THE RELATIONSHIP BETWEEN STRATEGIC INFORMATION SYSTEMS AND STRATEGIC PERFORMANCE: THE CASE OF ISLAMIC BANKS IN MALAYSIA

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Abstract

The purpose of this paper is to determine whether strategic information systems sophistication leads to multiple strategic performances in terms of cost reduction and flexibility of operations in Islamic banks. A second generation method of data analysis known as the Structural Equation Modelling (SEM) was used to analyze 302 questionnaires that were distributed among the Islamic bank executive staff in Kuala Terengganu, Malaysia. The results of the study revealed that strategic information systems sophistication has a positive effect on the strategic performance of Islamic banks especially in terms of flexibility and cost reduction. The study is restricted to twelve Islamic banks in Kuala Terengganu. Thus, it would be important to conduct the study in the whole of Malaysia, and number of banks should be involved. The paper reveals that Islamic bank managers and stakeholders must understand the importance of strategic information systems sophistication and its relevance to strategic performance. Several studies were conducted to examine the relationship between strategic information systems and organizational performance. The paper examines the relationship between sophisticated strategic information systems and strategic performances of Malaysian Islamic banks, a subject not yet explored.

Keywords: sophisticated strategic information systems, contingency theory, strategic performance.

1. INTRODUCTION

Information systems in organizations provides various examples of successful information systems implementation providing benefits for both organizations and employees working for them (Dwivedi, Watsell, Laumer, Henriksen, Myers, Bunker, Elbanna, Ravishankar & Srivastava 2014). These benefits include improved profitability and improved organizational performance, as well as efficient and effective business processes or working routines on an individual level (Dwivedi et al. 2014). However, organizations adopt sophisticated information systems, which 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).

Notwithstanding, the major problem of information systems adoption by Islamic banks is closely associated with the managements inability to understand the full benefits of its adoption and the expertise of its usage in relation to strategic performances (Kuppusamy, Raman, Shanmugam & Solucis 2009) and lack of standards that define a real compliant shari’a system of banking due to a difference in Shari’ah interpretation in most countries and across most regions and sometimes...
within the country, depending on their individual Shariah advisor and his interpretation (Kuppusamy et al. 2009).

However, most organizations find the sophisticated strategic information system as a significant support for the human resources in order to improve operations and performances (Bacha 2012). Therefore, this study conducted an empirical analyses of the relationship between sophisticated strategic information systems and strategic performances in the Malaysian Islamic banks.

2. PROBLEM STATEMENT

In a bid to remain abreast with global development, improve the quality of service delivery, reduce transaction costs, improve performance as well as develop a flexible and user-friendly banking services, banks have heavily invested on information systems and have widely adopted information and communication technology networks for delivering wide range of value-added products and services (Aliyu & Tasnim 2012). This condition imposes additional demands on the organization's information processing capabilities and the strategic information systems sophistication and compatibility with the organizational operations in order to promote internal performance that are focused on achieving flexibility and cost reduction (Naranjo-Gil 2009).

Notwithstanding, the major problem or challenges of strategic information systems utilization in Islamic banks is closely associated with lack of standards that define a real compliant shari’ah system of banking due to a difference in shari’ah interpretation, shortage of competent Shariah experts in the Islamic banking industry. Only a small group of shariah experts is serving on several shariah boards of Islamic banks worldwide (Khan & Bhatti 2008) and management's inadequate understanding of strategic information systems cost portfolio, due to a focus on reaping the benefits from strategic information systems investment and ignoring the full cost implications of their investment (Cornish et al 2014).

However, this prolongs additional years in order to achieve the required financial returns from strategic information systems utilization and at the end, the Islamic banks or organization faces lower productivity, performance and competitiveness due to incessant utilization of obsolete or unsophisticated technology (Kuppusamy et al 2009).

Although, previous studies have not empirically highlighted the relationship between strategic information systems and strategic performance in the Islamic banking sector, as most of the studies only focused on the financial performances, measured by the financial ratios (Dusuki & Abdullah 2009). Also, most of the studies usually focus on conventional banks, for example Becalli (2005) and others on other sectors such as the hotel (Gil-padilla & Rodriguez 2008). Therefore, this study attempts to fill the research gap by conducting an empirical analyses of the identified issue.

3. RESEARCH OBJECTIVES

i. To analyze the relationship between sophisticated strategic information systems and bank’s flexibility based strategic performance.

ii. To analyze the effect of sophisticated strategic information systems on bank’s cost based strategic performance.
4. STRUCTURE OF THE PAPER
The study is organised and structured into different headings. The introduction, problem statement, research objectives, literature review, the research framework model, the methodology, the method of data analysis and finally the conclusion with practical and theoretical implications of the study, all combine to form the complete structure of the study. Thus, it is pertinent to state that this study applied a quantitative method of analysis using the second generation method of data analysis which is popularly known as the Structural Equation Modelling (SEM).

5. LITERATURE REVIEW
5.1 Strategic information systems-
In the words of Rainer and Watson (2012), an information system are any system that enables a firm achieve competitive advantage and reduces competitive disadvantage. Hemmaftar et al (2010) defined a strategic information system as 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.

5.2 Strategic performance
There are basically two strategic performances which are cost based strategic performances and flexibility based strategic performances (Naranjo-Gil 2009). A cost based strategic objective focuses on internal efficiency and cost control and thus tends to emphasize current organisational structures rather than adopt new ones (Miller 1988; Porter 1985). While a flexibility-based strategic goal focuses on diversification, coordination and decentralization within the organisation (Porter 1985).

5.3 The Relationship between Strategic Information Systems and Strategic Performance
Contemporary information system researchers have increasingly directed interest and attention towards the link between information systems investment and organisational performance as many information systems research have focused on the relationship between information systems sophistication and organizational performance and found that information systems sophistication have positive impact on organizational performance (Salleh, Jusoh & Isa 2010). The study on the relationship between information systems sophistication and performance measurement systems (Salleh et al. 2010), indicate that information systems sophistication is a determinant of performance measures.

The results also indicate that different dimensions of Information Systems sophistication affect different dimensions of performance measures usage. On the other hand, several studies were conducted to examine the impact of information systems on the performance of firms and thus indicated some positive and significant results as well as some negative results (Bacha 2012). Consequently, Kharuddin, Ashshari & Nassir (2010) conducted an empirical study on the utilization of information systems and firms performance among 205 Malaysian small and medium enterprises (SMEs) and the findings revealed that SME’s that utilize information systems increase performance as compared to those that do not.
However, studies on both management accounting and information systems are still limited. While management accounting researchers are actively involved in studying Performance measurement systems (PMS), such studies have received only limited attention in the information systems literature (Burney & Matherly 2007; Church & Smith 2007). However, Gil-Padilla and Rodriguez (2008) reveal that the more valuable, non-substitutable and inimitable the information systems area is, the better the performance. Studies also show that the resources and capabilities that most affect performance are the internal and external technical resources and the capabilities of the information systems area to strengthen and influence relations with users (Gil-Padilla & Rodriguez 2008).

Further, Resca & D’Atri (2012), reveal that strategic information systems can be useful instruments not for only refomulating business models but also dynamics that characterize entire business sectors. Consequently, on the issue of bottom–line performance (profitability). In a study on the firm-level performance impact of strategic information systems support for product innovation (Zhang 2011) revealed that providing information systems support for product innovation alone did not improve profitability as measured by returns on sales and returns on assets but confirms that only when complemented by firm-specific information and knowledge would strategic information systems support for product innovation lead to profitability gains and strategic performances.

Naranjo-Gil (2009) analyzed how different team compositions interact with a sophisticated information system, and how this interaction affects strategic performances, which are focused on cost reduction and flexibility. The findings show the effect of information system on strategic performance (focused on flexibility). Palanisamy (2005) reveal that information systems success and organizational flexibility could be achieved through information system flexibility, which could be generated by involving users in information system planning. Also, the study results have shown that user expectations, perceived personal usefulness, and users’ internal flexibility possess a high driver power for user involvement. However, research on the impact of information systems adoption and utilization on banks performance is insufficient, and the available studies are more of US, European and Australian banking industry (Aliyu & Tasmin 2012). Furst et al (2002), reveals that federally chartered US banks had higher return on equity (ROE) by using the conventional business model, strategic information systems was one of the major factors that affect banks financial performance within the period under study and they also observe that more profitable banks adopt information systems after 1998 but yet they are not the first movers. Nevertheless, Becalli (2005) revealed that the relationship between strategic information systems investments and improved bank performance in terms of profitability or efficiency was not effective as it indicated a profitability paradox.

However, the impact of different type of strategic information systems or information technology investments (hardware, software, and services) on banks performance is heterogeneous (Becalli 2005). Investments in strategic information systems services from external providers (consulting services, implementation services, training and education, support services) appears to have a positive influence on accounting profits and profit efficiency, while the acquisition of hardware and software seems to reduce banks performance as argued by Becalli (2005). Thus, investment in strategic information systems poses some problems in terms of
hardware and software incompatibility, information overload and job insecurity among the workers due to the fear that they may be replaced by machines (Kuppusamy et al. 2009).

6. CONTINGENCY THEORY

Contingency approach is the only one which asserts that performance depends on the existence of an alignment between several organizational characteristics, such as information systems, organizational structure and strategy (Choe 1996; Kim & Lee 1986 as cited in Naranjo-Gil 2009). Several empirical studies on strategic information systems and its relationship with performance have adopted the contingency theory and have been able to empirically prove how the theory links these variables. For example, Naranjo-Gil (2009), Bechor et al (2009), Choe (2004) and Sullivan (2000).

The Model

7. HYPOTHESIS:

i. \( H_1 \) There is a positive relationship between sophisticated strategic information systems and flexibility based strategic performance.

ii. \( H_2 \) There is an effect of sophisticated strategic information systems and cost based strategic performance.

8. METHODOLOGY

8.1 Sample Characteristics and Questionnaire Administration

The unit of analysis in this study mainly consists of the Islamic banks in Kuala Terengganu. And hence, the sample was derived from these banks, which consisted of the banks executive staff or the users of the banks strategic information systems. Notwithstanding, a simple random sampling technique was applied in the sampling procedure, while the Krejcie & Morgan (1970) table was used to determine the sample size of the study. Consequently, the sampling frame consisted of the list of
the 12 Islamic banks in Kuala Terengganu, in which some are fully fledged (100%), partial fledged (50%) and window operated (30%).

Data collection was conducted via a questionnaire survey. The researcher personally gave out 313 questionnaires to the participants to fill, out of which only 302 were returned and were fully answered and used for analysis. Some of the completed questionnaires were collected right after it has been completed or at a later date. The mail survey, method whereby the researcher mails the questionnaire directly to the participants for them to complete and return was also applied for data collection in the event of the researchers inability to meet face-face with the respondent.

Finally, data was analyzed using a structural equation modelling, with the help of the AMOS (analysis of moments and structures) software in order to determine the relationship between the latent constructs of the study. The structural equation modelling is a second generation method of data analysis that responded to the limitations of the ordinary least squares approach (OLS).

8.2 Measurements:
Following Naranjo-Gil (2009), sophisticated strategic information system as an endogenous (Independent variable) construct was measured based on the questionnaire items. The researchers asked questions regarding different information dimensions, such as scope, timeliness, aggregation and integration. Respondents were questioned on the extent to which they know that their bank’s information system provided each of the dimensions identified (Naranjo-Gil 2009). Finally, the exogenous (Dependent variable) constructs, which is the strategic performance was measured on the bases of flexibility and cost reduction as adopted from Porter (1985) and Miller (1988). Thus, the study questioned the respondents to indicate the extent to which the following dimensions fit their personal situation: decentralization of responsibility, programs of cost reduction, cooperation with other units or departments inside the bank and other institutions (Narnjo-Gil 2009).

8.3 Validity of the Instruments:
Although majority of the study instruments were adopted and thus their validity has already been confirmed by the previous studies. Yet, some of the instruments were self-developed as they do not specifically focus on the subject matter under investigation. Therefore, in as much as some of the instruments were self-developed, then the need for their validation is highly indispensible for the success of the study. Thus, a pre-test of the instruments was carried-out.

However, it is pertinent to state that the most common criteria for the assessment of accuracy and consistency of the measurement scales are by ensuring the validity and reliability of the constructs of the study. According to Hair, Babin & Samouel (2003), when the validity and reliability are properly addressed, the measurement error, data input error, respondents misunderstanding or misinterpretation and so forth are reduced. The measurement error is minimized when the observed numbers accurately represent the characteristics being measured (Hair et al. 2003). Thus, an essential part of empirical study is to maximize the reliability and validity of study measures. This study however follows two type of validity namely, content validity and construct validity.

For the content validity, an extensive literature search was carried out and a group of experts were consulted in order to ascertain the validity of the contents in
the questionnaire and the model of the study. Thus, the study questionnaire was distributed among the senior and experienced researchers for validation and suggestful comments. Also, a pre-test pilot study was conducted among the Islamic banks staff. 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. The EFA (exploratory factor analysis) was performed using SPSS version 21 while the CFA (confirmatory factor analysis) was tested using the structural equation modelling using the AMOS software version 19.

9. DISCUSSIONS

9.1 Assessing the Validity and Reliability for a Pooled Measurement Model

Thus after the conclusion of the CFA procedure for every measurement model, the next step is to compute certain measures which indicate the validity and reliability of the construct and summarize them in a table. However, it should be noted that the assessment for undimensionability, validity and reliability for measurement models is required before modelling the structural equation model. The following reveals the procedure of the CFA in steps.

i. Undimensionability: The item was achieved through item deletion and multi-collination between the items in various constructs with a low factor loading. This process was however repeated until the fitness indexes were achieved.

ii. Validity: This requirement was achieved through a convergent validity of an AVE ≥ 0.50, construct validity to ensure all fitness indexes for the models meet the required level and a discriminant validity in which redundant items were deleted and some were multi-collinated (as shown in table 2 below).

iii. 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 hypothesis were analyzed using a structural equation modelling with the help of the AMOS (version 21) software. The path coefficients in the structural model are interpretable as $\beta$-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 undimensionality of the constructs, with a Cronbach’s alpha of 0.6 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 with the squared correlations between the constructs (in table 2). Results revealed that the discriminant validity was satisfactory because the AVE’s were higher than the correlations.

Figure 1 shows the relationship or the direct effect of the independent construct sophisticated strategic information systems (SSIS) on the construct cost based strategic performance (CBSP). The standardized beta estimate is $0.76 (\beta=0.76, p < 0.1)$ 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, sophisticated strategic information systems (SSIS) and the dependent construct, strategic performance (SP). Also, the standardized beta estimate for the relationship between sophisticated strategic information systems and flexibility based strategic performance is $0.81 (\beta=0.81, p <$
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 analysis their relationships in the structural equation modelling we found that there is a significant relationship between the constructs as the beta estimate was 0.76 and 0.81 respectively.

Table 1: The CFA results for the measurement model

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Factor loading</th>
<th>Cronbach’s Alpha (Above 0.7)</th>
<th>CR (Above 0.6)</th>
<th>AVE (Above 0.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSIS</td>
<td>SSIS1</td>
<td>This item was deleted due to a low factor loading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS2</td>
<td>0.84</td>
<td>0.939</td>
<td>0.934</td>
<td>0.640</td>
</tr>
<tr>
<td></td>
<td>SSIS3</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS4</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS5</td>
<td>0.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS6</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS7</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS8</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSIS9</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FBSP</td>
<td>FBSP1</td>
<td>This item was deleted due to low factor loading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FBSP2</td>
<td>0.87</td>
<td>0.870</td>
<td>0.963</td>
<td>0.742</td>
</tr>
<tr>
<td></td>
<td>FBSP3</td>
<td>0.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FBSP4</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FBSP5</td>
<td>0.89</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>FBSP6</td>
<td>0.90</td>
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<tr>
<td></td>
<td>FBSP7</td>
<td>0.82</td>
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<tr>
<td></td>
<td>FBSP8</td>
<td>0.82</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FBSP9</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FBSP10</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBSP</td>
<td>CBSP1</td>
<td>0.80</td>
<td>0.959</td>
<td>0.958</td>
<td>0.741</td>
</tr>
<tr>
<td></td>
<td>CBSP2</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBSP3</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBSP4</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBSP5</td>
<td>0.92</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>CBSP6</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBSP7</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBSP8</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 indexes for the models meet the required level and a discriminant validity in which redundant items were deleted and some were multi-collineated. 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

<table>
<thead>
<tr>
<th>Construct</th>
<th>FBSP</th>
<th>SSIS</th>
<th>CBSP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Standardized regression weights for the direct effect of SSIS on CBSP and FBSP

<table>
<thead>
<tr>
<th>Construct</th>
<th>Path</th>
<th>Construct</th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P-Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost based strategic performance</td>
<td></td>
<td>Sophisticated strategic information system (SSIS)</td>
<td>0.76</td>
<td>0.66</td>
<td>12.429</td>
<td>***</td>
<td>Significant</td>
</tr>
<tr>
<td>Flexibility based</td>
<td></td>
<td>Sophisticated strategic</td>
<td>0.81</td>
<td>0.061</td>
<td>14.351</td>
<td>***</td>
<td>Significant</td>
</tr>
</tbody>
</table>
Table 2 above is the tabular representation of the relationship between the independent construct, sophisticated strategic information systems (SSIS) and the dependent construct, strategic performance (SP). Thus, after analysis their relationships in the structural equation modelling (as depicted in figure 1 above) we found that there is a significant relationship between the constructs as the beta estimate was 0.76 and 0.81 respectively. The direct effect which was measured through beta coefficient was significant and hence supports the hypothesis of the study.

CONCLUSION
The study therefore comes to conclude that strategic information systems sophistication has an impact on the strategic performance of Islamic banks. However, unlike previous or related studies, this study is an exception in terms of its major contribution, as it used a second generation method of data analysis (SEM) to analyze the relationships between the latent constructs of the study. Thus, among the key findings of the study is that flexibility based strategic performance is more likely to be achieved if there is an effective and efficient utilization of sophisticated strategic information system in the Islamic banks, as indicated by the beta estimates.

Theoretical and Practical Implications
Several studies have been conducted in examining the impact or relationship of strategic information systems on strategic performance. In this study, we examined the relationship between sophisticated strategic information systems, user information systems expertise and strategic performance in the Islamic banking sector, a subject not yet explored. We showed that there is a strong and positive relationship between sophisticated strategic information systems and strategic performances in an organization and hence the executives, managers and other stakeholders in the Islamic bank must be aware of the impact of strategic information systems sophistication and how it affects performance. Moreover, leaders must also be aware of the relevance of training sessions for employees in order to improve their technical IT skills and expertise in the usage of more advanced and sophisticated strategic information systems. Conclusively, if proper utilized, strategic information systems will give the Islamic banks the ability to gain a competitive advantage and to be able to differ from competitors.

Limitations
Just like any empirical study, this study also has its limitations. The first is related to the nature of the sample of the study. Thus, we recommend that our findings to be replicated across a sample of organizations as this study only restricted its findings within the context of the Islamic banking industry. Also, it would be important to exploit a larger sample, that constitutes more number of Islamic banks that operate internationally. The study also failed to distinguish which of the measures of strategic performance is more related to information systems sophistication. Finally, our study is 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 suitable to use technical IT skills to measure the strategic performance.

**DIRECTION FOR FUTURE RESEARCH**

Thus, more number of banks can be included in future research. Also, future researchers can focus on the relationship between sophistication of the strategic information systems and the competitive strength financial performance and other strategic management issues such as decision making of the Islamic banks as this study only focused on strategic performances. Notwithstanding, this study was conducted within Kuala Terengganu and hence, future researchers can broaden the study to encompass the whole of Malaysia and as well explore other industrial sectors like the takaful industry or the tourism industry.

**REFERENCES**


