

Organizational Behaviour, Culture, Information Technology and Activity-Based Costing Implementation Success: A Malaysian Survey Evidence

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Rapid technological changes have caused the traditional costing system to be inappropriate for companies especially those that undertake mass production. The traditional costing system could hardly reflect the true cause and effect relationship between indirect costs and individual products. Using a contemporary management accounting technique i.e. Activity-Based Costing (ABC), managers could address issues concerning cost allocation and product cost computation which can then enable them to make better decisions on pricing, product line, customer market, and capital expenditure. Despite ABC's numerous benefits, the implementation of the technique is still low in Malaysia. Studies on ABC in the local context are limited and tend to confine to certain contextual variables. Therefore, this paper aims to examine the current state of implementation success of ABC and its influential factors consisting of organizational behaviour, culture and information technology in the manufacturing industry in Malaysia. Using the survey method, questionnaires were distributed via different modes to manufacturing companies registered with the Federation of Malaysian Manufacturers Association. The results revealed that ABC implementation is still at the infancy state and its implementation success was significantly influenced by organizational behaviour and information technology. The findings put forth to managers the important factors to consider in ensuring ABC implementation success, which in turn can enhance firm performance.

Key words: *Activity-Based Costing; organizational behaviour; organizational culture, technology.*

Introduction

Globalisation and increasing competitiveness in the business environment have led companies across the industries to change the way they manage their business operations and activities (Alsmadi, 2012; Maelah and Ibrahim, 2007; Majid and Sulaiman, 2008). Moreover, production activities are becoming more complex and diversified as well as, the market has become more segmented (Kocakulah, Foroughi, Stott and Manyoky, 2017). Thus, the dynamic business environment caused the traditional management accounting system to be no longer suitable for companies especially those that undertake mass production. Cooper and Kaplan (1988) stated that the traditional management accounting system led to inaccurate information on product cost and frequently understate profits on high volume products and overstate profits on specialty items. The traditional management accounting system also caused inappropriate and unprofitable strategy due to distortion of product costing and unstable unit product cost whereby the cost related to unused or idle capacity is also applied to the products (Emengini, 2014).

The rapid business environment and market change necessitates companies to respond quickly and effectively in strategizing their cost management (Emengini, 2014). To achieve competitive advantage and producing better quality products at a competitive cost, the manufacturing companies have to be more flexible, integrated and highly automated (Rundora et al., 2013). Thus, when various costs especially the overheads are incorrectly allocated to products line, many organizations faced strategic failures (Kumar and Mahto, 2013). Therefore, the issues that are often a concern among the manufacturing companies can be related to cost information and cost production. Within this backdrop, Activity Based Costing (ABC) developed by Cooper and Kaplan in 1988 emerged to address the weaknesses of traditional costing system. In ABC system, multiple cost drivers are utilised to allocate overheads, hence leading to accurate product costing (Innes and Mitchell, 2000). Despite its popularity (Maelah and Ibrahim, 2007), implementing ABC is not easy as there are numerous challenges, hence the focus of this paper.

This paper is organised in five sections. The next section provides a review of the literature on ABC, the factors influencing its successful implementation and the contingency theory used in the study. This is followed with the research methodology section and the results discussion. The final section will conclude the paper.

Literature Review and Hypotheses Development

Activity Based Costing

ABC facilitates many organisations in making good decisions by providing an understanding of the cost structure (Mansor et al., 2012). The design and introduction of ABC started when the used of direct labour was no longer relevant due to the diminishing usage of direct labour and increasing overhead cost (Cooper and Kaplan, 1988). Krumwiede and Roth (1997) stated that ABC is a tool to allocate resource costs to products based on the activities used by the products or services. Al-Hroot et al. (2015) discovered that the Jordanian companies that have adopted ABC have experienced significant increase in their Margin before Interest and Tax ratio (MBIT), Net profit margin (ROS), Return on Assets (ROA) and Return on Investment (ROI). Furthermore, Hardan and Shatnawi (2013) explained that using ABC enables companies to reduce indirect costs by eliminating unnecessary non- value added activities, thus improves financial performance. Elhamma and Fei (2013) found that using ABC increases competitiveness, profitability and performance. Elhamma's (2015) finding also indicated that 87.5% of the ABC adopters in Morocco enterprises have improved their competitiveness, productivity and profitability. Velmurugan (2010) explained that using ABC provides positive impact on work quality, control over work, ability to complete tasks more efficiently, support for critical aspects of the job, productivity, performance, ability to accomplish more work, and job effectiveness.

Organizational Behaviour and ABC Successful Implementation

Al-Dhubaibi, Rahman, Haniff and Sanusi (2013) discovered that the factors influencing ABC successful implementation include top management support, competitive strategy, training, resources adequacy and performance evaluation. Liu and Pan (2007) also revealed that there is a positive influence of top management support on ABC successful implementation. Using China manufacturing companies as their sample study, they explained that when ABC software was plagued with problems and uncertainty during the most critical period, the top management played a crucial role in ensuring the continuity of the ABC implementation. They also illustrated that the finance directors in the China manufacturing companies cooperated with the line managers and have authority in ensuring sufficient resources for the entire duration of ABC implementation. Similarly, Godil and Warraich (2015) reported that the factors influencing ABC successful implementation in the textile companies in Pakistan is related to the organisational behaviour which also comprised of top management support. Similar findings were also discovered in other studies (e.g. Fei and Isa, 2010a, Intakhan, 2014b). Maelah and Ibrahim (2007) concluded that the support received from management and non-accounting department and top management sponsorship are key factors for successful implementation of ABC adoption. While Intakhan (2014b) opined that to ensure that companies achieve their goals and objectives, top management has to play their role as a leader.

Thus, for ABC implementation success, top management should provide their staff with sufficient material, equipment as well as be committed to use information from the ABC system. Intakhan's (2014b) study revealed that top management support has a direct effect on system training, link to performance evaluation and non-accounting ownership. This is because top management is involved in decision making and sets policy's regarding employees' engagement.

In similar vein, Rahmouni, Allah, Charaf, and Karim (2012) provided empirical evidence that training influences ABC successful implementation. They stated that through internal communication, employees' belonging is felt at the company which led to goal congruence. However, Rahmouni et al. (2012) found no evidence on the relationship between top management support and ABC implementation success. Nassar, Al-Khasah, Sangster and Mah'd (2013) emphasised that the three most important factors that facilitate ABC successful implementation can be linked to training, more useful data information and top management support. Adequate training provided from the management helps in ABC successful implementation. To retain organisational performance, to reduce resistance to change and to ensure employees understand the ABC practices, training needs to be provided to the employees (Krumwiede, 1998). Therefore, the following hypothesis is developed:

H1: There is positive relationship between organisational behaviour and ABC successful implementation among the manufacturing companies in Malaysia.

Organisational Culture and ABC Successful Implementation

In this study, culture is defined as “a set of shared values, norms and beliefs that get everybody heading in the same directions” (Higginson and Waxler, 1993, p. 11). Malmi (1997) said the factors influencing ABC failure include the resistance to change which is related to the organisational culture. The three culture dimensions proposed by Baird, Harrison, and Reeve (2004) are innovation, outcome orientation, and tight versus loose control. However, four culture dimensions are used in this study namely, innovation, outcome orientation, team orientation and intention to details (Baird, Harrison, and Reeve, 2007; Zhang, Hoque, and Isa, 2015). Nonetheless, studies examining the relationship between organisational culture and ABC implementation especially in Malaysia are sparse.

Baird, Harrison, and Reeve (2007) reported that there is an association between organisational culture and activity management practices. They found attention to details is the highest score showing association with the activity management. This is because attention to details requires determination of cost pools and activity drivers to product costing and decisions. Their finding suggested that the contribution of organisational culture is small compared to the organisational behaviour but, it is still significant. In addition, Fei and Isa (2010a) have proved that ABC can

be successfully implemented when organisational culture is compatible with the ABC system. The results from their study indicated that between the four culture dimensions, the outcome orientation and team orientation have significant relationship with ABC success. They stressed that ABC implementation can be achieved when company's emphasis on the results, performance and team work. However, based on Fei and Isa's study, they found no significant relationship exists between attention to details and innovation with ABC successful implementation. Charaf and Bescos (2013) also explained that companies that have strong culture in terms of outcome orientation tend to adopt ABC, thus innovation culture in the companies influenced ABC adoption.

Zhang, Hoque, and Isa (2015) extended the study on organisational culture and ABC successful implementation. Their study revealed a significant relationship between outcome orientation and ABC successful implementation. However, there is no significant relationship between team orientation and ABC implementation. Unlike innovation and attention to details, there is no significant association with ABC successful implementation. Thus, the following hypothesis is developed:

H2: There is positive relationship between organisational culture and the ABC successful implementation among manufacturing companies in Malaysia.

Information Technology and ABC Successful Implementation

Information technology plays a crucial role in most organisations. Without the advance information technology in an organisation, operations and management become less effective, low quality and slow in production. Information technology can also ensure companies' survival in the competitive environment. Krumwiede (1998) suggested that companies that have good information system such as sales and manufacturing system, integration, user-friendly query capability and real time updates of data would face less difficulty in implementing ABC. Al-Nuaimi, Mohamed and Alekam (2017) found significant relationship between information technology and ABC implementation in the Iraqi banks sector. Their findings concluded that higher information technology usage would ease ABC implementation and indirectly enhance the organisational performance due to the existence of institutional websites, customer relationship management systems, online workflow systems and other information technologies that are relevant to banks.

James (2013) discovered that the usage of software to support ABC is also one of the significant factors of ABC implementation. According to Ajibolade (2013), technology moderates the relationship between performance and management accounting system design. His findings indicated that companies that are facing technical complexity of production process would lead to more sophisticated management accounting system (MAS) design. Further to that, Rahmouni et al. (2012) reported that complexity of information technology as negatively

associated with ABC successful implementation. Based on the interviews that they conducted with the heads of account department, they found information technology was a critical success factor of ABC implementation. This is because ABC is integrated into the information system and used by accounting and non-accounting department for decision-making purposes. Therefore, it is hypothesized that

H3: There is positive relationship between information technology and ABC successful implementation among manufacturing companies in Malaysia.

Theoretical Lens

Contingency theory assists in analysing a situation and determines the variables that may influence a decision (Schoech, 2006). Its application covers wide areas such as performance measurement, budgeting behaviour, management control system and design, job satisfaction, change in practices, and product innovation (Otley, 2016). The performance, effectiveness and design of systems are the most frequently examined and used as dependent variables. Iyamu and Tunzelana (2016) explained that contingency comprises of structure, environment, strategy and performance. When the organisational structure possess these characteristics of contingency, then a fit exist which will aid in enhancing organisational performance. Otley (2016) divided the contingency variables into internal and external variables. Internal contingency consists of organisational size, structure, strategy, compensation systems, information systems, psychological, employees' participation in the control systems, market position, product life-cycle stage, and systems change. On the other hand, external variables comprises of technology, market competition or hostility, environmental uncertainty and national culture. In addition to that, Phillips (2010) indicates that different organisational structure is caused by different technologies in the companies. He emphasised that unit production, mass production, large batch and process production influenced types of accounting system used in the companies. Thus, it can be concluded that the organisational structure can be influenced by different environment, knowledge and experience. Good fit between the contingent factors and the organisation enable them to perform and make good decisions.

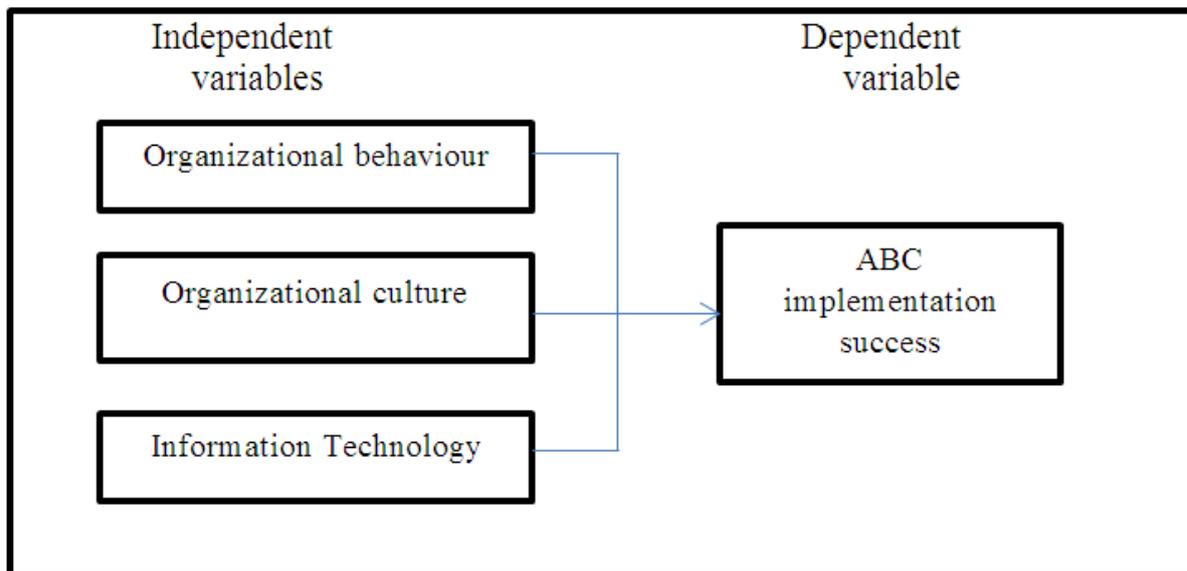
In line with the concept of contingency theory, the decision to implement the system successfully is dependent on the contingent factors such as environment, technology, strategy and culture. In terms of environment, competition is seen as one of the factors that can influence the decision to adopt ABC. Price competitiveness and varieties of eye-catching products put pressure on the manufacturing companies to improve their costing system. Influence from external business environment such as intense competition can also motivate companies to improve their system especially in management system in order to stay resilient and competitive. Besides that, Zhang, Hoque, and Isa (2015) supported that contextual and

organizational factors are the contingent factors for the success of ABC implementation. Thus, consistent with prior studies this study used organizational culture which comprises of innovation, attention to details, team orientation and outcome orientation.

Framework of the study

Figure 1 presents the framework of the study which was premised upon the contingency theory and literature review (Al-Nuaimi, Mohamed, and Alekam, 2016; Al-Nuaimi, Mohamed, and Alekam, 2017; Fei and Isa, 2010a; Godil and Warraich, 2015; O'Relly et al., 1991; Zhang, Hoque, and Isa, 2015). The framework illustrates the relationship between the factors that leads to the ABC implementation success. The independent variables comprised information technology, organisational behaviour and organisational culture. As proposed by Al-Nuaimi, Mohamed, and Alekam (2017), information technology is taken as one of the factors influencing ABC successful implementation. Shields and Young (1989) identified organisational behaviour dimension to include top management support, adequate internal resources, non-accounting ownership, training, ABC link with performance evaluation and compensation, ABC link with competitive strategies and clarity of ABC objectives. Previous studies that have examined organisational behaviour are Maelah and Ibrahim (2007), Liu and Pan (2007), Fei and Isa (2010), Nassar et al. (2013) and Intakhan (2014a). In terms of organisational culture, O'Relly et al. (1991) identified outcome orientation, team orientation, innovation and attention to details as dimensions that may influence ABC successful implementation. However, there have been limited studies that examined the link between organisational culture and ABC implementation (Baird, Harrison, and Reeve, 2004; Charaf and Bescos, 2013; Fei and Isa, 2010b; Zhang, Hoque, and Isa, 2015). As put forth by Zhang, Hoque, and Isa (2015), ABC implementation success taken as the dependent variable is measured using four elements; users' attitude towards ABC implementation, technical characteristics, perceived usefulness and impact on organisational process.

Figure 1. Research Frame



Methodology

The unit of analysis in this study is at the organizational level since ABC adoption is examined at the company level. The study examined the relationships between information technology, organizational behaviour, organizational culture and ABC successful implementation, thus, in line with Sousa et al. (2007) the quantitative approach via the survey method was considered as most appropriate. Quantitative methods take shorter to administer, facilitate numerical data for groups (Choy, 2014) and address reliability issue better relative to qualitative approach (Carr, 1994; Ramli, Sulaiman and Mitchell, 2012). Following Ramli and Ismail (2013), the population of this study is the manufacturing companies that are registered members of the Federation of Malaysia Manufacturers (FMM). Based on the latest directory, 2,400 companies are registered members of FMM. This study uses probability sampling to provide all the manufacturing companies in the population to have a known and non-zero chance of being chosen. Only manufacturing companies that are located in Selangor, Penang, Johor, Perak and Negeri Sembilan were selected for this study due to these regions have high number of manufacturing firms registered with FMM. These manufacturing companies are located in a variety of industries such as food processing, steel processing, automotive and medical supply. The members in FMM include large size companies (33.25%) and SMEs (66.8%). The respondents of the questionnaire survey used in this study were the top management consisting of the Chief Financial Officers, senior managers and accountants. The reason for selecting top management as the respondents is because they have sufficient knowledge and skills on ABC. Moreover, these respondents are the personnel who evaluate organisational performance and are authorised to make decisions as well as, to develop business strategies. Apart from that, top

management is also responsible on the designing and implementing of ABC in their companies (Fei and Isa, 2010b). Table 1 summarises the survey instruments used in this study.

Table 1: Summary of survey instrument

Section	Aims	Measurement and scale
A	Respondent's backgrounds	Job position, current position, length of service, highest education level, gender and age.
B	Organizational background	Principle activities of the business, number of employees, years of establishment, size of companies (Askarany and Smith, 2008; Botero, 2014)
C	<ul style="list-style-type: none"> • Organizational behaviour • Organizational culture • Information technology 	<ul style="list-style-type: none"> • Krumwiede (1998) • Baird, Harrison and Reeve (2007); Zhang, Hoque and Isa (2015) • Cagwin and Bouwman (2002) 1 (Strongly Disagree) to 5 (Strongly Agree)
D	ABC implementation success <ul style="list-style-type: none"> • Users attitude • Technical characteristics rating • Perceive usefulness in improving job performance • Impact on organisational behaviour 	McGowan (1998) <ul style="list-style-type: none"> • 1 (Strongly Unfavourable) to 5 (Strongly Favourable) • 1 (Strongly Disagree) to 5 (Strongly Agree) • 1 (Strongly Disagree) to 5 (Strongly Agree) • 1 (Strongly Disagree) to 5 (Strongly Agree)

The survey instrument was pre-tested on seven respondents from the industry for logical inconsistencies, questions sequence and task relevance (Ramli, Zainuddin, Sulaiman, and Muda, 2013). Positive comments on the language and structure of the questionnaire were received. After corrections were made, the questionnaires were distributed through snail mail and email to 290 registered members of FMM. The total respondents for this study was 65 comprising 33 respondents (11.37%) working in the manufacturing companies that do not adopt ABC and 32 (11.03%) of the respondents employed in the manufacturing companies that adopt ABC. After two follow ups, only 23.21% (65/290) of questionnaires were obtained and usable. Data were normally distributed and issues related to reliability and validity have been appropriately addressed. Data were analysed descriptively and inferentially using SPSS.

Results and Discussion

Descriptive Results

Company's Background

Table 2 and 3 present the employees' size at the organization and their years of operation, respectively. About a third of the manufacturing companies registered with FMM are small to medium sized (< 100 employees) and majority of them have been in operation for six years or more.

Table 2: Number of Employees

	Frequency	Percent	Valid percent	Cumulative percent
less than 100	20	30.8	30.8	30.8
100-200	14	21.5	21.5	52.3
201-500	12	18.5	18.5	70.8
501-1,000	5	7.7	7.7	78.5
1,001-10,000	11	16.9	16.9	95.4
Over 10,000	3	4.6	4.6	100.0
Total	65	100.0	100.0	

Table 3: Years of Operation

	Frequency	Percent	Valid percent	Cumulative percent
1 – 5 years	10	15.4	15.4	15.4
6 – 10 years	15	23.1	23.1	38.5
11 – 15 years	8	12.3	12.3	50.8
16 – 20 years	14	21.5	21.5	72.3
21 – 25 years	17	10.8	10.8	83.1
More than 26 years	11	16.9	16.9	100.0
Total	65	100.0	100.0	

ABC Adoption

Table 4 shows the number of ABC adopters and non-adopters. There were 32 (49.2%) manufacturing companies in the survey sample that adopt ABC as their costing system. Meanwhile, 26 (40%) of the manufacturing companies are ABC non-adopters. Seven of the manufacturing companies (10.8%) adopted ABC at the early stage but then decided to abandon this system. In sum, the number of ABC adopters among the manufacturing companies in Malaysia is still small, suggesting the infancy state especially among the small and medium

manufacturing firms. Other factors such as the size of the companies may have influenced the decision to adopt ABC or not to adopt ABC.

Table 4: Number of ABC Adopters and Non-Adopters

	Frequency	Percent	Valid percent	Cumulative percent
Yes but the company has abandoned	7	10.8	10.8	10.8
No	26	40.0	40.0	50.8
Yes	32	49.2	49.2	50.8
Total	65	100.0	100.0	

ABC Implementation Success

ABC successful implementation is divided into four categories which are users' attitude, technical characteristics, perceived usefulness in improving user job performance and impact on organisational process. Table 5 presents overall result of ABC successful implementation in Malaysian manufacturing companies based on four perspectives. Based on the figures shown in Table 5, "Perceive usefulness in improving user job performance" has the highest mean score ($M=4.26$, $SD=.467$) followed by the statement "Technical characteristics" with ($M=4.26$, $SD=.441$). The overall average ABC implementation success is ($M=4.25$, $SD=.379$). Thus, it can be concluded that most of the respondents are satisfied with the ABC implementation in their organisation. Using ABC as a costing approach enhances the productivity and efficiency of the business operation.

Table 5: ABC Overall Implementation Success

	N	Minimum	Maximum	Mean	Std. Deviation
Users attitude	32	3.00	5.00	4.25	.622
Technical characteristics	32	3.60	5.00	4.26	.441
Perceive usefulness in improving user job performance.	32	3.33	5.00	4.26	.467
Impact on organisational process.	32	3.17	5.00	4.23	.482

Overall average ABC implementation success	32	3.61	5.00	4.25	.379
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Factors Influencing ABC Implementation Success
Organizational Behaviour

Table 6 provides a descriptive result of the organizational behaviour which has been summarised into four perspectives based on the 19 statements to measure the variable. They are top management support, training, non-accounting ownership and link to performance evaluation. Based on Table 6, “Top management support” obtained the highest score (M=4.14, SD=.582) followed by “Non-accounting ownership” (M=3.76, SD=.509). Overall, the average organizational behaviour factor shows the mean score is moderate (M=3.69, SD=.544).

Table 6: Summary of Organizational Behaviour based on Four Perspectives

	N	Minimum	Maximum	Mean	Std. Deviation
Top management support	32	2.00	5.00	4.14	.582
Training	32	1.00	3.00	3.15	.509
Non-accounting ownership	32	1.00	5.00	3.76	.849
Link to performance evaluation	32	1.00	5.00	3.64	.861
Overall average organizational behaviour	32	1.00	5.00	3.69	.544

Organizational Culture

Organisational culture which were measured using 17 statements are categorised into four factors; outcome orientation, team orientation, innovation and attention to details. These four factors were introduced by O'Relly, Chatman and Caldwell (1991), and used by Zhang, Hoque, and Isa (2015) in determining the effect of organisational culture on the success of ABC implementation. Table 7 shows the overall descriptive result for organizational culture. Based on the result shown in Table 7, companies moderately agree that organizational culture is an important factor that can influence the implementation success of ABC (M=4.04, SD=.456). “Attention to details” scored highest (M=4.15, SD=.500), suggesting that in today’s complex business production, the ability to devote to voluminous minutiae with accuracy and focus is a crucial skill. This is followed by “Outcome orientation” (M=4.13, SD=.450), “Team orientation” (M=4.10, SD=.467) and “Innovation” (M=3.89, SD=.688). In essence, these four

vital facets that make up the organizational culture ought to be embraced company-wide for ABC success.

Table 7: Summary of Organizational Cultures based on four perspectives

	N	Minimum	Maximum	Mean	Std. Deviation
Outcome orientation	32	3.00	5.00	4.13	.450
Team orientation	32	3.00	5.00	4.10	.467
Innovation	32	1.00	5.00	3.89	.688
Attention to details	32	3.00	5.00	4.15	.500
Overall average organisational culture	32	3.00	5.00	4.04	.456

Information Technology

Table 8 provides the descriptive result of information technology that may facilitate ABC success. It shows that all six statements scored high mean score which is greater than 4. “Detailed sales and operating data are available in the information systems for the past year” scored highest with $M=4.28$, $SD=.581$. This is followed by “The quality of the operating data is excellent” ($M=4.19$, $SD=.535$) Therefore, it can be concluded that on average respondents are more than agreeable that the success of ABC can be because of the information technology used at the company ($M=4.1667$, $SD=.47140$).

Table 8: Information Technology

	N	Minimum	Maximum	Mean	Std. Deviation
The business unit's information systems are integrated with each other.	32	3	5	4.16	.628
The information systems offer user friendly query capability.	32	3	5	4.09	.588
Detailed sales and operating data are available in the information systems for the past year.	32	3	5	4.28	.581
Different aspects of cost and performance data are available in the information systems.	32	3	5	4.19	.535
The quality of the operating data is excellent.	32	2	5	4.19	.693

When the ABC initiative began, the objectives of ABC implementation were clearly understood both by designers and users.	32	2	5	4.09	.689
Overall average information technology	32	2	5	4.1667	.47140

Results from Pearson Correlation

Table 9 presents the result of Pearson Correlation between information technology (IT), organizational behaviour (BHVR), organizational culture (CULTR) and ABC success (ABCSUCCESS). The results shows that information technology ($r=.614$, $p=.001$), organizational behaviour ($r=.606$, $p=.010$) organizational culture ($R=.544$, $P=.01$) are significantly correlated with ABC implementation success. This study suggests the ability and mobility of information technology in providing timely information as well as, increasing accuracy of data for ABC successful implementation. In addition, the result suggests that internal environment and practices in an organization relates to ABC success. The beliefs, values and norms in a company also can motivate the ABC system accomplishment. Therefore, H1, H2 and H3 are supported.

Table 9: Correlation between Independent Variables and Dependent Variables

		IT	BHVR	CULTR	ABCSUCCESS
IT	Pearson Correlation	1.000	.660**	.605**	.614**
	Sig. (2-tailed)		.000	.000	.000
BHVR	Pearson Correlation		1.000	.685**	.606**
	Sig. (2-tailed)			.000	.000
CULTR	Pearson Correlation			1.000	.544**
	Sig. (2-tailed)				.001
ABCSUCCESS	Pearson Correlation				1.000
	Sig. (2-tailed)				

** . Correlation is significant at the 0.01 level (2-tailed).

Regression Analysis

Further test on the relationship between the independent variables and dependent variable was conducted using hierarchical regression analysis. Three models were developed. Model 1 refers

to the first stage that depicts only organizational behaviour as predictor. In Model 2, the second stage organizational behaviour and information technology were the predictors. Meanwhile, all three variables were included as predictors in Model 3, the final stage. Table 10 summarizes the three models.

Table 10: Summary of Models

Model	R	R Square	Adjusted R square	Std. Error of the Estimate
1	.606 ^a	.367	.346	5.53034
2	.669 ^b	.448	.410	5.25292
3	.667 ^c	.459	.401	5.29289

Based on the above table, Model 1 specifies that organizational behaviour accounts for 36.7% of the variation in ABC implementation success. In model 2, when information technology is added as a second predictor, the value increases to 44.8% of the variance in ABC implementation success. This indicates that information technology provided an additional value of 8.1% to ABC implementation success. The R square in model 3 demonstrates that the inclusion of organizational culture as a third predictor caused R square to increase to 45.9% of the variance in ABC implementation success. Thus, organizational culture provided an additional value of 1.1%.

Table 11: ANOVA Results

Model		Sum of Squares	df	Mean Squares	F	Sig.
1	Regression	532.336	1	532.336	17.405	.000 ^b
	Residual	917.539	30	30.585		
	Total	1449.875	31			
2	Regression	649.674	2	324.837	11.772	.000 ^c
	Residual	800.201	29	27.593		
	Total	1449.875	31			
3	Regression	664.872	3	221.624	7.905	.001 ^d
	Residual	785.003	28	28.036		
	Total	1449.875	31			

a. Dependent variable: ABCSUCCESS

b. Predictors: (Constant), BHVR

c. Predictors (Constant), BHV, IT

d. Predictors (Constant), BHV, IT, CULTR

Table 11 presents the F ratio results based on the three hierarchical stages. All three models show similar results in which the F ratios (model=17.405; model 2=11.772; model 3=7.905)

are significant at $p < .001$. The result indicates that all the models significantly improved the ability to predict the outcome variable. The relationships between the variables are examined further by referring to the coefficient values provided in Table 12. The following is the regression equation of the model:

$$Y = \beta^0 + \beta^1 X^1 + \beta^2 X^2 + \beta^3 X^3 + \varepsilon$$

Where, Y = ABC implementation success

β^0 = constant value

β^1 = regression coefficient

X^1 = organizational behaviour

X^2 = information technology

X^3 = organizational culture

ε = residual (error)

Table 12: Coefficient Result

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.	Collinearity Statistics	
		β	Std. Error	Beta			Tolerance	VIF
1	(Constant)	49.677	6.518		7.621	.000		
	BHVR	.362	.087	.606	4.172	.000	1.000	1.000
2	(Constant)	37.877	8.431		4.493	.000		
	BHVR	.213	.110	.356	1.938	.062	.564	1.773
	IT	.916	.444	.379	2.062	.048	.564	1.773
3	(Constant)	34.678	9.544		3.633	.001		
	BHVR	.168	.126	.282	1.366	.192	.435	2.298
	IT	.820	.466	.339	1.760	.089	.520	1.921
	CULTR	.129	.175	.146	.736	.468	.489	2.043

a. Dependent variable: ABCSUCCESS

Table 12 presents the coefficient results for all three stages of hierarchy and the table also shows the absence of collinearity issues. Model 1 explains the relationship between organizational behaviour and ABC implementation success at $b = 3.62$, $t = 4.172$ and $\text{sig.} = .001$. This illustrates a significant positive relationship exists between organizational behaviour and ABC implementation success. Thus, H1 is accepted. The involvement of top management and their clear commitment to use ABC coupled with provision of adequate resources facilitates the ABC implementation success. The result for Model 2 suggests that there is a significant positive relationship between information technology and ABC implementation success ($b = .916$, $t = 2.062$, $p < .05$). Therefore, H3 is accepted. Consistent with Al-Nuaimi,

Mohamed and Alekam (2017), the more the usage of information technology in an organization, the better ABC can be successfully implemented. Detailed information and data available from past years and user friendly information system facilitated the data collection which directly influenced ABC successful implementation. The results from model 3 demonstrates that there is no significant relationship between organizational culture and ABC successful implementation ($b = .129$, $t = .736$, $p > .05$). Hence, H2 is rejected. This findings contradicts with the finding from several studies (Baird et al, 2007; Godil and Warraich, 2015; Zhang et al. 2015). They found outcome orientation as the significant perspective that influenced the success of ABC implementation. Therefore, it can be concluded that only organizational behaviour and information technology have significant positive relationship with ABC successful implementation by Malaysian manufacturing firms. Based on t statistics, organizational behaviour have larger impact on ABC implementation success ($t = 4.1720$) in model 1, followed by information technology ($t = 2.062$) in model 2. Table 13 provides a summary of the research hypotheses.

Table 13: Summaries of Research Hypotheses

Hypotheses	Accept / Reject
H1: There is positive relationship between organisational behaviour and ABC successful implementation.	Accept
H2: There is positive relationship between organisational culture and ABC successful implementation	Reject
H3: There is positive relationship between information technology and ABC successful implementation	Accept

The findings from the study suggest that ABC adoption is still low, whereby only almost half of the manufacturing companies in FMM uses the advanced management accounting technique. However, there were also seven companies that decided to abandon the technique after the initial application. Nonetheless, most companies that used ABC in the study feel satisfied with their ABC implementation. This study also aims to examine the relationship between information technology, organizational behaviour, organizational culture and ABC successful implementation within the manufacturing sectors in Malaysia. All three independent variables have significant and positive association with the dependent variable however, upon further investigation only organizational behaviour and information technology contributed to ABC implementation success. Specifically, there is a significant positive strong relationship between information technology and ABC successful implementation. This finding suggests the accessibility of information technology across various internal units has made the data easy to transmit, combine and process (Al-Nuaimi, Mohamed, and Alekam, 2017). They also explained that the use of digital and sophisticated information technologies can facilitate ABC successful implementation. Further to that, the success of ABC implementation can be

associated with organizational behaviour which includes top managers support in terms of materials, equipment, and the commitment to use the information from ABC system (Intakhan, 2014b). The present study found when further test was conducted that organizational culture could not explained the variation in ABC implementation success. The finding from the present study did not provide support for the findings from other studies relating to organizational culture; Zhang, Hoque, and Isa (2015), Godil and Warraich (2015), Charaf and Bescos (2013), Fei and Isa (2010a) and Baird, Harrison, and Reeve (2007). They discovered that for ABC to be successfully implemented, the system needs to be compatible with the organisation culture.

Conclusions

The paper puts forth the current state of ABC successful implementation among manufacturing companies in Malaysia. In addition to that, the paper specifically looks at whether organizational behaviour, organizational culture and information technology can influence ABC successful implementation. In this paper, the success of ABC implementation is measured based on the user's attitude, technical characteristics, perceive usefulness of ABC and impact on organizational process. Descriptive results indicate that ABC system is useful in enhancing job performance such as the costing system enables the task accomplishment more quickly and enrich the effectiveness on the job. The result also indicates that most of ABC users are satisfied with the system. ABC helps in providing accurate information, easy to access, timeliness, reliability and understand ability. Overall, the findings from the study suggest that the adoption of ABC is still low, thus confirming earlier studies by Ahmad et al, (2017) and Maelah and Ibrahim (2006). The result from the study also discovered that organizational behaviour and information technology have significant positive relationships with ABC implementation success. However, organizational culture has no significant relationship with ABC implementation success.

The findings from this study have contributed to the literature and practices of advance management accounting specifically on ABC which are limited in the local context. The results provided evidence on ABC successful implementation in the manufacturing companies in Malaysia. Even though there are studies that have examined the factors associated with ABC adoption using the Malaysian context such as by Maelah and Ibrahim (2007) and Majid and Sulaiman (2008), these studies were conducted decades ago. The present study extends previous studies by examining the implementation stage with additional new variables; information technology and organisational culture. This study provides a clear picture to the management on the factors that can help ABC successful implementation. For a company that is still at the consideration stage to adopt ABC or at adoption stage, the company can focus on information technology and organisational behaviour factors especially top management support and training as well as organisational culture to enhance and ensure the success of ABC. Thus, management can reduce their time to plan the successful implementation of the



ABC system. Besides, by looking at the organisational culture, management would be able to know the suitability of the ABC system in their companies. The small sample size of the present study in itself constitutes an avenue for further research. Since this study did not separate the use of ABC whether organisation wide use or partially used at certain departments, future studies can examine into this aspect of the use of ABC. In addition, future research can examine the relationship of the variables at different stage or during the implementation process.

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REFERENCES

- Ahmad, K., Teng, N. W. and Zabrie, S. M. (2017). The Implementation of Activity Based Costing in Malaysian small and medium-sized enterprises. *Advanced Science Letters* 23(4), 3170-3173.
- Ajibolade, S. O. (2013). Management accounting systems design and company performance in Nigerian manufacturing companies: A contingency theory perspective. *British Journal of Arts and Social Sciences*, 14(2), 228-244.
- Al-Dhubaibi, Rahman, Haniff, & Sanusi, (2013). Implementation Of Activity Based Costing In The Telecommunications Sector. *Malaysian Accounting Review*, 12(1), 55-82.
- Al-Hroot, Y. A. K., Mssadeh, A. A. D., & Amireh, M. S. L. (2015). The effect of ABC on companies financial performance A study among Jordanian Industrial Shareholding companies. *European Journal of Business and Management*, 7(35), 146-153.
- Al-Nuaimi, S. I. M., Mohamed, R., & Alekam, J. M. (2016). Contextual Factors Influencing the Implementation of Activity Based Costing In Iraqi Banking Sector: A Research Framework. *Asian Journal of Multidisciplinary Studies*, 4(12), 34-41.
- Al-Nuaimi, S. I. M., Mohamed, R., & Alekam, J. M. E. (2017). The Link between Information Technology, Activity-based Costing Implementation and Organizational Performance. *International Review of Management and Marketing*, 7(1), 452-457.
- Alsmadi, M., Almani, A. and Jerisat, R. . (2012). A comparative analysis of Lean practices and performance in the UK manufacturing and service sector firms. *Total Quality Management and Business Excellence*, 23 (3-4), 381-396.
- Askarany, D., & Smith, M. (2008). Diffusion of innovation and business size: a longitudinal study of PACIA. *Managerial Auditing Journal*, 23(9), 900-916.
- Baird, K., Harrison, G., & Reeve, R. (2007). Success of activity management practices: the influence of organizational and cultural factors. *Accounting & Finance*, 47(1), 47-67.
- Baird, K. M., Harrison, G. L., & Reeve, R. C. (2004). Adoption of activity management practices: a note on the extent of adoption and the influence of organizational and cultural factors. *Management Accounting Research*, 15(4), 383-399.
- Botero, I. C. (2014). Effects of communicating family ownership and organisational size on an applicant's attraction to a firm: An empirical examination in the USA and China. *Journal of Family Business Strategy*, 5(2), 184-196.
- Bülend Terzioglu, E. S. K. C. (2014). The Interplay Between National Culture And Diffusion Of Activity-Based Costing: An Asia-Pacific Perspective. *Asia-Pacific Management Accounting Journal*, 9(1) 46-81.



- Cagwin, D. and Bouman, M. (2002). The association between activity-based costing and improvement in financial performance. *Management Accounting Research*, 13(1), 1-39.
- Carr, L. T. (1994). The strengths and weaknesses of quantitative and qualitative research: what method for nursing? *Journal of Advanced Nursing* (20), 716-721.
- Charaf, K., & Bescos, P.-L. (2013). The Role Of Organizational And Cultural Factors In The Adoption Of Activity-Based Costing: The Case Of Moroccan Firms. *Accounting and Management Information Systems*, 12(1), 4-21.
- Choy, L. T. (2014). The Strengths and Weaknesses of Research Methodology: Comparison and Complimentary between Qualitative and Quantitative Approaches. *Journal Of Humanities And Social Science*, 19(4), 99-104.
- Cooper, R., & Kaplan, R. S. (1988). Measure Costs Right: Make the Right Decisions. *Harvard Business Review*, 5(66), 96-103.
- Elhamma, A. (2015). Perceived benefits of ABC implementation in Moroccan enterprises: Results of an empirical study. *American Journal of Business, Economics and Management*, 3(2), 24-28.
- ElHamma, A., & Fei, Z. Y. (2013). The Relationship Between Activity Based Costing, Business Strategy And Performance In Moroccan Enterprises. *Accounting and Management Information Systems*, 12(1), 22–38, 2013.
- Emengini, S. E., Ezuwore-Obodoekwe, Charity N and Ofoegbu, Grace N. (2014). Product Cost Management in Developing Countries: Activity - Based Costing. *Research Journal of Finance and Accounting*, 5(2), 24-31.
- Fei, Z. Y., & Isa, C. R. (2010a). Behavioral and organizational variables affecting the success of ABC success in China. *African Journal of Business Management*, 4(11), 2302-2308.
- Fei, Z. Y., & Isa, C. R. (2010 b). Factors Influencing Activity-Based Costing Success: A Research Framework. *International Journal of Trade, Economics and Finance*, 1(2) 144-150.
- Godil, D. i., & Warraich, U. a. (2015). ABC Practices in textile sector of Pakistan. *Journal of Business Strategies*, .9(2), 23–32.
- Hardan, A. S., & Shatnawi, T. M. (2013). Impact of Applying the ABC on Improving the Financial Performance in Telecom Companies. *International Journal of Business and Management*, 8(12) 48-61
- Higginson, T. J., & Waxler, R. P. (1993). Corporate Cultures for the 1990s: What Is Needed? *Industrial Management-Chicago Then Atlanta-*, 35, 11-11.

- Innes, John, Mitchell, F., & Sinclair., D. (2000). Activity-based costing in the UK's largest companies: a comparison of 1994 and 1999 survey results. *Management Accounting Research*, 11(3), 349-362.
- Intakhan, P. (2014a). ABC success: evidence from ISO 9000 certified companies in Thailand. *Asian Review of Accounting*, 22(3), 287-303.
- Intakhan, P. (2014b). Direct & Indirect Effects of Top Management Support on ABC Implementation Success: Evidence from ISO 9000 Certified Companies in Thailand. *Procedia - Social and Behavioral Sciences*, 164, 458-470.
- Isa, C. R., & Foong, Y. (2005). Adoption of advanced manufacturing technology (AMT) and management accounting practices: the case of manufacturing firms in Malaysia. *World Review of Science Technology and Sustainable Development*, 2(2), 35-48.
- Iyamu, T., & Tunzelana, S. (2016). Contingency Theory as a Lens for Qualitative Data Analysis in Information Systems Studies. *Proceedings of the 15th European Conference on Research Methodology for Business Management": ECRM2016. Academic Conferences and publishing limited, (2016).*
- James, P. C. (2013). An Analysis of the Factors Influencing the Adoption of Activity Based Costing (ABC) in the Financial Sector in Jamaica. *International Journal of Business and Social Research (IJBSR)*, 3(7), 8-18.
- Kocakulah, M. C., Foroughi, A., Stott, A., & Manyoky, L. (2017). Activity-Based Costing: Helping Small and Medium-Sized Firms Achieve a Competitive Edge in the Global Marketplace. *Journal of Accounting & Marketing*, 06(03) 1-9.
- Krumwiede. (1998). ABC why it's tried and how it succeeds. *Management Accounting*, 79(10), pg.32.
- Krumwiede, & Roth. (1997). Implementing Information Technology Innovations: The Activity-Based Costing Example. *Advanced Management Journal*, 62(4), 4-13.
- Kumar, N., & Mahto, D. (2013). Current Trends of Application of Activity Based Costing (ABC): A Review. *Global Journal of Management and Business Research Accounting and Auditing*, 13(3) 1-16.
- Liu, L. Y. J., & Pan, F. (2007). The implementation of Activity-Based Costing in China: An innovation action research approach. *The British Accounting Review*, 39(3), 249-264.
- Maelah, R & Ibrahim, D. N. (2007). Factors influencing ABC adoption in manufacturing industry. *Investment Management and Financial Innovations*, 4(2), 113-124.



- Maelah, R., & Ibrahim, D. N. (2006). Activity based costing (ABC) adoption among manufacturing organizations The case of Malaysia. *International Journal of Business and Society*, 7(1), 70-101.
- Majid, J. A., & Sulaiman, M. (2008). Implementation of activity based costing in Malaysia: A case study of two companies. *Asian Review of Accounting*, 16(1), 39-55.
- Malmi, T. (1997). Towards explaining activity-based costing failure: accounting and control in a decentralized organization. *Management Accounting Research*, 8(4), 459-480.
- Mansor, N. N. A., Tayles, M., & Pike, R. (2012). Information Usefulness and Usage in Business Decision-Making An Activity-Based Costing (ABC) Perspective. *International Journal of Management*, 29(1 Part 1), 19-32.
- McGowan, A. S. (1998). Perceived benefits of ABCM implementation. *Accounting Horizons*, 12(1), 31.
- Nassar, M., Al-Khasash, H., A., Sangster, A. & Mah'd, O. (2013). Factors that catalyst, facilitate and motivate the decision to implement ABC.pdf>. *Journal of Applied Accounting Research*, 14(1), 8 - 36.
- O'Relly, C. A., Chatman, J., & Caldwell, D. F. (1991). People And Organizational Culture A Profile Comparison Approach To Assesing Person-Organization Fit. *Academy of Management Journal*, 34(3), 487-516.
- Otley, D. (2016). The contingency theory of management accounting and control: 1980–2014. *Management Accounting Research*, 31, 45-62.
- Rahmouni, Allah, A. F., Charaf, & Karim. (2012). Success Of Abc Projects In French Companies The Influence Of Organizational And Technical Factors. *Cost management*, 26(6), 12.
- Ramli, A. and Ismail, M. S. (2013). Environmental Management Accounting Practices: A Survey of ISO 14001 Certified Malaysian Organisations. *Journal of Energy Technologies and Policy*, Vol. 3 (11), pp. 415-432.
- Ramli, A. Sulaiman, S. and Mitchell, F. (2012). Value Engineering for value creation in the automotive industry. *Malaysian Accounting Review Special Issue*, 11 (2), 161-189.
- Ramli, A., Zainuddin, Z. N., Sulaiman, S. and Muda, R. (2013). Changing roles of management accountants in Malaysian companies: A preliminary study. *International Journal of Finance and Accounting*, 2 (2), 89-93
- Rundora, R., Ziemerink, T., & Oberholzer, M. (2013). Activity-Based Costing In Small Manufacturing Firms: South African Study. *The Journal of Applied Business Research*, 29(2), 458-498.



Shields, M., & Young, S. (1989). A behavioral model for implementing cost management systems. *Journal of Cost Management*, 17-27.

Sousa, V. D., Driessnack, M., & Mendes, I. A. C. (2007). An Overview of Research Design Relevant to Nursing: Part 1: Quantitative Research Designs. *Rev Latino-am Enfermagem*, 15(3), 502-507.

Velmurugan, M. S. (2010). The Success and Failure of Activity-Based Costing Systems. *Journal of Performance Measurement*, 3-33.

Phillips, N. (2010). Joan Woodward's 'Technology and Programmability'.

https://www.academia.edu/3461112/JOAN_WOODWARD_S_TECHNOLOGY_AND_PROGRA

Zhang, Y. F., Hoque, Z., & Isa, C. R. (2015). The Effects of Organizational Culture and Structure on the Success of Activity-Based Costing Implementation. *Advances in Management Accounting*, 25, 229-257.