Business Process Reengineering and Quality Performance in the Islamic Banks: The Information Technology as a Moderator

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***Abstract*— One of the critical challenges of business world is to manage change. This rapid rate of change has forced many companies to radically improve its business processes or better known as business process reengineering (BPR). Financial sector is one of the main drivers in economy in any nation and has been experiencing drastic change in its operations. This paper examines the effectiveness of business process reengineering (BPR) and the moderation role of information technology (IT) capability on the performance of Islamic bank in Malaysia. BPR dimensions namely change management, strategy alignment, management commitment, customer focus, IT investment, process redesign, adequate financial resource and less bureaucratic structure are investigated to observe their effects on the Islamic banks' performance. The performance of Islamic bank is unique because it is based on three main quality aspects which include (1) educating individual, (2) public interest, and (3) establishing justice. However, in our case, the performance is measured by the cost spent by the banks to fulfill those three quality aspects. The direct relationship and moderation effects were analyzed using the Partial Least Square (PLS) structural equation modeling. Collectively, the results show the effect of BPR dimensions particularly change management and less bureaucratic sturucture on the performance of Islamic banks. The moderating effect of IT capability, however, is insignificant. The outcome of this study provides the important insights to both managers and researchers for further understanding of BPR factors particularly on the Islamic bank's performance.**

***Keywords*—** *Business Process Reengineering, quality performance, Islamic bank, Information Technology capability*

1. Introduction

The progressive globalization of financial markets requires banks to change their operational processes to better meet the global competitiveness. To survive in this environment, banks in the developing countries need to improve their customer service quality, speed of delivery, operating costs, and ultimately profitability performances. As a result, the focus is no longer on cutting costs alone, but simultaneously the emphasis is also on improving services to customers. These objectives, in fact, require radical improvement on the business processes or better known as the business process reengineering (BPR).

The literature on BPR implementation is widespread with lack of thorough empirical evidence of BPR impact on quality performance. Hence, there is a need to relate factors that contribute to quality performance within the context of other variables that also affect performance [1]. In the meantime, the financial service industry is one of the early adopters of new information technology to improve its performance. However, previous findings on the role of IT capability on the firm performance is inconclusive particularly in the banking sector [2]. Hence, the main objective of this study is to examine the effectiveness of business process re-engineering (BPR) and the role of information technology (IT) capability on the quality performance of Islamic bank in Malaysia.

1.1 Malaysian Islamic Banking Sector

Islamic banking in Malaysia began in September 1963 when Perbadanan Wang Simpanan Bakal-Bakal Haji (PWSBH) was established. PWSBH

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was set up as an institution for Muslims to save for their Hajj (pilgrimage to Mecca) expenses. In 1969, PWSBH merged with Pejabat Urusan Haji to form Lembaga Urusan dan Tabung Haji (now known as the Lembaga Tabung Haji).

The National Syariah Advisory Council additionally has been developed as the advisor for the Bank Negara Malaysia (BNM) on the *Shari'ah* aspects of the operations of the Islamic banking institutions, as well as on their products and services. In 2006, Bank Negara Malaysia has setup International Centre for Education in Islamic Finance (INCEIF) a dedicated University to provide skilled and certified personnel for Islamic Finance in Malaysia. The university was established as part of the Malaysian Government's initiative to further strengthen the country's position as an international Islamic finance centre. It is the only university in the world that is wholly dedicated to postgraduate study in Islamic Finance.

The first Islamic bank in Malaysia was established in 1983. In 1993, commercial banks, merchant banks and finance companies were allowed to offer Islamic banking products and services under the Islamic Banking Scheme (IBS). These institutions, however, are required to separate the funds and activities of Islamic banking transactions from that of the conventional banking business to ensure that there would not be any co-mingling of funds. In the early implementation period of Islamic banking in Malaysia, the performance was lower than conventional banks [3]. Nevertheless, the industry has progressively grown from year to year [4]-[5]. The development of banking industry that is based on *Shari'ah* principle in Malaysia is supported by the government of Malaysia and contributed by the aspiration to develop a strong Islamic banking in the region [6].

Today, Malaysia has been successful in implementing a dual banking system and able to obtain a full-fledged Islamic banking system operating side by side with the conventional banking system. It has been the Government's aspiration to develop the country as the capital or hub of Islamic banking worldwide [7]. Under the Economic Transformation Programs (ETP), the Malaysian Government and Bank Negara Malaysia (BNM) predicted that the Islamic banking sectors would achieve more than 40% of growth by the year 2020 [8].

Recognizing the importance of this sector to the country, Islamic banks are expected to be flexible, being fast in taking actions, and responsive to the customers. A study emphasized that Malaysian banking industry should increase the speed, deliver high quality outputs and reduce its operating cost in order to survive [9]. BPR is the way to achive this objectives.

2. Business Process Reengineering and Quality Performance

BPR gained immense and unexpected popularity [10]-[11]. The BPR concept was also introduced in Malaysia in the 1990s and gained popularity when Malaysia's famous Vision 2020 was revealed by the former Prime Minister, Tun Dr. Mahathir Mohammad in the year 1994. Malaysian government has successfully implemented many reengineering projects such as MyKad - a multipurpose digital application card for all citizens over the age of 12, Public Services Network (PSN) – an online network application system that enables user to make payment or renewal of various Government agencies' services at the Post Offices and E-Government (began in 1997 with the launch of the Multimedia Super Corridor's (MSC) E-Government Flagship Application) for the sake of the public and the country by changing the way government interacts with citizens and businesses through new ways of the government's operations.

Business Process Reengineering can be defined as "the analysis and design of workflow and processes within and between organizations" [12]. BPR has three key targets, namely:

1. Customer Friendly: To get a competitive edge and that can only be gained by providing the customers more than what the others in the market are asking for.
2. Effectiveness: How effective is the product or service that the business or manufacturing company is providing the customer?
3. Efficiency: How efficient is the company that is providing the product/services before introducing it to the market to minimize costs? Efficiency is not just about being efficient at the production floor level but also at the management level.

In addition, the rapidity of technological change also promotes innovation and improvements in business processes. Through advanced technology, companies are able to diminish the time available to develop new products and introduce them to the market.

BPR helps banks to deal with new economic challenges and change the traditional processes to improve their customers' satisfaction. In this study,

BPR are operationalized by eight dimensions, namely: (1) change management, (2) strategy alignment, (3) top management commitment, (4) customer focus, (5) IT investment, (6) process redesign, (7) adequate financial resource, and (8) less bureaucratic structure. These dimensions are expected to improve the overall quality performance.

With regards to the performance measurement, previous studies were more focusing to cost reduction, productivity, quality, process improvement, speed, employee satisfaction, service performance, environment protection, customer service performance, operations efficiency, financial profitability and customer satisfaction. Nevertheless, the current study measures the Islamic banking performance using the *Maqasid al-Shari'ah* Framework [13]-[14]. Measuring the performance based on the *Shari'ah* principle is better than common measurement because the Islamic principle further emphasizes the profit and loss sharing and it prohibition of the collection of interest[4]. Hence, this study is interested to study about the relationship between BPR dimensions, IT capability and performance of Islamic banking in Malaysia based on this quality performance or better known as *Maqasid al-Shari'ah* perspective. Note that from this perspective, the performance is operationalized as costs improvement rather than profitability.

The above argument leads to the following hypothesis:

H1: BPR has a significant effect on the quality performance.
H1a: Change Management has a significant effect on the quality performance
H1b: Strategic Alignment has a significant effect on the quality performance
H1c: Top Management Commitment has a significant effect on the quality performance
H1d: Customer Focus has a significant effect on the quality performance
H1e: IT Investment has a significant effect on the quality performance
H1f: Process Redesign has a significant effect on the quality performance
H1g: Adequate Financial Resource has a significant effect on the quality performance
H1h: Less Bureaucratic Structure has a significant effect on the quality performance

2.1 IT Capability as a Moderator

Reengineering of operational processes undertaken in the banks should be handled by the project management expertise within the IT department. The IT capability includes both the technical and managerial expertise required to provide reliable physical services and extensive electronic connectivity within and outside the firm. IT increases the market share of the bank through offering a product or service that is not offered by others, e.g., those customers who prefer private/personalized services or use of debit cards have become the focus of retail and investment in banking.

The application of IT capability is to enhance the service-delivery process, produce new products, processes, strategy, and work faster, eliminate all communication barriers within the organization, and empower workers to link up with customers and suppliers to achieve the competitive advantage.

IT in banking sector is an important tool that helps to streamline the back-office operations by improving both efficiency and cost reduction. Advances in technology also influence the way banks' services are delivered with the aim of making them more convenient for customers. For example, many banks have their branches connected online real time (24/7). Banks also practice e-banking, telephone, and mobile services, money transfer services through MoneyGramme, and Western Union Money transfer. Moreover, the IT capability has also resulted banks to participate more effectively in the financial service arena. For instance, some organization can access international banking networks for efficient fund transfers, open, amend, and negotiate letters of credit, and retrieve up to date status of customer transactions between the banks that joined the Society for Worldwide Inter-bank Financial Telecommunication (SWIFT). In other words, IT capability plays major role in delivering their services to the banks' customers.

Hence, we hypothesized that:

H2: IT Capability moderates the relationship between BPR dimensions and Quality performance.
H2a: IT Capability moderates the relationship between Change Management and Quality performance.
H2b: IT Capability moderates the relationship between Strategic Alignment and Quality performance.
H2c: IT Capability moderates the relationship between Top Management Commitment and Quality performance.

H2d: IT Capability moderates the relationship between Customer Focus and Quality performance.
H2e: IT Capability moderates the relationship between IT Investment and Quality performance.
H2f: IT Capability moderates the relationship between Process Redesign and Quality performance.
H2g: IT Capability moderates the relationship between Adequate Financial Resource and Quality performance.
H2h: IT Capability moderates the relationship between Less Bureaucratic Structure and Quality performance.

3. Methodology

This is a cross sectional descriptive and causal research. Descriptive research was undertaken to identify the implementation level of BPR and IT capability of the Islamic banks. The causal research or hypothesis testing was further conducted to examine the relationships between the exogeneous and the endogeneous variables.

Questionnaire method was adopted for data collection. These questionnaires were distributed to managers of Islamic banks. The study used the organization as the unit of analysis. The population of the study is the Islamic banks Headquarters (HQs) in Malaysia. A total population of sixteen (16) organizations participated in the Islamic banking scheme (Islamic full-pledge & Islamic window of conventional bank) registered with the Bank Negara Malaysia. Four questionnaires were distributed for each bank. A total of 64 questionnaires were distributed to all Islamic banks headquaters. The respondents were those managers in the position of top managerial levels who were deemed knowledgeable on the subject matter.

We used Partial Least Squares (PLS), SmartPLS 3.0 technique to analyze the causal relationships among major constructs. The reason for choosing the PLS analysis was due to the fact that it can analyze all paths at once, particularly on the moderation effect. In addition, the bootstrapping method was used to derive the statistical significance. The size of sub-samples to run bootstrapping technique was based on the suggestion by Hair, Hult, Ringle and Sarstedt [15].

4. Findings

4.1 Descriptive statistics

Out of the 64 distributed questionnaires, only 35 sets were used for further analysis. The descriptive analysis showed that there were 51.4% male respondents and the remaining 48.6% were female respondents. All respondents had significant experience in BPR projects in their career life in the banking sector. In terms of their positions, 37.1% held the position of the executive director/general manager, 5.7% as the deputy general managers, 40% as the senior managers, and 17.1% as the head of department. Finally, the respondents were also asked on the objective of BPR at their banks. The findings showed that 31.4% of the BPR projects was aimed to increase revenue, 28% to improve quality services, 14.3 % to react to competitive pressure, 14.3% to reduce costs, and 11.4% to proactively prepare organization for the future.

4.2 The BPR implementation in the Islamic banking sector

Table 1 shows the means and standard deviations of all dimensions of the BPR implementation. All items were measured on a six-point scale. The mean scores for lean practices were found to be ranged from 4.62 to 4.76 points. The highest level of BPR implementation could be seen in terms of the strategic alignment, while the lowest was the change management and adequate financial resources.

Table 1: The level of BPR implementation

Dimensions	Mean	Standard Deviation
1. Change Management	4.62	.39
2. Strategy alignment	4.76	.52
3.Management Commitment	4.74	.50
4.Customer Focus	4.64	.45
5. IT Investment	4.63	.43
6. Process redesign	4.57	.37
7. Adequate Financial Resources	4.62	.34
8. Less Bureaucratic Structure	4.55	.51

The following sections will answer the remaining of our research objectives. In doing so, we divide

our findings into two sections, namely (1) measurement model and (2) structural model.

4.3 Measurement model

Figure 1 shows the overall results for our hypothesized model. A good model fit in PLS depends on several factors such as (1) the availability of the significant path coefficients, (2) acceptable R^2 values, and (3) good construct reliability [16]. Our results as shown in Figure 1 showed that all path coefficients were statistically significant. The R^2 values were 63.7% for path BPR dimensions and quality performance. The R^2 value above 26% is considered substantial [17]. Thus, we can conclude that our model was a highly acceptable model.

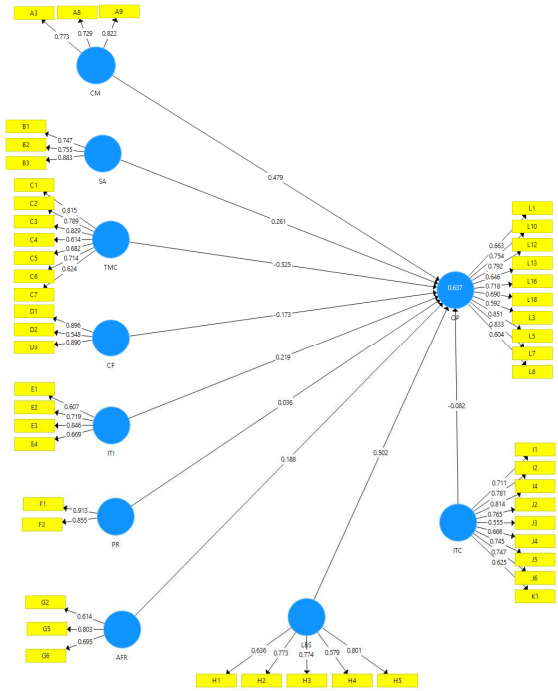

Figure 1: Hypothesized model structure and results

The composite reliability (CR) and average variance extracted (AVE) were used to assess the reliability of the constructs. Table 2 shows the results of the analysis. Composite reliability is recommended to be higher than 0.7 [18]. Our CR values for the the eight constructs were all above the recommended 0.7 level. The values of the Cronbach's alpha (α) for the constructs were also above 0.7 except for variable adequate financial resource. The AVE, on the other hand, denotes the amount of variance that a construct captures from its indicator relative to the amount due to measurement error [19]. The recommended critical value for AVE is 0.5 [18]. In our case, the AVE values were also above the recommended value of 0.5. In addition, the convergent validity was also assessed through the loadings of each indicator. The standardized loadings should be greater than 0.7 [15]. As shown in Table 2, the loadings were above the cut-off point except for the following varibles: C4, C5, C7, D2, E1, E4, G2, H1, H4, J3, J4, K1, L1, L3, L8, L13 and L18. We decided to maintain these indicators since the AVEs for the particular variables were above the threshold of 0.50.

Table 2: Convergent validity and reliability of the constructs

Latent variable	Indctr	Loadings	AVE	CR	α
Change Management (CM)	A3	0.77	0.60	0.82	0.70
	A8	0.73			
	A9	0.82			
Strategic Alignment (SA)	B1	0.75	0.64	0.84	0.71
	B2	0.76			
	B3	0.88			
Top Management Commitment (TMC)	C1	0.82	0.53	0.89	0.86
	C2	0.79			
	C3	0.83			
	C4	0.61			
	C5	0.68			
	C6	0.71			
	C7	0.62			
Customer Focus (CF)	D1	0.90	0.63	0.83	0.71
	D2	0.55			
	D3	0.89			
IT Investment (ITI)	E1	0.61	0.51	0.81	0.70
	E2	0.72			
	E3	0.85			
	E4	0.67			
Process Redesign (PR)	F1	0.91	0.78	0.88	0.73
	F2	0.86			
Adequate	G2	0.61	0.50	0.75	0.50

Financial Resources (AFR)	G5	0.80			
	G6	0.70			
Less Bureucratic Structure (LBS)	H1	0.64	0.52	0.84	0.78
	H2	0.77			
	H3	0.77			
	H4	0.58			
	H5	0.80			
Information Technology Capability (ITC)	I1	0.71	0.51	0.90	0.88
	I2	0.78			
	I4	0.81			
	J2	0.77			
	J3	0.56			
	J4	0.67			
	J5	0.75			
	J6	0.75			
	K1	0.63			
Quality performance (OP)	L1	0.66	0.52	0.91	0.89
	L10	0.75			
	L12	0.79			
	L13	0.65			
	L16	0.72			
	L18	0.69			
	L3	0.59			
	L5	0.85			
	L7	0.83			
	L8	0.60			

Next, we assessed the discriminant validity through the cross loadings and the relationship between correlations among constructs and the square roots of AVE [18]-[19]. Table 3 shows the results of the analysis. The cross loadings exhibited adequate levels of discriminant validity as the square roots of AVE (bold in diagonal) were greater than the correlations among the constructs (off diagonal values).

4.4 Structural model

Table 4 summarizes the results of the structural model. First, there were mix results found based on the standardized path coefficient of the BPR dimensions. Two relationships were found to be significant, namely change management (0.48; t >1.65) and less bureaucratic structure (0.48; t >2.33). The other hypothesized relationships were found to be insignificant. Hence, these results only support our *H1a and H1h*. In other words, change management and less bureaucratic structure would have positive effects on the performance of the Islamic banks.

4.5 Moderating role of IT Capability

We followed the suggestion of Chin, Marcolin and Newsted in assessing the moderating role of IT Capability in the relationships between BPR dimensions and quality performance [20]. Eight interaction terms for each exogeneous variable were created and tested. The findings of PLS Algorithm are shown in Figure 2. In the moderation analysis, the R^2 change is important. Recall the R^2 for the main effect model was 0.637 and the interaction effect above had change the R^2 to 0.729. Hence, the R^2 change was 9.2%. The effect size (f^2) was 0.339 which deemed to be relatively large [17].

Next, we tested the significance of the interaction effects by running the bootstrapping procedure. The results were shown in Table 5. The findings showed that all hypothesis on the mediation were not supported as the t-value for all hypothesized relationships were less than 1.65. Hence, we can conclude that IT Capability has no moderating effect on the organizational performane of Islamic banks.

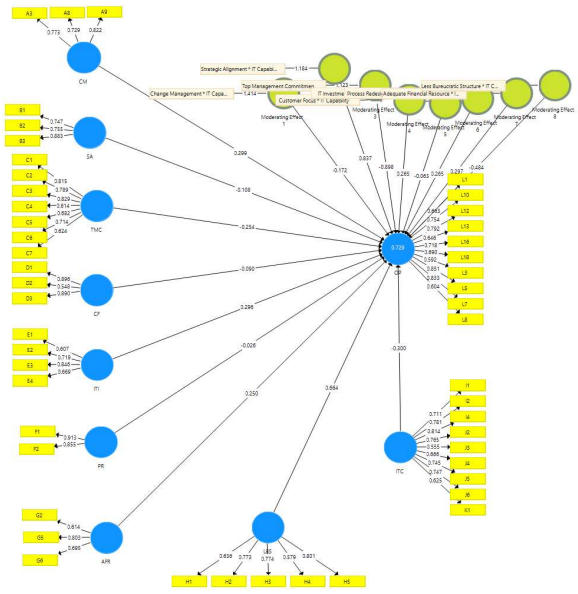

Figure 2: PLS-SEM Algorithm

Table 3: Discriminant validity of constructs

	Change Management	Strategic Alignment	Top Management Commitment	Customer Focus	IT Investment	Process Redesign	Adequate Financial Resource	Less Bureucratic Structure	IT Capability	Quality performance
Change Management	**0.776**									
Strategic Alignment	0.679	**0.797**								
Top Management Commitment	0.605	0.888	**0.728**							
Customer Focus	0.431	0.374	0.421	**0.795**						
IT Investment	0.658	0.536	0.568	0.513	**0.716**					
Process Redesign	0.434	0.441	0.291	0.287	0.521	**0.884**				
Adequate Financial Resource	0.390	0.555	0.613	0.230	0.491	0.324	**0.708**			
Less Bureucratic Structure	0.345	0.586	0.584	0.280	0.302	0.255	0.360	**0.718**		
IT Capability	0.454	0.615	0.605	0.197	0.561	0.230	0.521	0.557	**0.716**	
Quality performance	0.632	0.535	0.417	0.200	0.503	0.440	0.415	0.562	0.453	**0.719**

Table 4: Structural model results

Path	Beta	t-value	Decision
Change Management -> Quality performance	0.48	1.97	**Supported**
Strategic Alignment -> Quality performance	0.26	0.63	Not Supported
Top Management Commitment -> Quality performance	-0.53	1.24	Not Supported
Customer Focus -> Quality performance	-0.17	0.85	Not Supported
IT Investment -> Quality performance	0.22	0.85	Not Supported
Process Redesign -> Quality performance	0.04	0.18	Not Supported
Adequate Financial Resources -> Quality performance	0.19	0.92	Not Supported
Less Bureucratic Structure -> Quality performance	0.50	2.74	**Supported**
IT Capability -> Quality performance	-0.08	0.35	Not Supported

Table 5: Results of the moderator analysis

Hypothesis	Relationship	Std Beta	t-value	Decision
H2a	Change Management* IT Capability > Quality performance	-0.17	0.03	Not Supported
H2b	Strategic Alignment*IT Capability > Quality performance	0.84	0.06	Not Supported
H2c	Top Management Commitment* IT Capability > Quality performance	-0.90	0.09	Not Supported
H2d	Customer Focus*IT Capability > Quality performance	0.27	0.10	Not Supported
H2e	IT Investment* IT Capability > Quality performance	-0.06	0.02	Not Supported
H2f	Process Redesign*IT Capability > Quality performance	0.27	0.02	Not Supported
H2g	Adequate Financial Resources*IT Capability > Quality performance	0.30	0.04	Not Supported
H2h	Less Bureucratic Structure*IT Capability > Quality performance	-0.48	0.12	Not Supported

5 Discussion and Conclusion

In general, BPR has a significant relationship with the organizational performance [9]-[21]-[22]-[23]. However, our findings show that only change management and less bureaucratic structure have significant effects on the Islamic banks' performance. The other variables do not statistically affect the performance. Even though, most of the variables are found to be insignificant, our findings highlight the importance of change management program before and after any BPR project implementation. Firstly, most of the BPR projects are not successful because of there is lack of proper planning before the project implementation. Furthemore, the importance of managing people's resistance is always taking for granted. This is what change management is all about. Secondly, the organizational structure is also critical for the BPR project success. This finding concurs with the previous findings [24]-[25]. In fact, less bureaucracy will encourage innovativeness in the organizations [26].

Next, although the change of R^2 by introducing IT capability is large, we have found that IT capability does not play any role as a moderator for all the relationships between BPR dimensions and the quality performance. In other words, the capability of Information Technology somehow has an effect, however, the effect is not strong enough to significantly improve the banks' performance. Further studies should be carried out to investigate the role of IT in enhancing the quality performance.

Finally, several limitations of the study must be noted. This study is done on a full-fledge Islamic banking as well as the Islamic window of conventional banks, hence, the sample is rather small. Generalization in a larger context must be done with caution. We recommend further investigations with a larger sample in the future.

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