

THE FINANCIAL MANAGERS' PERCEPTIONS OF THE IMPACT OF
INFORMATION TECHNOLOGY AND NON-ACCOUNTING OWNERSHIP ON
THE SUCCESS OF ACTIVITY-BASED COSTING IMPLEMENTATION IN
JORDANIAN INDUSTRIAL SHAREHOLDING COMPANIES

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Abstract

Activity-based costing (ABC) system is widely accepted as an innovative and alternative costing system to handle the deficiencies of traditional costing systems. This paper examines the direct impact of information technology and non-accounting ownership on the successful implementation of ABC. Based on recent reports and academic works, the present study aims to cope with the issue in industrial companies concerning the low ABC rate. A quantitative approach design was employed using a questionnaire to address the paper objectives. 327 financial managers responses were gained from Jordanian industrial shareholding companies. The present research has several contributions to fulfill the gap in recent literature, some of which are theoretical while others are practical by elaborating the direct impacts of the critical factors in the successful implementation of ABC in the industrial sector in the context of developing countries including Jordan.

Keywords: *Non-Accounting Ownership, Information Technology, ABC implementation, Industrial Companies.*

INTRODUCTION

In the current changing and challenging manufacturing environment, it has been argued that traditional costing systems are not able to cope with the needs of technological advancements in manufacturing practices (Reynolds, 2013; Jusoh and Miryazdi, 2015; Affes, 2016; Pashkevich, 2023). ABC system is widely accepted as an innovative and alternative costing system to handle the deficiencies of traditional costing systems (Sridharan and Tse, 2016; Niñerola et al., 2021; Elshaer, 2022; Simões et al., 2022). ABC has emerged logically as being able to offer more precise, relevant and quick information for managers in competitive business world. Addressing the shortcomings of conventional volume-based costing systems, Cooper and Kaplan (1988) came up with an alternative, the activity-based costing system technique; and they proclaimed: —ABC certainly ranks as one of the two or three most important management accounting innovations of the twentieth centuryll (Cooper and Kaplan, 1988, p.15). Roztocki and Schultz (2003), and Byrne (2011) noted that ABC offered substantial advantages over the traditional costing approach. For example, ABC did not depend on single-cost drivers, like machine hours and direct labor. It was rather based on multiple-cost drivers, which were utilized to determine the overhead costs of industrial activities, and allocate costs to products by estimating the sum of costs incurred during the activities necessary for the production of these products (Kim et al., 1997; Cooper, 1992).

Several academic works and reports were carried out to test the key factors that contribute to the success of ABC implementation. In addition, these reports reported that organizational antecedents can influence ABC implementation like non-accounting ownership and information technology (Al-Omiri & Drury, 2007). In addition, they mentioned that the impact of the implementation of ABC system on organizational performance for industrial companies can play important role in in offering accurate information for managerial operating decisions that support the organizations in improving the profitability and competition in industrial firms.

Likely, several reports have mentioned that non-accounting ownership and information technology factors are significant for an efficient implementation of ABC system (Al-Refa'ee, 2012; Nassar, 2011). The majority of ABC works were carried out in developed countries, but studies carried out in developing countries such as Jordan are rare. The present research discusses the key reasons that contribute to the low level of ABC implementation in Jordanian industrial companies. Jordanian industrial organizations, like most companies in developing countries prefer to produce items that can generate sizable profit and necessitate only the existing resources (Omar 2009; Khadash and Mahmoud, 2010; Al-Refa'ee, 2012; Al-Bawab and Al-Rawashdeh, 2016). For this reason, these companies should implement the ABC system as it would enable them to compete efficiently locally and internationally. It was seen that ABC implementation was relatively low in the industrial sector in Jordan (Al-Bawab and Al-Rawashdeh, 2016). To date, not much is known about the Jordanian manufacturing sector regarding the ABC implementation and the factors affecting its success. Therefore, it is crucial to investigate if ABC can be successfully used in Jordan, in terms of its unique culture.

THEORETICAL REVIEW

Non-Accounting Ownership

To implement the ABC, continuous support from non-accounting ownership, including staff from each non-accounting department, is needed, since detailed data from the entire firm is needed (Aldukhil, 2012). Firm members who are employed in different departments have the knowledge on how to offer data to the accounting department. In the case there exists a lack of communication on the procedure at the beginning phase of ABC implementation; there will be less support by employees (Sartorius *et al.*, 2007). Concerning the technology aspects, (Sleihat *et al.*, 2012) argued that the execution of any advanced practices is easier when there is a high usage of computers in the departments with existing network connections within accounting departments. ABC information can be employed more by non-accountant employees in the case they are a part of its overall development. In-depth data from the whole company is necessary, and could only be gotten through cross-departmental collaboration (Chongrukut, 2002).

Information Technology

Information technology has significant effects on the outline of a costing system. More advanced technologies result in more extensive and reliable systems. Without the technological advancements that made low-cost personal computers dependable, ABC may have not become so widely used (Kongchan, 2013). Moreover, better information technologies contributed beyond measures to the development and survival of ABC. Furthermore, Anderson (1995) and Kongchan (2013) reported that the companies that have a higher information technology level are more likely to contribute in ABC success. Askarany et al. (2007) found that ABC implementation depends very much on the quality of information technology.

According to Agbejule (2006) and Al-Sayed et al. (2008), top-level executives who had superior information technology systems are more likely to lead the ABC to success.

ABC Implementation Success

The current section discussed the measure adopted to measure the success of ABC used by prior studies. Generally, there could be some variables that define ABC success. A variety of variables can be used to measure ABC success, but the success definition relies on the individual value of ABC system. In earlier studies some examples of success measures tested were presented, some limitations were outlined; also, the measures for ABC success of the current study were mentioned.

The organizations could assess the ABC success according to the consumed time in implementing the system. The managers could assess the success of ABC depending on preferable outcomes compared with traditional cost system or depending on projected savings as presented by the cost-benefit-test. Based on ABC related literature, there is no specific agreed definition of successful ABC implementation and past studies examined ABC success measures differently. Swenson (1995) used satisfaction of cost management system and the numerous usage of ABC information for decision making, in order to measure ABC success. There are three dimensions used to measure the satisfaction with cost management system: (1) performance management satisfaction (2) product cost satisfaction (3) cost control satisfaction. A comparison was held between the change in satisfaction prior to the ABC implementation and after. Added to that, the extent of ABC usage is associated with the satisfaction. Previous studies have used some variables, Krumwiede (1998) and Gosselin (1997) and Shields (1995) used management evaluation as ABC success measure, at their studies they asked the participants to rate the success level using a single item, although that measure is problematic according to Anderson and Young (1999). Future suggestions were given by Shields (1995). He provided his suggestions that a multiple-item instrument has to be employed in the coming research for measuring the main variables. In order to assess the degree of success of ABC, McGowan and Klammer (1997) adopted the employee's satisfaction. In their study, staff were asked to rate the satisfaction degree for ABC implementation. In their survey, there was only one-single item measuring the level of ABC success, this limitation was similar to Shields (1995). They provided that the coming research must adopt better and more accurate measures.

However, multiple-item measure success of ABC was firstly applied by Foster and Swenson (1997), the applied measures were; decision use, decision actions taken, dollar improvements and management evaluation. Nevertheless, those measures of ABC success such as improve in value of firm or dollar improvements were accused of being difficult to control as Byrne et al. (2009) stated. To be noted, dollar improvements or some other measures are influenced by many factors, like improvement in revenue, and enhance in market share. That's why it is very difficult to identify the enhancement degree in performance added by successful implementation of ABC. According to Brewer (1998), the success of ABC definition is defensive routines and usage of ABC information. In other words, two points have to be satisfied to have ABC success. The first one is that management has to recognize the ABC social-technical context through satisfying employees defensive and routines (Argyris and Kaplan, 1994). The second point is that employees have to use information of ABC to make decisions (Argyris and Kaplan, 1994). For Anderson and Young (1999), they adopted overall accuracy as standard for success of ABC. Those measures contain the ABC data accuracy, overall value as well as the perceived usage of ABC data. The ABC success measure that was applied by earlier researchers is basically stratification with ABC, financial benefit or use information of ABC to make decisions. However, the ABC success definition has been vague towards the measure subjective beliefs (Byrne et al., 2009). The prior researches suggested that a more accurate approach is required for measuring ABC success. Technical characteristics, perceived usefulness in improving job performance and organizational process impact, measures are used by McGowan (1998). Some researchers have used one-single measure and the other used multi-measures for ABC success. The management evaluation was used to measure ABC success by Shields (1995), Anderson (1995) and Krumwiede (1998). Moreover, Shields (1995) suggested for future researches must adopt multi-measures to define ABC success. Byrne et al. (2009) found that some measures such as increase in firm value or dollar improvements are fraught that are extremely difficult to control.

The current study follows the model of Byrne *et al.* (2009) on success of ABC as it's considered the suitable toward the measurement of ABC success in ABC studies; So, the present study followed this model. The current research variables as indicators for this success are technical characteristics, organizational process impact, and perceived usefulness in improving job performance (McGowan, 1998).

HYPOTHESIS DEVELOPMENT

The conceptual model of the present study depends on the contingency theory. The contingency theory is widely applied as a foundation for studies on management accounting-ABC context (Chenhall, 2003). In the current study, based on the conceptual model of the present study that showed in Figure 1, the independent variables are non-accounting ownership and information technology, and the ABC implementation success is the dependent variable.

Non-Accounting Ownership and ABC Implementation Success

The promise of support for ABC initiative from firm members external to the accounting department can be crucial in extensively and successfully using the ABC model. Moreover, the ABC is restricted for accounting system but it is also for the management system all through the whole organization. It gives accurate, relevant and updated information for managers to help them in making decisions. So, the information given by ABC would be used by different employees for many goals (Chenhall, 2004; Jarrar *et al.*, 2007; Al-Omiri and Drury, 2007; Maiga and Jacobs, 2007; Aldukhil, 2012). According (Chongruksut, 2002), non-accounting ownership is a measure of the likelihood of personnel outside of the accountancy department to utilize ABC information. He held that non-accounting ownership could serve to predict the success rate of ABC implementation in a certain setting. It goes without saying that ABC will be far more efficient and established once non-accountants like the marketing personnel, human resource officers and senior corporate leaders become reliant on the system. ABC information can be employed more by non-accountant employees in the case they are a part of its overall development. It is thus predicted that the greater the commitment to the ABC model from the employees external to the accounting department, the more probable it will be extensively employed. The commitment of others, who

are not accountants to utilize the ABC information, it is a key role of the success of the ABC (Kongchan, 2013). Accordingly, the following hypothesis will be tested:

H1: There is a statistically significant relationship between non-accounting ownership and ABC implementation success.

Information Technology and ABC Implementation Success

Technological innovations may have a great impact on the design of a costing system in terms of shaping that system and its features and contributing to its consumer-appeal and significance (Askarany *et al.*, 2007). For instance, a system that is capable of generating elaborate historical data and a user-friendly interface should be sufficient to supply most of the driver information that is integral to ABC. An integrated ABC system would support a comparatively higher level of data complexity and allow intricate and modifiable data stratification operations to take place in real-time (Anderson, 1995; Cagwin and Bouwman, 2002; Roztocki and Imai, 2003). Building on a similar argument, Bvumbi (2017) concluded that superior information Technology systems could either facilitate or hinder ABC implementation. This led to the following hypothesis:

H2: There is a statistically significant relationship between information technology and ABC implementation success.

RESEARCH MODEL

The present study has adopted contingency theory (CT) as a theoretical foundation. The most widely practical model is the contingency theory and this theory has been widely applied in management accounting–ABC context (Kongchan, 2013; Aldukhil, 2012; Al-Omiri and Drury, 2007). The CT has been applied widely in the context of management accounting research and explained the developments in management accounting systems (MAS) relying on internal and external factors. (Zhang *et al.*, 2012; Al-Omiri and Drury, 2007; Auzair and Langfield-Smith, 2005). Thus, the contingency theory is the theory that builds the basis of this research. The contingency theory used to strength the theoretical argument in this research in terms of the effect of ABC key factors. In the vein of present study, the factors are defined as non-accounting ownership and information technology, management accounting system (MAS) is defined as ABC implementation. The present research proposed that the success of ABC implementation in Jordanian industrial firms is influenced by non-accounting ownership and information technology. So, the present study framework is relevant to the prior reports and studies which used contingency framework for control system and management accounting (See Figure 1).

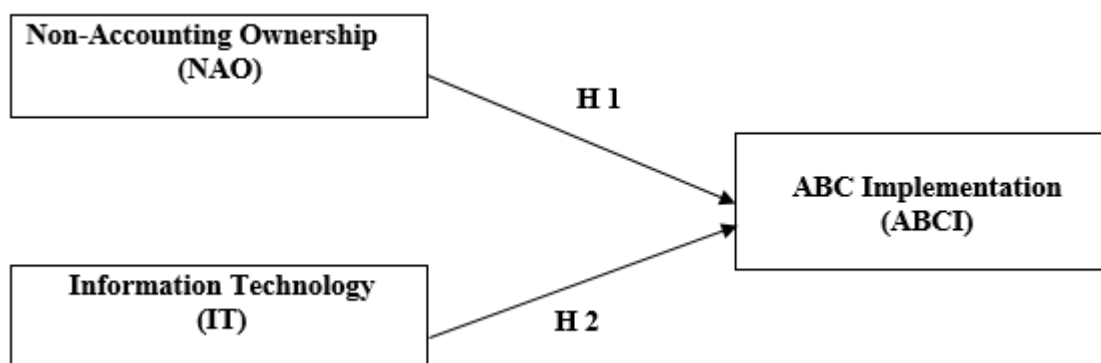


FIGURE 1

ABC FACTORS IN ABC IMPLEMENTATION

RESEARCH METHODOLOGY

The main purpose of the present research is to test the key impact of non-accounting ownership and information technology on the successful implementation of ABC among Jordanian industrial firms. Several works and researches on ABC implementation are employing the survey method (Like: Baird *et al.*, 2007; Zhang, 2010; Askarany *et al.*, 2010; Aldukhil, 2012; Jusoh & Miryazdi, 2015). The present research adopted the quantitative approach by using a questionnaire in order to test the research theoretical model. Survey approach was employed to collect data on factors influencing ABC implementation success by financial managers/head of accounts in Jordanian industrial shareholding firms, and the sample data of 327 financial mangers responses were gained, to test the key effect of non-accounting ownership and information technology on the ABC implementation success.

The questionnaire of the current study consists of three parts. Part A one aimed to collect data related to respondents and companies. Part B aimed to collect data on the non-accounting ownership and information technology affecting the ABC implementation. Part C focused on some aspects of the use of the ABC in firms. The research variables were assessed by gathering the responses of the respondents by using a five-point Likert scale from 1=strongly disagree” to “5=strongly agree. Those items were developed based from the relevant prior studies. As the current research is important in Jordanian economy, it focuses on the industrial sector in Jordan. So, the target population was financial mangers/ Head of accounts in Jordanian manufacturing companies, excluding the respondents who are working in the companies that have less than 50 workers as management accounting systems would be irrelevant at such companies. The study questionnaire was hand distributed to a total of 500 accountants; however, 327 respondents fully completed the questionnaire corresponding.

MEASUREMENT MODEL

In this research, inferential analysis was employed by adopting the Structural Equation modeling (SEM). Structural equation modeling (SEM) was performed to test the relations of hypothesized. In this research use a two-stage approach to SEM as two sub-models, the structural model and measurement model. The measurement model is to assess the relations between both observed and unobserved variables. The structural model is to assess the relationships in unobserved variables by determining the pattern in which the specific variables are influencing each other directly or indirectly in the model. Thus, SEM analysis of the current study begins with evaluating the whole measurement model containing confirming construct validity, and then the structural model is established to assess the relations among the constructs.

Table 1: Results of Cronbach's alpha and Convergent Validity

Latent Variables	Items	Factor loading	Average Variance Extracted (AVE)	Composite Reliability (CR)	Internal Reliability Cronbach's alpha
Non-Accounting Ownership (NAO)	NAO 1	0.594	0.676	0.890	0.880
	NAO 2	0.933			
	NAO 3	0.963			
	NAO 4	0.743			
Information Technology (IT)	IT1	0.654	0.528	0.869	0.85
	IT2	0.769			
	IT3	0.723			
	IT4	0.653			
	IT5	0.783			
	IT6	0.764			
ABC Implementation (ABCI)	ABCI 1	0.705	0.507	0.837	0.833
	ABCI 2	0.791			
	ABCI 3	0.687			
	ABCI 4	0.651			
	ABCI 5	0.719			

As presented in Table 1, in determining the construct reliability in SEM, the Cronbach's alpha and composite reliability were used. Also as presented in Table 1, all the values of composite reliability which depict the degree to which the construct (latent variable) indicators indicate the latent constructs are above than the cut-off 0.6 as suggested by Hair et al. (2011). All values of Cronbach's alpha, which describe the level to which a measure is error-free, are above than the cut-off 0.7 as recommended by Hair et al. (2006). The results of the model prove the unidimensionality of the variables and give acceptable level of convergent validity and discriminant validity.

HYPOTHESES TESTING

The parameter estimates and determination coefficients were tested for hypothesized effects of the variables. Table 2 represents the results of testing the hypothesized relationships relating to the direct relationships among constructs in the structural model.

Table 2: Examining Results of hypothesized Effects of the Variables

Hypothesis (Path)	Unstandardized Estimate		Standardized Estimate	CR	P value	Assessment
	Estimate	S. E	Beta (β)			
H1: NAO \rightarrow ABCI	0.126	0.039	0.21	3.257	0.001	Supported
H2: IT \rightarrow ABCI	0.177	0.065	0.238	2.707	0.007	Supported

As presented in table 2, all hypothesized relationships were supported. In the current research proposed model, the researcher hypothesized that non-accounting ownership (NAO) will affect ABC success positively (H1). The results of the parameter estimation (H1: NAO \rightarrow ABC; $\beta = 0.21$, CR-value= 3.257, P= 0.001) were positive and statistically significant which suggests that there is a significance positive effect of non-accounting ownership (NAO) on the ABC success implementation. Thus, this hypothesis was supported. In the current research proposed model, the researcher hypothesized that information technology will affect ABC success positively (H2). The results of the parameter estimation (H2: IT \rightarrow ABC; $\beta = 0.238$, CR-value= 2.707, P= 0.007) were positive and statistically significant which suggests that there is a significance positive effect of information technology on the ABC success implementation.

DISCUSSION OF RESULTS

In the present research, an integrated model was suggested to explain the phenomenon under examination. The theoretical model of the present research was mainly built on contingency theory. The theoretical model assumed that successful

ABC implementation as dependent variable is affected by independent variables (i.e. non-accounting ownership and information technology). Recent reports and works also reported that non-accounting ownership plays a vital role on successful ABC implementation (e.g. Brown et al., 2004; Taba, 2005; Sartorius et al., 2007; Fei and Isa, 2010; Akinyomi, 2013; Dubihlela and Rundora, 2014; Intakhan, 2014; Madwe, 2017). In addition, several academic works have reported evidence of the key impact of information technology on successful ABC implementation (e.g., Agbejule, 2006; Al-Sayed et al., 2008; Rahmouni and Charaf, 2010; Xiao et al., 2011; Kongchan, 2013). The present research offered clear and good empirical evidence to support the proposition that information technology has impact on the successful ABC implementation. Based on the above discussion, the present research offered a model of achieving a successful ABC implementation, which can also be used for describing other variables that increase the rate successful ABC implementation.

CONCLUSIONS AND RECOMMENDATION

The topic of management accounting innovations implementation in firms has become of great essential. The successful implementation of advanced management accounting techniques like ABC is crucial for any firm in any industry. Thus, it's important to have a clear understanding to the factors that influence implementation processes. The current research intends to widen our knowledge about the key successful factors of ABC system. Overall, the findings of the study presented adequate support explores non-accounting ownership and information technology as crucial factors influencing successful ABC implementation. Those factors enhance the whole activity's efficiency. The research has offered beneficial information and insight on the relation among and non-ownership accounting and information technology with successful ABC implementation. ABC models are not solely for finance or accounting departments. ABC information can be applied for other functions within firms including production, distribution and marketing. Offering access to any ABC information for managers increases the advantages of the new model. It is critical to mention that the functions or managers are the main users of the model. An ABC model is a control model that must be seen only by authorized people. Thus, it is critical for firms to promote and sustain non ownership accounting as requirements for successful execution of the ABC. For Jordanian companies to secure a high level of implementation, great attention must be placed on information technology during the introduction and implementation of the ABC. Studying the actions of information technology on the ABC implementation was seen in related work to be crucial and advantageous for a successful implementation. In general, accountants possess a positive intention towards the implement of the ABC to achieve accounting projects. Thus, it is critical for firms to promote a great level of information technology as a requirement for the successful implementation. With this, the system for successful usage of the ABC could be applied as a guideline. Particular attention must be concentrated on the availability of high-level information technology within the firms. The researcher hopes that this study serves as a foundation for an effort to sharpen the understanding of the implementation of ABC. The next research can adopt some of the methodological issues and theoretical perspectives. Thus, a better comprehensive ABC success framework may be obtained.

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