

# The Costing Systems in Saudi Arabian Hospitals: Do They Need to Be Modified?

Hanadi Mohammed Alshamlan

Department of Accounting, College of Economics and Administrative Science

Imam Muhammad ibn Saud Islamic University, Saudi Arabia

E-mail: hmalshamlan@imamu.edu.sa

Svetlana Zverovich (Corresponding author)

Bristol Business School

University of the West of England, United Kingdom

E-mail: Svetlana.Zverovich@uwe.ac.uk

Received: March 6, 2018

Accepted: March 14, 2018

Published: March 21, 2018

doi:10.5296/ijافر.v8i1.12774

URL: <https://doi.org/10.5296/ijافر.v8i1.12774>

## Abstract

Since most costing system studies concentrate on the manufacturing industry, the costing systems in Saudi Arabian hospitals are an important area to be investigated given a current lack of focus in this field. In this context, this article highlights the cost systems in 50 Saudi Arabian hospitals in both the public and private sectors. The participants in the study were asked about the costing systems used and which one they would prefer to use, along with the factors influencing ABC adoption. The main findings show that only 28% (14) of the surveyed hospitals adopt ABC. The adoption of ABC was much higher in public hospitals than private hospitals. In addition, general hospitals considered using ABC more often than specialised hospitals. There were some variables which could affect the ABC adoption, such as the education and qualifications of the accounting and management staff, the level of overhead costs and the size of hospitals. The greatest benefit of ABC adoption, which is agreed to by the participants, was the improvement in the quality of service. On the other hand, the participants also agreed that the biggest challenge of ABC adoption was the lack of staff expertise.

**Keywords:** Activity-based costing, Traditional cost system, Factors influencing activity-based costing adoption, Advantages and challenges of activity based costing adoption

## 1. Introduction

A costing system is the main part of a management accounting system. The costing system aims to provide timely and relevant information to the management (Reyhanoglu, 2004). The costing systems are used in business accounting strategies in many industries (e.g. manufacturing and non-manufacturing industries) to determine the costs of the products and services. Companies use cost accounting systems to estimate the relevant costs assigned to their products or/and services. The aim of cost accounting systems is to control costs, analyse profitability and evaluate inventories. Costing systems vary in terms of what costs are allocated to cost objects. There are two typical classifications of cost systems: (1) direct costing systems and (2) absorption/full costing systems. Direct costing systems assign only direct costs to cost objects, and there is no assignment of indirect costs to cost objects. The second classification is the absorption/full costing systems. These systems assign direct and indirect costs to cost objects using either traditional absorption cost accounting systems or ABC systems (Mishra and Vaysman, 2001). This paper discusses the absorption/full costing systems in more detail in section 2.1.

The majority of the previous studies examined the benefits of ABC adoption in developed countries and many studies focused mainly on the adoption of ABC in manufacturing industry. Accordingly, this article will contribute to the literature of the adoption of the ABC method in the non-manufacturing industry, in the context of emerging countries and Saudi hospitals in particular. Saudi Arabia has an enormous number of hospitals and it is the largest consumer of health care in the Middle East (Saudi Arabian General Investment Authority, 2016). Some of the hospitals are owned by the Ministry of Health (MOH) which is the government agency that manages health care in Saudi Arabia. The other hospitals are either owned by other governmental sector or group of owners (private sector).

The number of hospitals in 2015 could double by 2020 in Saudi Arabia (Export.gov, 2015). There will be a noticeable increase in the number of beds, which could grow approximately twice as much as 2015 figures in the public and private sectors (Export.gov, 2015). Table 1 shows the number of beds expected in 2020 compared to in 2015 (Ministry of Health, 2016). According to the Saudi Arabia General Investment Authority (Barrage *et al.*, 2007), by 2020 the demand for health care is likely to increase due to various reasons. One of the reasons is that, the population alone in Saudi Arabia is expected to rise by 10% by 2020 (Statista, 2012). In addition, 30% of Saudi people are likely to suffer from being overweight and 10% - 15% of Saudi children could face issues with breathing (asthma). Moreover, nearly a quarter of Saudi people are likely to be active smokers which will increase the number of cancer patients. Heart disease patients could increase by 5.3% and 17% of Saudi people could suffer from diabetes (Statista, 2012).

Table 1. Number of beds in Saudi Arabian hospitals

Year	Ministry of health	Another governmental sector	Private sector
2015	41,297	11,449	16,648
2020 (projected)	74,000	26,000	20,000

The budgeting in Saudi Arabia is one of the main elements of Saudi Arabia's vision for the future; it is called "Vision 2030". This vision aims to develop the budget in order to meet the challenges in the future (Vision 2030, 2016). The budget in Saudi Arabia has been divided among many sectors, such as infrastructure, health, social services, security services, water treatment services and education. In the next few years, education and health care will continue to be priority sectors in Saudi Arabia. In 2015, 18.6% of the total budget was allocated to the health care budget (US-Saudi Arabian Business Council, 2015). Due to the current global economic conditions and an increase in spending on military and security as well as on the support of some poor countries, such as Yemen and Syria; the budget for the health care in 2016 was 5.5% lower than the budget in 2015. The budget for health care in 2015 was 62 billion Saudi Riyal however, in 2016 was 58 billion Saudi Riyal (Ministry of Health, 2017). In this situation, it is very important to manage and control costs in hospitals more effectively. The present paper sheds some light on the costing systems used in emerging market countries (i.e. Saudi Arabia) and on the advantages and challenges of using the activity-based costing systems (ABC).

In this context, this article aims to present the results of an empirical study done in Saudi Arabian and attempts to answer the following questions:

- What kind of costing systems do Saudi Arabian hospitals use in estimation of patient care costs? Do private hospitals use the same costing systems as public hospitals to measure their costs?
- How satisfied are these organisations with their current costing systems?
- What are the main factors influencing the ABC adoption in Saudi Arabian hospitals?
- What are the advantages and challenges of ABC adoption in Saudi Arabian hospitals?

The paper is organised as follows: section two provides the theoretical background for the study. Section three describes the data collection method, sample size and questionnaire's design. Section four discusses the data analysis and the key findings. The final section concludes this paper.

## 2. Literature Review

The literature in this paper falls into the following four main categories: (1) absorption/ full costing systems such as the traditional costing systems and ABC, including the advantages and disadvantages of both systems, (2) the definition of ABC adoption and non-ABC adoption, (3) factors influencing the ABC adoption, (4) advantages and challenges of ABC adoption.

## 2.1 Background of Absorption Costing Systems

There is no problem with the allocation of direct costs to cost objects because all types of cost systems can assign direct costs to individual products or services. However, it is not always easy to allocate indirect costs correctly to individual products or services. Traditional costing systems and ABC are used to determine the overhead costs and then allocate those costs to products based on the cost drivers. In fact, the difference between these two concepts is based on the number of cost pools and the number and types of cost drivers. The *activity cost pool* is the total cost that correlates with an activity. The *cost driver* influences the costs of activities, and may include the number of labour hours, the volume produced or non-volume based (Rasiah, 2011). A ‘cost driver is an event associated with an activity that results in the consumption of firms’ resources.’ (Babad and Balachandran, 1993, p.563)

### 2.1.1 Traditional Costing Systems

Traditional costing systems play an important role in distributing overhead costs to cost objects using a small number of volume based cost drivers – for example, direct labour hours, machine hours and direct labour costs (Cooper and Kaplan, 1988). Traditional costing systems include two stages of overhead costs allocation to products or services (Drury, 2015). In the first stage, traditional costing systems assign overhead costs to cost centres (i.e. departments). In the second stage, traditional costing systems allocate overhead costs to cost objects using volume cost drivers.

The traditional costing systems are easy to apply because managers can trace direct costs associated with a product and they could also offer good ideas on the cost of manufacturing product for business manufacturing large amounts of products (Akhavan *et al.*, 2016). Despite the apparent strengths associated with traditional costing systems, these systems also present certain disadvantages:

1. Archaic: Traditional costing systems are dependent on valuations of employee working hours even though computerised technological advancements are able to monitor production-related indirect costs (Kaplan and Norton, 2001). Employee working hours are deemed to be unsuitable and inconsistent cost drivers (Armstrong, 2014; Javid *et al.*, 2016).
2. Restrictive: The marginalisation of non-production-related indirect costs by the system can render the valuation biased and it can be unreliable for the foundation of executive decisions (Cooper and Kaplan, 1988; Reyhanoglu, 2004).

Drury (2015) stated that traditional costing systems depend on only one overhead rate for each production department and that this rate can be unsuitable for all departments. Consequently, there is a need for an accurate system, such as ABC, that uses more cost drivers to allocate overhead costs more accurately.

### 2.1.2 Activity-Based Costing

An activity-based costing system aims to allocate costs more precisely by assigning overhead costs to the activities that generate those costs (Boyd, 2013). Therefore, ABC has a tendency

to identify activities that drive overall costs in organisations. Because of the weaknesses of the traditional absorption costing, ABC was developed and adopted in manufacturing and non-manufacturing industries (Antos, 1992; Gunasekaran *et al.*, 1999; Rasiah, 2011).

The ABC system was developed by Robin Cooper and Robert Kaplan in 1988 to assign overhead costs to activities by cost drivers, and then to cost objects such as products, departments, customers, services, and machinery. ABC includes two stages to allocate overhead costs. In the first stage, ABC assign overhead costs to each major activity centre (i.e. cost pools) rather than departments. In the second stage, ABC allocate overhead costs using volume and non-volume cost drives (Drury, 2015). Therefore, the main distinguishing feature between ABC and traditional costing systems is that ABC depend on a greater number of cost centres and many types of second stage cost drivers. Consequently, as ABC uses a greater number of cost centres and cost drivers, ABC can be more accurate than traditional costing systems in terms of product/service costs.

## 2.2 The Definition of ABC Adoption and Non-ABC Adoption

Cohen *et al.* (2005) examined the level of application of ABC in Greek companies. The study focused on three industry types: manufacturing, retail and services. In addition, the study examined four definitions of ABC application: adopters, supporters, deniers and unawares. The authors divided the definition of ABC into ABC adoption and non-ABC adoption. The definition of ABC adoption was that the company was currently using ABC. Non-ABC adoption was defining with three definitions: (1) ABC supporters were in the company, meaning their current costing system was not using ABC but were considering changing it, (2) ABC deniers who were not considering changing the system to ABC and (3) ABC unawares, meaning they were unfamiliar the ABC technique. The study found 40.9% (=36) of the respondents' companies adopt ABC, 31.9% (=28) of the respondents denied ABC, 13.6% (=12) were considering to adopt ABC, and other 13.6% (=12) of the total respondents were unaware.

## 2.3 Factors Influencing the ABC Adoption

### 2.3.1 Level of Overhead Costs and ABC Adoption

Khalid (2005) formulated an argument that overhead costs had been emerging as one of the major elements associated with production costs. It is important to note that extensive criticisms of traditional costing systems have been aimed at antiquated costing approaches, which employ overheads to singular production units by utilising an input base; one example of this is direct labour hours or machine hours. In instances of this kind, this method of apportionment serves to jeopardise the precision of the costing process by exaggerating overheads with regard to high-volume goods and, conversely, underemphasising overheads with regard to low-volume products. One appropriate method by which this challenge can be overcome is the adoption of ABC, which establishes an etiological connection between activities that consume overhead costs and products/services produced (Khalid, 2005).

Bjørnenak (1997), Krumwiede (1998) and Jusoh and Miryazdi (2015) found the relationship between the level of overhead costs as a percentage of the total manufacturing costs and ABC

adoption. The authors found that a large level of overhead costs tends to force companies to adopt ABC. On the other hand, Cohen *et al.* (2005), Khalid (2005) and Brierley (2011) could not find an association between the level of overhead costs and ABC adoption. The measurements tools used in each study may be responsible for the inconsistency of these results. Some studies used production and non-production overhead costs compared to total cost to measure the costing structures, while others used the percentage of manufacturing overhead costs compared to the total manufacturing costs to determine the costing structure.

### 2.3.2 The Adoption of ABC and the Size of Organisations

The relationship between operational unit size and ABC adoption has been tested in previous studies. “Company size is often considered an important factor for ABC adoption as larger enterprises operate under greater complexity and have more sophisticated accounting needs” (Srbinoska, 2017, p.421). Previous studies measured the size of the organisation by using a particular proxy, such as the level of sales revenue or the number of employees. The number of employees is the most popular measure used in manufacturing research (Askarany *et al.*, 2010). There had been many studies which supported the positive relationship between the size of organisations and the ABC adoption (Bjørnenak, 1997; Van Nguyen and Brooks, 1997; Krumwiede, 1998; Cagwin and Bouwman, 2002; Khalid, 2005; Brierley, 2011). On the other hand, Cohen *et al.* (2005) found that there is no relationship between the business size and ABC adoption. This paper used the total number of beds to measure the size of hospitals because it is a more relevant and appropriate measure than number of employees or sales revenue in the healthcare sector.

### 2.4 ABC Advantages and Challenges

Grandlich (2004) investigated the adoption of the ABC system in the surgery department of a hospital “Froedtert Memorial Lutheran Hospital” (Froedtert) in the United State. The results of the study revealed that ABC determines the costs of activities accurately and prices of services correctly. Grandlich (2004, p.192) stated that “activity-based costing provides a mechanism for health care organisations to identify costs, develop appropriate charges, determine variance by providers to improve standardisation, and give detailed information for benchmarking with peer facilities”.

According to Yereli (2009), the adoption of the ABC system in Turkish hospitals produced more accurate information for decisions concerning budgeting and strategy planning. Hu (2010) found that the application of ABC could provide more accurate pricing than the traditional costing systems. In addition, Atif *et al.* (2012) examined the adoption of the ABC system in the chest x-ray department of a Malaysian hospital. The descriptive analysis method was used in this study. The findings showed that ABC led to a truer cost estimation and, in general, to more accurate information than the conventional accounting system.

Elhamma and Zhang (2013) tested the relationship between costing systems, such as ABC and organisational performance, such as competitiveness, profitability and productively, in Moroccan companies. The study used a five-point Likert-type scale and then applied a



student *t*-test to find a difference in means. The study found that the application of ABC could help companies increase their competitiveness, profitability and general performance.

Nevertheless, there are some challenges in the adoption of the ABC system. Udpa's study (1996) focused on the adoption of the ABC in the in-patient services at St. Joseph's Hospital in the United Kingdom. Here, the disadvantages of the adoption of ABC appeared to outweigh the advantages. There were various difficulties in administering an ABC framework in St. Joseph's Hospital. Initially, gathering and incorporating the information into the ABC framework is tedious and costly. An ABC framework is substantially more perplexing and extensive than a conventional cost framework since expenses are dispensed to various activity pools, and each of these pools is further separated into a few separate categories (Udpa, 1996). This requires the nitty-gritty examination of money-related bookkeeping records as well as inquiries and interviews used to recognise and accumulate costs and other data in particular exercises. Now and again, the data required for an ABC framework is, practically speaking, difficult to acquire. Likewise, collection of the information needed to adopt the ABC could be almost impossible, and the allocation of overhead costs by using the statistical analysis is complex. Another boundary to completely executing the ABC framework is that many organisations view it as a quick fix and merely an activity in bookkeeping concerned with acquiring better cost information. An effective execution of the ABC framework requires an extensive project shift in administration (Udpa, 1996).

Some of the challenges of ABC adoption were identified by Lawson (2005) who carried out the research into the adoption of ABC in the health sector in the United State. He found the adoption of ABC declined compared with previous surveys from last years. His study referred to the results from a survey conducted ten years earlier, which were then compared to the current results. Lawson's study distributed 404 surveys, but the response rate was just 14.5%. Several reasons were given for the rejection of adopting ABC in the health sector: (1) the high cost of installing the ABC system, and (2) the lack of senior management support.

Moreover, Popesko (2013) found that hospital supervisors in the Czech Republic who consider the adoption of the ABC need to confront various hurdles. Hospitals normally have exceptionally complex structures of products, clients, performance activities, and budgetary streams in contrast with standard processing operations. The definitive goal of analysis in this area ought to be characterising the general technique for the ABC adoption in the organisation's wider province. A more profound level of expertise here could encourage the hospital's administrators to utilise their restricted resources even more successfully and recover the escalating cost of the health services.

There is a lack of studies about the ABC adoption in healthcare sector in developing countries. In addition, there is a lack of studies about factors influencing the ABC adoption in healthcare sector; and most studies measured these factors on manufacturing industry or on mixed industries that can lead to inconsistent results as each industry has different tangibility regarding its products or services produced (Bjørnenak, 1997; Krumwiede, 1998; Cohen *et al.*, 2005; Brierley, 2011). Thus, this paper will add contribution knowledge in this research area.

### 3. Methodology

It is important to present the methodology for any study conducted. The following two sub-headings describe the data collection process and the responds rate. As well as, how the questions were designed.

#### *3.1 Data Collection Process and Responds Rate*

The potential respondents to the questionnaire are staff members of Saudi Arabian hospitals who go by the job titles of cost manager, cost accountant or financial manager. An initial letter was sent out via e-mail and Twitter® accounts and was posted to all potential participants in different hospitals in Saudi Arabia. This letter informed them that they would receive a questionnaire within one week. The study used three different methods for distributing the questionnaire: through e-mail, a paper-based questionnaire through face-to-face meetings and an online questionnaire through Twitter®.

The questionnaire was sent via e-mail to 100 public hospitals and 50 private hospitals. The response rate was only 2% from the public hospitals and 2% from the private hospitals. The total number of responses was very low (three responses), since some people ignore emails and since in the Saudi tradition, it is preferred that requests are made face-to-face or through paper letters. The paper copy of the questionnaire was written, printed, and then distributed among the accounting and financial departments of Saudi Arabian public and private hospitals. Later, the questionnaires were retrieved by hand in face-to-face meetings with the distributors. A total of 20 paper questionnaires were distributed to different hospitals; the response rate from these copies was 50% (10 responses).

As the e-mail questionnaire and face-to-face meeting questionnaire did not attract many respondents, the study tended to use the online questionnaire to increase the response rate. The online questionnaire was designed through Google Forms® and was sent to 170 hospitals via their Twitter® accounts. The total number of responses from Twitter® was 41% (70 responses). However, 47% of them (33 responses) were not used in this study, since 47% of the participants either were students or did not work in the financial/accounting departments in Saudi Arabian hospitals, so they did not have the knowledge needed concerning the costing systems in Saudi Arabian hospitals. On the other hand, 53% (37 responses) of the total responses were useful and were consequently considered in this study.

Thus, the total number of questionnaires distributed was 340; however, the total number of questionnaire responses was 83 (24%) and only 50 (60%) of the responses questionnaires were used in the study because some questionnaires contained unanswered questions and some of them filling by irrelevant participants.

#### *3.2 Questionnaire Design*

The questionnaire contained a cover letter and four main sections. Overall, the questionnaire consists of 17 questions. The study used closed-ended questions and Likert five-point scales. The aim of the first section of the questionnaire is to identify information regarding the hospitals' accounting department personnel (e.g. age, current position, years of experience



and educational qualification). The second section requested general information about the hospitals such as classification, type, size, and level of overhead costs. The third section includes some questions about the hospitals' costing systems in Saudi Arabia. Moreover, this section investigated whether or not accountants in Saudi Arabian hospitals currently adopt ABC or are considering adopting it, and the reasons why they either did or did not consider adopting ABC. The final section was designed only for the participants who had adopted ABC. The main purpose of this section is to investigate the benefits and challenges of ABC adoption.

#### **4. Results and Discussion**

The data collected was analysed in this part in six main sections. The first and second sections included general information about the participants and hospitals, respectively. The third section in this part discussed the types of cost systems in Saudi Arabian hospitals and the accuracy and effectiveness of their systems in estimation of patient care costs. Also, this section focused on non-ABC adopting in hospitals and their considerations changing their systems from the traditional costing systems to ABC. The fourth section discussed factors influencing the ABC adoption. The fifth and sixth sections outlined the advantages and challenges of ABC adoption in Saudi Arabian hospitals.

##### *4.1 General Information about the Participants*

This study aimed to collect the data from specific participants such as accountants and financial managers who are currently working in the financial and accounting departments in Saudi Arabian hospitals. The general information about the participants was divided into four parts: current position, education, years of experience, and age. Thirty-four percent of the participants worked as cost managers, 26% of the participants worked as cost accountants, and 20% of the participants worked as financial managers. In addition, 20% of the participants worked in the management departments, but with other position titles (e.g. budget managers and other managers and accountants). In addition, the questionnaire asked the participants about their education. Nineteen of the participants had bachelor's degrees in accounting, 16 of them had diplomas, 14 of the participants had master's degrees and, only one participant had a PhD.

The study asked the participants about their years of experience in management and accounting departments in Saudi Arabian hospitals. Half of the participants had more than 10 years' experience. In addition, 16 of the participants had between 5 and 10 years of experience, and 9 participants had less than 5 years' experience. Moreover, thirty-eight percent (19) of the participants were between 30 and 39 years old, 30% (15) of the participants were above 50 years old, 22% (11) of the participants were between 40 and 49 years old and only 10% (5) of the participants were between 20 and 29 years old.

##### *4.2 General Information about the Hospitals*

The number of completed questions received from the private hospitals was higher than those received from the public hospitals—29 and 21 hospitals, respectively. The general information about the hospitals was divided into three parts: the type of hospitals, the size of

hospitals, and the levels of overhead costs. Table 2 illustrates the types of hospitals that participated in this study. Sixty percent of the hospitals were classified as general hospitals, which means they provided several services for patients. Only 4% of the total hospitals were maternity and dermatology hospitals.

Table 2. Type of hospitals

Type of hospital	Frequency	Percentage
General hospitals	30	60%
Paediatric hospitals	6	12%
Eye hospitals	5	10%
Dental hospitals	4	8%
Orthopaedic hospitals	3	6%
Other hospitals	2	4%
Total	50	100%

Different sizes of hospitals are used in this study. Out of the hospitals surveyed, 36% had between 100 and 149 beds, 24% had over 149 beds, 22% of the hospitals had from 50 to 99 beds, and 18% of them had from 10 to 49 beds. There were also different levels of overhead costs in each hospital. Nearly half of the hospitals surveyed in Saudi Arabia had the level of overhead costs between 25% and 49% of the total costs, and only 1 hospital had the level of overhead costs above 75%.

#### 4.3 Costing Systems

The first objective of the study was to determine whether the public hospitals use the same or different costing systems in estimation of patient care cost as the private hospitals. With respect to the ABC adoption in the estimation of patient care costs, the respondents were classified into two groups, ABC adopters and the traditional costing systems users as illustrated in Table 3. Only 14 (28%) of the responding hospitals adopted ABC, while 36 hospitals (72%) adopted the traditional costing systems. The adoption rate was very similar to those in the previous studies investigated. For example, Saaydah and Khatatneh (2014) found that 28% of Jordanian manufacturing companies adopted ABC. In addition, Al-Basteki and Ramadan (1998) reported that 25% of Bahraini manufacturing companies applied ABC. However, the adoption of ABC by Egyptian companies was 33% (Ismail and Mahmoud, 2012), and the application of ABC in the largest 100 companies in Saudi Arabian was also equal to 33% (Khalid, 2005), which is higher than in the Saudi Arabian hospitals due to the size of companies and the variety of products. The adoption of ABC in estimation of patient care costs in public hospitals was higher than the private hospitals—48% (10 out of 21 hospitals) and 14% (4 out of 29 hospitals) respectively. On the other hand, the application of traditional costing systems in estimation of patient care costs in private hospitals was higher than in public hospitals.

Table 3. Costing systems for patient care costs in public and private sectors

	ABC adopters		Traditional costing systems users			Total hospitals
	Frequency	Percentage	Public	Frequency	Percentage	
Public	10	48%	Public	11	52%	21
Private	4	14%	Private	25	86%	29
						50

#### 4.3.1 The Adoption of Traditional Costing Systems

##### 4.3.1.1 The Accuracy and Effectiveness of the Traditional Costing Systems

Table 4 shows the total number of hospitals—36—that adopted the traditional costing systems. Those hospitals were asked about the accuracy of their costing systems in estimation of patient care costs. Forty-seven percent of the hospitals agreed that their traditional costing systems were either accurate or moderately accurate, and 53% of the respondents agreed that their traditional costing systems were either somewhat accurate or not at all accurate. Also, the hospitals were asked about the effectiveness of their traditional costing systems, and 44% responded that the adoption of traditional costing systems were either effective or moderately effective. However, 56% of the traditional costing systems users agreed that the traditional costing systems were either somewhat effective or not at all effective (see Table 5).

Table 4. The accuracy in estimation of patient care costs by using traditional costing systems in Saudi Arabian hospitals

	Frequency	Percentages
Very accurate	0	0
Accurate	5	14%
Moderate	12	33%
Somewhat accurate	17	47%
Not at all accurate	2	6%
Total	36	100%

Table 5. The effectiveness in estimation of patient care costs by using the traditional costing systems in Saudi Arabian hospitals

	Frequency	Percentage
Very effective	0	0
Effective	3	8%
Moderate	13	36%
Somewhat effective	16	44%
Not at all effective	4	12%
Total	36	100%

Nearly half of the traditional costing systems users agreed that their traditional costing systems were accurate and effective in the estimation of patient care costs. However, fewer than 12% of the traditional costing system users agreed that the traditional costing systems were not at all accurate and it was not at all effective in the estimation of patient care costs.

#### 4.3.1.2 The Consideration for Adopting ABC

The users of the traditional costing systems were asked whether or not they were considering or thinking about the adoption of ABC. In addition, they were asked about the reasons why they do not consider using ABC. Surprisingly, 29 out of 36 hospitals (81%) had not considered ABC, and only seven hospitals (19%) were interested in ABC (the reasons discussed below).

#### 4.3.1.3 The Reasons for Not Considering ABC Adoption

The reasons for non-consideration of ABC were asked in the form of a multiple-choice question. The participants could choose more than one answer to the question. There was a total of eight choices. As shown in Table 6, 17 (68%) participants agreed that there were high costs when adopting ABC. Similar result was discovered by Lawson (2005, p.89) “The cost of designing and implementing an ABC/M system was a top concern to respondents of the 1994 survey, and it remained the top concern a decade later”. Fourteen (56%) participants agreed that there was a lack of adequate staff expertise to develop ABC. In addition, 14 (56%) participants admitted that of the main reasons of no- adopting ABC is software compatibility issues. On the other hand, the least frequent reasons for non-adoption of ABC were the lack of management support and the unfamiliarity of the staff with ABC.

Table 6. The reasons for not considering ABC adoption

Reason	Frequency	Percentage
High costs of adoption	17	68%
Lack of adequate expertise to develop ABC	14	56%
Software compatibility issues	14	56%
Time required to adopt	12	48%
Satisfactory existing costing system	11	44%
Employees' reluctance to adopt the new costing technique	10	40%
Unfamiliarity with ABC	8	32%
Lack of top management support	8	32%

#### 4.3.2 ABC Adopters

##### 4.3.2.1 The Accuracy and Effectiveness of ABC

A total of 14 hospitals adopted ABC. They were asked about the accuracy of their costing systems in the estimation of patient care costs. Eighty-six percent of the ABC users agreed

with the statement that ABC was either very accurate, accurate, or moderately accurate in estimation of patient care costs, and only 2 (14%) of the ABC users agreed that ABC was somewhat accurate. Also, the ABC adopters were asked about the effectiveness of their costing systems when using ABC to estimate patient care costs. Sixty-four percent of the ABC users believed that the adoption of ABC was either very effective, effective, or moderately effective. However, 36% of the ABC users agreed that the ABC was either somewhat effective or not at all effectiveness.

#### 4.4 The Factors Influencing ABC Adoption

The study sought to find the relationship between the influencing of factors and ABC adoption. These factors were the classification and the type, and the size of hospitals, the level of overhead costs and the education level of accounting and management staff.

##### 4.4.1 Classification and Type of Hospitals and ABC Adoption

The study found that 10 out of 14 of ABC adopting hospitals were from the public sector and only four hospitals from the private sector adopted ABC. This is because the financial resources available in governmental hospitals are normally much higher than in private hospitals. Also, the type of hospitals had an impact on the likelihood of ABC adoption. The questionnaire was distributed to different types of hospitals (e.g. general, dental, paediatric, and eye). The study found that 72% of ABC adopting hospitals were general hospitals, and 21% (3 hospitals) of ABC adopting hospitals were eye hospitals (see Table 7). Thus, the adoption of ABC in general hospitals in Saudi Arabia was much higher than in the other types of the hospitals, because most of the general hospitals are normally much larger than specialised hospitals, they have the higher level of overhead costs, and they provide a large number of different healthcare services.

Table 7. The relationship between the type of hospitals and adoption of ABC

Type of hospital	Frequency	Number
General hospitals	10	72%
Eye hospitals	3	21%
Dental hospitals	1	7%
Paediatric hospitals	0	0%
Orthopaedic hospitals	0	0%
Total	14	100%

##### 4.4.2 Size of Hospitals and ABC Adoption

There was a positive relationship between the size of hospitals and ABC adoption. Approximately 43% of the hospitals that adopted ABC were large hospitals which have more than 149 beds, while none of the smaller hospitals (i.e. 10-49 beds) had adopted ABC (see Table 8). There had been many studies which supported the positive relationship between the

size of organisations and ABC adoption (Bjørnenak, 1997; Van Nguyen and Brooks, 1997; Krumwiede, 1998; Cagwin and Bouwman, 2002; Khalid, 2005; Brierley, 2011). However, Cohen *et al.* (2005) found that there is no relationship between business size the ABC adoption.

Table 8. The relationship between the sizes of hospitals and ABC adoption

Number of beds	Frequency	Percentage
10-49 beds	0	0%
50-99 beds	3	21%
100-149 beds	5	36%
More than 149 beds	6	43%
Total	14	100%

#### 4.4.3 Levels of Overhead Costs and ABC Adoption

There is a positive relationship between the level of overhead costs and the adoption of ABC (see Table 9). This finding was also supported by Bjørnenak (1997); Krumwiede (1998) and Jusoh and Miryazdi (2015); they found a positive relationship between ABC adoption and the level of overhead costs. On the other hand, Van Nguyen and Brooks (1997), Cohen *et al.* (2005), Khalid (2005) and Brierley (2011) could not find any association between the level of overhead costs and ABC adoption.

Table 9. The relationship between the level of overhead costs and ABC adoption

Percentage of overhead costs	Frequency	Percentage
Less than 25%	1	7%
25%-49%	4	29%
50%-74%	8	57%
More than 75%	1	7%
Total	14	100%

#### 4.4.4 Level of Staff Education and ABC Adoption

The adoption of ABC in Saudi Arabian hospitals also has a relationship with the qualification of the hospital staff. Table 10 shows that 57% (eight out of 14) of the ABC adopting hospitals had staff with master's degrees who worked in financial or accounting departments and all of them are from public hospitals. However, only 1 out of 14 of the ABC adopting hospitals had a doctorate.



Table 10. The level of education in ABC adopting hospitals

Education Level	Frequency	Percentage
Diploma	2	14%
Bachelors	3	21%
Master	8	57%
PhD	1	7%
Total	14	100%

#### 4.5 ABC Advantages

The questions of this part of the survey were designed only for those participants who have adopted ABC. The main purpose of this section was to investigate the benefits of adopting ABC. Previous studies agreed with some benefits of ABC. The adoption of ABC has had a positive effect on decision-making by making them much more accurate (Grandlich, 2004; Yereli, 2009; Atif *et al.*, 2012). In addition, ABC has reduced costs and non-added-value activities (Khalid, 2005).

Table 11 displays some of the most popular benefits of ABC identified in the previous studies. The Likert scale question included six predetermined potential benefits. On the scale, “1” meant “very beneficial,” “2” meant “beneficial,” “3” meant “moderate,” “4” meant “somewhat beneficial,” and “5” meant “not at all beneficial.” It was interesting to note that the average ranged from 2.29 to 3.07 on the five-point scale. Those average scores, in fact, reflected that hospitals benefit from ABC. More particularly, ABC adopting hospitals agreed that they had improved high quality services (mean=2.29). It was also evident that ABC had helped to increase the hospitals’ operational profits (mean=2.50), reducing total costs (mean=2.57), making better decisions (mean=2.64), and eliminating non-value-added activities (mean= 2.79). Surprisingly, the benefit of measuring costs more accurately had the lowest scales (mean=3.07); whereas, Khalid (2005) found that this was the most significant benefit of ABC.

Table 11. The benefits perceived by ABC adopting firms

Perceived benefit	Mean (5.00 scale)
Improving the quality of services	2.29
Increasing operating profits	2.50
Reducing total costs	2.57
Making better decision	2.64
Elimination non-value added activates	2.79
Measure costs more accurately	3.07

\*1=very beneficial, 2=beneficial, 3=moderate, 4=somewhat Beneficial, 5= not at All beneficial

#### 4.6 The Challenges of ABC Adoption

Al-Basteki and Ramadan (1998) and El-Ebaishi *et al.* (2003) found that the greatest challenges of the ABC adoption was the high cost of adoption. In addition, the biggest challenges of ABC adoption in Saudi Arabian companies were their lack of staff expertise with this system and using particular software. El-Ebaishi *et al.* (2003, p.95) stated that:

The environment of Saudi Arabia is not yet fully equipped to use such techniques. For example, using ABC applications requires particular software. Saudi managers may be disinclined to attend training courses to assist them in using software or in some instances the Arabic version of certain software may not be available.

The ABC adopting hospitals in Saudi Arabia were asked about the greatest challenges that might be faced when adopting this system. As shown in Table 12, the average range of difficulties was between 2.50 and 3.71. The Likert five-point scale in this section based on six predetermined potential difficulties. Number “1” meant “very difficult,” “3” meant “moderate,” and “5” meant “not at all difficult.” Most of the participants agreed that the greatest challenge to adopting ABC was the lack of staff expertise (mean=2.50), and the least significant challenge was the difficulty to determine cost drivers causing cost to occur (mean=3.71).

Table 12. The difficulties of ABC adopting hospitals

Perceived Difficulty	Mean (5.00 scale)
Lack of staff expertise	2.50
High costs of adoption	2.93
Difficulty in altering employees' habits	3.07
Time consuming	3.21
ABC is not supported by top management	3.21
Difficulty to determine cost drivers causing cost to occur	3.71

\*1=very difficult, 2= difficult, 3=moderate, 4=somewhat difficult, 5= not at all difficult

## 5. Conclusion

This research investigated the costing systems in Saudi Arabian hospitals in both sectors: public and private. The purpose of the study was to find out whether the private hospitals use the same costing systems as the public hospitals, and how satisfied the participants were with their current costing systems. In addition, the study aimed to find out how accurate and effective the Saudi Arabian costing systems are in the estimation of patient care costs. Also, the study investigated whether the traditional costing systems users had considered changing their systems to ABC, and if so, then why. Furthermore, this paper aimed to analyses the factors influencing the adoption of ABC such as the hospitals size, the level of overhead costs and the education level. In addition, the study explored the advantages and challenges of

ABC adoption in Saudi Arabian hospitals. Thus, this paper contributes to the literature of the adoption of ABC in the hospitals in the context of emerging countries and Saudi Arabian hospitals in particular.

The research used questionnaire to collect the data from the participants in Saudi Arabian hospitals. Only 60% of the total responses were used, due to the fact that some of the questionnaires were not fully completed or were completed by irrelevant participants. The total number of usable questionnaires was 50. The research found that only 14 hospitals (28%) used ABC, and nearly three-quarters of the ABC users were from public hospitals. In addition, 36 of the participants (72%) adopt the traditional costing systems. All hospitals were asked about whether or not their systems were accurate. Eighty-six of the ABC users agreed that their system was either very accurate, accurate, or moderately accurate. However, only 47% of the traditional costing systems users agreed that the traditional costing systems were either accurate or moderately accurate. On the other hand, only 14% of the ABC users agreed that the ABC system was somewhat accurate; whereas, 53% of the traditional costing systems users agreed that the traditional costing systems were either somewhat accurate or not at all accurate.

Also, all hospitals were asked whether their costing systems were effective. According to the study, 64% of the ABC users agreed that their systems were either very effective, effective, or moderately effective. Whereas, only 44% of the traditional costing systems users agreed that their traditional costing systems were either effective or moderately effective. In addition, 56% of the traditional costing systems users and 36% of the ABC users agreed that their costing systems were either somewhat effective or not at all effective.

Seventy-two percent (36 hospitals) of the surveyed hospitals adopted the traditional costing systems; however, only 19% of them (7 hospitals) have considered adopting ABC. The most common reasons for not using ABC were the high costs of adoption and the lack of staff expertise required to develop ABC. These findings were also confirmed by Al-Basteki and Ramadan (1998) and El-Ebaishi *et al.* (2003) but in manufacturing companies.

Also, the previous studies identified a positive relationship between the organisational size and the ABC adoption (e.g. Bjørnenak, 1997; Krumwiede, 1998). According to our study, the majority of the Saudi Arabian hospitals that adopt ABC were large hospitals which had more than 149 beds and the level of overhead costs more than 50%. In fact, the majority of ABC users were public and general hospitals, which provide many services to their patients. In addition, the study reveals that nine out of fourteen of the ABC users had master's degrees or PhDs, whereas only six out of thirty-six traditional costing systems users had master's degrees. This implies that there is a relationship between the ABC adoption and the education and qualification of the accounting and management staff.

The participants were asked about the benefits of ABC. The participants ranked the benefits of ABC from greatest to smallest as follows: improvement of service quality, increased operating profits, reduction in total costs, better decision-making, elimination of non-value adding activities, and more accurate measurement of costs. Grandlich (2004); Yerehi (2009); and Atif *et al.* (2012) also agreed that the adoption of ABC has had a positive impact on

decision-making by making them much more accurate. In addition, ABC has reduced costs and non-added-value activities (Khalid, 2005). Also, the participants were asked about the challenges of ABC adoption. Most of the participants agreed that the greatest challenge when adopting ABC was the lack of staff expertise and the high costs of application. This opinion was supported by Al-Basteki and Ramadan (1998) and El-Ebaishi *et al.* (2003). The least significant challenge, however, was the difficulty in determining cost drivers causing cost to occur.

### Acknowledgments

The authors would like to thank Professor Robert Luther for valuable guidance, helpful comments and constructive suggestions. The first author also would like to thank Imam Muhammad ibn Saud Islamic University in Saudi Arabia and Saudi Arabian Cultural Bureau in London for funding this research.

### References

- Akhavan, S., Ward, L., & Bozic, K. J. (2016). Time-driven activity-based costing more accurately reflects costs in arthroplasty surgery. *Clinical Orthopaedics and Related Research*, 474(1), 8-15. <https://doi.org/10.1007/s11999-015-4214-0>
- Al-Basteki, H., & Ramadan, S. (1998). A survey of activity-based costing practices in Bahraini manufacturing firms. *Journal of King Abdul Aziz University, Economics and Administration*, 11(1), 17-29. <https://doi.org/10.4197/Eco.11-1.2>
- Antos, J. (1992). Activity-based management for service, not-for-profit, and governmental organisations. *Journal of Cost Management*, 6(2), 13-23.
- Armstrong, P. (2014). Limits and possibilities for HRM in an age of management accountancy. In J. Storey (Ed), *New Perspectives on Human Resource Management* (pp.154-166). New York. Routledge.
- Askarany, D., Yazdifar, H., & Askary, S. (2010). Supply chain management, activity-based costing and organisational factors. *International Journal of Production Economics*, 127(2), 238-248. <https://doi.org/10.1016/j.ijpe.2009.08.004>
- Atif, M., Sulaiman, S. A. S., Shafie, A. A., Saleem, F., & Ahmad, N. (2012). Determination of chest x-ray cost using activity based costing approach at Penang General Hospital, Malaysia. *Pan African Medical Journal*, 12(4), 1-7.
- Babad, Y. M., & Balachandran, B. V. (1993). Cost driver optimization in activity-based costing. *Accounting Review*, 65(3), 563-575.
- Barrage, G., Fares, Z., Perillieux, R. & Shediach, R. (2007). Investing in the Saudi Arabian healthcare sector. Retrieved from [https://www.strategyand.pwc.com/media/file/Investing\\_in\\_the\\_Saudi\\_Arabian\\_Healthcare\\_ector\\_FINAL.pdf](https://www.strategyand.pwc.com/media/file/Investing_in_the_Saudi_Arabian_Healthcare_ector_FINAL.pdf)

- Bjørnenak, T. (1997). Diffusion and accounting: the case of ABC in Norway. *Management accounting research*, 8(1), 3-17. <https://doi.org/10.1006/mare.1996.0031>
- Boyd, K. (2013). *Cost accounting for dummies*. Hoboken, New Jersey: Wiley.
- Brierley, J. A. (2011). Why the proper definition of the ABC matters: A note. In *Advances in Management Accounting*, 19, 225-249. [https://doi.org/10.1108/S1474-7871\(2011\)0000019016](https://doi.org/10.1108/S1474-7871(2011)0000019016)
- Cagwin, D., & Bouwman, M. J. (2002). The association between activity-based costing and improvement in financial performance. *Management accounting research*, 13(1), 1-39. <https://doi.org/10.1006/mare.2001.0175>
- Cohen, S., Venieris, G., & Kaimenaki, E. (2005). ABC: adopters, supporters, deniers and unawares. *Managerial Auditing journal*, 20(9), 981-1000. <https://doi.org/10.1108/02686900510625325>
- Cooper, R., & Kaplan, R. S. (1988). Measure costs right: make the right decisions. *Harvard Business Review*, 66(5), 96- 103.
- Drury, C. (2015). *Management and cost accounting* (9th ed.). Andover: Andrew Ashwin.
- El-Ebaishi, M., Karbhari, Y., & Naser, K. (2003). Empirical evidence on the use of management accounting techniques in a sample of Saudi manufacturing companies. *International Journal of Commerce and Management*, 13(2), 74-101. <https://doi.org/10.1108/eb047467>
- Elhamma, A., & Zhang, Y. I. (2013). The relationship between activity based costing, business strategy and performance in Moroccan enterprises. *Accounting and Management Information Systems*, 12(1), 22-38.
- Export.gov. (2015). Healthcare resource guide: Saudi Arabia. Retrieved from [https://2016.export.gov/industry/health/healthcareresourceguide/eg\\_main\\_092400.asp](https://2016.export.gov/industry/health/healthcareresourceguide/eg_main_092400.asp)
- Grandlich, C. (2004). Using activity-based costing in surgery. *Association of periOperative Registered Nurses Journal*, 79(1), 189-192. [https://doi.org/10.1016/S0001-2092\(06\)61152-6](https://doi.org/10.1016/S0001-2092(06)61152-6)
- Gunasekaran, A., Marri, H. B., & Yusuf, Y. Y. (1999). Application of activity-based costing: some case experiences. *Managerial Auditing Journal*, 14(6), 286-293. <https://doi.org/10.1108/02686909910280217>
- Hu, H. (2010). Primary research of the advantages and the cost control of the ABC & EVA integrated system. *International Business Research*, 3(3), 141-143. <https://doi.org/10.5539/ibr.v3n3p141>
- Ismail, T. H., & Mahmoud, N. M. (2012). The influence of organisational and environmental factors on cost systems design in Egypt. *British Journal of Economics*, 4(2), 31-51.

- Javid, M., Hadian, M., Ghaderi, H., Ghaffari, S., & Salehi, M. (2016). Application of the activity-based costing method for unit-cost calculation in a hospital. *Global Journal of Health Science*, 8(1), 165-172. <https://doi.org/10.5539/gjhs.v8n1p165>
- Jusoh, R., & Miryazdi, S. M. (2015). The influence of technological and environmental factors on the diffusion of activity-based costing in Iran. *Tekhnē*, 13(2), 95-109. <https://doi.org/10.1016/j.tekhne.2015.12.001>
- Kaplan, R. S., & Norton, D. P. (2001). Transforming the balanced scorecard from performance measurement to strategic management: Part II. *Accounting Horizons*, 15(2), 147-160. <https://doi.org/10.2308/acch.2001.15.2.147>
- Khalid, A. (2005). Activity-based costing in Saudi Arabia's largest 100 firms in 2003. *Journal of American Academy of Business*, 6(2), 285-293.
- Krumwiede, K. R. (1998). The implementation stages of activity-based costing and the impact of contextual and organisational factors. *Journal of Management Accounting Research*, 10, 239-277.
- Lawson, R. A. (2005). The use of activity based costing in the healthcare industry: 1994 vs. 2004. *Research in Healthcare Financial Management*, 10(1), 77-94.
- Ministry of Health. (2016). Statistical year book Retrieved from <https://www.moh.gov.sa/en/ministry/statistics/book/pages/default.aspx>
- Ministry of Health. (2017). Statistics and indicators. Retrieved from <https://www.moh.gov.sa/Ministry/Statistics/Pages/Budget.aspx>
- Mishra, B., & Vaysman, I. (2001). Cost-system choice and incentives—traditional vs. activity - based costing. *Journal of Accounting Research*, 39(3), 619-641. <https://doi.org/10.1111/1475-679X.00031>
- Popesko, B. (2013). Specifics of the activity-based costing applications in hospital management. *International Journal of Collaborative Research on Internal Medicine and Public Health*, 5(3), 179-186.
- Rasiah, D. (2011). Why activity based costing (ABC) is still tagging behind the traditional costing in Malaysia? *Journal of Applied Finance and Banking*, 1(1), 83-106.
- Reyhanoglu, M. (2004). Activity-based costing system advantages and disadvantages. <https://doi.org/10.2139/ssrn.644561>
- Saaydah, M. I., & Khatatneh, W. R. (2014). The level of adoption of some recent cost management tools and the perceived effect on the performance of Jordanian manufacturing companies'. *Global Review of Accounting and Finance*, 5(1), 52-75. <https://doi.org/10.21102/graf.2014.03.51.04>
- Saudi Arabian General Investment Authority. (2016). Invest Saudi. Retrieved from <https://sagia.gov.sa/en/InvestorServices/KeySectors/Pages/SectorDetails.aspx?SectorID=2>



Srbinoska, D. S. (2017). Implementation of activity-based costing systems by the Macedonian insurance segment: the influence of organisational factors on the adoption rate. *International Journal of Accounting and Financial Reporting*, 7(2), 417-450. <https://doi.org/10.5296/ijaf.v7i2.12203>

Statista. (2012). Saudi Arabia: total population from 2010 to 2020 (in million inhabitants). Retrieved from <https://www.statista.com/statistics/262467/total-population-of-saudi-arabia/>

Udpa, S. (1996). Activity-based costing for hospitals. *Health Care Management Review*, 21(3), 83-96. <https://doi.org/10.1097/00004010-199622000-00009>

US-Saudi Arabian Business Council (US-SABC). (2015). Saudi Arabia's 2015 budget maintains strong spending, diversification initiatives. Retrieved from <https://us-sabc.org/custom/news/details.cfm?id=1645>

Van Nguyen, H., & Brooks, A. (1997). An empirical investigation of adoption issues relating to activity-based costing. *Asian Review of Accounting*, 5(1), 1-18. <https://doi.org/10.1108/eb060679>

Vision 2030. (2016). Vision2030. Retrieved from <http://vision2030.gov.sa/en/foreword>

Yereli, A. N. (2009). Activity-based costing and its application in a Turkish university hospital. *Association of periOperative Registered Nurses Journal*, 89(3), 573-591. <https://doi.org/10.1016/j.aorn.2008.09.002>

### Copyright Disclaimer

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>)