The Relationship between Strategic Information Systems and Strategic Performance: The Case of Islamic Banks in Malaysia

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ABSTRACT

The banking business is very competitive and requires good strategies, thus, the use of information systems in the daily operationof banks is considered critical. This paper is aimed at determining the effects of strategic information systems on the strategic performance of Islamic banks. The sample of the study population was randomly selected, and a total of 302 questionnaires were distributed among Islamic bank executives in Kuala Terengganu, Malaysia. The analysis was conducted using a second generation multivariate analysis, also known as Structural Equation Modelling (SEM). The results of the study reveal that strategic information systems have a positive effect on the strategic performance of Islamic banks, especially in terms of flexibility and cost reduction. The paper reveals that Islamic bank executives and stakeholders are obliged to fully comprehend the relevance of strategic information systems in enhancing strategic performance of organisations.

Keywords: Contingency theory, Islamic banks, Malaysia, strategic information systems, strategic performance

INTRODUCTION

Information systems in organisations provide various examples of successful information systems implementation, providing benefits for both organisations and employees working for them (Dwivedi et al., 2014). These benefits include improved profitability and improved organisational performance as well as efficient and effective business processes or working routines at the individual level. However, organisations adopt strategic information systems that provide top managers with the required range of information to achieve multiple strategic performances, although they differ

in the extent to which they improve their performances (Naranjo-Gil, 2009).

The major problems of information systems adoption by Islamic banks are closely associated with the management's inability to understand the full benefits of its adoption and the expertise of its usage about strategic performances (Kuppusamy, Raman, Shanmugam, & Solucis, 2009). Another problem is the lack of standards that define a real compliant Sharia system of banking due to a difference in Sharia interpretation in most countries and across a particular country, depending on individual Sharia advisors (Kuppusamy et al., 2009).

However, most organisations find the strategic information system to be a significant support for human resources to improve operations and performances (Bacha, 2012). However, the utilisation of obsolete technology could result in lower productivity, performance and competitiveness in Islamic banks (Kuppusamy et al., 2009). Previous studies have not empirically highlighted the relationship between strategic information systems and strategic performance in the Islamic banking sector in Malaysia, as most of the studies only focussed on financial performance, measured by financial ratios (Siew & Isa, 2015; Kadir, Jaffar, Abdullah, & Harun, 2013; Dusuki & Abdullah, 2009). Also, most studies usually concentrate on comparison between Islamic and conventional banks (e.g. Zarrouk, Ben, & Moualhi, 2016; Wasiuzzaman & Gunasegavan, 2013) and on other sectors

such as hospitality (Gil-Padilla & Rodriguez, 2008) and Malaysian higher institutes of learning (Al-Hiyari, Al-Masregy, Mat, & Alekam, 2013; Al-Mamary, Shamsuddin, & Nor Aziati, 2014).

Thus, this study attempts to fill the research gap by conducting empirical analyses of the relationship between strategic information systems and performance of Islamic banks. This is the first study in the context of Malaysia. The main objective of this study was to examine the effects of strategic information systems on strategic performance in Malaysian Islamic banks.

Literature Review

Strategic information systems are defined as any information system that enables a firm to have competitive advantage and reduces competitive disadvantage (Rainer & Watson, 2012). A strategic information system is a system that helps companies change or otherwise alter their business strategies and/or structure and also streamline and quicken the reaction time to environmental changes and aid the organisation in achieving a competitive advantage. Information systems provide several benefits to the business organisation resulting in appropriate responses to a business situation via the means of effective and efficient coordination between different departments at all levels of the organisation, access to relevant data and documents, use of less labour as well as improvement in organisational and departmental techniques and management of routine activities (Nath & Badgujar, 2013).

Strategic performance is defined as cost-focussed strategic performance and flexibility-based strategic performance (Naranjo-Gil, 2009). A cost-strategic objective focusses on internal efficiency and cost control and thus, tends to emphasise on current organisational structures rather than adopt new ones (Miller, 1988; Porter, 1985). A flexibility-based strategic goal focusses on diversification, coordination and decentralisation within the organisation (Porter, 1985).

Underlying Theory

This particular study used the Contingency Theory as a foundation for research. The contingency theory suggests that there is no best way of managing an organisation. It is all contingent (dependent) on the resources available in the organisation. For example, Kim and Lee (1986) suggested that performance of an organisation depends on the existence of an alignment between several organisational characteristics, such as information systems, organisational structure and strategy. Several empirical studies on strategic information systems and their relationship with performance have adopted the contingency theory [e.g. Naranjo-Gil (2009); Choe (2004); Sullivan (2000)].

The Relationship Between Strategic Information Systems and Strategic Performance

Contemporary information system researchers have increasingly directed their interest and attention towards the link between information systems investment and organisational performance (Salleh, Jusoh, & Isa, 2010; Hia & Teru, 2015). This is because many information systems researchers have focussed on the relationship between information systems and organisational performance and found that strategic information systems have a positive impact on organisational performance (Salleh et al., 2010; Hia & Teru, 2015). The study on the relationship between information systems and performance measurement systems (Salleh et al., 2010) indicated that the strategic information system is a determinant of performance measures.

On the other hand, several studies were conducted to examine the impact of information systems on the performance of firms and these indicated some active and significant results as well as some negative results (Bacha, 2012; Taber et al., 2014). Consequently, an empirical study on the utilisation of information systems and firm performance among 205 small and medium Malaysian enterprises (Kharuddin, Ashhari, & Nassir, 2010) revealed that SMEs that utilised information systems showed increased performance compared to those that did not. However, studies on both strategic performance and information systems are still limited (Burney & Matherly, 2007; Shehzad & Ismail, 2014), while researchers involved have received only limited attention in the information systems field (Burney & Matherly, 2007; Church & Smith, 2007; Budiarto & Prabowo, 2015). Evidently, the studies revealed that the more

valuable the information systems area is, the better the performance (Gil-Padilla & Rodriguez, 2008; Hia & Teru, 2015).

Furthermore, experts have revealed that strategic information systems can be vital tools not only for restructuring business models but also for dimensions that define the complete organisational sectors (Resca & D'Atri, 2012; Al-Mamary et al., 2014). Researchers have revealed how different team compositions related with a strategic information system, and how this interaction affected strategic performance (Naranjo-Gil, 2009). Other studies revealed that information systems' success and organisational flexibility can be attained through information system compatibility (Palanisamy, 2005; Nath & Badgujar, 2013).

Conceptual Framework

The contingency theory shows that performance is a function of a relationship between multiple organisational features, such as information systems, organisational hierarchy and policy (Choe,1996; Kim & Lee, 1986). Several empirical studies on strategic information systems and their relationship with performance have adopted the contingency theory and have been able to prove empirically how the theory links these variables (e.g. Naranjo-Gil, 2009; Choe, 2004; Sullivan, 2000).

From the above literature review, it can be seen that on the whole, there is a positive relationship between strategic information systems with organisational performance. Specifically, there is a positive relationship between strategic information systems with

flexibility-based and cost-based strategic performance. Based on the contingency theory and past literature, the conceptual framework of this study is derived as follows:
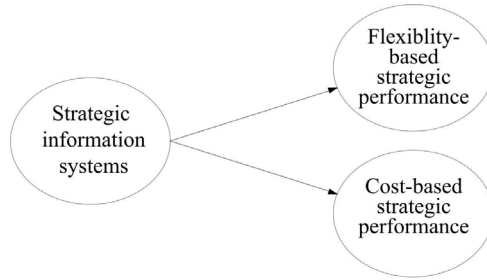

Figure 1. Conceptual research framework

From the above framework, the following hypotheses can be developed:

H_1. There is a positive and significant effect between strategic information systems and flexibility-based strategic performance.

H_2. There is a positive and significant effect of strategic information systems and cost-based strategic performance.

METHODS

This study used a quantitative approach and a survey questionnaire for data collection. The unit of analysis used in this study mainly consisted of executives in Islamic banks in Kuala Terengganu. Kuala Terengganu was chosen due to the assumption that people in this state have better religious understanding (Adnan, Nasir, Azeanti, & Mohd, 2013). These bank executives were the users of the bank's strategic information systems.

A simple random sampling technique was applied in the sampling procedure, while the Krejcie and Morgan (1970) table was used to determine the sample size of the study. Consequently, the sampling frame consisted of a list of 12 Islamic banks in Kuala Terengganu, some of which are full-fledged or partial Islamic banks and window-operated Islamic banks.

Data collection was conducted via a questionnaire survey. A sample of 313 respondents was randomly selected from a population of 1730 as suggested by Krejcie and Morgan (1970). The researcher personally distributed 313 questionnaires to the respondents (bank executives), of which only 302 were returned with complete answers and therefore, able to be used for analysis. Some of the questionnaires were collected after they had been completed immediately or at a later date. The mail survey, a method whereby the researcher emailed the questionnaire directly to the respondents for them to complete and return, was also applied for data collection in the event of the researcher's inability to meet face-to-face with the respondent.

Finally, data were analysed using structural equation modelling, with the help of the AMOS (Analysis of Moments and Structures) software to determine the relationship between the latent constructs of the study. Structural equation modelling is a second-generation multivariate analysis that responds to the limitations of the ordinary least squares approach (OLS).

RESULTS AND DISCUSSION

Measurements

Following Naranjo-Gil's suggestions (2009), the strategic information system as an endogenous (independent variable) construct was measured based on four dimensions, namely scope, timeliness, aggregation and integration. Respondents were questioned on the extent to which they knew that their bank's information system provided each of the dimensions identified. Finally, the exogenous (dependent variable) constructs, which was the strategic performance, was measured on the basis of flexibility and cost reduction as adopted by Porter (1985) and Miller (1988). Thus, this study questioned the respondents to indicate the extent to which the following dimensions fit their personal situation: decentralisation of responsibility, programmes of cost reduction, cooperation with other units or departments of the bank and other institutions (Naranjo-Gil, 2009).

Validity of the Instruments

A majority of the study instruments were adopted as their validity had already been confirmed by previous studies. However, some of the instruments were self-developed as they did not specifically focus on the subject matter under investigation and the need for their validation was highly indispensable for the success of the study. Thus, a pre-test of the instruments was carried out.

It is crucial to state that the most common criterion for the assessment of accuracy and consistency of the measurement scales was ensuring the validity and reliability of the constructs of the study (Kline, 2013). According to many researchers, when validity and reliability are properly addressed, measurement errors, data input errors, respondents' misunderstanding or misinterpretation and so forth are reduced (Awang & Mohamad, 2016). Measurement error is minimised when the observed numbers accurately represent the characteristics being measured. Thus, an essential part of the empirical study was to maximise the reliability and validity of study measures.

The study questionnaire was distributed among 10 senior and experienced researchers for content validation and suggested comments. Most of them approved the questions as being valid and relevant to the research; however, the comment was given that the number of questions asked should be minimised for convenience of answering as most of the respondents were bank executives who would not have much time to fill in a questionnaire due to their tight schedule. Also, a pre-test pilot study was conducted among 20 Islamic bank executives while the construct validity was conducted through the use of both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to determine evidence of convergent and discriminant validity (Marsh, Morin, Parher, & Kaur, 2014). The EFA was performed using SPSS version 21 while the CFA was tested using the structural equation modelling feature of AMOS software version 19.

Assessing Validity and Reliability for a Pooled Measurement Model

After the conclusion of the CFA procedure for every measurement model, the next step was to compute certain measures that indicated the validity and reliability of the construct and then summarise them in a table (Awang, 2014). However, it should be noted that the assessment of unidimensionality, validity and reliability for measurement models was required for modelling the structural equation model (Kline, 2013). The following reveals the procedure of the CFA in steps.

1. Unidimensionality: The item was achieved through item deletion and multicollinearity between the items in various constructs with a low factor loading. This process was however repeated until the fitness indices were achieved.

2. Validity: This requirement was achieved through a convergent validity of an AVE ≥ 0.50, construct validity to ensure all fitness indices for the models met the required level and a discriminant validity in which redundant items were deleted, some being multicollinear (as shown in Table 2 below).

3. Reliability: This requirement was achieved through an internal reliability with a Cronbach's alpha ≥ 0.70, a composite reliability of a CR ≥ 0.60

and an AVE ≥ 0.50 (as shown in Table 1 below).

The hypotheses were analysed using structural equation modelling with the help of the AMOS (version 19) software. The path analysis in the structural model was interpretable as β- statistics from the analysis of moments and structures as depicted in Figure 1 of the study. The confirmatory factor analysis (CFA) confirmed the reliability and unidimensionality of the constructs, with a Cronbach's alpha above 0.7 as shown in Table 1 of the analysis. Notwithstanding, we also assessed the discriminant validity of the measurement model by calculating the Average Variance Extracted (AVE) and comparing it with the squared correlations between the constructs (in Table 2). Results revealed that the discriminant validity was satisfactory because the AVEs were higher than the correlations.

Figure 1 shows the relationship or the direct effect of the independent construct strategic information systems (SSIS) on the construct cost-based strategic performance (CBSP) and flexibility-based strategic performance (FBSP). The standardised beta estimate was 0.76 ($\beta = 0.76$, $p < 0.1$), which indicates a significant and direct relationship between the two constructs because the "P" value is less than 0.1. Table 1 is the tabular representation of the relationship between the independent construct, strategic information systems (SSIS) and the dependent construct, strategic performance (SP). Also, the standardised beta estimate for the relationship between the strategic information systems and flexibility-based strategic performance was 0.81 ($\beta = 0.81$, $p < 0.1$), which also indicates a significant and direct relationship between the two constructs because the "P" value is less than 0.1. Thus, after analysing their relationships in the structural equation modelling we found that there was a significant relationship between the constructs as the beta estimates were 0.76 and 0.81, respectively.

Table 1
The CFA results for the measurement model

Construct	Item	Factor loading	Cronbach's alpha (Above 0.7)	CR (Above 0.6)	AVE (Above 0.5)
SSIS	SSIS1	This item was deleted resulting from a low factor loading			
	SSIS2	0.84	0.939	0.934	0.640
	SSIS3	0.78			
	SSIS4	0.81			
	SSIS5	0.77			
	SSIS6	0.78			
	SSIS7	0.82			
	SSIS8	0.78			
	SSIS9	0.82			

Table 1 *(continue)*

FBSP	FBSP1	This item was deleted resulting from a low factor loading			
	FBSP2	0.87	0.870	0.963	0.742
	FBSP3	0.85			
	FBSP4	0.90			
	FBSP5	0.89			
	FBSP6	0.90			
	FBSP7	0.82			
	FBSP8	0.82			
	FBSP9	0.87			
	FBSP10	0.83			
CBSP	CBSP1	0.80	0.959	0.958	0.741
	CBSP2	0.78			
	CBSP3	0.84			
	CBSP4	0.88			
	CBSP5	0.92			
	CBSP6	0.86			
	CBSP7	0.89			
	CBSP8	0.89			

The requirement for the validity in Table 1 above was achieved through a convergent validity of an AVE ≥ 0.50, construct validity to ensure all fitness indices for the models met the required level and a discriminant validity in which redundant items were deleted, with some being multicollinear. Also, the table above met the requirement of the reliability as achieved through an internal reliability with a Cronbach's alpha ≥ 0.70, a composite reliability of a CR ≥ 0.60 and an AVE ≥ 0.50 (as shown in Table 1 above).

Table 2
The discriminant validity index summary

Construct	FBSP	SSIS	CBSP
FBSP	0.861		
SSIS	0.793	0.800	
CBSP	0.809	0.734	0.861

The square root of the AVE in Table 2 above is represented by the diagonal values (in bold), while the others are the correlation between the respective constructs. The discriminant validity of all constructs was achieved because the diagonal values (in bold) were higher than the values in their rows and columns (Kline, 2013). Thus, referring to Table 2 above, the discriminant validity of the constructs of the study was achieved. Therefore, the discriminant value for the independent construct SSIS was 0.800 and the value for the dependent construct FBSP were 0.861 and 0.861 for CBSP, respectively. This is an indication that the pooled measurement model was valid, and the data were reliable for analysis (Awang, 2014; Wirth & Edwards, 2007).
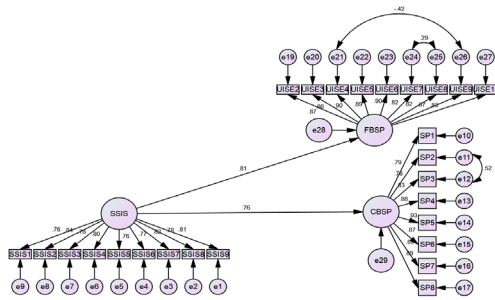
Figure 2. The relationship between the strategic information system and strategic performance

CONCLUSION

The study, therefore, concluded that strategic information systems have an impact on the strategic performance of Islamic banks. However, among the key findings of the study were that flexibility-based strategic performance was more likely to be achieved if there were effective and efficient utilisation of strategic information

Table 3

Standardised regression weights for the direct effect of SSIS on CBSP and FBSP

Construct	Path	Construct	Beta Estimate	S. E.	C. R.	P-Value	Result
Cost-based strategic performance (CBSP)	←	Strategic information system (SSIS)	0.76	0.66	12.429	0.000	Significant at 1%
Flexibility-based strategic performance (FBSP)	←	Strategic information system (SSIS)	0.81	0.061	14.351	0.000	Significant at 1%

Table 3 above is the tabular representation of the relationship between the independent construct, strategic information system (SSIS) and the dependent construct, strategic performance (SP). After analysing their relationships in the structural equation modelling (as depicted in Figure 1 above) we found that there was a significant relationship between the constructs as the beta estimate was 0.76 and 0.81, respectively. The direct effect that was measured through beta coefficiency was significant and hence, supported the hypothesis of the study. The results were consistent with those of other studies (e.g. Salleh et al., 2010; Gil-Padilla & Rodriguez, 2008).

systems in Islamic banks, as indicated by the beta estimates.

Several studies have been conducted in relating the effect of strategic information systems on strategic performance (Al-Mamary et al., 2014; Hia & Teru, 2015; Salleh et al., 2010). This study examined the relationship between strategic information systems and strategic performance in the Islamic banking sector, a subject not yet explored. We showed that there was a strong and positive relationship between strategic information systems and strategic performances in the banks studied and hence, the executives, managers and other stakeholders in Islamic banks must be

aware of the impact of the sophistication of strategic information systems and how it affects performance. Another contribution of the study was that the researchers used a second-generation method of data analysis to relate the effect between the latent constructs. In this regard, the constructs were modelled into a structural equation modelling and were analysed with the help of the AMOS software version 19. Consequently, the study also revealed that organisational leaders must also be aware of the relevance of training sessions for employees to improve their technical IT skills and expertise in the usage of more advanced and strategic information systems. Conclusively, if properly utilised, strategic information systems will give Islamic banks the ability to gain a competitive advantage and to be able to differ from competitors.

Just like any empirical study, this study also had its limitations. The first was related to the sample of the study, which was focussed only on Kuala Terengganu. We recommend that our findings be replicated in samples to include other states in Malaysia. Also, it would be important to exploit a larger sample constituting a number of Islamic banks that operate internationally. Perhaps future studies could include other industries as this study is restricted to the Islamic banking industry. Finally, our study was based on the subjective judgement of the staff or users of the strategic information systems and can serve as a bedrock for more extensive research. In particular, it would be advisable to use technical IT skills to measure strategic performance.

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