# IMPACT OF ENTERPRISE RESOURCE PLANNING (ERP) SYSTEM ON PERFORMANCE OF PUBLIC SECTOR

BY

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A thesis submitted in fulfilment of the requirement for the degree of Master of Science (Accounting)

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#### **ABSTRACT**

The introduction of enterprise resource planning (ERP) system as a tool to increase performance has encouraged many organizations to adopt it. This includes the public sector organization (PSO) that adopted a more effective system to deliver a more efficient citizencentric services and enhance operational proficiencies. Even though the government should strive for improvement via the adoption of ERP, however, they might not benefit from these enhancement. The aim of this study is to investigate the impact of the ERP system upon PSO's performance in Malaysia using the DeLone and McLean Information System (IS) success model and four perspectives of Balanced Scorecard (BSC) measurement model, which are financial, customer, internal business, and innovation and learning. This study presents evidence, gathered from a questionnaire survey of 52 local authorities (LAs) in Malaysia that have implemented the system. The data were collected by an electronically distributed Google Form questionnaire. The findings indicated that system quality is positive as predicted and significant for all perspectives of BSC. It is also found that the information quality is positively related and significant towards the customer perspective, and positively related but not significant towards the financial, internal business, and innovation and learning perspective in Malaysia. It was also proven that a good quality system supporting user performance is related to the net benefits gained, leading to a positive impact for all perspectives of BSC. The results also ascertained that the implementation of ERP system in LA organizations leads improved performance, proving the suitability of the system vis-à-vis the PSO. The results are expected to encourage other PSOs to adopt a similar strategy in order to gain benefits similar to ones enjoyed by LAs.

# خلاصة البحث

إن ظهور نظام تخطيط موارد المؤسسات قد شجع العديد من المنظمات على عتماده، حتى إن قد اعتمدته نظرا إلى فاعليتيه في خدمة المواطنين بجودة أكثر (PSO)منظمات القطاع العام وتعزيز البراعات التشغيلية. إن اعتماد الحكومة على هذا النظام سوف يسعى حتما إلى تطويره، وقد لا تستفيد المنظمات من هذه التحسينات والتطورات. الهدف من هذه الدراسة هو التحقق من مدى تأثير نظام تخطيط مؤسسات القطاع العام في ماليزيا باستخدام نظام نجاح المعلومات، كنموذج فضلاً عن استخدام محددات بطاقة الأداء المتوازن (McLean) وماكلين (DeLone)دي لون الأربعة، هي المنظور المالي، ومنظور العملاء، ومنظور الأعمال التجارية الداخلية، ومنظور النمو والتعلم. عرضت دراسة الأدلة التي جمعتاستبانات العينات وعددها 52 من عينة السلطة المحلية التي طبقت هذا النظام بماليزيا. وقد جمعت البيانات الموزعة إلكترونيا عن طريق استبانات جوجل. ، (BSC). وأشارت النتائج إلى أن نظام الجودة كان إيجابياً ومتوقعاً وهامًا بالنسبة إلى جميع جهات كما أنها وجدت نوعية المعلومات المتصلة بصورة إيجابية وهامة نحو منظور العملاء ومتصلة بشكل إيجابي، ولكن ليس بالنحو الكبير، بالنسبة إلى المالية والأعمال التجارية الداخلية والابتكار والتعلم في منظرو دولة ماليزيا. وأثبتت أيضا أن النظام ذو النوعية الذي يدعم أداء المستخدم مرتبط بالفوائد تؤكد النتائج أن تنفيذ نظام تخطيط .(BSC) المكتسبة، ويؤدي إلى التأثير الإيجابي لجميع وجهات .(PSO) موارد المؤسسات في المنظمات يحسن الأداء، وتثبت مدى ملاءمة النظام تجاه دعم توقعت النتائج أيضا تشجيع الأنظمة الأخرى لاعتماد استراتيجية مماثلة من أجل الحصول على (LAS)مزايا مماثلة التي تتمتع بما السلطات المحلية

# APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a thesis for the degree of Master of Science (Accounting).	
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I hereby declare that this dissertation is the result of my own investigations, except	
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# LIST OF ABBREVIATIONS

AG Accountant General's Department

APS Advanced Planning and Scheduling

BSC Balance Scorecard

CRM Customer Relationship Management

e-Government Electronic Government

e-Procurement Electronic Procurement

ERP Enterprise Resource Planning

e-SPKB Electronic Budget Planning and Control System

GFMAS Government Financial and Management Accounting System

HRMIS Human Resource Management Information System

IAU Internal Audit Unit

ICT Information and Communications Technologies

IS Information System

IT Information Technology

LAs Local Authorities

LGD Local Government Department

MAMPU Malaysian Administrative Modernisation and Management

Planning Unit

MIS Management Information System

MRP II Manufacturing Resources Planning

MRP Material Requirements Planning

NPM New Public Management

PSO Public Sector Organization

PTJ Responsibility Centre

SAGA Standard Accounting System for Government Agencies

SCM Supply Chain Management

SMEs Small-and Medium-sized Enterprises

SPEKS State Government's Standard Computerized Accounting System

SPM Micro Accounting System

SPSS Statistical Package for the Social Sciences

# **CHAPTER ONE**

### INTRODUCTION

#### 1.1 INTRODUCTION

This chapter introduces the intricacies pertaining with this study, encompassing its background, problem statement, motivation for the study, research objectives and questions, and the scope. Its significance IS discussed at length, culminating in a detailed explanation of the thesis' structure.

# 1.2 BACKGROUND OF THE STUDY

Public sector organizations (PSO) have a unique culture, encountering numerous challenges due to social responsibilities, complex legislative and higher public expectations (Kumar, Maheshwari & Kumar, 2002). In the early 1980s, governments throughout the world began experimenting with numerous approach towards governmental reform. Some involved the implementation of management principles from the private sector (Rosacker & Rosacker, 2010), called "new public management" (NPM), in which the public sector emulating major practices of the private sector (Rosacker & Rosacker, 2010; Hood, 1991). One of them called the Enterprise Resource Planning (ERP) system. Its initial use was to serve the manufacturing companies. However, due to its tremendous benefits, the public sector worldwide has begun to adopt this system in their respective organizations (Rosacker & Rosacker, 2010).

Technological changes significantly affect accounting in the function of business organization. The developments in information and communications technologies (ICT) have greatly enhanced the global economic market (Scapens & Jazayeri, 2003). Among the key initiative that help businesses deal with their resources

is ERP. It can be very much characterized as a configurable, standard application software that comprises integrated business modules, which is designed for primary practices and functions of an organization, with the aim of presenting a holistic view of an organization via the utilization of a single ICT infrastructure (Klaus, Rosemann & Gable, 2000). Moreover, according to Gelogo and Kim (2014), ERP is a management process business software that comprehensively integrate the applications of organizational management and functions, such as product planning, development, manufacturing, sales and marketing, while automating office functions associated with technology, services and human resources. Furthermore, it is a process-driven module constructed around software, with the aim of delivering a comprehensive business process in order to present the best organizational practice in the industry (Robinson & Wilson, 2001). In addition, Koch (1996) accentuated that this system is a greatly integrated and highly complex system, and thousands of businesses are applying them effectively throughout the world.

With the business environment rapidly changing and organizations facing extensive changes both internally and externally, organizations are facing the pressure to shorten throughput times, provide a superior product and quality service, and to possess well-organized global management functions (Umble, Haft & Umble, 2003). Wallace and Kremzar (2001) posited that developments in organizational process are represented by one of these three methods:

- Enhancing the organizational process using the total quality management tools, such as six sigma and others,
- Handling the process complexity through lean manufacturing, and
- Organizing the functions of the overall set of organizational processes through enterprise resource planning (ERP).

Apart from other management accounting tools, ERP is fast becoming one of the essential tools and strategy of enhancing the business process.

During the early stages of the introduction of the system, there was an overwhelming adoption of ERP system by developed countries. 66% of the ERP market was from North America, followed by Europe, contributing 22% of the ERP market (Huang & Palvia, 2001). According to market share analysis reported by Gartner for ERP software in 2012, the ERP market grew by 2%, and the top 10 vendors represents 64% of the total market size.

The implementation of ERP in organizations resulted in many discernible impacts. It can change the way of collecting, receiving, and transferring information, and also helps enhance the process of decision making (Kumta, 2009). ERP has been used by governments globally due to the use of information and communications technologies (ICT) to enhance services to citizens, have a smoother workflow, and provide better governance and transparency (Kumta, 2009). According to Davenport (1998), governments adopt ERP systems because it helps reshape governmental organizations as they create the potential of elucidating challenges posed by cases of disconnected and uncoordinated applications. The combined computing systems resulted in a seamless integration of the entire informational network within an organization (Markus, Axline, Petrie & Tanis, 2000; Davenport, 1998).

This study investigates the impact of ERP on PSO by using the integrated Delone and McLean Information System (IS) success model and Balanced Scorecard (BSC) measurement model to evaluate the performance of this system. The IS success model has been established by DeLone and McLean in 1992, and has been used in many studies on IS (Kadir & Yatin, 2015; Hsu, Yen & Chung, 2015; Gorla, Somers & Wong, 2010; Lin, Hsu & Ting, 2006; Gable, Sedera & Chan, 2003) as it helps deliver the

integrated view of the concept of IS success. On the other hand, the BSC measurement model has been established by Robert S. Kaplan and David P. Norton in 1992 due to the need of having indicators of future performance. The BSC measurement model is a framework that added strategic non-financial performance measures to traditional financial metrics to give managers and executives a more 'balanced' view of organizational performance (Kaplan & Norton, 1992). It consist of four perspectives which are financial perspective, customer perspective, internal business perspective, and innovation and learning perspective. The BSC measurement model is used in this work as it is able to provide not only financial, but also non-financial performance measurement. On the other hand, most existing model were solely based on traditional financial measures, and lack other indicators pertaining to organizational performance. Thus, by employing this model, it will provide a comprehensive understanding of the impact of ERP on PSO.

# 1.3 PROBLEM STATEMENT

Increased concerns regarding the performance of the public sector in various developed nations have been linked to the need for an effective system. In line with the best "new" management practices, private sector organizations have superseded in embracing the values of service quality at a much earlier as compared with PSO caused by the dissimilarities in their environmental and historical contexts (Agus, Barker & Kandampully, 2007). The main objective of PSO is to deliver social benefit in a restricted budget and diminishing costs (Dewhurst, Martinez-Lorente & Dale, 1999). Nevertheless, the main objective of private sector organizations is concerning profit maximization. Hence, this is the focal reason that caused the private sector

organizations to have a significantly greater efficiency, productivity, and profitability as compared with the PSO (Agus et al., 2007).

As reported in Utusan Online (2008), the majority of local authorities (LAs) have failed to report its annual audit in a timely manner. It was reported that only 46 percent of Internal Audit Unit (IAU) of LAs nationwide submitted their audit report annually. Hence, the performance of the preparation of the annual audit report of LAs across the country are unsatisfactory. This is supported by the Auditor General's Report for 2014 on the audit of activities of the Federal Ministries/Departments and management of the government companies by National Audit Department Malaysia, generally there are weaknesses, such as work, procurement, or service not meeting specifications, unreasonable delays, improper payment, wastages, and weaknesses in government's assets and financial management. Due to these reasons, it indicated the need to improvise the quality standards in the public sector.

According to Teicher et al. (2002), quality standards can be enhanced by adopting new mechanisms, such as privatisation, explicit contracts, separating service provision agencies from policy, and e-government. Some of the benefits of E-government are enhanced efficiency, effectiveness, and productivity of public sector's processes and services, as well as the deepening of the governance process. Public sector is evolving towards increased efficiency in the provision of services to citizens. In order to deliver a citizen-centric service and enhance the operational efficiencies, many PSO adopted a more effective system in their respective organizations. The introduction of the ERP system as a tool to create competitive advantage and the potential benefits derive from the system adoption has encouraged many organizations to adopt the ERP system.

However, the adoption of ERP should be carefully considered. While governments expect to have improved economic status via the adoption of ERP, organizations might not benefit in the same way, which is mostly attributed to high implementation costs. For instance, the Malaysian government has allocated RM15 million under the 9<sup>th</sup> Malaysia Plan towards the development of the ERP system for LAs, which is the ePBT system (Jidwin & Mail, 2015). ePBT system is one of the product of ERP that has been implemented by the government of Malaysia in order to enhance the efficiency and effectiveness of local authorities (LAs) services. This adoption is quite costly both in terms of financial resources and human capital. Furthermore, the implementation of ERP is a rather intricate undertaking (Poston & Grabski, 2001), involving problems such as integrating the ERP software with the operating systems, hardware, telecommunications, and database management systems, and cater it to the requirement of organizations (Markus et al., 2000). Moreover, organizations faces difficulties when ERP is implemented due to changes to the inner working of the divisions, or in some cases, entire organizations (Poston & Grabski, 2001). It also necessitate large investments in direct implementation costs, software and hardware, and training for system users (Davenport, 2000).

The successful implementation of ERP might negatively affect organizations, due to automated tasks and eliminated positions (Poston & Grabski, 2001). According to Arnold, Hunton and Sutton (2000), employees who lost their posts and were reassigned in an organization will be less productive, thus affecting organizational productivity. Moreover, ERP models focused upon both the order and streamlined processes, which supresses creativity and innovation (Arnold et al., 2000). The system induces the prevalence of a hierarchical organization via control-and-command view, which might not be suitable for all organizations (Davenport, 2000). Additionally,

Arnold et al. (2000) added that the "best practice" models implemented by the ERP vendors are constructed from previously successful organizations, and is possibly unsuitable for evolving organizations. Furthermore, when organizations undertake reengineering, it is assumed that the current processes are inadequate. However, this might not be the case; the current process might be the most appropriate and best fit for the organization (Poston & Grabski, 2001).

Finally, the main feature of the ERP system is the fact that it helps integrate all functions within the organizations. The information errors that occur in the system are not restricted to a particular area, instead, it will spread throughout the organization (Lynn & Madison, 2000). In the event of subpar information quality and incongruous processes, plain wrong answers will look better, which will consequently influence decision makers, leading to incompetent and unproductive organizational management (Lynn & Madison, 2000). Therefore, despite the promises made by the implementation of ERP, other factors could result in economic losses. Consequently, the main agenda of this study is to determine the impact of ERP system on PSO's performance.

#### 1.4 MOTIVATION FOR THE STUDY

There are many benefits of the ERP system vis-à-vis organizations; organizations could enhance productivity and its financial cycle, reduce administrative and operating costs, and improve cash management (Gargeya & Brady, 2005). Despite the substantial effort and costs associated with the adoption of ERP, the foreseen benefits of its implementation has encouraged its adoption by numerous organizations.

This includes the adoption of ERP by PSO. The number of PSO in Malaysia currently implementing ERP system is fast increasing (MAMPU, 2015). Adopting the ERP system is deemed as necessary and crucial for PSOs. Many PSOs have adopted

this system, and non-adopters are perceived as a being behind in the technological arena. Furthermore, it is in line with New Public Management (NPM) concept, which is to be compatible with the private sector, and for the public sector to provide better quality services. Even though governments expect improvements from the adoption of ERP, organizations might experience adverse effects.

Moreover, while there are some researches focusing on factors influencing the successful implementation of ERP, there are still limited works on performance measurement of ERP system, especially on the usage of BSC (Chand et al., 2005). Moreover, there is a very limited literature on the subject in the context of PSO, especially in Malaysia. According to Rosacker and Rosacker (2010), the majority of studies conducted on ERP do not focus on PSO. It is important to conduct a study on PSO, as its environment, structure, and working culture differs from the private sector (Cats-Baril & Thompson, 1995; Project Management Institute, 2006). Based on the knowledge of the author, there are no studies specifically on ePBT system. This forms the main motivation of this work, which is the impact of ERP system towards the performance of PSOs in Malaysia.

#### 1.5 RESEARCH OBJECTIVE AND RESEARCH QUESTIONS

The main purpose of this study is to determine the impact of ERP system on the performance of PSO in Malaysia from the perspectives of financial, customer, internal business, and innovation and learning. In order to meet this objective, this study explored the following research questions:

**RQ1:** What are the impacts of ERP system (system quality and information quality) on the performance of PSO in Malaysia from the financial perspective?

- **RQ2:** What are the impacts of ERP system (system quality and information quality) on the performance of PSO in Malaysia from the customer perspective?
- **RQ3:** What are the impacts of ERP system (system quality and information quality) on the performance of PSO in Malaysia from the internal business perspective?
- **RQ4:** What are the impacts of ERP system (system quality and information quality) on the performance of PSO in Malaysia from the innovation and learning perspective?

#### 1.6 SCOPE OF THE STUDY

The study focused on the impact of ERP via ePBT system in the LAs of Malaysia. ePBT was developed to improve the delivery of LAs via the usage of ICT. It has been implemented by Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) and Local Government Department (LGD) since 2007, at various stages. The impact of this system was analyzed based on opinions received by LAs' accountants, who are mostly the main user of this system.

## 1.7 SIGNIFICANCE OF STUDY

This study is significance as it has several implications for research. First, there is very limited research on the impact of ERP system utilizing the BSC measurement model. This study fulfil the current calls for studying the impact of ERP from some different contexts other than the traditional operational and technical aspects. For this reason, it can provide new benchmarks and guidance for ERP adopters, educators, and researchers.

Moreover, to the best knowledge of the researcher, so far, there is no study on the effect of ERP system on PSO in Malaysia. Most studies in the context of ERP were conducted in the private sector. Therefore, it is expected that this study will address a current gap in literature and trigger research on the public sector.

Furthermore, the empirical evidence reported by this study along with prior researches (Jidwin & Mail, 2015; Kanellou and Spathis, 2013; Singla, 2008; Kamhawi, 2008; Agus, Barker & Kandampully, 2007; Lin, Hsu & Ting, 2006; Chand et al., 2005) can then be applied to create the best way forward in fully utilizing ERP's capability. Moreover, the results of this study can assist to enhance the assessment regarding the benefits of accounting that an ERP system might be able to provide.

The result of this study will also help to give a new idea to potential ERP adopters in the PSO, especially on the benefits they stand to gain. Adopters will gain more insight when they compare their performances with the findings that will be reported in this work. The results will also be of help to non-adopters, as it helps the consultants and vendors in their quest to improve their usage of the system.

#### 1.8 ORGANIZATION OF THE STUDY

The present chapter underscores the background, motivation, problem statement, objectives and research questions, and the significance of the study. The next chapter provides an overview on the Malaysian public sector and its transformation. It will then be followed with an explanation on the accounting systems being used in the government. Chapter three will provide a general discussion of reviews on prior studies regarding the subject area and justify the research questions for the study. While the theoretical framework, hypotheses developed, as well as the research framework used