

## The Implementation of Activity-Based Costing in the Accountant General's Department of Malaysia

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### ABSTRACT

*This research aims to provide insights into the process of implementing an Activity-Based Costing (ABC) system in the Accountant General's Department of Malaysia (AGD). Additionally, this paper examines the critical factors that influence the success of the ABC implementation process, the usefulness of the ABC system and the challenges faced during the process of implementation. Using a single case study approach, this research uses semi-structured interviews, a self-developed questionnaire survey and a documents review as methods of data collection. The findings show that the most critical factors impacting the success of ABC implementation in the AGD are related to the technicality of the ABC system during the design stage. However, findings also reveal that the ABC information derived from the ABC system has limited use. This study makes a contribution to the empirical literature on the application of the New Public Management (NPM) mechanism, particularly the adoption of a private sector management technique in the context of a public sector organization in a developing country.*

*Keywords: Activity-based costing; new public management; public sector organization*

### INTRODUCTION

The adoption and implementation of ABC as a new costing method in public sector organizations is not a particularly new phenomenon under the New Public Management (NPM) approach. The idea of NPM reform has taken hold in many government sectors across the globe, and the adoption of private sector management accounting styles has become a prominent aspect of the transformation of public sector organizations (Jackson & Lapsley 2003). It has been claimed that the application of the ABC system in the context of the public sector is relevant because its operational activities mainly involve the provision of services to the public (Becker, Bergener & Rackers 2009). This is related to the fact that the cost of providing services in public sector organizations contains a high proportion of overheads and, thus, the ABC technique can function as a method of allocating overheads in a more precise manner than the traditional costing method.

Although past studies claim that ABC system is applicable and can give benefits to public sector organizations (Arnaboldi & Lapsley 2003; Mullins & Zorn 1999), there has also been concern regarding the issue of transferability of the ABC technique to public sector organizations (Arnaboldi & Lapsley 2004; Carter, Danford, Howcroft, Richardson, Smith & Taylor 2011). The process of implementing and adapting this private sector management technique for use in a public sector organization may not be simple. This could be due to two reasons. Firstly, the technique itself (in this case ABC technique) deals with complex processes and is surrounded by many technical and behavioural difficulties even in the private sector, as documented in past

studies (e.g., Anderson 1995; Foster & Swenson 1997; Krumwiede 1998). Secondly, the complexities of public sector organizations could hinder the process of ABC implementation, given that the nature of public sector organizations is multi-service and they have multifaceted operations (Arnaboldi & Lapsley 2003; 2004).

Therefore, further investigation of ABC implementation in public sector organizations is worth pursuing to enhance understanding of the complex process of ABC implementation in the public sector context. The majority of past studies have examined ABC implementation in a specific contextual setting (e.g., local government, the healthcare sector) and focused on developed countries (Arnaboldi & Lapsley 2003; 2004; 2005). Hence, a study of ABC implementation in another contextual setting, specifically in a developing country, would be useful to add empirical evidence on ABC implementation in the public sector context. Accordingly, this study examines the critical success factors in the effective implementation of the ABC system in a public sector organization in Malaysia. To begin, an overview of the process of ABC implementation is analysed based on the interview survey. The finding from this study shows that the most critical success factors are related to the technicality of the ABC system in the design stage. In addition, the investigation of the uses of ABC information demonstrates that although it has been used only for limited purposes, it has proved to provide much accurate and detailed cost information. This study is significant in adding empirical evidence on the application of the private sector management style (i.e., the ABC system) in a government setting in a developing country.

## LITERATURE REVIEW

### THE THEORETICAL UNDERPINNINGS: NEW PUBLIC MANAGEMENT

Since the 1980s, the agenda of public sector reform across countries has been embedded in the notion of NPM, as frequently mentioned by past studies in public sector accounting research (Helden 2005; Matto & Sippola 2016). The concept of NPM is commonly referred to as a governmental reform that aims to improve public sector efficiency and performance in the delivery of services (Hood 1995). This key reform has given greater emphasis to the adoption of private sector management style in public sector organizations to improve efficiency and performance (Pollit 2002; Siddiquee 2006). Under the NPM approach, cost information gains prominence in assisting public sector managers to create greater efficiency, cost reduction and better resource allocation. This can be achieved through adoption of an advance costing method such as ABC (Verbeeten 2011). Thus, underpinned by the NPM, the adoption of the ABC system by the public sector organizations can be regarded as a key reform aimed at increasing their efficiency in managing resources (Hyndman & Lapsley 2016).

NPM can be used to explain the process of adoption of private sector management style in the public sector. For instance, Pollit (2002) divides the process of adoption of private sector management style into four stages. The first stage is discursive, which refers to a general discussion of private sector management techniques for the purpose of public sector organizations (for instance, performance budgeting, total quality management, ABC) to improve performance and efficiency. The second stage is described as decisional and refers to the decision taken by government to implement these techniques. The third stage is practice, which concerns the actual use of these techniques in public sector organizations. Finally, the fourth stage is referred to as results, which concerns the impact of the adoption of such techniques on public sector organizations' performance. In referring to Pollit's (2002) framework of the NPM concept, this present study is primarily concerned with the third stage of the NPM concept, the practice stage. Specifically, it investigates how the implementation of a private sector management technique (i.e., ABC) was conducted in a public sector organization. The examination of the ABC implementation process in the context of the private sector has emphasized the critical success factors which contribute to the understanding of the ideal process of ABC implementation. Accordingly, this study attempts to add empirical evidence by assessing the critical success factors of ABC implementation, along with the benefit or usefulness of such a technique, from the public sector experience in the context of NPM.

### ACTIVITY-BASED COSTING IN THE PUBLIC SECTOR CONTEXT

With the increased pressure for efficiency, public sector organizations need more complex costing systems that can

supply better cost information (Verbeeten 2011). ABC was first developed in the 1980s to overcome problems with the traditional costing method which uses a single driver to allocate the overhead cost and causes distortion of cost information (Cooper & Kaplan 1992). It was introduced as a more sophisticated and advanced costing method that allocates the overhead cost using multiple cost drivers which provide more accurate cost information (Mullins & Zorn 1999).

A number of studies have been conducted over the years to explore the application of the ABC system in a public sector context (e.g., Arnaboldi & Lapsley 2003; 2004; 2005; Baird 2007; Granof, Platt & Vayesman 2000; Verbeeten 2011). For instance, Baird (2007) studied the extent of the adoption of activity management practices in 250 Australian public sector organizations by applying Gosselin's (1997) model of three levels of activity management (activity analysis, activity cost analysis and ABC). He found that the majority of the public organizations studied adopted activity management practices only at the level of activity cost analysis. ABC is adopted less widely because of the cost and benefit issue. Past studies have also investigated the application and implementation of the ABC system in public sector organizations in a specific contextual setting such as in public universities (e.g., Granof et al. 2000; Hashim 2012; Mohd Amir, Md Auzair, Maelah & Ahmad 2012), healthcare industries (e.g., Arnaboldi & Lapsley 2004; 2005), local government (e.g., Arnaboldi & Lapsley 2003; Brown, Myring & Gard 1999; Mullins & Zorn 1999) and federal government (e.g., Fortin, Haffaf & Viger 2007; Miller 2009). Research on ABC application and implementation in such specific contextual settings provides useful insights into the experience of ABC practices from a public sector perspective.

### THE USEFULNESS OF ABC IN THE PUBLIC SECTOR CONTEXT

The ABC system was initiated and has been predominantly implemented in private sector organizations; therefore, much of the literature on ABC implementation in public sector organizations uses insights from literature in the private sector context (Baird 2007). However, the ABC system might be useful in particular ways that reflect the nature and context of specific public sector organizations. Activity-based costing can be used in the public sector context to improve the management of public expenditure, and it particularly offers an opportunity to improve decision making in relation to resource allocation and the identification of under-utilized resources (Aboumrad 2000). Miller (2009) in her study of ABC implementation in ten federal government agencies in the US found that ABC information is used in providing new measures of resource usage, which allows management to evaluate performance in terms of service delivery (the most cost-effective services provided) in public agencies.

In addition, ABC usage in the public sector context can contribute to improving cost awareness in public sector organizations (Brown et al. 1999), which also enhances

public accountability, particularly in the management of resources (Miller 2009; Mohd Amir et al. 2012). Becker et al. (2009) in their study of application of ABC in public administration in Germany note that ABC can become an efficient tool for process governance in public sector organizations, and it also helps to assess and evaluate performance for public sector organizations.

In the context of the public university, Granof et al. (2000) found evidence of the applicability of ABC to public universities to determine unused capacity. Further, Mohd Amir et al. (2012) in their study of ABC application in public universities proved that ABC can improve information visibility and improves the accountability of the public university. In a more recent study that investigated ABC adoption in public sector organizations, Oseifuah (2013) conducted a case study of ABC adoption in a Municipal government in South Africa, and found that ABC provided information that was more accurate and useful than that provided through traditional costing. Moreover, ABC can lead to better cost control, cost management and better understanding of cost reduction opportunities. Thus, it allows the restructuring of public entity operations and processes to increase an organization's efficiency.

#### CRITICAL SUCCESS FACTORS OF ABC IMPLEMENTATION

Insight from previous literature on the critical success factors of ABC implementation demonstrates several key factors that contribute to successful ABC implementation, namely, commitment of managers and employees (Anderson & Young 1999; Krumwiede 1998) and top management support (Arnaboldi & Lapsley 2003; Al-Saidi & Gawda 2014). Top management support and employees' commitment towards ABC implementation are crucial; top management support is required to drive the employees to commit and implement the ABC system as intended. The role of the external consultant has also been emphasized as an expert in the ABC system can help to progress the ABC implementation (Innes & Mitchell 1991; Arnaboldi & Lapsley 2005; Yin Fei & Isa 2010). Implementation training and continuous learning further contribute to the successful implementation of ABC (Arnaboldi & Lapsley 2003; Shields 1995). In fact, these two factors are crucial in the process of implementing the ABC system in public sector organizations because the managers and employees in public services may not have necessary skills and knowledge of the ABC conception as this costing method may be relatively new for them (Arnaboldi & Lapsley 2003).

Another crucial factor in implementing the ABC system is the linkages to performance evaluation (McGowan & Klammer 1997; Shields 1995). The lack of linkages between the ABC system and performance evaluation or reward may result in ABC being under-utilized and thus hamper the objective of ABC adoption (Major & Hopper 2005). Finally, the usefulness of cost information is also central in implementing the ABC system, with the extent of the ABC usefulness often being regarded as an indicator

to measure the success of ABC implementation (Krumwiede 1998). The extent of usefulness of the cost information can be measured in terms of strategic decision making or efficiency and process improvements (Fortin et al. 2007). In the context of the public sector, this factor is crucial as the system was not originally designed for use in the public sector and, thus, this vital aspect needs to be investigated to gauge the applicability of the ABC system for public sector use.

The vast majority of past studies that have investigated the critical success factors of ABC implementation have been in the context of the private sector. Nonetheless, insights from the private sector experiences contribute to an investigation of ABC in the public sector setting. Arnaboldi and Lapsley (2005) adopted a case study approach to investigate the critical factors of ABC implementation in a healthcare organization. This study developed a framework that segments the implementation process for ABC into several stages (initiation and adoption, design, implementation and use of information) and defined critical factors for each implementation stage that affect the overall ABC implementation. They argued that different implementation factors have a unique effect on the process of ABC implementation in each stage. For example, top management support is extremely important during the initiation and adoption stages, while the role of external consultant is central during the design stage, and staff's commitment, training and IT support are crucial in the implementation stage. Arnaboldi and Lapsley's (2005) framework is referred to in this present study in order to assess the extent of ABC implementation in the AGD, because it clarifies the factors that affect each of the stages of the implementation process. This framework is suitable to be used in explaining the process of ABC implementation for this study because it was developed in the context of a public sector organization setting that implemented the ABC system. Moreover, this framework was developed in the context of the services sector, which is relatively similar to the AGD as a public-service organization. Sulaiman and Abdul Majid (2008) used the same framework in their case study of ABC implementation in two companies in Malaysia.

#### CHALLENGES IN IMPLEMENTING THE ABC SYSTEM

The implementation of the ABC system in an organization will result in major changes and a transformation of the management system of the organization. Thus, during the implementation process of the ABC system, the organization may experience a variety of issues and challenges. Based on a review of past studies on the challenges encountered in implementing an ABC system, these challenges can be classified into two types: (1) technical issues and (2) organizational and behavioural issues, with many of these past studies claiming that the organizational and behavioural factors are more problematic than technical issues (e.g., Shields 1995; Sulaiman & Abdul Majid 2008). In regard to the technical issues encountered during the

process of implementing ABC, Brown et al. (1999) pointed out that the selection of accurate cost drivers is an important concern because this ensures that the ABC system can produce reliable cost information. Given the complex structure of the operational activities in an organization, there are difficulties in determining the correct cost drivers in order to exactly trace the cost for each activity involved in producing the outputs (Arnaboldi & Lapsley 2003). Ramadan and Al-Basteki (1998), in their survey on ABC practices in manufacturing companies in Bahrain, found that the major difficulty faced by those companies relates to identifying the activities, cost drivers and costs of the activities. This issue arises particularly during the design and implementation stage.

In addition, a lack of technical skills in ABC may be counted among the technical issues that could be encountered when implementing an ABC system in an organization. This issue relates to the education and training provided to supply the appropriate knowledge to staff to run the ABC system. This issue was found to be significant by several past studies (e.g., Arnaboldi & Lapsley 2003, 2005; Shields 1995). The challenges of ABC implementation could be the critical factors that determine its success.

#### METHODOLOGY

The descriptive case study approach adopted by the present study aims to provide a description of the social phenomena that occur as a result of the implementation of the ABC system in a particular government agency. This case study takes the Accountant General's Department of Malaysia (AGD) as its research setting because it is the first Malaysian government agency to implement the ABC system. The adoption of ABC is to replace the traditional costing method known as the Micro Accounting System (MAS), which had been used since 1992. The AGD was created under the Ministry of Finance Malaysia with the establishment of the Accountant General's position in 1946. The AGD is authorized to handle accounting procedures in regard to the accounts for the federal government as well as for the state governments (Ministerial Functions Act, 1969). The main office of the AGD is located in the Malaysian government centre at Putrajaya and consists of eight divisions that carry out accounting and financial services for government ministries and agencies. Additionally, the AGD has 25 branches throughout Malaysia to carry out accounting and financial services for other government agencies.

The data collection process in this study was undertaken in the AGD headquarters, which is located in Putrajaya using semi-structured interviews, documents review and questionnaires as the research instruments. The questionnaires were also sent to the 25 AGD branches located throughout Malaysia. The use of a combination of interviews, documents review and questionnaires was necessary to address different research enquiries (Arnaboldi & Lapsley 2003, 2005). This present study

utilised semi-structured interviews and documents review to assess the implementation process of ABC, along with its challenges. Additionally, the questionnaire survey was used to investigate the critical success factors, the perception of the usefulness and the implementation challenges. While the documents review and semi-structured interviews were carried out at the main office of the AGD and one branch, the questionnaires were used to reach out to respondents including those in AGD branches throughout Malaysia.

#### SEMI-STRUCTURED INTERVIEWS AND DOCUMENTS REVIEW METHOD

Semi-structured interviews were conducted to gather information on the overall process of the adoption of ABC by the AGD. The semi-structured interview was carried out in two stages. First, the semi-structured interview with one member of the ABC Steering Committee was undertaken as a preliminary study to gather information on the overview process of ABC implementation in the AGD. This interview took place in January 2014. Later, based on the information gathered through the preliminary study, the second stage of semi-structured interviews with all the members of the ABC Steering Committee was conducted in the period of June and July 2014 to understand the process of implementing the ABC system in this particular agency and to discover the challenges faced during the implementation process. Subsequently, in August 2014, a series of interviews was also conducted with the ABC users to gain insights into the ABC system's usefulness and challenges from the user's perspectives.

Overall, seven participants were involved in the semi-structured interviews in the present study (refer to Table 1). All four members of the ABC Steering Committee were interviewed to gather information on the technical application of the ABC system in the AGD and the challenges faced when implementing the ABC system. Three ABC system users were also interviewed to gather insights on their perception of the usefulness of the ABC system in this particular government organization. Of the three ABC users, one was a user of the ABC system at the branch level, while the other two were from the division level. All respondents were assigned a coding number for the purpose of anonymity. Interviews were conducted by following a predetermined interview guideline and took approximately 30 minutes to one hour for each interview. The data gathered from the semi-structured interviews was analysed using a manual code-based approach.

In order to enhance the researcher's understanding of the process of ABC adoption and implementation, a documents review was performed to obtain secondary data such as costing reports, minutes of meetings, rules and regulations, ministries' and departments' webpages, bulletins and the AGD's annual reports. This information was scrutinized in detail to gain a clearer picture of the overall process of implementing the ABC system in the AGD.

TABLE 1. Profile of Interview Participants

Interviewee	Code	Position	Role
1	Officer 1	ABC Steering Committee	ABC Preparer/ Implementer
2	Officer 2	ABC Steering Committee	ABC Preparer/ Implementer
3	Officer 3	ABC Steering Committee	ABC Preparer/ Implementer
4	Officer 4	ABC Steering Committee	ABC Preparer/ Implementer
5	ABC User 1	Top Management	ABC User
6	ABC User 2	Top Management	ABC User
7	ABC User 3	Top Management	ABC User

#### QUESTIONNAIRE SURVEY METHOD

The questionnaire survey instrument was used in this study to examine the critical success factors for ABC implementation, to gather insights on the ABC system's usefulness and ABC implementation challenges. The survey items were developed based on prior literature and the findings from a preliminary study that had been conducted with the ABC Steering Committee in the AGD. Some of the items were also adapted from previous studies (e.g., Arnaboldi & Lapsley 2005; Brown et al. 1999; Foster & Swenson 1997; Innes, Mitchell, & Sinclair 2000; Shields 1995). A pilot test was conducted to refine and improve the contents of the self-developed questionnaire in order to enhance its validity and reliability in capturing the data required for this study. The pilot test was carried out in June 2014 to obtain feedback on the questionnaire from five academicians and two members of staff from the AGD (ABC Steering committee). In order to gather much clearer feedback on the questionnaire, all the participants in the pilot test were interviewed personally to discuss their opinions on the overall content of the questionnaire, including the clarity and understandability of each item in the questionnaire. Generally, the comments from academicians and AGD personnel related to the improvement of certain terminology and the sentence structure of the questions, which was unclear in places, to make the questionnaire more readable. The questionnaire was then amended accordingly after considering the comments and suggestions of the participants in the pilot test.

The respondents of the questionnaire survey consisted of AGD officers who were directly in charge of ABC implementation in each division both at headquarters and in the branches. These officers, also known as the implementers of the ABC system, were among the middle management or lower level staff (below grade W41). The top management (grade W41 and above) in each division and the branches were also identified as the respondents to the questionnaire for the purpose of this case study. The potential respondents for the questionnaire survey were recommended by the ABC Steering Committee during the preliminary study. These participants were identified as suitable respondents who would be able to give opinions related to the implementation of the ABC system as they had reasonable experience and knowledge pertaining to ABC implementation in the AGD.

In total, 169 questionnaire surveys were distributed to the target respondents and 49 completed questionnaires were received, which is equivalent to a 29% response rate. Table 2 presents the relevant demographic information for the 49 respondents who completed the questionnaire. As can be seen from the table, the majority of the respondents (83.7%) had more than five years of services in the AGD. This indicates that the respondents had appropriate working experience to give an informed opinion on the implementation of the ABC system in the AGD. In addition, 59.2% of the respondents were employed at job grade W41 and above while the remaining 40.8% were lower than grade W41. This shows that the questionnaire was answered by appropriate groups of respondents, that is, the management and professional level and middle management of the ABC system in the AGD.

TABLE 2. Demographic Information of Respondents

Years of service	Frequency	Percent
Less than 3 years	4	8.2
3–5 years	4	8.2
5–10 years	22	44.9
More than 10 years	19	38.8
Total	49	100.0
Job Position	Frequency	Percent
Grade W41 and above	29	59.2
Below than W41	20	40.8
Total	49	100.0

#### FINDINGS

##### PROCESS OF ABC IMPLEMENTATION IN THE AGD

The descriptions and analysis of the process of implementing the ABC in this particular government agency are discussed in the following, based on the result of the semi-structured interviews with the ABC Steering Committee and users of the ABC system. The analysis was also supported by the information gathered through the documents review, which enhanced an understanding of the ABC implementation process in the AGD. The process of implementing the ABC system in the AGD is analyzed and described according to the ABC implementation framework presented by

Arnaboldi and Lapsley (2005) that segmented the ABC implementation into four stages: initiation and adoption, design, implementation, and use of information.

#### STAGE 1: INITIATION AND ADOPTION OF THE ABC SYSTEM

The implementation of the ABC system in the AGD was initiated by the top management of AGD to replace the previous costing method, the MAS. The decision to adopt the ABC system was made because of the adoption of a new government accounting system, the Government Financial Management Accounting System (GFMAS), in 2006. The AGD uses the GFMAS as its main accounting system and this system integrates accounting functions (e.g., payments, receipts, salary management, government loans, investments, and preparation of public accounts) into a single system. A basic ABC system was already included in the GFMAS package, although it needed further system development to make it ready to use.

With GFMAS, almost all of the accounting processes in the AGD needed to rely on electronic data to produce the outputs. As a result, the MAS, which is a stand-alone costing system based on manual operation, became obsolete as it was not suitable to use with the GFMAS package. Consequently, the top management of the AGD decided to implement the ABC system, which was already part of the GFMAS system, to replace MAS to ensure the costing information could be produced in an efficient and timely manner. As one respondent explained:

“... MAS is a separate accounting system which is based on the traditional costing... we need to key in all the costing data and prepare the costing report manually. It is tedious and required a lot of work and time to collect and prepare the data... After they adopted GFMAS, all the accounting data was integrated... MAS is a manual operation system and did not match with the GFMAS” (Officer 1, ABC Steering Committee).

Also referring to the process of initiating and adopting the ABC system, another respondent mentioned that:

“...As the ABC system is part of the GFMAS, the costing information is easy to extract to and from other systems. This new system can reduce extra work to prepare and get the costing information, as compared to the MAS that required manual operation” (Officer 2, ABC Steering Committee).

Thus, the process of initiating and adopting the ABC system was triggered through the employment of the GFMAS, which required all-new integrated and updated systems. As referred to in the comments made by the committee members, replacing the MAS in AGD with the ABC system was for the purpose of increasing efficiency and effectiveness in the preparation of costing information for the agency.

Concerning the task of implementing this new costing system in this agency, the process of ABC implementation was governed directly by the Deputy Accountant General (Operations). Also, an ABC Steering Committee was

officially formed under the Accounting and Management Development Division (AMDD), one of the AGD's divisions. This committee is an official committee responsible for the whole process of ABC implementation in the AGD. The committee consists of four members and is chaired by the Deputy Accountant General (Operations). The committee members underwent a number of training courses on the ABC system to gain knowledge about ABC prior to the implementation. An external consultant was also hired specifically to assist the committee in the process of developing the ABC system in the GFMAS package.

#### STAGE 2: SYSTEM DESIGN

The design of the ABC system involved further development of the basic ABC system package already in the GFMAS to make it ready to use. The process of developing the system was handled by the external consultant. At this stage, the ABC Steering Committee was tasked with supplying all the important information related to the organization's operations for the purpose of ABC system development. This involved, among other things, identifying the activities, activity cost drivers and units of measurement, as well as establishing the output structure. This was crucial as the AGD is one of the biggest Malaysian government agencies, and it performs many different types of services and activities:

“... The process of identifying the technical units for the purpose of the ABC system such as activities, cost drivers, units of measure and so forth, is very important during the stage of developing the system. We carefully looked into it for each and every division and branch. As each division and branch provides different types of services, massive lists of activities and cost drivers needed to be properly identified” (Officer 1, ABC Steering Committee).

Later, a dictionary of activities and outputs was established for use as the main reference for the implementers of the system. The dictionary of activities and outputs contains the descriptions and standard definitions for all activities and outputs that have been defined for the ABC system. It also includes information about the unit of measure and cost driver for each activity and output. In this way, the users and preparers of the ABC system can have a common understanding of the terminology and concepts being used in the ABC system by referring to the dictionary of activities and outputs. The process of developing the ABC system took place from 2006 to 2009, and the system was ready to be implemented in 2009. Examples of activities, cost drivers and outputs of the AGD can found in the appendix section.

#### STAGE 3: ABC IMPLEMENTATION

##### *Early Implementation and System Redesign: 2009*

By 2009, the ABC system was ready to be implemented at the divisional level at AGD headquarters. Unfortunately, during the early process of implementation, it was discovered that the ABC system had several technical errors and there was a systems failure:

“... In 2009, the system was actually ready to operate, but when the outputs (from the ABC system) came out, it did not produce what we expected... There were a number of technical errors in the input system...and there were problems with extracting the data from other systems into the ABC system... So we decided to ask them (the external consultant) to do corrections to the system” (Officer 2, ABC Steering Committee).

As a result, the ABC system was redesigned by the external consultant to fix all the technical errors and address the issues pointed out by the ABC Steering Committee that was responsible for ensuring that the outputs of the ABC system would be useful. Thus, the implementation of ABC was postponed to allow the process of correction and rectification. The process of correction of the ABC system was finished by 2012, and the system was ready for full implementation starting from January 2012.

#### *Full Implementation: 2012*

In 2012, after the ABC system had been corrected and redesigned, it was officially implemented in all divisions and branches. After the process of system migration from MAS to the ABC system was completed, the external consultancy function ended. The implementation process was then fully monitored by the ABC Steering Committee, and a team with a technical support function from the Information Technology Management Division in the AGD provided continuous assistance to solve any technical issues related to the operation of the ABC system. The process of implementing the ABC system was later cascaded down to all divisions at the headquarters and branches.

Prior to the implementation, all the staff who would be directly involved in the ABC system in all divisions and branches underwent a series of training. Further on-going training was also provided to supply them with knowledge on the operation of ABC system. Specific training for the users of the ABC system (the top management of divisions and branches) was also provided to equip them with reasonable knowledge of ABC to ensure they can utilize the ABC information.

The ABC report is produced on a monthly basis at the branch and division level. In the AGD’s headquarters, these ABC reports from all the branches and divisions are compiled into quarterly reports and presented at quarterly meetings chaired by the Deputy Accountant General (Operations). Once the ABC system was implemented in all divisions and branches across Malaysia, steering committee members visited the branches to closely monitor the implementation of the system at the branch level.

#### STAGE 4: USE OF ABC INFORMATION

The final stage of the ABC system implementation is concerned with the actual use of the ABC information. The assessment of the extent of the actual use of the ABC information was made based on the interviews with the users and the ABC Steering Committee. It is claimed that the cost information produced is more accurate and detailed than that of the previous system:

“... The benefits of the adoption of the ABC system are mostly in terms of providing accurate cost information and detailed cost information based on activities. So our staff actually can see how their work can affect the costs of the agency” (ABC System User 3).

Other than that, the AGD uses the ABC information in quite limited areas, namely cost comparison between branches that have similar outputs, monthly cost comparison, job rotation and task restructuring for idle staff:

“So far we have not seen the ABC function as how it was perceived in our agency. We can only use the ABC information for the purpose of cost comparison between branches, segregation of duties, job rotation and task restructuring for our staff” (Officer 1, ABC Steering Committee).

Referring to the use of ABC information for the purpose of cost comparison between the branches, the same respondent added that they can evaluate branch performance based on the lowest or highest costs for the same outputs, as the following comments suggest:

“... Based on the information in the ABC reports prepared by each branch, we can see which branches have performed well in managing their costs for the same outputs produced. The branch’s management who have the highest cost for outputs need to provide a justification for their costs being relatively high.... However, the results from the ABC reports do not tie into any formal performance evaluation criteria for individuals or the whole branches” (Officer 1, ABC Steering Committee).

At the branch and divisional level, the costing information derived from the ABC system is presented at monthly management meetings. Similar to the situation at headquarters, the ABC information is used by the management of the branch or division in limited areas, including job rotation, staff relocation and task restructuring:

“There is not much we can do with the ABC information based on the current system at our branch. Our services are more about being intermediaries in managing the government’s accounts. We act as a support unit for government organizations. Thus, the information on costs might be less crucial in our agency. At most, we use the ABC information to make staff arrangements. For example, if we found the cost of an output produced is higher due to the staff’s salary, we would arrange for the same staff to perform other tasks to reduce the salary contribution to the cost of the output produced” (ABC System User 2).

In light of the above, some of the respondents’ comments provide evidence on the extent of the usefulness of ABC information in several areas, such as performance evaluation across branches and the management of staff responsibilities. However, the ABC information has not been shown to offer substantial benefits in terms of the strategic decision-making process in the AGD. Nevertheless, ABC information is noted to produce more detailed and accurate cost information for top management.

## CRITICAL SUCCESS FACTORS OF ABC IMPLEMENTATION

The findings regarding critical success factors of ABC implementation were derived by the survey method. Table 3 presents the overall results for the critical factors which would influence the different level of ABC implementation. In terms of ranking the critical factors, the overall results presented in Table 3 show that the five most recognised critical factors were identification of activities, followed by staff commitment, identification of output definitions, identification of cost drivers, branch or divisional managers' commitment and compatibility with other government systems. These findings show that the most critical factors impacting the success of ABC implementation in the AGD relate to the technicality of the ABC system during the design stage and the commitment of the managers and staff in the implementation stage. This tends to suggest that the design and implementation stages were the most critical stages influencing the success of ABC implementation. Further analyses on each of the critical factors in different levels of ABC implementation are discussed in the following paragraphs.

The overall findings from the assessment of the respondents' opinion on each of the ABC implementation factors in every stage of implementation presented in the Table 3 show that the respondents agree to some extent that each factor had properly taken place during the whole process of ABC implementation. Although the majority of respondents indicated their agreement, a significant number also indicated disagreement with each of the critical implementation factors. In fact, for the factor of the external

consultant's competency, the majority of the respondents (57%) were uncertain about or disagreed with the statement that the external consultant is competent to provide support for ABC implementation. One possible reason that can be offered for their uncertainty or disagreement regarding the external consultant's competency is that the majority of the respondents have never engaged with an external consultant because this team deals directly only with the ABC steering committee. Hence, the respondents, as users or preparers of the ABC system, may not have been able to evaluate the external consultant's competency and were uncertain about it. Nevertheless, it also may indicate that the respondents are uncertain and may not recognise the role of external consultant to provide extensive support to progress the ABC implementation especially during the design stage.

In addition, as can be seen in Table 3, analysis by ranking shows that the factor of the external consultant's competency attracts the lowest mean score (3.27). It is followed by the factor of on-going training (3.29) and that of communication of objectives and rationale of ABC implementation (3.47). The low mean scores for these three items, with the majority of respondents giving basically "neutral" responses, may suggest that the respondents have concerns about these factors. Possibly the weaknesses in implementation procedures contribute to dissatisfaction with these three items.

## PERCEPTION OF THE USEFULNESS OF THE ABC SYSTEM

The present study also investigated perceptions of the usefulness of the ABC system by assessing the respondents'

TABLE 3. Analysis of Critical Success Factors of the ABC Implementation in Different Stages

Implementation factors	Likert scale					Mean	Rank
	1	2	3	4	5		
	%						
Initiation and adoption stage:							
Communication of objectives and rationales (n=49)	2	12	25	59	2	3.47	11
Top management commitment and support (n=49)	4	2	19	65	10	3.76	7
Adequate training (n=49)	2	14	14	65	4	3.55	10
Design stage:							
Identification of activities (n=49)	-	4	6	76	14	4.00	1
Identification of cost drivers (n=49)	-	8	10	70	12	3.86	4
Identification of units of measurement of the cost drivers (n=49)	-	10	10	65	14	3.84	6
Identification of output definitions (n=49)	-	6	10	74	10	3.88	3
Compatibility with other government systems (n=47)	-	2	21	63	10	3.85	5
External consultant's competency (n=49)	2	14	41	41	2	3.27	13
Implementation stage:							
Branch/divisional managers' commitment (n=49)	4	-	10	78	8	3.86	4
Staff commitment (n=49)	2	2	10	72	14	3.94	2
Ongoing training (n=49)	4	20	25	45	6	3.29	12
Technical support (n=49)	2	8	23	59	8	3.63	9
Use of information stage:							
Usefulness of ABC report (n=49)	4	4	23	61	8	3.65	8

Notes: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

agreement on 16 items on ABC usefulness that were relevant to their agency on a scale of “1” (strongly disagree) to “5” (strongly agree). Table 4 summarizes all responses related to the perception of the usefulness of the ABC system.

As can be seen from Table 4, analysis by ranking reveals that the elements of the ABC system most perceived to be useful are: first, its provision of more accurate cost information (mean = 3.65); equal second, its improvement to managerial planning (mean = 3.61) and its improvement to management of resource allocation (also mean = 3.61); and equal third, its improvement to budgetary control activities (mean = 3.59) and its assistance in identifying non-value-added activities (also mean = 3.59).

However, it is interesting to find that the respondents indicated a weak agreement or either close to “neutral” (mean below than 4.00 for all items) on the list of 16 items asked in the questionnaire related to the ABC system’s usefulness. For the item judged to be the least useful – the ABC system can increase cost awareness (mean = 3.43) – only 55% of respondents agreed that the ABC system can increase cost awareness in their agency, while 45% of respondents were either uncertain or disagreed with this item. This finding seems to suggest that, although the majority of respondents (55%) indicated their agreement, a significant number of respondents were uncertain or actually did not perceive that the ABC system is useful for increasing cost awareness for their agency. Perhaps the reason for this is that respondents may not really understand the ABC concept and are thus uncertain about the real function of the ABC system within their organization.

#### ABC IMPLEMENTATION CHALLENGES

The survey instrument used in this study also aimed to discover the challenges that were faced by the agency

during the process of ABC implementation. The respondents were asked to indicate their level of agreement on the challenges that they faced in the ABC implementation process according to a five-point Likert scale ranging from “1” (strongly disagree) to “5” (strongly agree). However, assessments of the respondents’ level of agreement on the list of eight difficulties or challenges revealed that the majority of the respondents do not encounter these difficulties, as the mean for all items is less than “3”, which indicates low difficulties, as shown in Table 5. However, an interesting finding was noted regarding the analysis based on percentages. For example, by referring to the results in Table 5, according to percentage, 53% of respondents disagreed that they had a problem with the statistical accuracy of the ABC system. On the other hand, 47% of respondents indicated either a neutral response or agreement with this problem. This seems to suggest that a significant number of respondents may have encountered this problem during the ABC implementation process.

This also applies to the difficulties in understanding the interrelationship between the activities, unit of measurement, cost drivers and outputs in the ABC system. For this item, 51% of respondents indicated that they disagree that this is a challenge, while 49% indicated either a neutral response or agreement that they faced this problem. Again, although the majority of respondents disagreed that it was a challenge, a significant number of respondents indicated that they may encounter the challenge of understanding the interrelationship between the activities, unit of measurement, cost drivers and outputs in the ABC system.

With the above analysis, although the overall result was a mean score indicating low difficulties for all items, challenges faced by a significant number of respondents, according to percentage, could also be noted. Analysis

TABLE 4. Analysis of Respondents’ Perception on the Usefulness of the ABC System

Usefulness of the ABC system	Likert scale					Mean	Rank
	1	2	3	4	5		
	%						
Provides more accurate cost information	2	10	16	64	8	3.65	1
Improves cost control	2	12	25	53	8	3.53	6
Improves cost management	4	10	16	64	6	3.57	4
Improves managerial planning	4	8	16	65	6	3.61	2
Improves decision making	4	8	23	61	4	3.53	6
Improves budgetary control	4	8	22	55	10	3.59	3
Improves service delivery	4	8	27	57	4	3.49	8
Improves management of resource allocation	4	8	14	70	8	3.61	2
Increases cost awareness	4	12	29	47	8	3.43	10
Improves the process of accountability within the organization	4	12	21	59	4	3.47	9
Improves the process of accountability between the organization and the parent ministry	4	12	21	57	6	3.49	8
Helps to identify the non-value-added activities	4	10	14	66	6	3.59	3
Helps to eliminate the non-value-added activities	4	10	27	53	6	3.47	9
Useful for process improvements	4	12	19	59	6	3.51	7
Useful for performance evaluation	4	10	16	66	4	3.55	5
Benchmarking between branches of the AGD	-	10	29	53	8	3.59	3

Notes: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

TABLE 5. Analysis of the ABC Implementation Challenges

ABC implementation challenges	Likert scale					Mean	Rank
	1	2	3	4	5		
	%						
	n= 49						
Difficulties in understanding the units of measurement	10	45	12	31	2	2.69	5
Difficulties in understanding cost drivers	10	39	16	33	2	2.78	3
Difficulties in understanding the interrelationship between the activities, units of measurement, cost drivers and outputs	6	45	14	33	2	2.80	2
Difficulties in understanding and interpreting the costing information	8	49	14	25	4	2.67	6
Problems with the statistical information accuracy	2	51	14	29	4	2.82	1
Difficulties in getting appropriate technical support	8	43	25	22	2	2.67	6
Difficulties to operate the overall function of the ABC system	10	41	20	25	4	2.71	4
Less comfortable to use ABC system	6	45	33	14	2	2.61	7

Notes: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

by percentage revealed that a significant number of respondents (as discussed in the previous paragraph) may have encountered difficulties which relate to the technicalities of ABC system.

Findings from the survey on the ABC implementation challenges do not offer much insight on the difficulties or challenges. However, findings from the semi-structured interviews revealed some interesting facts related to the ABC implementation challenges in the AGD.

According to members of the ABC Steering Committee, they faced many different types of challenges in different implementation stages. Of these, the process of identifying the activities, cost drivers, units of measurement and of establishing the output structure, which occurs during the design stage, was the most challenging and time-consuming. This is due to the complexity of the AGD's operations, which involve an extremely large number of activities and procedures that need to be properly identified.

"The development of the ABC system was not an easy task. This agency's operation comprises numerous complex processes and procedures. Thus, it caused to a prolonged process in developing the ABC model for this agency." (Officer 2, ABC Steering Committee)

During the implementation stage, the challenges were related to inadequacy in technical skills among the staff in terms of being able to operate the ABC system and to prepare the ABC report:

"The staff in charge of the ABC system, particularly at the branch level encountered many issues in operating the ABC system. We need to help them to use the ABC system, although a substantial amount of training has been given." (Officer 1, ABC Steering Committee)

It was also claimed that the ABC system is not user-friendly:

"... The ABC system is not user-friendly. If we need to make changes to the items, it is difficult to adjust accordingly. We need to seek help from the IT department to make adjustments in

the system which usually take time to resolve." (Officer 1, ABC Steering Committee)

There is also a behavioural issue pertaining to the implementation of the ABC system in the AGD, as shown by the lack of commitment of staff in preparing the ABC reports, particularly at the branch level. This is evidenced by the delay in submitting ABC quarterly reports to the headquarters level. According to Major and Hopper (2005), the issue of the punctuality of workers in submitting ABC reports is a persistent one. Nevertheless, the staff's commitment was identified among the critical factors that can influence the success of ABC implementation. Thus, lack of commitment of staff can disturb the smooth process of ABC implementation.

#### DISCUSSION AND CONCLUSION

The implementation of the ABC system in this particular government agency has been a prolonged process with many challenges, including system corrections. However, this can be considered as actually a "normal process" faced in implementing the ABC system, as documented in the literature of ABC implementation (Anderson 1995; Arnaboldi & Lapsley 2003). Analysis of the process of implementing this new costing method in the AGD revealed that complexities of the agency's operations become a critical factor, particularly in the design stage. This challenge was also found in previous studies such as Brown et al. (1999) and Arnaboldi and Lapsley (2003), who found that the complexity of government organizations' operations can make the process of identifying the activities and cost drivers more difficult. In addition, Arnaboldi and Lapsley (2005) suggested that the complexity of activities in the public sector organization that initiated adoption of the ABC system would require the employment of an external consultant; an external consultant with relevant expertise would assist in developing the ABC system. In this way, the development time of the ABC system can be reduced. However, in the AGD case, the process of ABC system development was prolonged even though the role

of external consultant had been used to assist the agency in developing the system. This may imply that the external consultants may not be able to simply apply private sector practices (the ABC system) to public sector settings because of the multifaceted nature of public sector organizations (Lapsley & Oldfield 2001). Moreover, the result from the questionnaire survey provides an interesting signal to this issue, as the majority of the respondents were uncertain or actually disagreed that the external consultant used by the agency to support the ABC implementation was competent (see result of questionnaire survey on critical factors of ABC implementation). As the role of the external consultant in providing support for the ABC implementation was among the critical success factors, inadequacy in this aspect could prevent the successful implementation of the ABC system in the AGD.

Investigation of the perception of the usefulness of ABC information revealed an interesting finding. Results from the survey revealed a moderate agreement with all the potential usefulness items. Out of the list of 16 items of ABC system usefulness, the most notable benefits of ABC in the AGD are that the ABC system is expected to provide more accurate cost information, improve management of resource allocation and help in identifying non-value-added activities. This result is also supported by the findings from the semi-structured interviews, which found that ABC information is used by the AGD in these three main areas. Findings from the semi-structured interviews with the users of ABC information and the ABC Steering Committee revealed that the information is marginally useful in certain areas. ABC information is used mainly for cost comparison between months and among branches with similar outputs. From that information, staff can evaluate the branch's performance based on its efficiency in using its resources to produce the same outputs. The information on the cost comparison gathered from the ABC system allows users to make suggestions to the AGD branches about how to improve their management of resources to reduce the cost of the similar outputs produced. This is indirect evidence that ABC information is somewhat useful in helping the organization to improve its efficiency. This finding is in line with that of Miller (2009), who found that ABC information can provide a new measure to evaluate public agencies' performance by looking at the most cost-effective service provided.

There is also evidence that ABC information is used by the AGD to identify and eliminate non-value-added activities by for instance, task restructuring where there are idle staff. Thus, again indirectly, ABC information assists in increasing the AGD's efficiency in delivery through the elimination of non-value-added activities by enabling managers to ensure that all staff are fully occupied in providing a more efficient service. This finding is similar to that of Aboumrads (2000), who found that the use of ABC in public sector organizations provides an opportunity to identify under-utilized resources and improve resource allocation. The most notable impact of the implementation of the ABC system in the AGD is in providing costing

information that is more accurate and timely than that of the previous system. Although the extent of usefulness is relatively insignificant in the context of strategic decision making, the ABC information is somewhat useful in terms of efficiency and process improvements. Although the efficiency improvement seems marginal, the findings of this study nevertheless provide some evidence that supports NPM theory, which posits that the adoption of a private sector management accounting technique improves public sector organizations' efficiency.

In terms of practical contribution, some lessons and recommendations can be offered based on the findings from this study. Firstly, understanding of the ABC concept should be enhanced to enable the users of the ABC information to fully comprehend and appreciate the benefits offered by the ABC techniques. Secondly, the role of the external consultant should be strengthened to progress smooth implementation in addition to empowering the staff with technical skills and thus encouraging their commitment. ABC implementation challenges highlighted by the result of the semi-structured interview surveys need to be addressed to ensure greater success of the ABC implementation.

The findings of the present study should be interpreted in light of its limitations. First, the findings may not be generalized to other contextual settings as this study focused on the experience of a single organization in a specific time period. Other organizations may experience different issues pertaining to the process of implementing the ABC system and thus would provide different results. Second, although the present study employed three methods of data collection, its findings are derived primarily from the perceptions of only two groups of respondents: the preparer or implementer and the user. As such, further research could be conducted to include much broader groups of respondents to enhance the understanding of the factors surrounding the implementation process. For example, further study may include the perspective from the top management of the agency. This can lead to a better understanding of the real motivation to implement the ABC. Apart from that, the results of the questionnaire survey on the critical success factors of ABC implementation revealed a significant number of respondents who indicated either uncertainty or disagreement with almost all of the critical factors. This provides an interesting signal that further investigation of this matter is warranted. Third, this study takes the perspective of NPM theory in investigating the implementation of ABC in this public sector organization. Other perspectives may provide interesting findings pertaining to the implementation of ABC in a public sector organization. Therefore, future research based on other perspectives (e.g., the new institutional perspective, legitimacy theory) is needed to gain more understanding in the process of implementing ABC in public sector context.

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## APPENDIX

## Main outputs/activities of the AGD

Outputs/activities	
1.	Financial statements of federal government
2.	Control and enforcement of accounting procedure
3.	Advisory and consulting services
4.	Financial information and management
5.	Highly trained financial personnel for the public sector
6.	Highly trained accounting personnel for the public sector
7.	Auditing reports

## Example of output of AGD's divisions

## Division 1

Outputs/activities	Drivers/Unit of measure
Financial statements of federal government	Number of books
Management reports	Number of reports
Management accounting services	Consultation hours
Advisory services	Consultation hours

## Division 2

Outputs/activities	Drivers/Unit of measure
Management of payments via Cheques/EFT	Number of cheques/EFT
Management of receipts	Number of receipts
Management of computerized emoluments	Number of paid staff
Management accounting services	Number of accounts Number of reports Number of transactions
Advisory services and training	Consultation hours Number of advisory cases Number of responsibility centers
Inspectorate	Inspectorate hours Number of responsibility center
Financial management of responsibility center	Number of reports
Management of information technology	Number of cases Consultation hours