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# Information Technology Governance on Public Sector Audit Performance

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## Abstract

The fast growing trend of information technology (IT) transformation in the organisation and huge IT investment by Malaysian Government have triggered the significance of IT risk and its related controls. Besides, technology-enabled auditing and IT oriented audit procedures have become crucial when performing audit task in an electronic environment. Technology-enabled auditing is a process of examination using audit technology in assuring the electronic data being managed properly and reliable in assisting auditors to form an audit opinion. Although, many initiatives being implemented to improve technology usage but audit technology usage among the auditors are still low and auditors are not attaining sufficient progress in the use of technology. This implies that technology-enabled audit performance may not lead to the expected outcomes in achieving the effective, efficient and quality audit task. Furthermore, it also indicates that the current strategies and policies may not effectively support the technology implementation. In the same vein, the under-utilisation of technologies was reported due to inadequate governance. Known the high cost and low success rate, reasons for these issues need to be understood and strategies towards success vital to be discovered. Thus, this study intent to investigate the impact of IT governance on technology enabled audit performance. IT governance is a mechanism to stimulate anticipated behaviour in the use of technology among the employees of an organisation and it is a subset of corporate governance. Agency theory will be employed in explaining the phenomena. A survey using closed-ended questionnaire will be distributed to approximately 300 Malaysia public sector auditor in National Audit Department of Malaysia whom performing technology enabled auditing. The finding of the study expected to enrich the existing body of knowledge and accounting professional practice on the significant role of IT governance in assuring the successful implementation of technology enabled auditing.

**Keywords:** IT governance, IT enabled audit, public sector auditing

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## 1. INTRODUCTION

The growing initiatives of Malaysian government in ICT related projects to escalate an effective and efficient public service delivery have increased the IT investment among the government agencies. In 9<sup>th</sup> Malaysian Plan (2006 – 2010), the total budget for ICT related project has increased to more than 180% as compared with the previous Malaysian Plan (NADM, 2015). This has triggered the significance of IT investment in public service delivery and the expected return from these investments also being an important concern among government agencies and citizen. However, in most of the ICT project being evaluated, the major issue was system underutilisation in terms of functionality. The audit assessment on e-Project Monitoring II, e-PBT (e-Local Authority), and 1Bestari projects for example yielded interesting facts such as, underutilisation of the system

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functions due to lack of knowledge, lack of training, delayed in project implementation due to the additional scope of work or change requests by users, system specifications were not clearly defined, and database was not updated due to lack of monitoring from the central agency (NADM, 2015). Importantly, most of the issues were related to inadequate governance measures as stipulated in the circulars. The Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) circular has required all government agencies should have committees to deal with ICT related issues such as steering committee, technical committee, and project management team. Nevertheless, in most cases, the agencies do not set up these committees because project owners assumed that the project implementation team is sufficient to manage the projects, and in cases where the committees are set up, their roles are uninformed (NADM, 2015). The key purposes associated with technology related governance are reducing risk, assisting performance achievement, and monitor the technology related investments.

As organizations rely on IT to some degree to conduct their business, IT governance (ITG) has gained importance in recent years as a key aspect of governance (Bhattacharjya & Chang 2007). The increasing complexity of information systems, the negative impact of individual defective behaviour, and consequences of legal requirements caused organisations to invest in IT governance (Novotny, Bernroider, & Koch, 2012). IT governance is important for an organization to attain its organisation objectives specifically related to IT investment. In order to employ an effective IT governance, a set of ITG mechanisms is compulsory (e.g., IT steering committee, IT organizational structure) that able to boosts actions consistent with the organization's missions. These ITG mechanisms are focused on several technology issues such as the way significant IS related practices being implemented and the way the strategies are aligned into practices (Weill & Ross, 2004). It also revealed that ITG support tool is needed for the standard internal control frameworks to successfully manage the strategic, operational, and financial and compliance risks (Rubino & Vitolla, 2014). IT transformation can affect the existing governance systems leading to a reduction in the capacity and capability of IT in public sector organisation if this transformation ignores the people and assets devoted to the systems. Once the accountability exists at board level, other factors that are reflected to be vital in modelling the audit tasks becomes controllable concerns (Al-Omari & Barnes, 2014). Thus governance is imperative to warrant the successful implementation of public service delivery to accomplish the corporate goals, whereby the decision-making process and monitoring system are aligned with the organisational goals and citizen expectation (Mukhtar & Ali, 2011).

## **1.2 Motivation of Study**

Notably, this fast growing trend of IT transformation in the organisation and huge ICT investment by Malaysian Government have triggered the significance of IT risk and its related controls. Besides, highly computerised accounting system has implicated the current audit practices and has led to the necessity of new audit procedures to evaluate the control in order to mitigate the new business risk (Soral & Jain, 2011). The new requirement of audit standards has given rise to the significance of IT related audit (Carlin & Gallegos, 2007) and increased the needs for technology oriented audit procedures (Masli, Peters, & Richardson, 2010). Although benefit from IT related audit being widely recognised but some auditors are still falling apart in performing technology-enabled audit task. Further it being evidenced by academic scholars on the slower adoption of technology related auditing (Bierstaker, Janvrin, & Lowe, 2014; Ahmi & Kent, 2013) as well as supported by professional literature which suggesting auditors are not attaining sufficient progress in their technology related competency and technology-enabled audit performance (Protiviti, 2016a).

Within the Malaysia context, Auditor General of Malaysia has expressed his recent concern over the under-utilisation of audit technology among public sector auditors (Buang, 2015) and most of the public sector auditors are still focusing on traditional IT control rather than advanced IT controls (Mahzan & Veerankutty, 2011). A study was conducted in Malaysia indicates lower audit technology usage among private auditors (Rosli et al., 2013) and only 21% of external auditors are using audit tools and only 16% of accounting firms are offering IT related audit services (Ismail & Abidin, 2009).

Besides, multiple initiatives being taken to improve the usage of technology among the auditors, IT utilisation among the auditors are still low. It may also indicate that the current strategies and policies may not effectively support the technology implementation. Major factors that caused IT projects failure were related to inadequate governance mechanism specifically no clear direction on IT with business performance, insufficient of management supports, improper of IT plan and in short supply of IT support service (Nawi, Rahman, & Ibrahim, 2011; Amid, Morteza, & Ravasan, 2012). Significantly, the key challenges facing by the audit function were the evolving technologies and risk related to information security, limited qualified human resources capabilities and skills, inadequate reporting structures for IT audit function and insufficient IT infrastructure, misalignment between technology and organisation performance, and limited audit methodology related to IT risk assessment as well as restricted use of technology in data analytics (Protiviti, 2016b).

Known the high-cost and low-success rate, reasons for these issues crucial to be understood and strategy towards success vital to be discovered. Nevertheless, the review indicates that reason for the slower adoption of technology-enabled auditing have yet been raised although the importance of audit technology in improving the auditors' task in the electronic environment have been recognised widely. As the plea for answerable and effective service delivery becoming progressively imperative, the public sector cannot afford to have inefficiencies and ineffective audit.

IT governance defines as a framework that determine the decisions rights and accountability to stimulate anticipated behaviour in the use of technology. As such effective IT governance stimulates and influences the workforces in technology usage and warrants compliances with organisation's missions and norms (Weil & Ross, 2004). Governments with ineffective IT governance may cause in low performance of technology assets such as ambiguous information quality, unproductive operational costs, delay in IT project and the close down of its IT department (Nfuka & Rusu, 2011).

Thus an effective IT governance anticipated playing a role in improving the performance of technology-enabled auditing thru the effective management of organization resources. Effective IT governance has a set of mechanism which involves structure, process, and communication. These mechanisms involve the formation of executive teams, committees and IT support services to assure clear strategic direction are established and technology related issues being handled appropriately. Well-disseminated IT strategies and policies are designed to ensure employees' behaviours are consistent with organisation objectives (Weil & Ross, 2004). Consequently, this study anticipates inspecting the influence of these governance mechanisms on the technology-enabled audit performance. Though studies have investigated the influence of governance mechanism on IT related activities but none of the studies has investigated the impact of IT governance on IT related activities in audit organisation specifically on audit task.

Additionally, prior researchers were focusing on auditors in a private setting and limited studies have discussed the performance of technology-enabled auditing among public sector auditors. Although the usage of some IT controls will be very similar for both the private and the public sector, many differences can be expected due to specific public sector characteristics (Liu & Ridley, 2005). In addition, very little has been researched about the adoption and practice of IT related auditing in developing economies particularly in the context of public sector audit (Ahmi, Saidin, & Abdullah, 2014; Mahzan & Veerankutty, 2011). Few scholars have highlighted that developing economies such as Malaysia have significant dissimilarities in IS implementation particularly in term social, economic, legal, cultural and political context as compared to developed countries (Ismail and King, 2005). Thus, having established an approach for the first time to test the impact of IT governance mechanism on technology related job performance in a developing country like Malaysia will be critical.

This study attempts to understand the influence of effective IT governance on the performance of technology-enabled auditing among Malaysian external public sector auditors. Detailed literature reviews were performed in the area related to the information system, auditing, and governance at the initial stage with the aim of gaining a better understanding of the values of governance on IT related activities. The finding of the study is expected to enrich the existing body of knowledge on the significant impact of IT governance in assuring the successful implementation of technology-enabled auditing.

## **2. LITERATURE REVIEWS**

### **2.1 Governance and Information Technology**

The United Nations Development Program described governance is "the exercise of economic, political, and administrative authority to manage a country's affairs at all levels. It comprises mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences" (UNDP, 1997, p.12). From the auditing literature, governance "is the framework, principles, structure, processes and practices to set direction and monitor compliance and performance aligned with the overall purpose and objectives of an enterprise" (ISACA, 2009). Research indicates that of governing board needs to emphasis in designing a strategy and policy framework which are excellent, feasible and transparent in order to manage the planning, implementation and evaluation activities in the organisations (Campbell & Hushagen, 2002). Good governance is one of the important element to achieve sustainable business performance other than profitability, reputation, and sustainability (Aras & Crowther, 2010). Further, UNESCO (2009) explains e-governance as "the public sector's use of information and communication technologies with the aim of improving information and service delivery, encouraging citizen participation in the decision-making

process and making the government more accountable, transparent and effective". Thus, e-governance relates to new ways of leadership, new means of discussing and determining policy and venture, new methods of retrieving learning, new techniques of attending public needs and new ways of managing and conveying information and services to the citizen.

IT governance is a part of the wider concept of corporate governance which emphasising the effective management and use of technology to accomplish business performance. ITG is generally denoted as a subsection of corporate governance (Heart, Moaz, & Pliskin, 2010). ITG defines as a framework that determines the decisions rights and accountability to stimulate anticipated behaviour in the use of technology. Effective ITG stimulates and influences the workforces in technology usage and warrants compliance with the business vision, norms, and beliefs (Weill & Ross, 2004). IT Governance Institute (ITGI) recognises ITG as an accountability of the board of controllers and senior management and it defines ITG as "an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives" (ITGI, 2003, p. 10). The key aims related with ITG are reducing risk, sustaining goal achievement, and monitoring of IT investments (Al-Omari & Barnes, 2014).

## **2.2 IT Governance Effectiveness**

Organisations with effective ITG have dynamically developed a set of ITG mechanism that motivates behaviour in line with the organisation missions, strategies, values, norms, and culture. According to Weill & Ross (2004), effective governance only take place when an organisation has a set of mechanism which involves structures, process, and communication. An effective ITG comprises of IT structures, management participation, well-disseminated IT strategies and IT policies as well as clearly define performance indicator (Nfuka & Rusu, 2010). Further, top management participation in IT decision making, the establishment of IT steering committees in handling IT related issue to be in line with organisational goals and use of key performance indicators related to IT have significantly measured the effectiveness of IT governance (Ferguson, Green, Vaswani, & Wu, 2013). IT strategies and IT plans (Wilkin & Chenhall, 2010; Ali & Green, 2012) able to ensure that IT investments have been evaluated for relevant risk and assist the business expectation. Some studies have found a significant relationship between IS support service thru the availability of IT experts and IS consultants in the successful use of the system (Fitzgerald & Russo, 2005).

## **2.3 Technology-enabled Audit Performance**

This study intent to develop contextualised measures and view an effective system/technology/application from the user perspective which highlighting the ability of audit technology in enhancing the job performance of the auditors and increase the quality of the audit. Additionally, the type of system being assessed is related to technology that supports the implementation of audit task in a digital environment which was focusing on the automation of individual job function and usually by a single user.

Looking into the IS literatures, the effectiveness of a system/application/technology broadly being measured using IS Success Model by DeLone and McLean (1992) which assesses the "effective creation, distribution and use of information via technology and anticipated to yield a continuous benefits into the future (Gable, Sedera, & Chan, 2008). The measurement of IS success is critical in understanding the value and efficacy of IS investment and its management (DeLone & McLean, 2003). IS Success model consists of three components: the creation of a system, the use of the system, and the consequences of this system use. This process model which being utilised to measure the dependent variable of IS success or performance consists of six interrelated dimensions namely "system quality, information quality, use, user's satisfaction, individual impact, and organizational impact.

Iivari (2005) examined the IS Success model in the mandatory use of accounting information system noted that perceived information quality and perceived system quality are significant predictors towards user satisfaction with the system and individual impact can be predicted strongly by user satisfaction whereas there is no significant association between system use and individual impact. The insignificant association between system use and individual impact may due the nature of the system usage. Another study conducted in Hong Kong among the certified accountant on the successful use of accounting information system indicated that information quality, system quality, and service quality do impact the organisational performance (Gorla, Somers, & Wong, 2010). A study examined the successful use of a mandatory taxation information system in Greek noted that there is a strong association within the five success construct of system quality, information quality, service quality, perceived usefulness and user satisfaction except for system quality and user satisfaction (Floropoulos, Spathis, Halvatzis, & Tsipaouridou, 2010). From the employee satisfaction perspective, a survey was conducted among 10,000 employees noted that service quality, information quality, user satisfaction, use, individual impact and

organisational impact contribute to the successful utilisation of employee portal (Urbach, Smolnik, & Riempp, 2010). Reviews show that the DeLone and McLean IS Success model is robust because the findings from studies among different users and involving different information system indicating the similar results in measuring the successful utilisation of technology. Thus this study utilised IS Success model to evaluate the audit technology success. In another word, this study aims to understand the technology enabled audit performance.

In summary, from the auditing context, IT enabled audit performance may further being improved when audit organisation established an effective IT governance mechanism by guiding auditors with appropriate IT strategy and IT policy as well as assisting the auditors with adequate IT support service. Besides, audit organisation may effectively manage IT related issues through the formation of IT committee and further supported by senior management. This is anticipated to encourage a positive behaviour toward the use of technology during the audit task among the auditors.

## **2.4 IT Governance and Performance**

The implementation of ITG anticipated to improve the operational and supply chain processes efficiently within and across the organisation (Ilebrand, Mesoy, & Vlemmix, 2010); and well-organised ITG may have progressive effects on organisation performance (Weil and Ross, 2004). There are some signs that the implementation of ITG mechanisms may lead organizations to manage and use the technology in business more efficiently than the organisation in which IT governance is not effective. Implementation of ITG mechanisms further able to assist in risk mitigations and IT business value creation. ITG mechanisms may enhance the administration of IT related activities by assuring technology usage is in line with business objectives, IT being managed effectively and IT outcomes being monitored effectively. Thus, the effectiveness of IT governance initiatives can affect the governance performance and, consequently, the organizational performance (Lunardi et al., 2014a). Some researchers found that ITG has improved the IT related activities in the organisation such as better quality IT alignment with ITG practice (De Haes & Van Grembergen, 2009); the positive association between the IT-oriented firm and ITG practice (Heart et al., 2010). Liang, Chiu, Wu, and Straub (2011) found that IT governance maturity enables strategic alignment, which in turn yields better organizational performance. Blackmer (2005) found that strategic alignment may assure the timely IT deliverables within budget. Consequently, the organisation needs to emphasise the importance of effective ITG adoption in order to increase system performance.

From the auditing context, effective IT governance mechanism anticipated impacting the audit work process which may result in the better job performance and productivity through the effective utilisation of audit technology during the audit task in the digital environment. Effective IT governance lay a foundation to the audit organisation and its workforce to follow a desirable behaviour and motivate the behaviour to be in line with the organisation's mission in providing quality audit opinion. In addition, senior management support, clear strategies, and policies as a part of governance mechanism in controlling the organisation activities considered to be significant drivers for audit technology usage (Mahzan & Lymer, 2014). IT support service also play a significant role in assuring the audit technology usage (Ahmi & Kent, 2013) as well as supporting culture impact the technology success. Accordingly, effective use of audit technology during the audit task through the existence of effective IT governance may enhance audit task efficiency and improved quality of audit opinion in addition to job performance.

Interestingly, studies examine the role of IT governance in IT related activities in public sector audit organisations have been limited. Most of the literature on the role of IT governance were focused mainly on its impact towards organisation performance. No attempt was done to explore the potential of effective IT governance on individual behaviour specifically from auditing context. Thus, this study anticipated enriching the existing knowledge by integrating the issues of IT-related investment and IT governance to highlight the importance of IT governance for the success of IT initiatives in audit organisation.

## **3. CONCEPTUAL FRAMEWORK**

Agency theory will be utilized to elucidate the phenomena as literature showed that agency theory being predominantly used in public sector accountability research (Schillemans & Busuioc, 2015) and very much related to governance issues such as monitoring mechanism (Maijoor, 2000). Accountability refers to relationships between two (or more) persons, where one is obliged to responsible for his or her behaviour to the other(s), and some specific mechanisms are arranged to make him or she behave in an accountable manner (Dubnick & Frederickson, 2010). Therefore, principals create some mechanism to bind the degree of such behaviour. Further, principals will also observe the conduct of management with the intention of discouraging unrelated activities and introduce mechanisms to bond the interest of both parties (Peirson et al., 1990). From this context, IT governance

mechanism being established by the government through the government circulars and high level of governing committee (e.g. parliamentary members meeting) in order to oversee the behaviour of employees to be in line with the government mission and objectives. This IT governance mechanism acts as principal in monitoring the behaviour of management. Whereas, Auditor General of Malaysia who representing the management is responsible for administering the organisation's activities thru effective work process and reporting such activities to the governing committees.

The proposed conceptual framework as per in Figure 1. The dependent variable for this study is technology-enabled audit performance which being explained thru the utilisation of IS Success Model by DeLone and McLean (1992). Item measurement for four constructs mainly adapted from Hussein et al., (2007a) which are: (1) system quality; (2) information system quality; (3) user satisfaction; (4) individual impact and one construct of (5) perceived usefulness was from Gable et al. (2008). While, effective IT governance construct measurements for this study were extracted from literature which signified management support (Li et al., 2015), IT Strategy (Ali & Green, 2012), IT Committee (Ferguson et al., 2013) and IT Support service (Ahmi & Kent, 2013). This construct denotes the mechanism that inspires actions concurrent with the organisation mission, strategy, and culture that related to IT which influence the successful use of technology during the audit task.

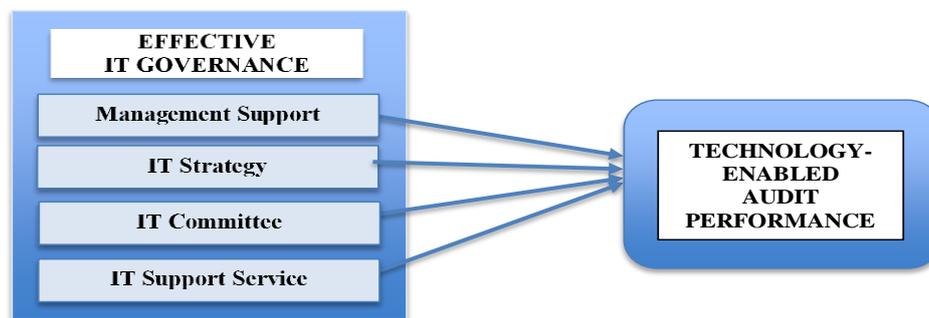


Figure 1: Research Framework

Implementation of ITG mechanisms may lead organizations to manage and use the technology in business more efficiently than the organisation in which IT governance is not effective. Effective ITG mechanisms may enhance the administration of IT related activities by assuring technology is in line with business objectives, IT being managed effectively and IT outcomes being monitored effectively (Lunardi et al., 2014b). Senior management support is important in creating supportive climate and allocating sufficient resources for the successful utilisation of technologies (Wang, Wang & Yang, 2010; Low et al., 2011) and playing significant drivers in making decision for technology adoption in audit organization (Mahzan & Lymer 2014; Ahmi & Kent, 2013,). Further, reviews indicated that IT strategy as the technology related strategic policies in providing guidance and direction on IT related activities (Nfuka & Rusu, 2010; Hussein, Karim, Mohamed, & Ahlan, 2007a) and IT Committee as a supporting mechanism for managing IS related activities (Ferguson et al., 2013; Ali & Green, 2012) are important mechanism for effective governance. IT support service also plays an important role in assuring the usage of audit technology among the auditors (Ahmi & Kent, 2013). Additionally, the study suggested an organisation to effectively govern the organisational IT related activities with appropriate infrastructure in supporting technology utilisation among the auditors and recommended to provide IT support service in order to enhance auditors confident in utilising audit technology i.e. CAATs during the audit task (Bierstaker et al., 2014).

Therefore, organisations need to focus on effective ITG before attempting to improve technology related activities. An effective IT Governance mechanism anticipated influencing technology-enabled audit performance. Accordingly, it is hypothesized that:

*H<sub>1</sub>: There is a relationship between effective IT Governance and technology-enabled audit performance*

*H<sub>1a</sub>: There is a relationship between management support and technology-enabled audit performance*

*H<sub>1b</sub>: There is a relationship between effective IT strategy and technology-enabled audit performance*

*H<sub>1c</sub>: There is a relationship between effective IT committee and technology-enabled audit performance*

*H<sub>1d</sub>: There is a relationship between effective IT support service and technology-enabled audit performance*

#### 4. RESEARCH METHODOLOGY

In the testing association between variables embedded in the proposed research framework, a survey is designed to fulfil the aim of the study. This research is a cross – sectional quantitative study, with descriptions and hypotheses testing, and the types of investigation is a causal relationship, using questionnaires from approximately 300 Malaysia public sector auditor in National Audit Department of Malaysia whom performing technology enabled auditing whom representing the majority of public sector auditor in Malaysia. Respondents will be requested to provide their insight on the perceived importance of each IT governance mechanism in influencing their decision on audit technology usage. Additionally, auditors requested to provide their feedback related to their perception of the impact of audit technology on the audit task / job performance. The constructs will be measured using 5 point Likert scale of 1-strongly disagree and 5-strongly agree. Data analysis will include exploratory factor analysis to determine the underlying structure of the variables, confirmatory factor analysis, correlation analysis and structural equation modelling (SEM) will be explored to investigate the research model.

#### 5. CONCLUSION

The originality of this research lies in the impact of IT governance on technology-enabled audit performance since there were no studies have investigated the proposed relationship in prior studies from the context of public sector auditing. The finding of the study expected to enrich the existing body of knowledge on the significant role of IT governance in assuring the successful implementation of technology enabled auditing. This model will be utilised as a guide in conducting an investigation to further understand the issues related to IT governance and technology-enabled audit performance among external public sector auditors in Malaysia.

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