sectors; education, entrepreneur and management sector. As of 30th April 2010, MARA organisation chart is shown in Figure 1.1.



Figure 1.1 : The MARA Organisation Chart

Through its Education Sector, MARA builds colleges for the secondary education level such as Maktab Rendah Sains MARA (MRSM). Others like Kolej MARA, Kolej Profesional MARA (KPM), Kolej Kemahiran Tinggi MARA(KKTM) and Institut Kemahiran(MARA) are for the tertiary education. Through the establishment of its subsidiary companies namely The University Kuala Lumpur(UniKL), British Malaysian Institute (BMI), German Malaysian Institut (GMI), Malaysia France Institute (MFI), Malaysia Spanish Institute (MSI) and Kolej Pengajian Tinggi MARA (KPTM) further promotes higher education level.

Through its Entrepreneur Sector, MARA's main objectives are to produce and continuously increase the number of Bumiputera entrepreneurs and also to improve their business transactions. It is the duty of the entrepreneur sector to provide entrepreneurship training programs, consultancy service, business areas, facilities, financial support, promotions and marketing schemes, and an efficient credit collection system.

The function of the Management of Services Sector is to primarily to facilitate the coordination of functions and activities of all MARA's sectors, centres and divisions. Such divisions like the Human Resource, Finance and Management Information System(MIS) Divisions play significant role in ensuring the MARA's vision, objectives and activities are achieved.

The Finance Division of MARA plays significant role in the finance management aspects including controlling and monitoring the financial activities such as budgeting and preparing timely financial reporting to the stakeholders. It's responsibilities also include planning and studying the user requirements of any new development of computerised accounting systems, upgrades of the existing computerised accounting system, create and suggest to the top management various indicators on financial policies as well as planning effective ways of controlling financial and accounting activities in order to achieve efficient use of financial resources.

The Finance Division has a tough task in developing an accounting system that is not just can only support a corporate culture and work environment but also of the three main businesses functions. The Finance Division's challenges also include ensuring that the mandates for the high levels of transparency and accountability are delivered and at the same time, able to response to the diverse, and often complex, stakeholders requirements.

As a Government agency, MARA has typically rely on older technology, which can make achieving these goals even more difficult. In order to keep users of MARA Computerised Accounting System satisfied as well as ensuring efficient service delivery, MARA need Computerised Accounting Systems that able to provide centralized accounting controls and facilitate internal and external collaboration.

1.1.2 MARA Financial System

MARA Financial System is a part of Management Information System in MARA, was developed in-house using internal resources since 1980 and is fully integrated. It is mostly customised for MARA business processes and caters primarily for its financial and accounting purposes, for activities such as education, entrepreneurship, management of services including training and staff loans. It was originally developed using COBOL programming language and continuous improvements and upgrades of the systems have been done ever since especially to improvise MARA's delivery systems. Basically, the development tools used in developing MARA financial system was done on:

<i>Operation System</i>	<i>:HP-UX</i>
<i>Programming Language</i>	<i>:PowerHouse</i>
<i>Database</i>	<i>:Eloquence</i>

The existing hardware and software of MARA Financial System are maintained at MARA headquarters (HQ) under the administration of the MIS Department. Most of the users for the computerised accounting systems are the staff of Finance Division. Deployment of computerised accounting system to MARA centres, namely Collection

and Payment Systems have been done in 1998 and 2006 respectively to cater for the increasing number of financial transactions collected and paid through the MARA centres particularly the MARA State Offices. Eventhough both of the computerised accounting systems have long been developed, deployment to other MARA centres is still not possible due to infrastructure and telecommunication constraints. The systems are not web-based applications and must be connected to MARA local area network (LAN) and wide area network (WAN) to get each MARA centres connected to the HQ.

The main categories of MARA Financial System consist of General Ledger, Prime Systems and Subsidiary Systems. Figure 1.2 below summarises the integrated MARA Financial System:

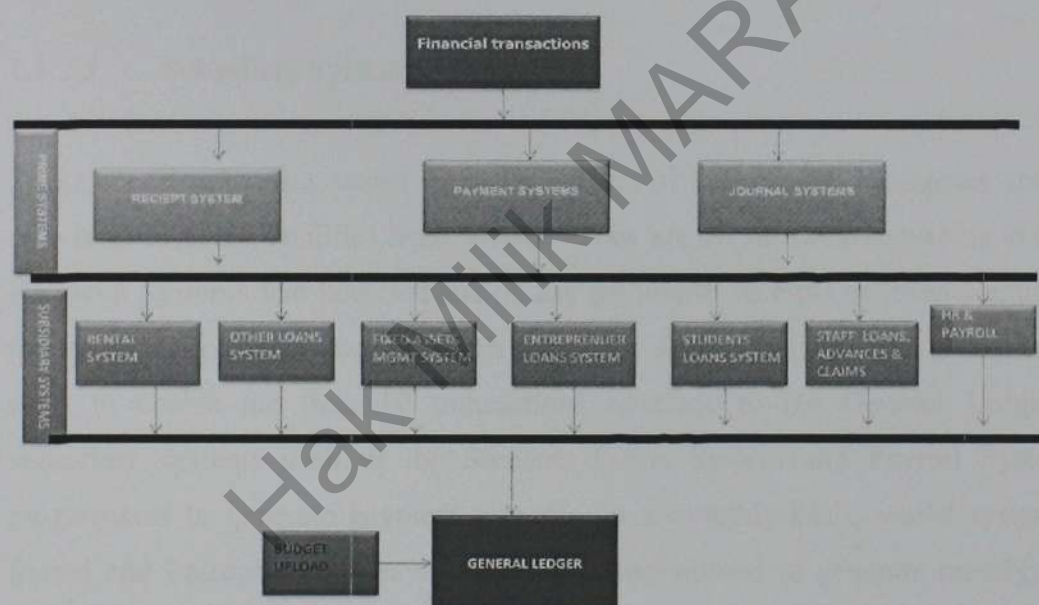


Figure 1.2 The Integrated MARA Financial System

1.1.2.1 General Ledger

The General Ledger is the final product of all MARA financial transactions. It keeps all the financial data, including budgeting information, expenditure and other accounting entries. It is used for preparing management reports, financial statements and other reports on a periodic basis.

1.1.2.2 Prime Systems

The Prime Systems are the origin of all MARA financial transactions. There are 13 prime systems which cater either for payments, receipts or journals transactions. Only 2 of the prime systems are deployed to MARA centres outside the HQ. Any financial data transacted through the Prime Systems is either being charged to the Subsidiary Systems or General Ledger. For instance, all payments and collections from repayments of students and business loans are charged to Subsidiary System (Students and Entrepreneur Loan Systems), whilst payments to supplier for purchasing office supplies are charged to expenditure code stipulated in MARA Charts of Accounts (COA) in General Ledger.

1.1.2.3 Subsidiary Systems

These are systems that record financial ledgers of individuals, businesses and staffs who have received facilities from MARA. They are 20 subsidiary systems in MARA Financial Systems that keep ledgers of any payments, receipts or journal entries into the individual personal account. Each subsidiary system will have its own generation chart to enable the financial transactions interface to the General Ledger. The subsidiary systems such as the Students Loans System and Payroll System are programmed to generate payment data file on a monthly basis, whilst systems like Rental and Entrepreneur Loans System are programmed to generate monthly rental and profit on disbursement respectively. Other subsidiary system such as the Fixed Asset Management System is programmed to generate annual depreciation and profit or loss on disposal of fixed asset.

1.1.3 Existing MARA Computerised Accounting Systems

MARA computerized accounting systems are still based on cash basis. Financial transactions for payments and collections are only captured in MARA Financial System once the bills or cash have been paid or received. Financial information

regarding the purchasing and unpaid bill are outside MARA Financial Systems. Therefore, MARA purchasing activities and bills receiving functions done by MARA centres are still recorded manually.

Besides the Finance Division, only MARA State Offices have been deployed the computerized accounting system due to their location at the city centres and the huge number of financial transactions occurring. Other MARA centers are still maintaining manual payment vouchers and cash books, whereby the all financial data will later be sent to HQ and input and processed by the Finance Division employees through the Impress System (Sistem Panjar) . However, due to the increasing number of financial transactions over the years whether due to the increasing numbers of MARA centres such as new MRSM, KKTM, IKM and KPM, delay in making input of all financial transactions by the Finance Division employees into the accounting system is inevitable.

Eventhough the deployment of MARA CAS to the MARA state offices was done in the early 2006, the deployment to other MARA centres has not been done due to the telecommunication connection and networking constraints. Some of the MARA centres which are located in the rural areas, their computers are stand alone and not connected through networking to the information system in HQ. The benefits from the investment in ICT for the telecommunication must outweigh the cost in order to have a fully integrated information system in MARA. and the Finance Division function s also noted that the existing computerised accounting systems has low

1.1.4 MARA's Annual Budget, Expenditure and Collections

MARA is providing services to the public such as education, business loans and rental of business premises for entrepreneurs, loans for students and other financial activities such as procurements from the suppliers and contractors. The major bulk of MARA financial transactions are for payments and collections from loan repayments. It is the functions of MARA centres to account for the financial transactions accurately and on a timely basis whether manually or computerized.

As shown in the Table 1.1 below, the Finance Division is accountable to report the significant amount of budget allocation, expenditure and collections to the stakeholders accurately and on a timely basis.

YEAR	FUND ALLOCATED (RM millions)	ANNUAL EXPENDITURE (RM millions)	ANNUAL COLLECTION (RM millions)
2008	2,793.12	2,855.49	505.80
2009	2,978.92	2,933.73	503.70
2010	2,996.48	819.33*	96.07*

Table 1.1: MARA Annual Budget, Expenditure and Collection

(Source: Budget Book, Annual Report, *Management Report as at 30 April 2010)

1.2 NEW DEVELOPMENT OF MARA FINANCIAL SYSTEM

The Government of Malaysia through the Department of Accountant General (JANM) has instructed MARA to implement the Standard Accounting System for Government Agencies (SAGA). This is a total Enterprise Resource Planning (ERP) System for an organisation and standardised for the Government agencies. It is developed based on web-based application and applying the accrual basis of accounting. The SAGA financial system enables its users, particularly the government agencies to close their accounts on a daily basis, monitor their daily financial activities as well as produce standardized financial reports to the stakeholders at any place and any time. The SAGA financial system can be illustrated in the Figure 1.3 below:

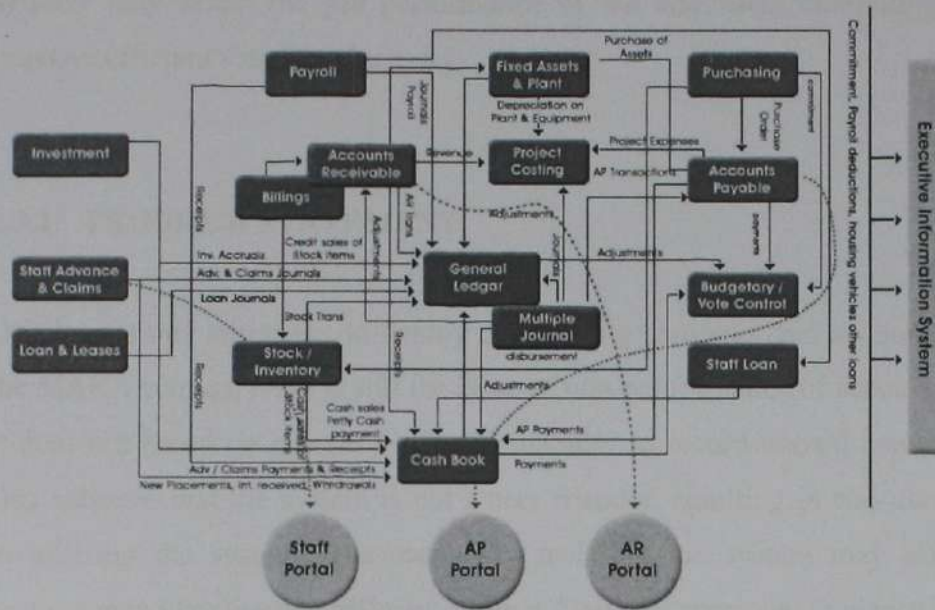


Figure 1.3 : The SAGA Financial System

However, upon the completion of the gap analysis of the SAGA financial system, MARA identifies that it cannot cater for all MARA business activities such as disbursement of scholarship and loans to students and entrepreneurs. MARA still has to maintain its existing databases and therefore requested to the JANM to be excluded in the implementation of SAGA while awaiting the MARA ICT Consultant for the recommendations on new development of MARA Total Information and Financial System.

As a conclusion, MARA has envisaged that the SAGA financial system, even though is totally integrated, cannot be utilised on MARA business functions and environments on its own. The end-users of MARA Computerised Accounting System will still need to operate both systems and are expected to be confused and burdened if they are to use two different types of system when updating certain type of financial transactions. As the end-users of MARA Computerised Accounting System can only utilise the SAGA Financial Systems just for the ordinary operating expenditure whilst any disbursement of expenditure pertaining to the subsidiary system, they still need to use the existing MARA Financial Systems. Consequently, internal controls and security functions may not be as easily in built as of it should be. The utilisation both

systems may affect the job performance of the end users computing in terms of improve efficiency and productivity.

1.3.1 PROBLEM STATEMENT

Despite various initiatives to deploy the existing computerized accounting system to the MARA centres, there is still the issue of non-conformance of accounting system as it does not based on accrual basis and inability to record unpaid commitments. It is also believed that the system is not a user friendly, resulting in end-user's reluctance in utilizing the system. The staff may feel that the system may affect their job performance in delivering efficient service. Until the empirical evidence is obtained, it is very difficult for the Finance Division to recommend to the Management of MARA whether a new system development or upgrades necessary.

1.4 OBJECTIVES OF THE STUDY

It is noted that the objectives of the study are:

- To evaluate the effectiveness of the existing MARA computerized accounting system using the EUCS measurement developed by Doll & Torkzadeh (1988).
- To investigate whether there is a relationship between the end-user's satisfaction of MARA computerised accounting system and individual job performance

CHAPTER II

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter provides the background of the research done in the area of information systems success particularly accounting information system, the evaluation for the effectiveness of computerised accounting system, its measurement, the end-user satisfaction in a computerised accounting system environment and its impact to the individual job performance.

This chapter will cover the literature review pertaining to the factors contributing to the success of information system, methods use in measuring the effectiveness of computerised accounting system and whether the end-user satisfaction for the system has any influence to the individual job performance. The research framework is then described in the later chapter.

2.1 LITERATURE REVIEW

2.1.1 Accounting Information System

As mentioned earlier, an Accounting Information System, same as Computerised Accounting System (CAS) can be considered as a subsystem of Management Information System (MIS). The American Institute of Certified Public Accountants (AICPA) stated that:

“Accounting is actually information system and if we be more precise, accounting is the practice of general theories of information in the field of effective economic activities and consists of a major part of the information which is presented in the quantitative form”.

From the above definition, accounting information system can be defined as a part of general information system of an economic entity. Boochholdt (1999) defines accounting information systems as systems that operate functions of data gathering, processing, categorizing and reporting financial events with the aim of providing relevant information for the purpose of score keeping, attention directing and decision-making. Therefore, in most organisations, accounting information system plays a vital role in the organizational mechanisms that is so critical as it measures the effectiveness of decision management and control in organizations.

In the study by Markus (1993) shows that successful implementation of accounting systems requires a fit between three factors. First, a fit must be achieved with dominant view in the organization or perception of the situation. Second, the accounting system must fit when problems are normally solved, i.e. the technology of the organization. Finally, the accounting system must fit with the culture, i.e. the norms and value system that characterize the organization. Systems will be useful when information provided by them is used effectively in decision-making process by users.

The study by Huber (1990) shows that, an integrated accounting information systems (AIS) leads to better coordination in organization which, in turn, increases the quality of the decisions. Some researches in accounting show that the effectiveness of accounting information systems depend upon the quality of the output of the information system that can satisfy the users' needs. Study by Kim (1989) shows that the quality of information generated from AIS is very important for management, in that, the usage of AIS depends on the perception of the quality of information by the users. In turn, the quality of information depends on reliability, form of reporting, timeliness and relevance to the decisions. Generally, it can be seen that accounting information systems; 1) provide financial reports on a daily and weekly basis and; 2)

provide useful information for monitoring decision-making process and performance of the organization.

Doll and Torkzadeh (1988) use some concepts of end-user computing satisfaction to measure the effectiveness of the accounting information systems. These concepts are content, accuracy, format, ease of use and timeliness. This study hope to examine these concepts of end-user computing satisfaction (EUCS) to measure user satisfaction for the information provided by the MARA Computerised Accounting System, whether it widely meets the requirements of the users and has an impact to the user's job performance.

2.1.2 Information System Success

The Information System (IS) literature provides several definitions and measurement of IS success. As DeLeon & McLean (1992) state that there are nearly as many measures as there are studies. Some researchers use the term "IS effectiveness" synonymously with IS success. From a software developer's perspective, a successful information system is completed on time and within budget will have set of features consistent with the specifications and functions correctly. Users may find information system is successful if it improves their work satisfaction or work performance. From an organizational perspective, a successful information system contributes to the company's profits, increase turnover or create competitive advantage. The variety of definitions of IS success in previous publication is illustrated in the Table 2.1.2:

Authors	Definition
Bailey and Pearson (1993)	"Measuring and analyzing computer user satisfaction is motivated by the management's desire to improve the productivity of information systems."
Byrd et al. (2006)	"... the effect of IS can lead to a better organizational performance, in this case, lower overall cost."
Goodhue & Thompson (1995)	"...MIS success ultimately corresponds to what DeLeon & McLean (1992) label individual impact or organizational impact. For our purposes, the paper focuses on individual performance impact as dependent variable of interest."

Authors	Definition
Gatian (1994)	"If an effective system is defined as one of that adds value to the firm, any measure of system effectiveness should reflect some positive change in user behavior, i.e, improved productivity, fewer errors or better decision making."
Lucas (1978)	"Because of the extreme difficulty of measuring implementation success through cost/benefit analysis, some other indicator of success is needed. The most appealing indicator to measure is the system use."
Rainer & Watson (1995)	"An EIS should be developed in response to a specific business need, such as a need to be more responsive to changing customer desires, to improve product quality, or to improve organizational communications. Systems that do not support business objectives are unlikely to succeed."

Table 2.1.2 Definition of IS success

As many IS researchers assessed the success of IS or an application through the measurement of user satisfaction (for example, Bailey & Pearson 1983; DeLone & McLean 1992; Doll & Torkzadeh 1988; Ives & Olson 1984; Ives et al. 1983), this study attempts to evaluate the MARA CAS using end-user satisfaction model developed by Doll & Torkzadeh (1988) where End-user satisfaction is "the affective attitude towards a specific computer application by someone who interacts with the application directly".

2.1.3 End-User Computing Satisfaction (EUCS)

As many organisation embark on ICT projects, the End-user Computing (EUC) has become one of the most common and widespread activities carried out to evaluated the effectiveness of such investments. As Igbaria and Guthrie (1998) pointed out that every business transaction begins and ends with a computer operated, i.e., the end user. The term end user computing describes a job situation in which employees utilise computers as supporting tools to complete their tasks.

Many researchers differ in defining end-user computing, some based on their own objectives and setting of the study whilst others define EUCS as the affective attitude towards a specific computer application of someone who interacts with the application directly (Doll and Torkzadeh 1988). End-user computing satisfaction was first defined as a multidimensional attitude of the user towards different aspects of a product or a system, whereas Ives *et al.* (1983) defined it as the extent to which users believe IT product available to them meets their information requirements (Bailey 1983).

Doll and Torkzadeh (1988) argue that the nature of the instrument items assume a more traditional computing environment and like user knowledge, involvement and IT products items are not application specific. They then developed a 12-items instrument of end user satisfaction (EUCS). Doll and Torkzadeh (1988) first hypothesised that the EUCS is a second-order two-factor model with five first-order factors. The proposed model consists of one second-order factor (satisfaction) and five first-order factors (content, accuracy, format, ease of use and timeliness). In 1994, Doll and Xia conducted a confirmatory factor analysis and concluded that the EUCS explained end-user satisfaction.

As the structure and dimensionality of user satisfaction are important theoretical issues, many studies have given considerable attention (Ives, Olson, & Baroudi 1983; Doll & Torkzadeh 1988, 1991; Doll, Xia, & Torkzadeh 1994; Harrison & Rainer 1996) to the subject matter. It is important to develop standardized instruments for measuring user satisfaction as stressed by several researchers (Ives & Olson 1984; DeLone & McLean 1992). The use of the End User Computing Satisfaction Instruments (EUCSI) as a general measure of user satisfaction has several rationales. First, Doll and Torkzadeh (1988 p. 265) stated that 'the items ... were selected because they were closely related to each other'. Secondly, 8 out of Doll and Torkzadeh's 12 items use the term 'system'. Users could perceive the term 'system' to nonspecifically encompass all the computer-based information systems and applications that they might encounter.

In the study by McHaney et al. (1999) validated the EUCS model for the use of decision support systems in a test-retest study. They used a survey approach involving 342 knowledge-workers in Taiwan. Knowledge-workers refer to those individuals whose primary work-related activities were information-based and required the use of information technology (IT) to complete those activities. The researchers validated the EUCS model and concluded that format, accuracy and ease of use were the top contributors to end-user computing satisfaction. Xiao and Dasgupta (2002) also used the EUCS to measure users' satisfaction of Web-based information systems at a large mid-Atlantic university. The sample comprised full time and part time students from a variety of industries and management levels. They found that with the exception of one item that measured sufficiency of information, the rest of the items in the model were valid. In the study by Abdinnour-Helm et al. (2005), the EUCS was used to measure users' satisfaction with a Web site in the United States. The study used students as participants in a lab simulation. They concluded that the EUCS model was valid and robust although the timeliness sub-factor might require further refinement in the future.

Somers et al. (2003) evaluated enterprise resource planning (ERP) packages and reported that content, format and ease of use were the top three contributors of end-user computing satisfaction. They concluded that the EUCS model was also valid in predicting satisfaction. Other researchers, such as Heilman and Brusa (2006) where they conducted a survey of computer use in Mexico using a Spanish version of the EUCS, provided evidence that the EUCS model was valid and reliable outside the United States and in a language other than English. Content, format and ease of use were the top three contributors of satisfaction. Doll et al. (2004) has also tested and validated the EUCS model using 1,166 responses across 300 different applications. The study concluded with recommendations for the use of a five first-order factor model. They cited that accuracy was more important in user-satisfaction for operating personnel than it was for managerial or professional respondents.

In a study measuring users' satisfaction with online banking services in Finland, Pikkarainen et al. (2006) concluded that the contributors of end-user computing satisfaction were only content, ease of use and accuracy. The study adopted a convenient sampling approach where respondents replied to questionnaires that were translated to Finnish. Wang et al. (2007) evaluated group decision support systems among undergraduates in China in an experiment and concluded that the EUCS model was valid and reliable. The top three contributors of end-user computing satisfaction were format, content and accuracy. Deng et al. (2008) tested the EUCS model across cultures using samples in the United States, Western Europe, Saudi Arabia, India and Taiwan. For all the cultures that they examined, they found that all five factors were equivalent. There were no significant differences for content, format, accuracy and timeliness; however, there was a difference for ease of use. The finding suggests that the meaning of user satisfaction may differ between cultures. Azadeh et al. (2009) tested the EUCS model in an Iranian power holding company and found that the model was valid and the instrument reliable. They also indicated that the type of information systems did not influence the EUCS model.

Tojib and Ly Fie (2007) developed a scale to measure users' satisfaction of the business to employee portal. They found that the scale comprising usefulness, confidentiality, ease of use, portal design and convenience of access would be appropriate for use in the business to employee portal. They concluded that the user information satisfaction scale and EUCS scale would not be appropriate for measuring users' satisfaction in the business to employee portal.

Over the years, researchers have reiterated the importance of good measurement through testing and validation (Boudreau et al., 2001; Straub et al., 2002). Researchers also must exercise caution in generalising about EUCS in the public sector environment, as literature has cited similarities and differences between the public and private sectors (Dufner et al. 2002; Chircu and Lee, 2003; Kamal 2006; Ward 2006). Eventhough the end-user computing satisfaction (EUCS) model has been widely tested and validated in various research settings, whether on application systems or computerised accounting system and in several countries such as the United States, Saudi Arabia, Western Europe, Taiwan, Finland, Mexico and Iran (McHaney et al.

1999, 2002; Doll et al. 2004; Heilman and Brusa 2006; Pikkarainen et al. 2006, Deng et al. 2008; Azadeh et al. 2009, research in Malaysian environment especially in the public sectors is still not apparent.

2.3 INDIVIDUAL JOB PERFORMANCE

Most organisations see that the main concern in any ICT investment is whether the benefits it generates outweighs the costs, in monetary and non-monetary values. The impacts of ICT are often influenced by human, organizational and environmental factors such as cultures and technology advancements. It is also important for the information system (IS) researchers to understand the link between IS and the individual performance of the employees in the organisation. It has been argued that IS success contributes to the improvements in the organisation productivity, enhances the quality of management decision and improves the quality of life (Ang & Koh 1997). It also mentioned that one way to measure IS success is to determine the impact of IS on individual performance or organizational performance (Lucas 1975; DeLeon 1988). Organizations are developing computer systems for more efficient management. The growing utilization of IS may encourage employees to increasingly use IS to help them perform task and manage work. With the use of internet, the employees are able to perform their work at any place and any time. According to Sorebo, Christensen & Eikebrokk (2004), the core activities in end-user computing influence job performance. Study by DeLeon & McLean (1992) find that utilization and user attitudes about the technology lead to individual performance impacts. Goodhue & Thompson (1995) then validate that for an information technology to have a positive impact on individual performance, the technology must be utilised and a good fit with the task it supports. As Croates (1988) and Kaye and Sytton (1985) found that computerisation had affected office work productivity, as well as the quality of work of those involved in office work. Millan and Hartwick (1987) claimed that middle managers believe that office automation has given them autonomy, more freedom to do their work and greater responsibility.

Almutairi & Subramanian (2005), based on their empirical application of Delone & McLean model in private sector organization of Kuwait, identified certain direct association between the variables in the original Delone & McLean model. They revealed that; information quality and system quality impact user satisfaction significantly, system usage has significant influence on individual impact. Torkzadeh and Doll (1999) has performed a study concerning perceived impacts of information technology on work life, in which a set of four criteria were derived from a larger set of questions. These criteria were task productivity, task innovation, customer satisfaction and management control. It should be noted that the tool only measured the opinions about whether a technological artifact had had a good impact, there were no factual measurements. Martinsons et al (1999) have developed a balanced score card approach to measuring a set of criteria from four different points of view. These points of views are business value, user orientation, internal process and future readiness.

Therefore, identifying measure of specific impacts on the performance is not an easy task particularly in public organisations, such as MARA where a wide range of services and stakeholders involved. As frontliners of MARA, management and employees at the State Offices may expect to have activities and tasks that outside the scope of their normal day-to-day working as instructed from the top management at the HQ level. However, it is important that every individual employees whether at the State Offices or anywhere in MARA, has a specific key performance indicator as a performance measurement to ensure that MARA can deliver a cost effective, high quality and fast services that meet the needs of stakeholders.

The management and employees of MARA State Offices are the users of MARA Computerised Accounting System but they are regarded as non-financial people. Their utilization of the system is mandatory as they are now responsible for the input of all financial data, controlling and monitoring the financial documents as well as financial reportings such as budget, expenditure and collection of their centres, in a periodic basis.

With the increasing volume of financial transactions, one would expect that the use of a computerised accounting system would improve job performance, reduce errors in accounting entries, increase speed or saving the time taken in completing tasks and improve productivity. This study seeks the impact on job performance of users of MARA Computerised Accounting System at the MARA State Offices, using EUCS model developed by Doll & Torkzadeh (1988). In addition, it is also interesting to explore any differences between the sub-groups of respondents such as gender and the level of employment where they work.

2.2 RESEARCH FRAMEWORK

The starting point for developing the conceptual model for assessing information success is to develop the research framework. The research model for measuring end-user computing satisfaction developed by Doll & Torkzadeh (1998) is shown in Figure 2.1 proposed that Content, Accuracy, Format, Ease of Use and Timeliness linked to end-user satisfactions. The study then investigate the link between EUCS components with the individual job performance, in respect of speed, productivity and efficiency.

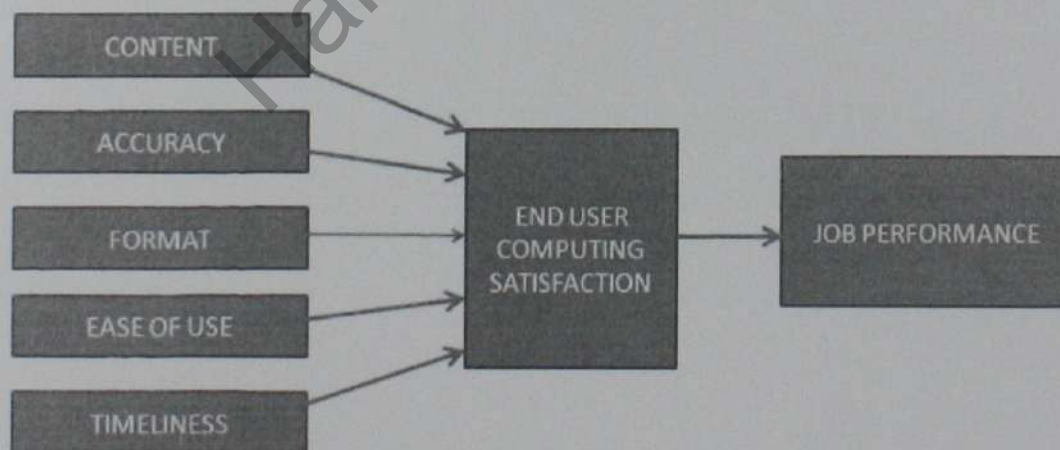


Figure 2.1 Research Framework

2.3 CONCLUSION

This study is based on the EUCS instrument by Doll and Torkzadeh because it is a widely used instrument, and has been validated through several confirmatory analyses and construct validity tests. After the exploratory study was completed in 1988, two confirmatory studies with different samples were conducted respectively in 1994 and 1997, which suggested the instrument was valid (Doll et al. 1994; Doll and Xia 1997). A test-retest of reliability of the instrument was conducted in 1991, indicating the instrument was reliable over time (Torkzadeh and Doll 1991). The instruments are also widely accepted and adopted by other researchers. This study then examines the link between EUCS and individual job performance.

Hak Milik MARA

CHAPTER 3

RESEARCH METHODOLOGY

3.0 INTRODUCTION

This study is conducted to evaluate the MARA Accounting System Effectiveness using the measurement of end user computing satisfaction (EUCS) developed by Doll & Torkzadeh (1988). It is then used to investigate whether users are satisfied with MARA CAS and its impact to the individual job performance.

This chapter will cover the research method, sampling method, research instrument, data collection and data analysis.

3.1 RESEARCH DESIGN

Doll and Torkzadeh developed a 12-item EUCS (Figure 3.1) instrument by contrasting traditional data processing environment and end-user computing environment, which comprised of 5 components: content, accuracy, format, ease of use, and timeliness. Their instrument was regarded as comprehensive, because they reviewed previous work on user satisfaction in their search for a comprehensive list of items. They included measurement of ease of use, which was not included in earlier research. Two global measures of perceived overall satisfaction and success were added to serve as a criterion. The construct was developed with a five point Likert-type scale (1 = almost never; 2 = some of the time; 3 = about half of the time; 4 = most of the time; and 5 = always).

3.2 RESEARCH METHODOLOGY

This study used the quantitative method approach. Data used are both primary data and secondary data. Primary data are collected from users of MARA Computerised Accounting System while secondary data are collected from reports and concept papers related to end-user computing satisfaction and its impact on individual job performance.

The primary data were collected from the respondents by post. This approach is chosen as data can be collected in a convenient and quick manner, but the rate of response is not as high as compared if the data is collected personally from the respondents. Data are then analyzed based upon the research objectives.

3.3 LIMITATIONS

This study has certain limitations caused by the problems and things beyond the ability of the researcher. Among the limitations are time constraint, limited respondents, and the accuracy of data.

3.4 SAMPLING METHOD

The target population for this study is the users of MARA Computerised Accounting System at the State Offices. The systems are Payment and Collections Systems (*Sistem Bayaran Pusat Operasi* and *Sistem Pungutan Pusat Operasi*). The users of MARA computerized accounting system are then contacted by telephone to participation in the study as they are in a better position to evaluate the effectiveness of MARA computerised accounting system.

A total of 78 users have participated in the study. The breakdown for the respondents according to MARA State Offices are as listed in Table 3.1 below:

	MARA State Offices	Planned sample	Actual respondents	Response rate
1	Johor	10	6	60.0%
2	Melaka	10	10	100.0%
3	N. Sembilan	10	9	90.0%
4	Selangor	10	5	50.0%
5	Perak	10	5	50.0%
6	Kedah	10	6	60.0%
7	Pulau Pinang	5	4	80.0%
8	Perlis	5	3	60.0%
9	Kelantan	10	5	50.0%
10	Terengganu	10	6	60.0%
11	Pahang	10	8	80.0%
12	Sabah	10	3	30.0%
13	Sarawak	10	4	40.0%
14	Wilayah Persekutuan	5	4	80.0%
	Total	125	78	62.4%

Table 3.1

3.5 RESEARCH INSTRUMENT

Upon receiving the consent through telephone calls, the survey questionnaires are then either posted or emailed through the Director of MARA State Offices. Responds were requested to be returned within one week.

The survey questionnaire consists of three sections specifically to address the objectives of this study. The first section contains questions to capture the EUCS instruments developed by Doll & Torkzadeh. This questions in this section contain 5-point Likert scale ranging from 1 = 'Almost Never' to 5 = 'Always'. The second section contains 5-point Likert scale ranging from 1 = 'strongly disagree' to 5 = 'strongly agree' used to measure user's satisfactions and IS impact on the individual

job performance. The third section contains questions to capture the profile of the respondents.

A copy of the questionnaire is attached in the Appendix.

3.6 DATA COLLECTION

Data in this study is collected using a self-completion questionnaire by the users of MARA Computerised Accounting System at the MARA State Offices, as respondents.

3.7 DATA ANALYSIS

Data collected was checked for completeness in order to reduce the possibility of missing data before they were coded and entered into SPSS Version 16.0 for subsequent statistical analyses. Descriptive statistics such as frequency counts, crosstabulation are used for demographic analysis purposes. The study also conduct the reliability and analyses of variance (ANOVA) test as well as the factor analysis and regression analysis.

3.8 CONCLUSION

Basically, the instrument of this study is based on the instruments which was developed by Doll & Torkzadeh (1998), focusing based on the same five factors of EUCS which are Content, Accuracy, Format, Ease of use and Timeliness. It then analysed the relationship between those EUCS components to the end user satisfaction and individual job performance of users of MARA Computerised Accounting System.

CHAPTER IV

RESEARCH FINDINGS

4.0 INTRODUCTION

This chapter focuses on the findings that emerge from the study conducted by analysis technique is explained and detailed results are also presented.

The first part of the chapter discusses the findings from analysis using SPSS version 16. The analyses include exploring the Demographic of user using the Descriptive Analysis. Results are then summarized and described where appropriate.

The second part of the chapter discusses the findings from Factor and Regression analysis. These are used to validate the model and evaluate the factors that contribute to the users' job performance.

4.1 DESCRIPTIVE ANALYSIS

These are demographic analysis of users of MARA Computerised Accounting System at the MARA State offices.

4.1.1 Gender Distribution

The distribution of respondents by Gender and by MARA State Offices is, 22 (28%) are Male and 56 (72%) are Female. Table 4.1.1 indicates number of respondents by Gender of the 14 MARA States Offices participated in the study.

	MARA State Offices	Gender		Total
		Male	Female	
1	Johor	2	4	6
2	Melaka	2	8	10
3	N. Sembilan	4	5	9
4	Selangor	1	4	5
5	Perak	3	2	5
6	Kedah	2	4	6
7	Pulau Pinang	1	3	4
8	Perlis	1	2	3
9	Kelantan	0	5	5
10	Terengganu	1	5	6
11	Pahang	2	6	8
12	Sabah	0	3	3
13	Sarawak	1	3	4
14	Wilayah Persekutuan	2	2	4
	Total	22	56	78

Table 4.1.1 Gender Distribution of the Respondents

4.1.2 Distribution for Age and Current Position

Table 4.1.2 shows that the distribution of respondents by Age and Current Position. It is noted that 56 respondents (72%) aged below 40 and 22 respondents (28%) aged above 40, whilst for the current position, 39 respondents (50%) are clerks, 35 respondents hold position as Assistant Offices and Officers, and only 4 respondents are Assistant Directors. These shows that most of the respondents are still young and having low level authority in employment.

Age (years old)	Current Position				Total
	Clerical	Assistant Officer	Officer	Assistant Director	
21 - 30	14	7	7	0	28
31- 40	15	8	5	0	28
41 - 50	8	3	5	4	20
>50	2	0	0	0	2
Total	39	18	17	4	78

Table 4.1.2 Distribution of Age Group/Current Position

4.1.3 Length of time used daily by users of Computerised Accounting System

Table 4.1.3 shows that 59% respondents are using the MARA CAS for less than 3 hours daily as compared to approximately 30% of respondents use MARA CAS for 3-5 hours daily, and only 11% of respondents use CAS for more that 5 hours daily. It shows that most respondents spent only short time during their working time at the office in accessing and utilising the MARA CAS.

Daily Used of CAS	Frequency	%
< 1 hour	4	5.1
1-3 hour	42	53.8
3-5 hour	23	29.5
> 5 hour	9	11.6
Total	78	100

Table 4.1.3 : Frequency Distribution of Respondent on Daily use of CAS

4.1.4 Mean and Standard Deviation of EUCS components

The result show that the respondents were moderately satisfied with the MARA Computerised Accounting System as indicated by the mean scores in Table 4.1.4. The mean score s in Table 4.1.4 indicated that the respondents were least satisfied with the Ease of Use of the MARA Computerised Accounting System.

EUCS	Mean	Std. Deviation
Content	3.7756	0.51691
Accuracy	3.7660	0.38083
Format	3.7724	0.49377
Ease of use	3.5545	0.53853
Timeliness	3.7853	0.48805

Table 4.1.4 EUCS components

4.2 RELIABILITY ANALYSIS

Reliability Analysis is to measure the consistency of a constructs or variables. Eventhough the constructs have been established and validated by the previous researchers, Doll & Torkzadeh (1988), additional questions were add to some of the construct in this study. The realibility analysis is use as comparative puposes only.

To measure reliability, the *Cronbach's alpha* (α) which is based on the average correlation of items within a construct is used. *Cronbach's alpha* has value ranging from 0 to 1. Items having *Cronbach's alpha* value of at least 0.6 is accepted as reliable.

4.2.1 Reliability Analysis of EUCS

Results for the reliability analysis using the Cronbach's Alpha values according for the Constructs and Dependent Variables is summarised in Table 4.2.1. Overall, the analysis shows that the reliability of the 5 constructs and dependent variables are acceptable as it is more than 0.6.

Profile	Original by Doll & Torkzadeh (1988)	No Of Items	Cronbach's Alpha, α
CONTENT	4	4	0.850
ACCURACY	2	4	0.681
FORMAT	2	4	0.807
EASE OF USE	2	4	0.850
TIMELINESS	2	4	0.827
USER SATISFACTION		4	0.682
USER JOB PERFORMANCE		4	0.854

Table 4.2.1 : Cronbach's Alpha Values

As as indicated in Table 4.2.1, the values of Cronbach Alpha of the EUCS components, User Satisfaction and Job Performance are all above 0.6, all constructs and variables are consistent.

4.2.2. Analysis of Variance (ANOVA)

The results shows that there is no significant difference between male and female of the End-users of MARA Computerised Accounting System on their level of satisfaction with the system as well as in improving their job performance. It is noted from table 4.2.2(a) and 4.2.2(b) that the both value of p is more that 0.05.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.049	1	0.049	0.241	0.625
Within Groups	15.371	76	0.202		
Total	15.420	77			

4.2.2 (a) End user's gender and satisfaction with the system

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.022	1	0.022	0.087	0.769
Within Groups	18.906	76	0.249		
Total	18.927	77			

4.2.2(b) End user gender and Improvement on the job performance

4.2.3 Correlation between variables

The result in Table 4.2.3 of the study shows that Content, Accuracy, Format, Ease of Use, Timeliness all have a positive correlation to the end users satisfaction of MARA Computerised Accounting System and to the individual job performance. The least value of correlation of 0.273 for end users satisfaction is Format which indicates weak correlation. The highest and strongest correlation of 0.701 is between end user satisfaction element and individual job performance.

	X ₁	X ₂	X ₃	X ₄	X ₅	Y _{SAT}	Y _{PER}
X ₁ CONTENT	1.000						
X ₂ ACCURACY	0.608	1.000					
X ₃ FORMAT	0.542	0.486	1.000				
X ₄ EASE OF USE	0.578	0.479	0.588	1.000			
X ₅ TIMELINESS	0.524	0.412	0.438	0.521	1.000		
Y _{SAT} SATISFACTION	0.451	0.429	0.273	0.379	0.443	1.000	
Y _{PER} PERFORMANCE	0.556	0.572	0.384	0.408	0.430	0.701	1.000

Table 4.2.3 Correlation between variables

4.3 FACTOR ANALYSIS

Explanatory factor analysis (EFA) and Confirmatory Factor Analysis (CFS) are two major approaches to factor analysis. Doll and Torkzadeh (1998) used EFA to force a five-factor solution to derive their model of user satisfaction. They labeled these five factors as Content, Accuracy, Ease of use, Timeliness and Format. Based on this

study, 20 items were generated to measure the degree of end users' satisfaction with MARA Computerised Accounting Systems. As in Doll and Torkzadeh (1998) model, these items are Content, Accuracy, Format, Ease of use and Timeliness.

In Section B, respondents are then required to evaluate about their level of Satisfaction and the impact of the Computerised Accounting System towards their Job Performance. Table 4.3.1 provides a list of all variables or questionnaires evaluated in the study.

A. EUCS measures:

CODE	ITEM
CONTENT1	The system provides the precise information that I need
CONTENT2	The information content meets my needs
CONTENT3	The system provides reports that seem to be just about exactly what I need.
CONTENT4	The system provides sufficient information.
ACCURACY1	The information from the system is accurate.
ACCURACY2	I am satisfied with the accuracy of the system.
ACCURACY3	The reports generated from the system is reliable.
ACCURACY4	The system provides information that is relevant to my job.
FORMAT1	The output presented is in a useful format.
FORMAT2	The information that I get from the system is clear.
FORMAT3	The format of the screen is easy to understand.
FORMAT4	The format of the screen is as per laid out in the User Manual
EASE1	The system is user friendly.
EASE2	The system is easy to use.
EASE3	The system is easy to learn.
EASE4	The command language used is easy to understand.
TIMELINESS1	I can get the information that I need in time.
TIMELINESS2	The system provides me with up-to-date information.
TIMELINESS3	I can get quick response from the system.
TIMELINESS4	I can get on time assistance from Finance or MIS Dept personnel when needed.

B. Satisfaction and Performance-related measures:

SAT1	Overall, I am satisfied with the system.
SAT2	In consider the system is effective.
SAT3	MARA should maintain the existing computerised accounting system
SAT4	MARA does not have to implement a new computerized financial system in the near future.
PER1	Overall, the system helps me improve my job performance.
PER2	The system helps me save time in completing my task.
PER3	The system helps me in making a better decision.
PER4	The system helps me increase my productivity.

Table 4.3.1 List of Questionnaires

When analyzing the data, we include all variables. Factor Analysis were performed in order to find the smallest number of factors that would best reproduce the observed correlations and also provide a meaningful or interpretable grouping of the variables. Both the rule of eigen-values greater than one (1) and the scree test were employed in order to determine the number of factors. The analysis of the 20 variables revealed that six (6) factors had eigen-values greater than one (1). The results indicate that the six(6) factors together explain about 63.0% of variation in End User Computing Satisfaction with the factor loadings of the item between 0.31 to 0.795.

When five (5) factor loading is set, Correlated (oblimin) solutions for the model are examined for the interpretation. The correlated factor pattern obtained from the oblimin solution provided a better grouping of the variable than the varimax solution. This solution, along with the factor correlation matrix, is presented in Table 4.3.2. For ease of visualization and interpretation, all factor loadings less than 0.3 from measuring These coefficients indicate the relative contribution of an item to the construction of a scale for measuring a particular factor. The results indicate that the five(5) factors together explain about 58.4% of variation of the end-user computing measurements with the factor loadings of the item between 0.31 to 0.81. As shown in

Table 4.3.3, the factor correlation matrix indicates that factor Format have negative correlations with other factors of EUCS.

QUESTION CODE/ITEM	CONTENT	EASE OF USE	FORMAT	TIMELINESS	ACCURACY
CONTENT1	0.653				
CONTENT2	0.661				
CONTENT3	0.644				
CONTENT4	0.613				
EASE1		0.407			
EASE2		0.734			
EASE3		0.809			
EASE4		0.723			
FORMAT1			0.710		
FORMAT2			0.617		
FORMAT3			0.781		
FORMAT4			0.458		
TIMELINESS1				0.693	
TIMELINESS2				0.797	
TIMELINESS3				0.637	
TIMELINESS4				0.520	
ACCURACY1					0.443
ACCURACY2					0.519
ACCURACY3					0.666
ACCURACY4					0.312

Table 4.3.2 Rotated Factor Matrix of the EUCS

FACTOR	CONTENT	EASE OF USE	FORMAT	TIMELINESS	ACCURACY
CONTENT	1.000				
EASE OF USE	0.421	1.000			
FORMAT	-0.303	-0.281	1.000		
TIMELINESS	0.448	0.393	-0.423	1.000	
ACCURACY	0.242	0.188	-0.107	0.267	1.000

Table 4.3.3 Factor Correlation Matrix

4.4 REGRESSION ANALYSIS

4.1.1 End Users Satisfaction

The regression analysis is used to measure the relationship between two variables, X and Y. In general, the goal of linear regression is to find the line that best predicts Y from X. Linear regression does this by finding the line that minimizes the sum of the squares of the vertical distances of the points from the line. The results of the Regression Analysis for end user satisfaction of MARA Computerised Accounting System at the State Offices are presented in Table 4.4.1. The results explain the degree of dependent variable (Y) or user satisfaction is related to more than one independent variable of EUCS namely Content, Accuracy, Format, Ease of use and Timeliness.

Model	Coefficient of non-standardization		Coefficient of standardization	t-value	Sig.
	B	Standard Error	Beta		
(Constant)	0.825	0.484		1.702	0.093
CONTENT	0.164	0.124	0.189	1.316	0.192
EASE OF USE	0.250	0.152	0.213	1.648	0.104
FORMAT	-0.880	0.119	-0.098	-0.745	0.458
TIMELINESS	0.079	0.114	0.095	0.692	0.491
ACCURACY	0.229	0.113	0.250	2.029	0.046

$R^2 = 0.297$, $F = 6.072$, $F \text{ Sig} = 0.000^*$,
* : $p < 0.05$

Table 4.4.1 Regression analysis

The results show that in relation to the effect of Content on user satisfaction of MARA CAS supported at significant level of 0.05. User satisfaction of MARA CAS can be increased if the content of the system and reports are providing enough information to their needs. In relation to Ease of use of the MARA CAS, end user satisfaction can be increased if system is easy to use by providing proper training, command and language that are easy to understand by the user. Whereas for the Format, it has resulted in negative effect on users satisfaction of MARA CAS. MARA should improve the format of output presented by the system, make a better screen format layout and manuals as further dissatisfaction may cause users reluctant to fully

utilise the systems. In relation to Timeliness and Accuracy, these factor have significantly effect the user satisfaction of MARA Computerised Accounting System.

4.1.2 Individual Job Performance

Results for Regression Analysis for the End User Computing Satisfaction (EUCS) measurements on the Individual Job Performance are shown in Table 4.1.2.

Model	Coefficient of non-standardization		Coefficient of standardization	t-value	Sig.
	B	Standard Error	Beta		
(Constant)	0.291	0.491		-0.594	0.555
CONTENT	0.220	0.126	0.261	1.987	0.051
EASE OF USE	0.451	0.154	0.347	2.934	0.004
FORMAT	0.003	0.120	0.003	0.029	0.977
TIMELINESS	0.015	0.116	0.016	0.127	0.899
ACCURACY	0.143	0.114	0.141	1.250	0.215
R ² = 0.412, F = 10.084, F Sig = 0.000*, * : p < 0.05					

The result shows the significant relationship of EUCS components to individual job performance at significance level of 0.05 except for Format.

CONCLUSION

It was found that that the EUCS model developed by Doll & Torkzadeh (1998) namely Content, Accuracy, Format, Ease of use and Timeliness support this study for the end users of MARA Computerised Accounting Systems. This study shows that the end users of MARA Computerised Accounting System are moderately satisfied with the systems. The study then further developed that the EUCS components used to measure the effectiveness of the MARA CAS are positively impacted the individual job performance.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.0 INTRODUCTION

This chapter discussed the overall research findings and conclusion of the study. This research focused on the end user satisfaction of MARA Computerised Accounting Systems at the MARA State Offices namely, Payment and Collection Systems. This chapter also discussed the research implications and limitation.

Finally, this chapter discussed the suggestions and recommendations for future research.

5.1 DISCUSSION

The primary purpose of this study was to evaluate the effectiveness of MARA Computerised Accounting System by examining whether the end user of MARA Computerised Accounting System are satisfied with the systems and whether the satisfaction or dissatisfaction of the systems will have an impact on the individual job performance, particularly in terms of speed in doing work or saving time in completing the tasks, improve productivity and decision making. The research model of End User Computing Satisfaction (EUCS) instruments developed by Doll & Torkzadeh (1998) were used to test results presented in this study to confirm the relationship and in what instances, the factors involved influence the satisfaction of the end-user computing of MARA Computerised Accounting System and on individual job performance at MARA State Offices.

5.2 CONCLUSIONS

As discussed in Chapter IV that all the EUCS components were studied and examined on the end users' of MARA Computerised Accounting System at the MARA State offices. The participants in this study were 78 of end users of MARA computerised accounting systems at the MARA State Offices. The results found that the factors of EUCS namely, Content, Accuracy, Format, Ease of use and Timeliness, are positively correlated to the end users satisfaction of MARA Computerised Accounting Systems and consequently impacted the individual job performance. However there is no significant different between male and female users on their level of satisfaction of MARA Computerised Accounting System. Therefore, these EUCS measurements can be use to evaluate the effectiveness or success of MARA Computerised Accounting Systems.

The result also found that the strongest factor influencing the user satisfaction of MARA Computerised Accounting System is Timeliness, followed by Content, Format, Accuracy and Ease of Use. All components of EUCS tested have mean values of 3.55 to 3.78, offering moderately contribution to user satisfaction of MARA Computerised Accounting System. This may indicates that MARA Computerised Accounting System is not so effective as it should be as users are not satisfied due to the weaknesses in the Format and not so friendly system. On the positive side, respondents see the benefits of MARA Computerised Accounting System for their source of the timely information. Access to up-to-date information provided by the system as compared to the manual handing of financial data may offer users to better perform in terms of speed, efficiency and productivity who otherwise may be reluctant to use the computer systems.

5.3 RECOMMENDATIONS

To improve the ability to evaluate the effectiveness of MARA Computerised Accounting Systems further, these recommendations are offered:

5.3.1. Define appropriate system objectives and performance measurement

Since ultimate effects of any Computerised Accounting System may not be direct and immediate especially for a non-profit making organisation, and since the value of information is only realized in its use, a focus on definition of System Objectives and measures is recommended, namely the benefits of system usage and organisational performance. For example, organizational objectives and performance measures might be expressed in terms of increase in job efficiency, reduction in expenditure as compared to the budget allocated, reduction in receivables and increase in collections, and reduce customer complaints. Other measures of Information System success in supporting organizational processes are recommended for assessing IS effectiveness.

5.3.2 Develop a general view for evaluation of IS success

In determining the task objectives of the system, or the organizational units utilizing the system, criterion measures need to be developed to assess how well the objectives are being achieved. Effectiveness can be determined by comparing performance to objectives. An example of the goal-centred view of systems effectiveness would be comparing actual cost and benefits to budgeted costs and benefits. System effectiveness is then may be determined by attaining the organisation's Key Performance Indicators (KPIs). Effectiveness may also be conceptualised in terms of availability of resources such as in terms of IS and the human resource and financial, between IS and user participation in system implementation. In terms of technological resources, system effectiveness might be indicated by the quality of the system or service level. In order to explain the success or the lack of success, resources need to be investigated.

5.3.3 Enlarge the range of performance being evaluated

The intangibles qualitative effects of IS on organisational and individual are often more significant for assessing system effectiveness. Since objectives and measures are typically efficiency-oriented and easily quantified, a need exist to enlarge the range of performance being evaluated. MARA need to build appropriate capacity for useful effectiveness data analysis, data management and presentation at all levels and in different applications and organizational processes.

5.3.4 Recognize the dynamic of IS

The dynamic nature of the IS suggests that evolutionary changes in ICT are very fast such as the Internet, GPS/GPRS/4G, Cloud Computing and Mobile broadband and others have eventually make MARA Computerised Accounting System obsolete. Thus new development and implementation of a fully integrated financial system must be viewed as a planned organization change which will modify users' work system to improve its functioning. This view explained the importance of considering effects of technical change on the organizational processes and the dynamic nature of IS implementation.

5.3.5 Improvement on user support

MARA needs to establish Service Quality evaluation system. The IT and Financial personnel should be trained regularly in all aspect, e.g. professional skills in IT and support, accounting skills and service in relation with integral management to assure higher data quality, timeliness and promotes communications and resolution of problems. MARA should continually improve user education; improve user understanding and awareness through education, improved data accuracy, improved time for data recovery, improved coordination between functional groups, and improved users satisfaction.

5.3.6 Link fragmented Information Systems with interfaces to the Total MARA System

Other information system within MARA, such as the Sistem Perolehan Elektronik MARA and Sistem Pengambilan MRSM/IKM/KKTM, Sistem eEducation have not been able to be linked to the Total MARA Financial System. After achieving this link, the fully integrated information system within the MARA Financial System without disrupting the decentralized databases, by achieving shared forms and operational definitions, developed through central and decentralized data warehouses (including metadata). Thus communication between the users of financial information and easy access to overall data and related information throughout the MARA will be established.

5.3.7 Regular evaluations of Information System Effectiveness

MARA must establish regular evaluation of Information Systems effectiveness within the organisation and keep abreast of new development of information system to improve and maintain the quality of both Information System and Evaluation System (IS Success Model). A standard evaluation method is needed with appropriate statistics to end-users of MARA computerised information system as well as to the ICT personnel. Other models, such as D&M Model of IS success developed by DeLeon & McLean (1992) and Technology Acceptance Model pioneered by Davis (1989) may be used to evaluate the effectiveness of MARA Computerised Accounting System.

5.3.8 Carefully design of security features

In any development of IS, MARA must carefully design its security features and identify areas of risks. MARA must have clear communication with the core professionals involved, users of systems and management because of loss of financial and non-financial data should be addressed by both careful designing of security features and clear communication with users.

5.4 LIMITATIONS

Just like in most studies on evaluation of IS effectiveness or success, the analysis in this study is limited by both data and empirical specifications concerns. The data covers only the MARA State Offices involved; other MARA information systems involved have been overlooked. Moreover, the study focus on the MARA State Offices where their location are at the city, rendering easier access to telecommunication services and computerised environment as compared to MARA centres at the suburb such as MRSM, IKM, KPM or Kolej MARA. Nevertheless, the samples chosen has enabled to measure the success or effectiveness of MARA Computerised Accounting System, achieving thereby a significant advantage.

5.5 IMPLICATIONS FOR FUTURE RESEARCH

Taking in consideration that MARA is a Government agency under the purview of the Rural and Development Ministry, the social, economic and political circumstances may delay in the successful implementation of information system particularly in the financial section. So applying concepts and models will be relative. As this will not influence the overall results of the study, a fundamental stage in evaluating the ISs in the MARA.

The availability and accessibility of respondents was not easy for successfully gathering of the required information. Future studies should repeat this study at other MARA Centres as well as whether any difference exists between the different subgroups of IS users, e.g. executives, mid-level managers, end users and IS support personnel in terms of their ISs so as to provide more comprehensive evaluation approach.

Differences in objectives and their importance might also be studied as a measure of managerial effectiveness. Further studies are needed to distinguish between evaluating different applications and evaluating how extensively Computerised Accounting System is adopted for certain relevant functions. Careful consideration should be

given to the preparation time of the study, time and circumstances in the period of both preparation and execution of the study as well as the size and nature of the sample; e.g. low-level administrator may not be able to distinguish between problem solving and decision rationalization, but this distinction may be more apparently engaged in scientific or analytical works.

Another issue for further study is a more in depth analysis on the factors reviewed by other researchers of different models such as D&M Model of IS Success or Technology Acceptance Model (TAM). Proper weights should also be assigned to relevant factors based on the special features of MARA as a Statutory Body to help evaluate IS success model in a more accurate and precise manner.

Hak Milik MARA

REFERENCES

- American Institute of Certified Public Accountants, *Statement of Basic Accounting Theory*. New York: AICPA publication, 1966.
- Abdinnour-Helm, S. F., Chaparro, B. S. and Farmer, S. M. (2005). *Using the end-user computing satisfaction (EUCS) instrument to measure satisfaction with a Web site*. *Decision Sciences* Vol 36, No 2, pp. 341-364.
- Abdul Karim, M. R. and Mohd Khalid, N. (2003) *E-government in Malaysia*. Selangor, Malaysia: Pelanduk Publications (M) Sdn. Bhd.
- Almutairi, H & Subramanian, G. (2005). *An Empirical Application Of The Delone And Mclean Model In The Kuwaiti Private Sector*. *Journal Of Computer Information Systems*.
- Azadeh, A., Sangari, M. S. and Songhori, M. J. (2009) . *An empirical study of the end-user satisfaction with information systems using the Doll and Torkzadeh instrument*. *International Journal of Business Information Systems*, Vol 4, No 3, pp. 324-339.
- Azzone, G. and Bianchi, R. (2000). *Intranet: different configurations and their effects on the performance of corporate value chain's activities*. *Proceedings of the 2000 IEEE Engineering Management Society*, August 13-15, Albuquerque, NM, USA.
- Azleen Ilias, Mohd Rushdan Yusoa, Mohd Zulkeflee Abdul Razak & Rahida Abdul Rahman. (2009). *End-User Computing Satisfaction (EUCS) in Computerised Accounting System (CAS): Which the Critical Factors? A Case in Malaysia*. *Computer and Information Science* . vol. 1 (2), 18-24
- Azleen Ilias, Mohd Rushdan Yusoa, Mohd Zulkeflee Abdul Razak & Rahida Abdul Rahman. (2007). *The Study Of End-user Computing Satisfaction (EUCS) On Computerised Accounting System (CAS) Among Labuan F.T Government*

- Sectors: A Case Study In The Responsibility Centres*. Labuan E-journal Of Muamalat And Society. vol.1, 1-14.
- Bagozzi, R. and Yi, Y. (1988) "On the evaluation of structural equation models", *Journal of the Academy of Marketing Science*, Vol 16, pp. 74-94.
- Bailey, J., & Pearson, S. (1983). *Development of a Tool for Measuring and Analyzing Computer User Satisfaction*. *Management Science*, 29(5), 530-545.
- Byrd, T. A.; Thrasher, E. H.; Lang, T and Davidson, N. W. (2006). *A process-oriented perspective of IS success: Examining the impact of IS on operational cost*. *Omega* (5), 448-460.
- Bharati, P. and Chaudhury, A. (2004). *An empirical investigation of decision-making satisfaction in web-based decision support systems*. *Decision Support Systems*, 37 (2), 187-197.
- Boockholdt, J. (1999). *Accounting Information Systems Transaction Processing and Control*. The Mac-Graw-Hill companies.
- Brown, M., Mines, C., Moore, C. and Barnett, J. (2007). *Companies Adopt Employee Portals, Not Portal Best Practices*. Forrester Research, Inc, Cambridge.
- Bruce, R. L., Gary, F. T. and Terry Anthony, B. (2005). *A Methodology for Construct Development in MIS Research*. *European Journal of Information Systems*, 14 (4), 388-400.
- Brynjolfsson, E. (1993). *The Productivity Paradox of Information Technology*. *Communications of the ACM*, 36 (12), 67-77.
- Brynjolfsson, E. and Hitt, L. M. (1998). *Beyond the Productivity Paradox: Computers are the Catalyst for Bigger Changes*. *Communications of the ACM*, 41 (8), 49-55.
- Brynjolfsson, E. (1996). *The Contribution of Information Technology to Consumer Welfare*. *Information Systems Research*. vol 7(3), 281-300.
- Brynjolfsson, E. and Yang, S. (1997). *The Intangible Benefits and Costs of Computer Investments: Evidence from Financial Markets*. *Proceedings of the International Conference on Information Systems*, Atlanta, GA.
- Chan, E. H. W. and Liu, C. (2007). *Corporate Portals as Extranet Support for the Construction Industry in Hong Kong and Nearby Regions of China*. *ITCon*, 12 181-192.

- Chang, J. C.-J. and King, W. R. (2005). *Measuring the Performance of Information Systems: A Functional Scorecard*. Journal of Management Information Systems, 22 (1), 85-115.
- Cheung, C. M. K. and Lee, M. K. O. (2005). *The Asymmetric Effect of Website Attribute Performance on Satisfaction: An Empirical Study*. Proceedings of the 38th Hawaii International Conference on System Sciences (HICSS 05), January 3-6, Big Island, Hawaii.
- Chin, W.W., & Lee, M. K. O. (2000). *A proposed model and measurement instrument for the formation of is satisfaction: The case of end-user computing satisfaction*. Proceedings of The Twenty First International Conference On Information Systems. 175-186.
- Churchill Jr, G. A. (1979). *A Paradigm for Developing Better Measures of Marketing Constructs*. Journal of Marketing Research (JMR), 16 (1), 64-73.
- Daniel, E. M. and Ward, J. M. (2005). *Enterprise Portals: Addressing the Organisational and Individual Perspectives of Information Systems*. Proceedings of the 13th European Conference on Information Systems (ECIS 05), May 26-28, Regensburg, Germany.
- David, H.B. (1983). *A field study of end-user computing: Findings and issues*. MIS Quarterly. 7(4), 34-47.
- Davis, F. D. (1989). *Perceived usefulness, perceived ease of use, and user acceptance of information technology*. MIS Quarterly, 13 (2), 319-340.
- DeLone, W.H., & McLean, E.R. (1992). *Information systems success: The quest for the dependent variable*. Information Systems Research. 3(4), 60-95.
- DeLone, W. H. and McLean, E. R. (2003). *The DeLone and McLean Model of Information Systems Success: A Ten-Year Update*. Journal of Management Information Systems, 19 (4), 9-30.
- Deng, X., Doll, W. J., Al-Gahtani, S. S. and Larsen, T. J. (2008). *A cross-cultural analysis of the end-user satisfaction instrument: a multi-group invariance analysis*. Information & Management Vol 45, No 4, pp. 211-220.
- Dias, C. (2001). *Corporate portals: a literature review of a new concept in Information Management*. International Journal of Information Management, 21 (4), 269-287.

- Doll, W. J. and Torkzadeh, G. (1988). *The Measurement of End-User Computing Satisfaction*. MIS Quarterly, 12 (2), 258-274.
- Eckerson, W. W. (1999). *Plumtree Blossoms - New Version Fulfills Enterprise Portal Requirements*. Patricia Seybold Group, Boston, MA.
- Eindor, P., & Segev, E. (1978). *Organisational context and the success of the management information systems*. Management Science. 24(10), 1064-1077.
- Farbey B, Land F and Target D A (1992), *Evaluating investments in IT*. Journal of Information Technology. no. 7.
- Forrester (2006). *Employee Benefit: Benefits Strategy And Technology Study*. Forrester Research, Inc., Cambridge.
- Gatian, A. W. (1994). *IS User Satisfaction A Valid Measure of System Effectiveness*. Information & Management, Vol. 26, Issue 3, 119-131.
- Gelderman, M. (1998). *The relation between user satisfaction, usage of information systems and performance*. Information & Management, 34 (1), 11-18.
- Goodhue, D. L. and Thompson, R. L. (1995). *Task-technology fit and individual performance*. MIS Quarterly, 19 (2), 213.
- Grover, V., Jeong, S. R. and Segars, A. H. (1996). *Information systems effectiveness: The construct space and patters of application*. Information & Management, 31 (4), 177-191.
- Hamilton, S., & Chervany, N. L. (1981). *Evaluating information system effectiveness. Part I comparing evaluation approaches*. MIS Quarterly, 5(3), 55-69.
- Heilman, G. E., & Brusa, J.O.A. (2001). *User information satisfaction in Mexico*. Journal of Information Systems. 8(8), 42-33.
- Henry, J. W., & Stone, R. W. (1994). *A structural equation model of end-user satisfaction with a computer-based medical information system*. Information Resources Management Journal. 7(2), 21-33.
- Hu, P. J.-H. (2003). *Evaluating Telemedicine Systems Success: A Revised Model*. Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS 03), January 6-9, Big Island, Hawaii.
- Huber, G.P. (1990). *A theory of the effects of advanced information technologies on organizational design, intelligence, and decision making*. Academy of Management Review, vol. 15, no. 1, pp. 47-71.

- Iivari, J. (2005). *An Empirical Test of the DeLone-McLean Model of Information System Success*. The DATA BASE for Advances in Information Systems, 26 (2), 8-27.
- International Data Corporation, idc
- Ives, B., Olson, M., & Baroudi, J. (1983). *The Measurement of User Information Satisfaction*. Communications of the ACM, 26, 785-793.
- Kamal, M. M. (2006). *IT innovation adoption in the government sector: identifying the critical success factors*. Journal of Enterprise Information Management, Vol 19, No 2, pp. 192-222.
- Kankanhalli, A., Tan, B. C. Y. and Wei, K.-K. (2005). *Contributing Knowledge to Electronic Knowledge Repositories: An Empirical Investigation*. MIS Quarterly, 29 (1), 113-143.
- Kim, K.K. (1989). *User satisfaction: A synthesis of three different perspectives*. The Journal of Information System, vol. 4(Fall), pg 1-12.
- Lewis, B. R., Templeton, G. F. and Byrd, T. A. (2005). *A methodology for construct development in MIS research*. European Journal of Information Systems, 14 (4), 388-400.
- Lin, H.-F. and Lee, G.-G. (2006). *Determinants of Success for Online Communities: An Empirical Study*. Behaviour & Information Technology, 25 (6), 479-488.
- Lucas HC Jr (1978). *Empirical evidence for a descriptive model of implementation*. MIS Quarterly 2(2):27
- Markus, M.L. (1983). *Power, Politics and MIS Implementation*. Communications of the ACM. vol. 26 , pp. 430-444.
- Martinsons, M., G., Davison, R., Dennis, T., (1999). *The Balanced Scorecard: a foundation for the strategic management of Information Systems*. Decision Support Systems, 25:1.
- Mihir, A.P. & Bijan, F. (2002). *Analysing user satisfaction with decisional guidance*. Decision Sciences Institute 2002 Annual Meetings Proceedings. 128-135.
- McHaney, R. Hightower, R., & Pearson, J. (2002). *A validation of the end-user computing satisfaction instrument in Taiwan*. Information & Management. 39(6), 503-511.

- McHaney, R., Hightower, R., & White, D. (1999). *EUCS test-retest reliability in representational model decision support systems*. *Information & Management*, 36(2), 109-119.
- McKinsey & Company. (1986). *Unlocking the computer's profit potential*. *McKinsey Quarterly*, 6(3), 17-31.
- Moore, G. C. and Benbasat, I. (1991). *Development of an Instrument to Measure the Perceptions of Adopting an Information Technology*. *Innovation, Information Systems Research*, 2 (3), 192-222.
- Petter, S., Straub, D. and Rai, A. (2007). *Specifying Formative Constructs in Information Systems Research*. *MIS Quarterly*, 31 (4), 626-656.
- Pikkarainen, K., Pikkarainen, T., Karjaluoto, H. and Pahnla, S. (2006). *The measurement of end-user computing satisfaction of online banking services: Empirical evidence from Finland*. *International Journal of Bank Marketing*, Vol 24, No 3, pp. 158-172
- Pitt, L. F., Watson, R. T. and Kavan, C. B. (1995). *Service quality: A measure of information systems effectiveness*. *MIS Quarterly*, 19 (2), 173-187.
- Rai, A., Lang, S. S. and Welker, R. B. (2002). *Assessing the Validity of IS Success Models: An Empirical Test and Theoretical Analysis*. *Information Systems Research*, 13 (1), 50-69.
- Rainer RK Jr, Watson HJ (1995). *The keys to executive information system success*. *Journal of Management Information Systems* 12(2):83-98
- Remus, U. (2006). *Critical Success Factors of Implementing Enterprise Portals*. *Proceedings of the 39th Hawaii International Conference on System Sciences (HICSS 06)*, January 4-7, Kauai, Hawaii.
- Rockart, F., & Flannery, L.S. (1981). *The management of end user computing*. *Proceedings of the Second International Conference on Information Systems*. Cambridge, Massachusetts, 15(5), 351-364.
- Schaupp, L. C., Fan, W. and Belanger, F. (2006). *Determining Success for Different Website Goals*, *Proceedings of the 39th Hawaii International Conference on System Sciences (HICSS 06)*, January 4-7, Kauai, Hawaii.
- Schrage, M. (1997). *The real problem with computers*. *Harvard Business Review*, (September-October), 178, 183-188.

- Seddon, P., & Yip, S.K. (2002). *An empirical evaluation of user information satisfaction (UIS) measures for use with general ledger accounting software*. *Journal of Information Systems*, 12(2), 49-60.
- Seddon, P. B. (1997). *A Respecification and Extension of the DeLone and McLean Model of IS Success*. *Information Systems Research*, 8 (3), 240-253.
- Seddon, P. B., Staples, S., Patnayakuni, R. and Bowtell, M. (1999). *Dimensions of Information Systems Success*. *Communications of the AIS*, 2 1-60.
- Shilakes, C. C. and Tylman, J. (1998). *Enterprise Information Portal - Industry Overview*. Merrill Lynch, Inc., New York City, New York.
- Sorebo, O, Christensen G.E. & Eikebrokk T.R. (2004), *The Impact of Purposeful End-User Computing Activities on Job Performance: An Empirical Investigation*. *Journal of Research and Practice in Information Technology*, Vol. 36, No. 2.
- Straub, D., Boudreau, M.C. and Gefen, D. (2004). *Validation Guidelines for IS*. *Research Communication of the AIS*, 13 380-427.
- Straub, D. W. (1989). *Validating Instruments in MIS Research*. *MIS Quarterly*, 13 (2), 147-169.
- Sugianto, L.-F. and Tojib, D. R. (2006). *Modeling User Satisfaction With an Employee Portal*. *International Journal of Business and Information*, 1 (2), 239-255.
- Sugianto, L.-F., Tojib, D. R. and Burstein, F. (2007). *A Practical Measure of Employee Satisfaction with B2E Portals*. *Proceedings of the 28th International Conference on Information Systems (ICIS 2007)*, December 9-12, Montreal, Quebec, Canada.
- Tojib, D. R., Sugianto, L.-F. and Sendjaya, S. (2006). *A Conceptual Model for B2E Portal User Satisfaction*. *Proceedings of the International Conference on Business and Information*, Singapore.
- Tojib, D. R., Sugianto, L.-F. and Sendjaya, S. (2008). *User satisfaction with business-to-employee portals: conceptualization and scale development*. *European Journal of Information Systems*, 17 (6), 649-667.
- Torkzadeh, G., & Doll, W. J. (1991). *Test-retest reliability of the end-user computing satisfaction instrument*. *Decision Sciences*, 22(3), 26-37.
- Urbach, N., Smolnik, S. and Riempp, G. (2008). *A Methodological Examination of Empirical Research on Information Systems Success: 2003 to 2007*.

Proceedings of the 14th Americas Conference on Information Systems (AMCIS 2008), August 14-17, Toronto, Ontario, Canada.

Yang, Z., Cai, S., Zhou, Z. and Zhou, N. (2005). *Development and validation of an instrument to measure user perceived service quality of information presenting Web Portals*. Information & Management, 42 (4), 575-589.

Hak Milik MARA

APPENDICES

SURVEY QUESTIONNAIRES

THE STUDY OF END USER SATISFACTION ON MARA COMPUTERISED ACCOUNTING SYSTEM: A CASE STUDY FOR MARA STATE OFFICES

APPENDIX A: THE QUESTIONNAIRE

Thank You in advance for taking the time in responding to the questionnaires.

These survey questionnaires are intended to evaluate the effectiveness of MARA Computerised Accounting System deployed to MARA State Offices by using the End User Computing Satisfaction (EUCS) measurement. The findings of the study will be used as empirical evidence whether the existing MARA computerised accounting system should be maintained, upgraded or MARA should implement or change to a new one.

Your participation is voluntary. Please rest ensured that any information that you provide is strictly confidential.

(Terima Kasih kepada tuan/puan yang sudi meluangkan masa untuk menjawab kaji selidik ini. Tujuan kaji selidik ini untuk. Semua maklumat akan dirahsiakan).

Hak Milik MARA

Section 1 RESEARCH INDICATOR (Maklumat Penyelidikan)

For each of the following statement, please circle the number that corresponds to your answer between 1 and 5 below:

Sila nyatakan tahap penilaian anda bagi kenyataan di bawah dengan menandakan berdasarkan skala yang diberi:)

1= Almost Never (*Tidak Pernah*), 2 = Some of the time (*Sekali sekala*),

3= About Half of the Time (*Kadang-kadang*), 4 =Most of the time(*Kerap Kali*),

5 = Always (*Selalu*)

CONTENT OF THE SYSTEM		Never	SCALE (SKALA)			Always
1	The system provides the precise information that I need.	1	2	3	4	5
2	The information content meets my needs.	1	2	3	4	5
3	The system provides reports that seem to be just about exactly what I need.	1	2	3	4	5
4	The system provides sufficient information.	1	2	3	4	5

ACCURACY OF THE SYSTEM		Never	SCALE (SKALA)			Always
1	The information from the system is accurate.	1	2	3	4	5
2	I am satisfied with the accuracy of the system.	1	2	3	4	5
3	The reports generated from the system is reliable.	1	2	3	4	5
4	The system provides information that is relevant to my job	1	2	3	4	5

FORMAT OF THE SYSTEM		Never	SCALE (SKALA)			Always
1	The output presented is in a useful format	1	2	3	4	5
2	The information that I get from the system is clear.	1	2	3	4	5
3	The system provides reports that is just about exactly what I need	1	2	3	4	5
4	The format of the screen is as per laid out by User Manual	1	2	3	4	5

EASE OF USE OF THE SYSTEM		Never	SCALE (SKALA)			Always
1	The system is user friendly.	1	2	3	4	5
2	The system is easy to use.	1	2	3	4	5
3	The system is easy to learn.	1	2	3	4	5
4	The command language used is easy to understand	1	2	3	4	5

TIMELINESS		Never	SCALE (SKALA)			Always
1	I get the information that I need in time.	1	2	3	4	5
2	The system provides me with up-to-date information.	1	2	3	4	5
3	I can get response fast to the system.	1	2	3	4	5
4	I can get assisted from Finance or MIS Dept personnel in time when encounter problem.	1	2	3	4	5

For each of the following statement, please circle the number that corresponds to your answer between 1 and 5 below:

Sila nyatakan tahap penilaian anda bagi kenyataan di bawah dengan menandakan berdasarkan skala yang diberi:)

1= Strongly Disagree, 2 = Disagree, 3= Neither , 4 = Agree, 5 = Strongly Agree

USER SATISFACTION		Strongly Disagree			Strongly Agree	
1	Overall, I am satisfied with the system.	1	2	3	4	5
2	In consider the system is effective.	1	2	3	4	5
3	MARA should maintain the existing computerised accounting system	1	2	3	4	5
4	MARA does not have to implement a new computerized financial system in the near future	1	2	3	4	5

JOB PERFORMANCE		Strongly Disagree			Strongly Agree	
1	Overall , the system helps me improve my job performance	1	2	3	4	5
2	The system helps me save time in completing my task	1	2	3	4	5
3	The system helps me in making a better decision	1	2	3	4	5
4	The system help me increase my productivity	1	2	3	4	5

Hak Milik MARA

Section 2 General Information (Maklumat Am)

Centre/Pusat : _____

Computerised Accounting System used (): Payment (SBPO) _____
Collection (SPPO) _____

1. Gender:

- Male
- Female

2. Age :

- < 20
- 21 - 30
- 31 - 40
- 41 - 50
- > 50

3. Length of service in MARA:

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- > 20 years

4. Length of service at MARA State Office

- 0-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- > 20 years

5. How long have you been using MARA Computerised Accounting System?

- <1 year
- 1-3 years
- 4-6 years
- 7-9 years
- > 9 years

6. Current Position:

- Clerical/ Sokongan
- Assistant Officer/ Penolong Pegawai
- Officer/ Pegawai
- Assistant Director/ Timbalan Pengarah
- Director/ Pengarah

7. Highest education:

- SPM
- Diploma
- Bachelor
- Master/ Profesional/ PhD

8. Estimated daily use of the Computerised System:

- < 1 hour
- 1-3 hours
- 3-5 hours
- > 5 hours

****Thank you *****