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AVAILABILITY OF THE FUNDAMENTAL FACTORS FOR ADOPTION OF ACTIVITY-BASED COSTING/ MANAGEMENT (ABC/M) AT SAUDI UNIVERSITIES

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ABSTRACT

Nowadays, the application of ABC/M is becoming more important for institutions in order to have a bright future. Hence, the aim of this study is to explore the main factors for adoption of activity-based costing/management (ABC/M) system. The data were collected from well-established two public universities in the Kingdom of Saudi Arabia (KSA). The results revealed that a significant positive effect of fundamental factors (i.e. top management support, high decision usefulness cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition) for enhancing the ABC/M adoption in public universities in KSA. Therefore, the authors recommended that public university leaders in KSA can proceed in adoption of ABC/M decision because the KSA educational institutions have facilitated environment to embrace that system. Finally, the limitations and future avenues have discussed.

KEYWORDS: Activity-based costing/management (ABC/M), Saudi Public Universities, fundamental factors for ABC/M adoption

1. INTRODUCTION

The great expansion of world-class of high education and producing knowledge with high using of technology have changed the financial environment in which Saudi universities operate. According to the statement of The Council for Aid to Education, New York, 1997" Higher Education Institutions are in a state of turmoil and physical crisis (Abu-Tapanjeh, 2008). This increased the need to establish strong financial management by improving managerial process in terms of planning, monitoring and resource allocation which is more essential to keep abreast of contemporary global trends in higher education. Cost management must be the concern and goal of the directors of higher education institutions in this new environment. Sound costing information to support decision-making at strategic and operational will lighten the financial challenges in universities (Cropper, Cropper, & Cook, 2015). Traditional cost management through budgetary control was no longer able to provide accurate knowledge of the cost of the university's activities and products/ services that are provided (Ismail, 2010). However, modern cost management systems such as activity-based management (ABM) provide accurate detailed information about the costs and consumption of activities in a specific process for managers to improve decisions (Khataie, Bulgak, & Segovia, 2011).

With ABM, universities' managers can gain useful information about the performance of activities and products/services provided (courses, research, working papers, consultancy etc.) which will give a large opportunity for keeping costs down and allocating resources more effectively. Many researches on ABC/M have revealed successful adoption within Higher education institutions (Milano,2000; Cropper & Cook (2000); Tatikonda & Tatikonda 2001; McChlery, Jim, & Tom 2007; Ismail, 2010; (Dražić Lutilsky & Dragija, 2012). However, the adoption of ABC/M is not widely spread within higher education institutions, particularly in Saudi Arabia. On the other hand, scholars have depicted that the adoption of ABM is

not a simple process which requires expertise, resources and other factors that must exist to ensure successful adoption and maximize the potential benefits. Hence, the aim of this study is to investigate the availability of the fundamental factors (i.e., top management support, high decision usefulness of cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition) for assisting Saudi universities to adopt ABM system in daily work.

1.1 Research problem

Despite that fact that the implementation of ABC system is become highly necessary for enhancing higher education in many countries, the public universities in the Kingdom of Saudi Arabia still have no commitment toward applying ABC system in its daily, monthly, or yearly activities.

1.2 Research questions

What are the important factors (top management support, high decision usefulness of cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition) of adapting the activity-based costing/management in public universities?

1.3 Research objective

This study is aim to explore the main factors (top management support, high decision usefulness of cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition) for adoption of activity-based costing/management (ABC/M) system in public universities in Kingdom of Saudi Arabia.

2. LITERATURE REVIEW

The literature review is divided into three sections. the first provides an overview of activity-based costing and management (ABC/M). The second discusses the activity-based costing and management (ABC/M) at universities. The third address the fundamental factors supporting the adoption of ABC/M at Universities

2.1 Overview of Activity-Based Management (ABC/M)

Activity-Based Management (ABM) one of the most modern cost and management accounting system that originated by Raffish & Turney in 1991 from activity-based costing - ABC (Lu, Wang, Wu, & Cheng, 2017). that was introduced by Cooper and Kaplan in the 1980s as a response to general dissatisfaction with traditional costing systems to obtain more accurate costs of their cost of their cost objects (Kaplan & Anderson, 2007). ABM is the application of ABC data to make informed decisions (Cima, 2001). Basically, ABM is defined by CAM-1 as system that focuses on the management of activities as the route to improving the value received by the customer and the profit achieved by providing this value. It includes cost driver analysis, activity analysis, and performance measurement, drawing on ABC as its major source of data (Management Accounting Committee, 2006). ABC is defined as costing method that measures the cost and performance of activities, resources, and cost objects (Cardos & Stefan, 2011). It assign costs to cost objects according to the appropriate cost drivers that best describe the underlying behavior of the cost (McChlery, McKendrick, & Rolfe, 2007a).

ABM supports operations by focusing on the causes of costs and how costs can be reduced. It assesses cost drivers that directly affect the cost of a product or service, and uses performance measures to evaluate the financial or nonfinancial benefit an activity provides (Player, 1998). The elements of ABC/M are*: Resources*: an economic element that is required in the performance of activities such as academic staff, research assistants, technicians, administrative staff, facilities, technology, materials etc. Activity: An activity is work performed within an organization such as teaching, research, administration. Cost objects: an activity, output, or item whose cost is to be measured such as products, services. Cost driver: factors that cause changes in the cost of an activity.(Kont, 2011, p.56) Value-added activities: are those which change the form, fit or function of a product or service. These are things for which the customer is willing to pay, whereas, non-valued added activities do not help create conformance to the customer's specifications and are something for which the customer would be unwilling to pay for (Kumar & Mahto, 2013, p.12). the activities classified according to a hierarchy described by Cooper & Kaplan (1991) to four level as follow: Unit-level: represent the activities necessary for a single product to be made or a single service to be performed. For example, teaching and research. Batch level: represent the activities where a new product or service order is placed, For example, a course committees, assessment and validation events. Product level: represent the activities that are needed to support the provision of each type of output such as college administration and maintenance activities. Facility level: : represent the activities that sustain the university's ability to function(Cooper & Kaplan, 1992);(Cropper & Cook, 2000);(Ferreira Lima & Pt, 2011).

ABM is divided into operational ABC/M and strategic ABM: Operational ABM uses ABC data to improve efficiency by identifying and improving activities that add value to the product and reducing activities that do not add value to product in order to cut costs without reducing the value of the product or service, while, Strategic ABM uses ABC data to make strategic decisions about what products or services to offer and what activities to use to provide those products and services and also to do customer profitability analysis in order to identify which customers are the most profitable so the company can focus more on them and on serving their needs(Hock, Brain & Roden, Lynn & Hock, 2015).

According to advocates of ABC/M, universities need ABC/M to perform the following functions (Nishikant et al., 2014):

- Measuring the cost of the resources consumed in performing the university's significant activities
- Identifying and eliminating the costs of non-value-added activities

Determining the efficiency and effectiveness of all major activities performed in the university; and Identifying and evaluating new activities that can the future performance of the university. Benefits of ABC/M to universities which have been shown by several empirical studies(Innes, 1999);(Milano, 2000); (Cropper & Cook, 2000); (Tatikonda & Tatikonda, 2001); (McChlery, McKendrick, & Rolfe, 2007b); (Ismail, 2010); (Dražić Lutilsky & Dragija, 2012);(Hamid, El Hassan, & El Bashari, 2013) are:

- Accurate cost information to support academic and managerial decisions.
- improving financial management and the decision-making process
- increased service quality to customer
- cost reduction
- Better cost control
- Better resources allocation
- better course and program mix
- gain customer satisfaction
- justification of internal transfer charge
- better capital investment proposals evaluation

Despite of the many benefits of ABC/M for universities, there are some difficulties or problems associated with the adoption process. some of them are related to technical such as difficulty in obtaining relevant financial data, difficulty in determining accurate activities cost bool, activity cost drivers, difficulty in obtaining necessary data for measuring activity performance, time consuming (Cropper & Cook, 2000). while, others related to behavioral and organizational factors such the cost of implement ABC/M outweigh the expected benefits; employees' resistance to change, lack of management support; appropriate staff , inadequate resources (Cropper & Cook, 2000; Cima, 2001; Fawaz & Al-Omiri, 2003; Dražić Lutilsky & Dragija, 2012).

2.2 Fundamental factors required for adoption Activity-Based Management (ABC/M)

According to contingency theory which is recent and important in management accounting asserts that that there is no one `best' design for a management accounting information system, ' and it all depends' upon the situational factors or contingent factors (Fawaz & Al-Omiri, 2003, p.9). Examples of the contingent factors that have been previously studied were *(cost structure, usefulness of cost information for decision making, the diversity and complexity of products/services, The intense of competition, get top management support, resources adequacy, information technology..etc.*) (Drury & Tayles, 1994;Cima, 2001; Fawaz & Al-Omiri, 2003; Hughes, 2005; Al-omiri & Drury, 2007; Fei & Isa, 2010; Szatmary, 2011):

2.2.1 Cost structure (level of overhead)

Cost structure factor or the level of indirect costs has frequently been cited in literature as the major motive influencing organizations to adopt ABC/M. Kaplan and Cooper (1998) suggest that the major elements of total costs in service organizations such as universities are fixed and indirect. So, ABC/M is ideal candidate for providing more accurate cost information than traditional costing systems(Drury & Tayles, 1994). Increasing of indirect costs requires to adopt more accurate cost management system such as ABC/M rather than traditional systems which distorts cost information. Examples of previous studies that found significant association between cost structure and ABC/M adoption (Bjørnenak, 1997; Pavlatos & Paggios, 2007; Pavlatos, 2011; Charaf & Bescos, 2013; Al-Sayed & Dugdale, 2016a), while others which found no association between cost structure and ABC/M adoption such as (Cagwin & Bouwman, 2002*;* Fawaz & Al-Omiri, 2003*;* Al-omiri & Drury, 2007). In view of the above, the following hypothesis is tested:

H_1: Cost structure (high level of overhead) is positively associated with adoption of ABC/M at Saudi Universities.

2.2.2 High decision usefulness for cost information

Before implementing an expensive information system or a more sophisticated costing system, decide what are the organization's most important issues or decisions and what types of information would help address those issues. Kaplan and Cooper (1998) reported that more detailed and accurate cost information about individual products became the driving force for effective managerial planning, controlling and decision-making. Moreover, (Pavlatos & Paggios, 2009) conclude that the level of cost-system functionality in hotels is positively associated with the extent of the use of cost data. studies of (Cagwin & Bouwman, 2002; Fawaz & Al-Omiri, 2003; Al-omiri & Drury, 2007) found that this factor has significant relationship with adoption of ABCM. Based on the above discussion the following hypothesis is formulated:

H_2: High decision usefulness for cost information is positively associated with adoption of ABC/M at Saudi Universities.

2.2.3 Get top management commitment

Connection with top management support is one of the reasons of the success of ABC/M adoption/ implementation. With help of top management, identify critical information needs, and show how an ABC/M could provide valuable information (Cima, 2001);(Naidoo, 2011) provide adequate resources, and use authority to overcome the obstacles of their success(Baird, Harrison, & Reeve, 2007). Several previous studies found positive association between get top management support and ABC/M adoption(Shields, 1995);(Brown, Booth, & Giacobbe, 2004); (Baird et al., 2007); (Al-Sayed & Dugdale, 2016a);(Al-Sayed & Dugdale, 2016b). Based on the above discussion the following hypothesis is formulated:

H_3: Get top management support is positively associated with adoption of ABC/M at Saudi Universities

2.2.4 Resources adequacy

Adoption of ABC/M require adequate resources, either financial or human (Naidoo, 2011). adequate resources can reduce variety of problems that may encountered the ABC/M adoption such as lack of top management support, employees' resistance to ABC/M, etc.(Shields, 1995); (Cohen, Venieris, & Kaimenaki, 2005);. Several previous studies found adequacy of resources is positively associated with adoption of ABC/M(Shields, 1995);(Cropper & Cook, 2000);(Cohen et al., 2005); (Intakhan, 2014);. However, (Fawaz & Al-Omiri, 2003) found no significant association for adequate resources with ABC/M adoption. Based on the above discussion the following hypothesis is formulated:

H_4: Adequacy of resources is positively associated with adoption of ABC/M at Saudi Universities.

2.2.5 Complexity/ diversity of services/activities

Cooper, (1988) argued that product diversity is to be the major factor causing product cost distortions in conventional costing systems(Pavlatos & Paggios, 2009);(Al-Sayed & Dugdale, 2016b). This includes production volume diversity, size diversity, complexity diversity, material diversity and set-up diversity. ABC/M will provide the most benefits to companies that produce very diverse products or have complex activities(Cagwin & Bouwman, 2002; Hock, Brain & Roden, Lynn & Hock, 2015). The universities provide services such courses, research and other services. large university with a number of different services and variations on those services will find ABC/M most beneficial by achieving many efficiencies and savings (Szatmary, 2011). Based on the above discussion the following hypothesis is formulated:

H_5: Complexity and diversity of services/activities is positively associated with adoption of ABC/M at Saudi Universities

2.2.6 Information technology

ABC/M needs an information system that provides detail historical data and easy access to users (Cagwin & Bouwman, 2002). Literature found IT is positively associated with adoption of ABC/M. The association is found to be strongest for organizations that have reached a high level of IT (Ibrahim Mahmood Al-Nuaimi, Mohamed, & Mohammed Esmail Alekam, 2017). Based on the above discussion the following hypothesis is formulated:

H_6: Information technology is positively associated with adoption of ABC/M at Saudi Universities.

2.2.7 Competition

Competition is influencing the adoption of ABC/M through increasing the costs distortion that caused by traditional costing systems. Cooper (1988b) suggest that ABC/M is suitable when competition was intense (Bjørnenak, 1997). This variable is often presented in the literature as influential for ABC/M adoption (e.g. (Bjørnenak, 1997; Cagwin & Bouwman, 2002; Fawaz & Al-Omiri, 2003). Based on the above discussion the following hypothesis is formulated:

H_7: Competition is positively associated with adoption of ABC/M at Saudi Universities.

3. METHODOLOGY

This study conducted in public universities in Kingdom of Saudi Arabia (KSA). It is cross-sectional study from different department in financial management in Umm Al-Qura and Majmaah universities where considering the adoption of ABM system as one of their sustainable goals. A questionnaire was distributed out to 60 employees who working full-time in financial management as financial manager, controller, accountants, and other employees. However, the final analyzed questionnaires were 40 because there were some missed data have found which equivalent to 66.7% of the total response rate. All items have been adapted from the previous scholarly work as follows. I) Cost structure was measured by indirect costs as a percentage of total costs by using four-items (Brierley et al., 2001). II) Decision-making usefulness for cost information was measured using nine-items adapted from (Cinquini & Tenucci, 2011). III) All the other items were developed for this study using five-point Likert scale from (1 = strongly disagree) and (5 = strongly agree). That variables are services diversity & complexity, top management support, information technology, and competition.

4. DATA ANALYSIS

4.1 Reliability and validity

For achieving the objective of this study, the authors have conducted the validity and reliability test in order to have proper findings from the collected data. For example, the result of Cronbach alpha test more than the rule of thumb 0.7 (Hair et al., 2017) (see, Table 1).

Table 1: Reliability of the major variables

Variables	No. of items	Cronbach's Alpha
Decision usefulness of cost information	9	0.955
Service complexity & diversity	5	0.814
Top management support	7	0.931
Resource adequacy	5	0.830
IT	4	0.868
Competition	3	0.947

4.2 Descriptive statistics

Table 2 (below) summarizes the profile of the respondents who working in two reputable KSA universities (Umm Al-Qura & Majmaah). Most of respondents had bachelor's degree (85%) beside some other have post-graduation studies. In addition, the majority of respondents were specialized in accounting (57.5%), financial management (43.5%), and small portion specialized in business administration. Thus, it can conclude that the respondents were scientifically aware of the importance of the ABM and were able to comprehend the needs of the questionnaires. Finally, there are huge number of respondents were financial employees (77.5%) with reasonable experience and the remain number scattered between accountants (22.5%) and financial managers. So, it can be concluded that the respondents are sufficiently well suit with their university and able to comprehend the needs of the questionnaires. This will give more support for adoption of ABM at (Umm Al-Qura & Majmaah) university.

Table 2: Profile of respondents working in (Umm Al-Qura & Majmaah) university

Demo. data	Items	Frequency	Percentage
Educational Qualifications	Secondary	5	12.5%
	Bachelor	34	85%
	Postgraduate	1	2.5%
Scientific Specialization	Accounting	23	57.5%
	Business Administration	7	17.5%
	Financial management	10	25%
Job (Occupation)	Financial manager	1	2.5%
	Managerial manager	3	7.5%
	Accountant	5	12.5%
	Financial Employee	31	77.5%
Work Experience Years	5 years or less	3	7.5%
	6-10 years	17	42.5%
	11-15 years	12	30%
	More than 15 years	8	20%
Number of training courses related to accounting and financial management?	Not found	4	10%
	1-3 courses	8	20%
	4-5 courses	22	55%
	More than 5 courses	6	15%

Table 3: Cost structure (indirect cost as a percentage of total cost)

Range	N	%
25% or less	9	22.5%
26% - 50%	6	15%
51%- 75%	17	42.5%
More than 75%	8	20%
Total	40	100%

Table 3 showed that the sample indicated that the percentage of indirect cost to total costs is more than 51% which ranked higher (62.5%). However, there are small portion less than 50%. This reflects that the adoption of ABM is more beneficial when cost structure (indirect cost) is higher than direct costs (more than 50% of total cost).

4.3 Dimension result

Table 5: Testing of overall used dimensions

Research variables	N	Mean	Std. Deviation	Sig.	R^2
Decision usefulness of cost information	40	3.60	.806	0.000	0.86
Service complexity & diversity	40	3.7	.793	0.000	0.76
Top management support	40	3.4	.946	0.000	0.85
Resource adequacy	40	3.2	.786	0.000	0.74
IT	40	3.4	.804	0.000	0.85
Competition	40	2.88	1.136	0.000	0.95

Table 5 showed that all tested dimensions have strong correlation in term of R square and the level of significant which is less than 0.05. Hence, these dimensions enhance positively the adoption of ABC/M in universities in KSA.

5. DISCUSSION AND CONCLUSION

The study focused on exploring the availability of the fundamental factors that represented by top management support, high decision usefulness of cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition for enhancing Saudi universities to adopt ABM system in daily work. The results uncovered that all that factors were correlated in high manner based the statistically significant results which were less than (0.05). Therefore, we can confirm that the educational environment in KSA is suitable and ready for adopting ABM system because the respondents assured their ability to ad availability to adopt that system. In line with previous studies which showed that it useful for institutions that need to adopt ABM system, should have some factors in order to support the ABM system to work well such as top management support, high decision usefulness of cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition (Drury & Tayles, 1994;Cima, 2001; Fawaz & Al-Omiri, 2003; Hughes, 2005; Al-omiri & Drury, 2007; Fei & Isa, 2010; Szatmary, 2011). In addition, based on contingency theory assumption that there is no one `best' design for a management accounting information system, ' and it all depends' upon the situational factors or contingent factors (Fawaz & Al-Omiri, 2003, p.9). Hence, the situation in the universities of KSA is more accessible for adopting ABC system for accounting management. Moreover, there is study has been done in KSA during 2015, which focused on exploring the application of ABC in the private companies operating in the Riyadh region of Saudi Arabia. The result stressed that around 94% of the respondents confirmed that they were using this costing system (Ali, Malo-Alain, & Haque, 2015). This result support our finding about the existence of suitable climate for using ABC in higher educational sector in KSA.

In conclusion, this study focused on investigating the significant role of managerial factors on the adoption of ABC/M system in KSA public universities. These factors are top management support, cost information, services diversity and complexity, adequate resources, cost structure, information technology, and competition which were achieved higher statistically significant. Therefore, we strongly support the public universities in KSA for adopting ABM system in their day-to-day work because their environment and employees are ready to deal with.

6. LIMITATION AND FUTURE AVENUES

Same as others, this study has limitations which can be address in coming researches. First, the context of study is attached to public universities in KSA. So, this study can be replicated in different settings such as companies in KSA or elsewhere. Secondly, the authors focused on disclosing the relationship between the prominent factors that paving the way for adopting the ABC/M system, so there is no secondary data has been given. However, for future studies can attempt to find some secondary data in order to show the real image for ABC adoption. Thirdly, in term of methodology, this study followed the cross-sectional approach for data collection. In contrast, the coming studies need to follows other approaches such as time lags studies or multi-level by collecting data from different sources for filling the knowledge gap in literature. Finally, we have certain believe that the stated factors for enhancing ABC/M adopting would not work, unless the institution has a conscious leadership style as transformational leadership or servant leadership for instance. Therefore, we recommend that future studies need to address what the important leadership style that can be beneficial for enhancing the adoption of ABC/M as general and educational institutions in particular.

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