

Accounting Information System (AIS) Users' Perception towards the System Effectiveness: Preliminary Findings in the Context of the Malaysian Federal Government

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Abstract

This paper presents a preliminary work in understanding the practice of Accounting Information System (AIS) in the Malaysian Federal Government setting by investigating AIS users' perception towards the system effectiveness. Recently, the Government had upgraded its AIS to cater the function of accrual accounting treatment as well as to improve the financial reporting practice. The advancement of the system entailed a huge investment in both money and human capital preparation. As such, the installed system is expected to be effective in order to make the investment worth. However, past literatures have shown that the measurement for system effectiveness is rather ambiguous and inconsistent due to the variation in system effectiveness definition. This has caused difficulties to both researchers and practitioners in terms of making comparison between studies to objectively assess the AIS effectiveness. Due to this, there have been continuous debates on the measurement of system effectiveness among academicians, as well as practitioners. Therefore, this study is significant as it presents qualitative evidence from an unstructured preliminary fieldwork by combining group discussion and observation approach. The data collection was conducted at the Accountant General's Department of Malaysia and Accounting Division of the Ministry of Finance Malaysia. As a result, this preliminary study (i) provide insight into the history of AIS enhancement and AIS current practice in the Malaysian Federal Government; (ii) provide understanding of AIS user's perception towards AIS effectiveness; and (iii) discover nine (9) criteria of an effective system.

Key words: Accounting Information System (AIS); System Effectiveness; User Satisfaction; System Quality; Information Quality; Benefit of AIS

1. Introduction

Accounting department is one of the important departments in an organization. The department is responsible to manage financial record and communicate the information to respective stakeholders. In most organization, accounting department is occupied with Accounting Information System (AIS). AIS is defined as the application of technology and computer in accounting processes (Pierre et al., 2013; Nicolaou, 2000). In other words, AIS combines human capital and machine to work together in performing the accounting process. The capability and capacity of the system should always at par with the needs and wants of its users. Most importantly, the system should be able to cater the changes in accounting practice as well as the advancement in technology. These are among the challenges faced by the accountant in this era of Industrial Revolution 4.0. These changes impacts not only private sector, but also government sector. Therefore, this study aims to: (i) understand the AIS practice in the Malaysian Federal Government focusing on the system and its users, and (ii) investigate the system users' perception towards the system effectiveness.

2. Significant of the Study

In early 2018, the Malaysian Federal Government had majorly upgraded its AIS and changed their accounting treatment from cash basis to accrual-based accounting. Previously, the system had been upgraded few times in order to carter the changes in technology and fulfill the need of its users. Specifically, the current system is known as iGovernment Financial Management Accounting System (iGFMAS) (previously known as 1GFMAS and was renamed after the general election of Malaysia in May 2018), in which is a result of the upgraded GFMAS. Prior to GFMAS, the Government had Branch Accounting System (BAS) in place that

perform the accounting process in semi-manual basis. As the volume of accounting transaction increased, the existing system requires improvement and advancement in order to cater the high volume of transactions and changes in accounting treatment.

Many people may think that the history of system improvement is not important to know. As a result, many of the Government's staffs do not know how the AIS of the Government evolved. In fact, some of them are the users of the system. The advancement of technology and the upgrade of AIS are continuously done in order to cater the needs of the system users as well as the needs for better reporting. According to Chalu (2012), many organisations enhance their AIS by upgrading their technology in order to fulfill the needs in accounting operation and decision makers. Nevertheless, the upgrade of AIS from time to time can never promise the enhancement of the system effectiveness. This is because the high-spec technology may not be effective if its users do not properly operate it (Wiechetek, 2012) nor optimized the function installed. In addition, Ilias et al. (2009) mentioned in their study about dissatisfaction among system users in the Malaysian Government with their computerised accounting system. Satisfaction was used and confirmed as a valid measure for effectiveness (Gatian, 1994). Therefore, dissatisfaction indicates ineffectiveness of the system. Furthermore, the present technology is mentioned as inefficient in coping with the challenges in accounting field (Belfo and Trigo, 2013). As evidences, fraud, corruption and manipulation of accounting data are still happening in today's world.

In most situations, upgrading a system requires a huge amount of money. It is such a waste if the upgraded function are not understood and not optimized by the system users. Therefore, the assessment of AIS effectiveness is important in order to ensure the system is worth to be upgraded or to identify area for improvement, either from human capital side or technology part. However, there is no one best way to measure effectiveness. The definition of system effectiveness varies from one study to another. To date, there are many ways of assessing system effectiveness in both AIS and information system field (Chalu, 2012; Hamilton and Chervany, 1981). In detail, previous studies have reviewed system effectiveness from the perspective of user satisfaction (Chalu, 2012; Ilias et al., 2009), information quality (Pornpandejwittaya, 2011), capability in supporting decision making (Dehghanzade et al., 2011; Kouser, 2011; Sajady et al., 2008; Nicolaou, 2000; Thong and Yap, 1996), meeting user requirement (Salehi et al. 2010), six (6) dimensions (i.e. system quality; information quality; usage of the information; user satisfaction; and positive impact on both the individual and the organization) (Ismail, 2009), cost-benefit (Sajady et al., 2008), achievement of system objectives (Iskandar, 2015; Hamilton and Chervany, 1981) or goals (Raymond, 1990) and etc. This leads to inconsistent assessment among practitioners to assess system effectiveness of their organization. In academic perspective, this causes difficulties among researchers to make a comparison between studies. In addition to that, there are very limited studies about the perception of AIS users towards the system effectiveness. Hence, this paper is significant to be studied and relevant to fill the research gap in the present literature.

3. Background of Study (The Malaysian Federal Government)

The Malaysian Government consists of three (3) tiers, which are federal government, state government and local authority. In the Malaysian Government's structure, federal government is the highest tier that consists of 23 ministries and a Prime Minister's Department. The accounting operation for the Malaysian Government is served by the Accountant General's Department (AGD). Specifically focus in the Malaysian Federal Government, AGD is assisted by accounting divisions located in every of the 23 ministries and the Prime Minister's Department. Given the big size of the Malaysian Federal Government, the accounting divisions of each ministry are supported by the responsibility centers throughout the country. In most situations, the responsibility center is responsible to collect data, keep record and report to the accounting division. Overall, the accounting operations are managed and monitored by the AGD.

The AGD was established under the Ministry of Finance Malaysia before 1957. AGD is responsible for: developing and improving the accounting and its related systems (e.g. human resource management system); managing, monitoring and enhancing accounting related operations; and performing the

enforcement of the Unclaim Monies Act 1965 for the Malaysian Government. The AGD also plays a role as a parent to all accounting offices in the Malaysian Government. There are 10 divisions and two (2) units under the AGD. Each division has their specific roles and responsibilities related to the accounting services for the Government. The two (2) units are Integrity Unit and Legal Unit. These units are more related to the governance and administration of AGD.

4. Literature Review

Prior to data collection, reviews were undertaken on prior studies about AIS effectiveness, measurement for the effectiveness and AIS studies related to the Government of Malaysia. The reviews were concurrently performed while conducting the fieldwork to enhance understanding of the context of this study.

Generally, system effectiveness is widely applied as a dependent variable in information system and AIS literature. The topic has been continuously debated among researchers due to its importance towards an organisation, as well as inconsistent results in prior research. Effectiveness is illustrated as a part of success in DeLone and McLean's Information System Success model (DeLone and McLean, 1992). Other studies emphasised effectiveness in terms of the achievement of system's objectives (Hamilton and Chervany, 1981), goals (Raymond, 1990), improve performance (Gatian, 1994) and support decision making (Thong and Yap, 1996).

In the context of AIS, the definition of system effectiveness has been studied and discussed in more specific contexts. For example AIS effectiveness is defined as the decision makers' perception of the ability of the system to provide information that meets their requirements for coordination and control purpose (Kouser et al., 2011; Nicolaou, 2000). The system is expected to benefit the system's users and the organisation in terms of operation improvements (Sajady et al., 2008) and better decision-making (Kouser et al., 2011). According to Salehi et al. (2010), AIS effectiveness refers to successfully applied systems that meet users' requirements. Adapting the definition of Nicolaou (2000), Dehghanzade et al. (2011) take further consideration in their measurement by taking into account the capacity of the system in providing the expected information, considering the relevant legal obligations, preparing financial reports and providing adequate control structures in order to meet decision makers' requirements. A study by Chalu (2012) viewed AIS effectiveness as a multidimensional construct by taking into account four dimensions, including accounting information quality, system quality, user satisfaction and organisational performance. Another study conducted by Pornpandejwittaya (2012) specifically defined the effectiveness of the AIS based on the features of information quality. The features are reliability, relevance and timeliness. These definitions are more likely to focus on the role of the AIS in providing information for its users. Theoretically, a good decision requires a substantial amount of high quality information. However, not all AIS users are using the system to retrieve information for decision making (Chalu, 2012). It is reliant on the level of the user. For example, low level management, such as accounting clerks, may only use the system to do the initial entry of data. On the other hand, top level management might not be involved in recording the data but they retrieve the processed information for use in decision-making.

5. Methodology

This study applied a qualitative research method through an unstructured fieldwork. The fieldwork consisted of unstructured interviews and observation at the Account General's Department (AGD) and the accounting office of the Ministry of Finance of Malaysia. Initially, a face-to-face interview was selected as an approach to conduct the unstructured preliminary fieldwork. However, the respondents preferred to have a group meeting as they believed it would be more convenient to share their knowledge and experience as a group.

Although the fieldwork was conducted on an unstructured basis, a checklist was prepared according to the specific aspects to be explored, in order to ensure a sufficient understanding was gained. However, the checklist was not limited to the aspects listed. Any additional questions or aspects that were thought to be necessary were added during the fieldwork. The checklist of aspects explored is listed in Table 1.

Table 1: The Checklist for the Unstructured Preliminary Fieldwork

Topic	Detail
i. General information about AIS	- Nature, function and objective.
ii. Operationalisation of AIS	- Various types of users and their responsibility. - Workflow of the system. - The system's integration with other eGovernment systems.
iii. Effectiveness of the system	- Opinion on the definition of AIS effectiveness. - Perception towards the effectiveness of AIS.

6. Sample of Study

Sampling technique applied in this study is purposive sampling. The sample was chosen based on their suitability to assist in achieving the objectives of this study. In this case, AGD was chosen because of its roles as an organisation that serves accounting services for the Malaysian Federal Government. AGD is the headquarters for all accounting divisions and responsibility centers in Malaysia. Practically, AGD is the most suitable organization that has a clear picture about AIS of the Malaysian Federal Government.

As refer to the organization chart of AGD, there are 10 divisions that practically related to accounting matters of the Malaysian Federal Government. Four (4) divisions and top management office were proposed to be the sample of this study. The selection is decided based on the roles and responsibilities of the divisions. However, their willingness to participate is depending on their preference and availability.

The four (4) are Management of Accounting Office Division (*BPOPP*), Central Operation and Agency Services Division (*BPOPA*), Information Technology Management Division (*BPTM*) and Accounting and Management Development Division (*BPPP*). Mainly, these divisions held responsibilities in: planning, monitoring and managing the accounting operations; performing accounting functions and producing financial reports for the Government; developing and managing the accounting system; managing the human resources needs related to accounting; enhancing the accountability of the Government; and providing consultancy services to the public sector in Malaysia. Nevertheless, *BPPP* was not available to participate in this study and thus was replaced by the Accounting Division of the Ministry of Finance (MoF) Malaysia, as suggested by the AGD. After considering of the roles of Accounting Division of the MoF as the department who operate the AIS, AGD suggestion was accepted and Accounting Division of MoF was included in the sample replacing *BPPP*. On the other hand, a meeting with the Accountant General of Malaysia was held in order to gain an understanding about the system from higher management level's perspective.

7. Data Analysis Technique

Qualitative data collected for this study are in the form of interview transcripts and observation notes. The transcripts were typed manually by listening to the audio recording saved from the interview sessions. On the other hand, the observation notes were taken during the observation session was conducted. Nevertheless, due to the lengthiness of conversation of interviews, the transcripts were done in MsWord and analysed in NVivo 11 software.

The analysis technique applied in this study is coding technique. 'Coding provides a means of purposely managing, locating, identifying, sifting, sorting and querying data ... to stimulate and facilitate analysis' (Bazeley, 2013, p. 125). Technically, the similar code in qualitative data is commonly grouped and themed accordingly into categories in order to improve the findings, as well as for a better structure. Coding is one of the useful ways of organising and managing qualitative data in order to draw analysis and lead to research findings (Saldaña, 2013).

There are many types of coding. Among all of the available types of coding, Saldaña (2013) asserted six (6) types of coding as grounded theory coding canon, which are *in vivo* coding, *process* coding, *initial*

(open) coding, *focused* coding, *axial* coding and *theoretical (selective)* coding. These types of coding are not only used in grounded theory studies, but are also popular in non-grounded theory studies, especially those that are commonly applied by beginners in the qualitative research field, such as *in vivo* and *initial (open)* coding. In the context of this study, three (3) types of coding were considered suitable to be applied, which are *in vivo*, *initial (open)* and *focused coding*.

8. Findings

8.1 Accounting Information System of the Malaysian Federal Government

iGFMAS is the current accounting system of the Malaysian Federal Government after GFMAS. Prior to GFMAS, the Government had Branch Accounting System (BAS) in place. The evolution of the accounting system in the Government is intended to cater the needs and wants of the Government, especially for better reporting.

Specifically, BAS is a semi manual accounting system in which some accounting tasks (e.g. reconciliation, review, analysis etc.) are done manually before the accounting data is entered into the system. As the volume of accounting transaction increased, there is a need for more sophisticated and automated system to cater the high volume of transactions and improve the accounting processes.

Prior to 2018, the Government's accounting functions were assisted by an accounting system namely GFMAS. This system was powered by SAP¹ 4.7 software that customised to suit cash-basis accounting treatment. The system was first launched in 2006 with a big bang implementation at the AGD and then by phases at the ministries and their responsibility centers. The main function of the system is to process and retrieve the accounting data from eSPKB and eTerimaan, process accounting transactions and produce financial and accounting information (e.g. financial reports). The GFMAS, eSPKB and eTerimaan are intranet based networks² that can be accessed through any computer within the organisation that has the application installed. Both, eSPKB and eTerimaan were developed in-house and integrated with the GFMAS. The installation of the proprietary software (i.e. GFMAS), the development of in-house accounting-related systems and the systems maintenance are assisted by external experts³ appointed by the Government on a contractual basis.

“GFMAS is an accounting system used at the accounting office [ministry] level. The system supports accounting functions in reporting, monitoring, controlling and decision-making.”

eSPKB is a Budget Planning and Control System Electronic that is used to process payment and expenses-related transactions. eSPKB has been in place since the year 2000 to control and manage the Federal Government's budget. This system was integrated with Branch Accounting System (BAS) prior to the implementation of GFMAS. eSPKB is also developed to integrate with other eGovernment applications such as Human Resources Management Information System (HRMIS), Project Monitoring System and so on. The entered data in eSPKB will then be processed and forwarded to GFMAS for further action.

On the other hand, eTerimaan is a Standard Collection and Receipting System that processes the Government's collection and accounting records related to revenue. eTerimaan was implemented in 2008 to smooth the accounting process, replacing the Government's manual collection system. eTerimaan is integrated with GFMAS through eSPKB. Both eSPKB and eTerimaan use the same server and platform. The integration between systems allows reconciliation to be done between the accounting records at responsibility centers and reporting in the accounting office, as well as at the headquarters (i.e the AGD). The main functions of the accounting system are to manage the accounting data and to produce financial statements. The accuracy of data and classification of accounts entered into eSPKB and eTerimaan are ensured through digital checks and approval in GFMAS at the accounting office.

In early 2018, the Government upgraded its accounting system in order to cater for the transition from cash basis accounting to accrual-based accounting. The upgraded system is called iGFMAS, before the name was changed to iGFMAS after the regime change subsequent to the Malaysian general election in May

¹ SAP is the acronym for System, Application and Products. SAP software is proprietary software, in which in the context of this study, this software offers accounting recording and reporting function.

² 'A network which is accessible only by authorised company members, employees and/or agents' (Boczek, 2012, p. 141).

³ Such as XYBASE Sdn. Bhd., Innovation Associates Sdn. Bhd. and Teliti Computers Sdn. Bhd.

2018. The iGFMAS uses SAP ECC 6.0⁴, integrated with SAP HANA⁵. The integration creates an intelligent system to manage the accounting data, enhance the accounting operation and improve financial reporting for the Malaysian Federal Government. A huge investment amounting to more than 200 million Ringgit Malaysia (approximately GBP37 million) was allocated for the iGFMAS project. The iGFMAS is applied to all accounting operations, replacing both the eSPKB and the eTerimaan. The iGFMAS is customised for cash-based and accrual-based accounting. The system is previously planned to be able to generate two different accounting-based reports (i.e. cash-based and accrual-based accounting) for the Malaysian Federal Government. Overall, the Government is continuously support the advancement of technology in order to cater to the changes in accounting practice as well as to respond to the challenges in business world, especially in this Industrial Era 4.0.

8.2 Accounting Information System (AIS) Effectiveness

Based on the group interviews conducted, majority of the interviewee perceived system effectiveness as a system that able to satisfy them. Regardless of any criteria wanted, a good system should be able to satisfy its users.

“If the system is able to meet, support and fulfill their [users] concerns, then the system is considered effective.”

“Stakeholders’ satisfaction indicates the effectiveness of the system.”

Additionally, the users are looking for a good system features such as user-friendliness, ease of understanding, ease of use and easy access. These features may look easy to fulfill by just a simple system in the case of a straightforward organisational structure. But, in the case of the government that dealing with a huge volume of transactions and a complex organisational structure, sophisticated technology is needed in order to deliver the required features which, at the same time, are able to manage the complexity of transactions within the government. In addition, the speed of retrieving the accounting information is also one of the effectiveness criteria mentioned by the interviewees.

“In my opinion, the system is effective when the system is user friendly, produces reliable data and easier to access [as compared to previous ways of accessing the data].”

“The system is considered effective when it can achieve its objective.”

“I can say that the government has a sophisticated system that is quite complex but customised to be friendly to its user.”

“The system is considered effective if the entered transactions can be quickly processed for reporting.”

Furthermore, the system is considered effective based on its ability to produce reliable data with easy access. However, the easy access feature requires a high internal control system to secure the accounting data. Commonly, the use of accounting systems is expected to automate most of the accounting functions (e.g. general ledger, cross-checking etc.). Apart from that, the effectiveness of the system is also considered based on the quality of information generated by the system. Reliable information is important to support the decision-making process. Since high quality of information is crucial for better decision-making, the system’s ability to provide such information is reflected in its effectiveness.

“The system is considered effective when it can help in budget control and allocation. We use the system to retrieve the accounting data and support decision-making.”

⁴ SAP ECC 6.0 is one of the latest versions of SAP. ECC stand for ERP Central Component, which covers the SAP Business Warehouse, SAP Strategic Enterprise Management and Internet Transaction Server.

⁵ SAP HANA is a platform for the real time data driven application that built with in-memory database. It allows integration with various data sources.

Source: <http://go.sap.com/developer.html>

“The system is effective when it is able to produce accurate data.”

Nevertheless, some of the system users are using the system in their daily routine to just enter accounting data, such as accounting clerk. This type of user expects the system to assist them in performing some of the accounting data entry process. The capability of the system in offering single entry record and automate another entry is benefitted its users. In addition, there are AIS users who use the system to process the accounting data entered and transform it into information. These users are likely concern on the technical performance of the system. Specifically, the users want a system that able to speed up the accounting process.

“The system is effective when it speed up the accounting process..”

9. Discussion

Overall, the Malaysian Federal Government of Malaysia has one of the best installed proprietary software (i.e. SAP ECC 6.0 integrated with SAP HANA) to assist their accounting operations. Having known the evolution of the Government’s AIS, it can be seen that the Government of Malaysia has continuously encouraged the improvement of the system from time to time to ensure that their system is not outdated. Besides, the advancement of technology is needed to cater the changes in accounting world. The history shows that the Government had taken sufficient time to make full preparation in ensuring the successful of the system update. Every updates made were planned well in that the Government appointed experts, provide trainings, made reference to other countries and improve the facilities related to the system. In addition, the timeline of implementation was extended to allow full preparation on both, system and its users.

Specifically discuss about the system effectiveness, previous studies (e.g. Chalu, 2012; Ilias and Razak, 2011; Ilias et al., 2009; Ilias et al., 2007; Doll and Torkzadeh, 1988) applied user satisfaction as one of the measures for system effectiveness. Naturally, satisfaction comes from the fulfilled requirements or expectations (Cameron, 1980; Pitt et al., 1995). In reality, it is very difficult to set the same expectation for everybody. Everyone has different expectation due to different experience, roles and purpose towards the system. Nevertheless, there is always a general understanding among the system users about system effectiveness. In this study, satisfaction towards the system is considered as generally accepted perception towards system regardless of any specific criteria.

In addition, other criteria found in this preliminary studies are consistent to the measures applied in literature, such as user-friendliness (Ismail, 2009; Mitchell et al., 2000), ease of understanding, ease of use (Cohen et al., 2016; Ilias and Zainudin, 2013; Ismail, 2009) and easy access. Nevertheless, the criteria of ease of understanding and easy access are commonly applied under or merge with ease of use criteria. Furthermore, this study found that the system users perceived system effectiveness as the ability of the system to provide high quality of information to support decision making.

Nevertheless, not every user of AIS is a decision maker (Chalu, 2012). As the function of technology is to assist in operation, its users perceived system effectiveness as a system that capable to assist in accounting process. In other words, they are more concern on the ability of the system in improving the accounting process. Particularly, this study found that the system effectiveness is perceived in terms of the benefit of the system in speeding up the accounting process. Besides that, there are users who are responsible in processing the accounting data into information and produce accounting report. In order to have that, the system should be able to perform real time transaction and integrated with other related system. Previous studies discussed and applied these criteria under the benefit of the system (Ilias and Zainudin, 2013; Seddon, 1997) and some other researchers consider this measure under the production of accounting information (Sacer and Oluic, 2013, Mitchell et al., 2000).

As discussed, the findings of this study are consistent with prior studies. However, previous studies applied the measures separately or differently from one to another. Some studies applied three (3) measures discussed in this study, while some other studies applied five (5) or more measures in assessing system effectiveness. As such, this study would like to suggest an integrated understanding of system effectiveness by proposing nine (9) characteristics of system effectiveness, which are user satisfaction, user friendly, easy access, information quality, meeting users’ requirement, assist in operation, improve productivity, support decision making and speed up accounting process.

10. Conclusion

In this era 4.0, the use of technology in organization's operations is a must. Inability to adapt and embed the advancement of technology in organisation may cause the organisation to be left behind. However, installing high-technology system does not guarantee the effectiveness of the system. In fact, its installation entails large amount of money as well as massive human capital preparation. Therefore, the assessment of system effectiveness is highly important. Nevertheless, inconsistent measures and various definitions in literature have led to difficulties among researchers and practitioners to choose the best measure for system effectiveness. Thus, this preliminary study provides insight into historical evolvement of AIS and the system current practices in the Malaysian Federal Government. Most importantly, this paper offers early view for the definition of AIS effectiveness from the perspective of the system users. In particular, this study discovered integrated characteristics for an effective system. The findings from this study are very useful in suggesting the direction for a comprehensive or integrated measurement of AIS effectiveness that can be generalised in a wider context.

Nevertheless, this study is a preliminary study on the system effectiveness in the context of the Malaysian Federal Government, thus its findings is limited to the Malaysian Federal Government only and should not be generalised to other context of study until further study being conducted in a wider context. Next, the data collection of this study was conducted using qualitative method, in which the collected data is based on people perception. Thus, the interviewee might be dishonest in sharing their opinion. However, consideration was taken accordingly to minimise the biasness. As such, future study is suggested to consider a larger context of population by applying the quantitative study.

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