An Empirical Study of Business Process Modelling and Business Performance in the Mobile Service Industry

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Abstract
Previous research discussed the guidelines for creating a good business Process Model (PM), the critical success factors of business PM and the importance of the links between IT and business alignment and business performance, Business Process Reengineering (BPR) and business performance, security, trust and customer satisfaction and customer loyalty. However, no previous study has attempted to empirically demonstrate the relationship between creating a good business PM, service quality, business process time, business process cost and customer satisfaction.
Thus, this paper aims to investigate if creating a good business PM has an impact on business process performance. An empirical analysis based on data from 130 business and IT managers is used to evaluate the hypotheses that creating a good business PM positively impacts service quality, business process time, business process cost and customer satisfaction. The results were subjected to reliability and validity analyses. Bivariate correlation analysis and multivariate multiple linear regression analysis were used to test five hypotheses. The results confirmed that creating a good business PM has a positive impact on business process performance.

Keywords:
Business process modelling (PM); Business Process Reengineering (BPR); Alignment; Security; Customer Power; Business Performance; Service Quality; Customer Satisfaction; Survey research

1. Introduction

A process is a major element of a business which is made up of several business activities and procedures that work together to achieve business goals. The literature indicates that many information systems fail due to a lack of information on business processes where the system is going to be used. As a result, business performance suffers [1]. The Standish Group conducted a study on the success of information systems within the business organisational sector and according to the results, only 29% of information systems successfully fulfil business demands, while 53% were found to perform poorly and 18% completely failed to achieve their objectives. However, managing business processes (BPs) is a critical task which requires continual improvement and rapid updating [2].

Business Process Modelling (PM) is a well-accepted method within the business organizational sector for structuring BPs [3]. There are many techniques and methods available, such as Business Processes Management Notation (BPMN) [4], Business Process Execution Language (BPEL) for Web Services [5], *i** modelling language [6], etc.

A number of existing studies has examined what exactly constitutes business PM, and a thorough description has been given on business PM definitions, business PM standards, tools and techniques, business PM challenges and organisational processes, the critical success factors of business PM and other issues related to business PM [7-8]. Furthermore, the previous research also discussed the guidelines for creating a business PM [9-10], and the link between IT business alignment and business performance [11], BPR and business performance [12], security, trust and customer satisfaction [13] and time, cost, service quality, customer satisfaction and customer loyalty [14-15]. However, no previous study has attempted to empirically demonstrate the relationship between creating a good business PM, service quality (SQ), business process time (BPT), business process cost (BPC) and customer satisfaction (CS).

As a consequence of the success of the first research survey on business PM dimensions in Saudi Arabian telecommunication companies, we decided to deepen our research and explore the connections and links between our research areas: creating a good business PM and the business performance concepts: SQ, BPT, BPC and CS.

The results were subjected to reliability and validity analyses. Bivariate correlation analysis and multivariate multiple linear regression analysis were used to test five hypotheses. The results confirmed that creating a good business PM has a positive impact on business process performance.

This paper is developed over the following sections. Section 2 presents a research framework and the main issues of business PM, based on the literature review. Also, the hypotheses are generated in advance of the study to be tested against the data collection. Section 3 describes our methodology, including the measurement of the variables and sampling and data collection procedures. Section 4 presents construction validity and reliability of the variables. Section 5 presents a discussion of the results of the descriptive statistics obtained from the bivariate correlation analysis and

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multivariate multiple linear regression analysis. Finally, section 6 presents the conclusion and future research.

2. Theoretical Background & Research Framework

The following areas were considered for the purposes of this paper:

- Creating a good Business PM: Business PM should ensure better alignment between business and IT staff, be secure, manage rapidly changing BPs and the business environment, manage customer power, be easily reengineered and easily derive IT goals from business goals.
- Business Performance: This includes SQ, BPT, BPC and CS.
- SQ: This involves following up on the customers' requests in a timely manner, providing outstanding assistance to customers and responding to the customers' complaints promptly.
- BPT: This involves reducing the time that the customer has to wait to be served and improving company's service time.
- BPC: This involves offering a reasonable price and offering a competitive service and price compared to other companies.
- CS: This involves meeting the customers' expectations and the company being the customer's first choice.

2.1 Research Framework

Figure 1 presents our research framework and illustrates the most important relationships between the different elements required for creating a good business PM as described in the literature. The concept of creating a good business PM is studied in connection with business performance areas: SQ, BPT, BPC and CS.

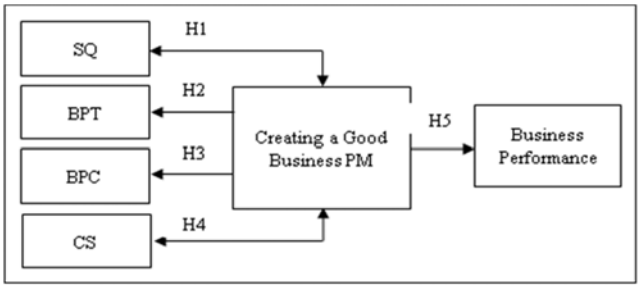

Fig. 1. Conceptual Research Framework.

2.2 Creating a Good business PM

Business PM is a management discipline that supports organizational processes using different methods, techniques and software tools to control and analyse organizational processes and activities, which includes people, organizations, applications, documents and other related information. This definition supports all business process modelling-related components, as well as defines how to analyse business components, and highlights the importance of business PM in the organization's success [16].

The implementation of good business PM has many advantages, such as improving business performance, directly involving the employees from the beginning of the modification of the BP to ensure they understand and support the redesign of the BP, and identifying erroneous models [17-18]. However, the literature shows that business PM faces many challenges, as shown in table 1.

One of the major challenges of business PM is that the business environment and BPs can change rapidly [2]. Hammer and Champy (1993) found that the business environment can be affected by several forces. Firstly, customers assume that they are in control instead of the product or service provider. Customers tell the product or service provider what kind of products they require, when they need them, how much they can pay and how. Secondly, competition between companies is stronger [19].

Table 1: Challenges of Business PM.

Challenges	Descriptions	References
People with different skills and background.	People working on BPs are not the same people working in software engineering to develop the system.	[19]
Misalignment between business strategies and IT.	The lack of alignment or misalignment between business strategies and IT results in the business failing to use the available IT support.	[20]
Driving IT goals from business goals.	It is not easy to drive IT goals from business goals.	[21]
Security.	Integrating security into a developed business PM is not very well understood.	[15]
Manage BPs	IS managers view business PM from a technical perspective and senior executives view business PM from a business perspective.	[22]
Business Process Reengineering (BPR)	BPR is one of the main challenges in business PM since the system's lifecycle is not the same in terms of evolution and IT used.	[23]
Business environment changes rapidly	The environments can be affected by several forces, such as the customers assume they are in control instead of the product or service provider. .	[5]
BPs change rapidly.	The transition from one BP stage to another BP stage can be slow and can contain faults.	[2]
Manage customer power.	Flexibility is an important attribute for businesses in order to deal with rapid changes in the business environment and manage customer power	[1]

Furthermore, the transition from one BP stage to another BP stage can be slow and error prone. Change management is very important in order to decrease the costs and risks and to obtain an advantage from changing IT and business strategies. For complex systems, it is impractical to modify them; rather, they need to be totally reworked in order to meet the system

requirements. Hence, it is essential to consider the rapidly changing requirements of BPs in a BPMS.

It is important to develop a strong link between the information system (IS) and information technology (IT) and the business PM in order to support, mirror and automate BPs. However, there are several challenges to creating a good business PM to manage BPs and IS/IT. Furthermore, it is very complicated to specify IT development requirements.

The alignment of IT with underlying BPs is one of the main challenges of business PM. Commonly, the people who work in the BPs are not the same people who work in software engineering to develop the system. Studies show that the lack of alignment or misalignment between business strategies and IT results in the business failing to use the available IT support. However, several organisations have successfully aligned business strategies and IT service performance [24-25].

Another challenge facing business PM is that IS managers view business PM from a technical perspective and senior executives view business PM from a business perspective. For instance, the aim of the technical management of software and IS is to maximize the transaction system throughput while the objective of senior executives is to maximize the profits of the transaction system [26].

It is very difficult to manage BPs as they change rapidly. Also, any BP involves people from different backgrounds, such as business or IT, and also involves difficult and comprehensive organizational analyses. It is very hard to find one person with a complete understanding of every system process because each person in the system is usually only familiar with one area of the overall system. For example, the IS team lacks BP knowledge and the BP team lacks IS knowledge. Furthermore, communication between IS and BPs teams is very complicated because their different experiences, culture and skills. Moreover, the number of model designers and users has increased dramatically, especially representatives from different IT and business departments who may not be fully involved in the business PM design [27].

Business Process Reengineering (BPR) is one of the main challenges in business PM since the system's lifecycle is not the same in terms of evolution and the IT used. When organizations require their system to be reengineered, the business PM tiers, which are business tier, IS tier and workflow tier should be totally analysed and granted the same weight. Hammer and Champy (1993) consider that IT is the key to enable BPR. However, Davenport et al. (1990) argued that BPR needs to have a wide view of business activities and IT and the relationships between the business activities and IT [19].

Many BPR attempts fail because modification requires IS redesign. For example, Mohsen Attaran conducted a survey on satisfaction in relation to BPR projects, the results indicating that 85% were not satisfied with BPR project outcomes. Another study conducted in the early 1990s found that almost 70% of BPR projects failed or could not be delivered as promised. Therefore, the BPs must be part of IT abilities and IT abilities have to support BPs [2].

Security plays a crucial role in business PM. However, the literature shows that it is quite challenging to add security into BPs for several reasons. Firstly, the integration of security into a developed business PM is not very well understood. Secondly, security properties are complicated and error-prone when integrated by hand. Furthermore, the lack of experience of IS developers can lead to security leaks. Therefore, IS developers need to have concrete guidelines and appropriate tools to develop secure business PM applications [28].

Managing customer power is one of the challenges to creating a good business PM where the customers' power is characterized in two different ways. First, the customers' power between the customers and suppliers results from the customers' ability to improve their decision position to reduce the price. Second, the customers' power allows the customers to specify their demand and identify their required goods and services. Therefore, managers of well operating organizations always make it a priority to satisfy the customers' needs and demands in order to stay ahead of the competition in the current rapidly changing competitive business environment. Thus, flexibility is an important attribute that businesses should possess in order to deal with the rapid changes in the business environment and manage the customer power [29].

The current literature shows that it is not easy to create a good business PM. Successful business PM should have the ability to:

- ensure better alignment between business and IT staff
- provide security
- manage the rapidly changing business environment
- manage rapidly changing BPs
- manage customer power
- be easy to reengineer
- ensure IT goals can be easily derived from business goals

2.3 Business Performance

Business performance includes the following four concepts: SQ, BPT, BPC and CS.

- ***Service Quality (SQ)***

SQ is an important aspect for firms to maintain a stronghold position and it is a key indicator of business performance in today's competitive environment. It is defined

as the delivery of superior or excellent service which meets customer expectations.

The provision of a service is quite different from the provision of a good or product. It is a process involving a number of intangible activities which normally take place in the interactions between customers and service employees or the system of the service provider as a solution to the customer's problems. Thus, there is a relationship between the customer and service provider where the key issue for the service provider is to use this relationship to manage customers by offering them what they want or need [30].

SQ is subjectively perceived by the customers during their interactions with the company or the service provider. SQ is defined as the customers' judgment of the company's SQ. In other words, it involves determining whether the perceived service exceeds, meets or fails to meet the customer's expectations which can ensure the company's continued competitive advantage.

One of the most commonly used measurement models of SQ is SERVQUAL which measures the difference between customer expectations and: (1) tangibles: the appearance of the physical facilities, employees, equipment and the communication materials from the service provider; (2) reliability: the ability of the service provider to perform the agreed service accurately and dependably; (3) assurance: the employees' knowledge and behaviour to convey confidence and trust; (4) responsiveness: the degree to which the service provider assists the customer and provides services on time; and (5) empathy: the degree to which the service provider provides care to its customers and whether it has suitable working or operating hours.

Another commonly used measurement model of SQ was proposed by Gronroos and uses the following criteria for perceived SQ: (1) employees' attitudes and behaviour; (2) professionalism and skills; (3) accessibility and flexibility; (4) service recovery; (5) reliability and trustworthiness; and (6) reputation and credibility [15].

In our proposed research paper, we tested seven statements on SQ: (1) the employee follows up the customer's request in a timely manner; (2) employees provide high quality assistance to customers (3) employees respond to the customers' complaints promptly; (4) employees provide a very high quality service; (5) employees offer personalized services to meet the customers' needs; (6) customers feel it is safe to use the company's services; and (7) employees can tell customers exactly when the services will be performed.

- ***Business Process Time (BPT)***

Time is a human concept which is commonly accepted in the social sciences. Also, time is a concept which affects the understanding of BPs where from the operational point of view, time is seen as in time-to-market and lead time [31].

There are different situations where customers have to wait to be served, such as waiting for a replying to a service enquiry, waiting to receive a password and username reminder, waiting to receive confirmation for an online transaction and payment and waiting at a check out when making a complex purchase.

Customers often select a service provider based on the perceived time they wait to be served or wait for a delivery. A shipment delay or a wait time which is perceived to be too long may negatively influence their probability of making a purchase whereas customers are attracted by perceived high quality and fast service. Hence, the time perception can influence customer satisfaction. In addition, the BP cycle time is a key success factor for achieving a competitive advantage and its measurement must be considered prior to deciding which is the most appropriate BP change [19].

In our proposed research paper, we tested three statements for BPT: (1) reducing the time that the customer has to wait to be served; (2) having a shorter development cycle time to create a new service; and (3) improving the company's service in a short time.

Business Process Cost (BPC)

Cost is defined as the customer's assessment of the difference between the company's product or service cost and the cost of other comparative companies and whether they feel this is acceptable, reasonable or justifiable where cost is the critical determinant affecting the customers' buying decision. Customers usually select a service provider based on the perceived cost.

The cost presents an image of the product or service, and indicates its uniqueness, quality and value. If customers don't have any experience with the service or product or have insufficient time or interest to evaluate the service or product quality, they are likely to use cost as the assessment tool.

The amount to be paid by customers varies according to their different wants and needs. A cost which is perceived as too high may negatively influence a customer's probability of making a purchase whereas customers are likely to be attracted by perceived high quality services at a perceived competitive price. Hence, cost perception can influence CS [32].

In our proposed research paper, we tested four statements for the BPC: (1) offering a reasonable price; (2) offering a flexible price for different services (Choudhary, 2010); (3) reducing the operational cost; and (4) offering a competitive service and price compared to other companies.

- ***Customer Satisfaction (CS)***

Satisfaction is a multi-dimension construct that is conceptualized as condition of the relationship between the customer and the company. It is usually defined as the full meeting of one's expectations and is measured by the customer's feelings towards the product or services after it has been used. Satisfaction is defined as the overall evaluation based on the total purchase and consumption experience of the target service and product performance compared with repurchase expectations over time.

Usually, CS improves the quality of the relationship between the service providers and customers and increases the probability of a repeated purchase. Furthermore, CS usually results in increased word-of-mouth advertising, sales, profitability, and stock value, decreased complaint behaviour, warranty cost and business risk, and enhanced corporate image [33].

CS is the result of an affective and cognitive evaluation where several evaluations are compared to the perceived performance. When the perceived performance is less than expected, the customers are dissatisfied [34]. However, when the perceived performance exceeds expectations, the customers are satisfied. Increasing CS can improve the company's performance because it leads to a higher customer retention rate and increases customers repurchase behaviour.

The customer's perception of services or products is used to measure CS. Five emotions are perceived by customers as being satisfactory: (1) satisfaction: the service or product can be accepted or tolerated; (2) content: the service or product results in a positive and happy experience; (3) relieved: the service or product can remove a negative state of mind; (4) surprise: the service or product makes the customer surprisingly satisfied; and (5) novelty: the service or product is exciting or novel [35].

In our proposed research paper, we tested four statements for CS: (1) meeting the customers' expectations easily; (2) the customer is satisfied with the service of the employee (3) only receiving a few complaints; and (4) the company is the first choice for customers.

2.4 Exploratory Hypotheses

Based on our proposed research framework, we formulated the following five hypotheses:

H1: A good business PM is positively associated with SQ.
H1-1: A good business PM which results in better alignment between business and IT staff is positively associated with SQ.
H1-2: A secure business PM is positively associated with SQ.
H1-3: A good business PM which can manage the rapidly changing business environment is positively associated with SQ.
H1-4: A good business PM which can manage rapidly changing BPs is positively associated with SQ.
H1-5: A good business PM which can manage customer power is positively associated with SQ.
H1-6: A good business PM which can be easily reengineered is positively associated with SQ.
H1-7: A good business PM where IT goals can be easily derived from business goals is positively associated with SQ.
H2: A good business PM is positively associated with the BPT.
H2-1: A good business PM which results in better alignment between business and IT staff is positively associated with BPT.
H2-2: A secure business PM is positively associated with BPT.
H2-3: A good business PM which can manage the rapidly changing business environment is positively associated with BPT.
H2-4: A good business PM which can manage rapidly changing BPs is positively associated with BPT.
H2-5: A good business PM which can manage customer power is positively associated with BPT.
H2-6: A good business PM which can easily be reengineered is positively associated with BPT.
H2-7: A good business PM where IT goals can be easily derived from business goals is positively associated with BPT.
H3: A good business PM is positively associated with BPC.
H3-1: A good business PM which results in better alignment between business and IT staff is positively associated with BPC.
H3-2: A secure business PM is positively associated with the BPC.
H3-3: A good business PM which can manage the rapidly changing business environment is positively associated with BPC.
H3-4: A good business PM which can manage rapidly changing BPs is positively associated with BPC.
H3-5: A good business PM which can manage customer power is positively associated with BPC.
H3-6: A good business PM which can easily be reengineered is positively associated with BPC.
H3-7: A good business PM where IT goals can be easily derived from business goals is positively associated with BPC.
H4: A good business PM is positively associated with CS.
H4-1: A good business PM which results in better alignment between business and IT staff is positively associated with CS.
H4-2: A secure business PM is positively associated with CS.
H4-3: A good business PM which can manage the rapidly changing business environment is positively associated with CS.
H4-4: A good business PM which can manage rapidly changing BPs is positively associated with CS.
H4-5: A good business PM which can manage customer power is positively associated with CS.
H4-6: A good business PM which can easily be reengineered is positively associated with CS.
H4-7: A good business PM where IT goals can be easily derived from business goals is positively associated with CS.
H5: A good business PM is positively associated with business performance.

H5-1: A good business PM which results in better alignment between business and IT staff is positively associated with business performance.
H5-2: A secure business PM is positively associated with business performance.
H5-3: A good business PM which can manage the rapidly changing business environment is positively associated with business performance.
H5-4: A good business PM which can manage rapidly changing BPs is positively associated with business performance.
H5-5: A good business PM which can manage customer power is positively associated with business performance.
H5-6: A good business PM which can easily be reengineered is positively associated with business performance.
H5-7: A good business PM where IT goals can be easily derived from business goals is positively associated with business performance.

3. METHODOLOGY

An exploratory survey research methodology was chosen to investigate the proposed issue. This research was the first large-scale study undertaken in Saudi Arabian Telecommunication companies on business PM. The research was divided into the following phases:

- A wide-ranging analysis of the existing literature was conducted to determine the major dimensions of business performance areas: SQ, BPT, BPC and CS, and creating a good business PM.
- A questionnaire was designed to investigate a business PM in a real world setting and was given to the business and IT managers in the Saudi Arabian Telecommunication companies. This questionnaire contained 25 items and was based on a five-point Likert scale.
- The resulting data were subjected to reliability, internal consistency and validity analyses.
- Bivariate correlation analysis was used to examine the relationship between SQ, BPT, BPC, CS and creating a good business PM factors.
- As bivariate correlation analysis does not take into account the inter correlation between SQ, BPT, BPC and CS, multivariate multiple linear regression was used to examine the multivariate relationship between creating a good business PM and the other four factors.

3.1 Data Collection & Measurement Analysis

The research was carried out in Saudi Arabian Telecommunication companies. We gave 150 surveys to business and IT managers and received 130 valid returned surveys. Thus, the response rate was 86.66% which is very good for this particular way of contacting participants.

A five-point Likert scale, ranging from strongly disagree to strongly agree, was used to indicate the degree or extent of every item as practised by their business unit so that we could calculate the weighted mean of the responses to the items on each factor.

Reliability, internal consistency and construct validity were assessed in order to determine the measurement properties of the constructs used in the statistical analysis by using Cronbach's alpha [35]. Dimensionality is tested and bivariate correlation analysis is performed because the associations might have multiple dimensions. Furthermore, multivariate multiple linear regression was used to examine the multivariate relationship between creating a good business PM and the other four factors.

3.2 Reliability

When conducting an evaluation survey, it is essential to know that the instrument will elicit consistent and reliable responses, even if the questions are replaced by similar questions. When a variable generated from such a set of questions returns a stable response, then the variable is said to be reliable. The measurement of reliability includes: (1) stability; (2) internal reliability; and (3) inter-observer consistency [36].

Reliability has two components: stability in time and equivalence in terms of means. The main instruments for the assessment of reliability are the test and retest method to measure stability and Cronbach's alpha to measure equivalence. As these variables were developed for the first time, we concentrated on the second aspect.

Cronbach's alpha is an index of reliability associated with the variation accounted for by the true score of the "underlying construct" where Cronbach's alpha is calculated according to equation 1 [37]. An alpha coefficient ranges in value from 0 to 1. The higher the value, the more reliable the generated scale. In other words, newly developed measures can be accepted with $\alpha \geq 0.6$ and $\alpha \geq 0.7$ should be the threshold while the measure is very reliable if $\alpha \geq 0.8$. We used Cronbach's alpha coefficient to evaluate the reliability of the scale for the factors being evaluated, and we obtain the results shown in table 2.

$$a = \frac{N\,\bar{c}}{(1+(N-1)\bar{c})} \quad (1)$$

where:
α = Cronbach's alpha.
N = number of items or statements.
$\bar{c}$ = c-bar is the average inter-item or statement covariance among the items and is the mean of the N (N – 1) /2.

Table 2: Reliability of all factors

Factors	Number of Statements	Cronbach's Alpha
SQ	7	0.893
CS	4	0.904
BPC	4	0.905
BPT	3	0.888
Creating a good business PM	7	0.828
Total	25	0.945

The values of Cronbach's alpha tend to be large (more than 0.8), that is, close to 1.0, which indicates the reliability of the scale.

3.3 Validity

The validity of the measure refers to the extent to which it measures what it was intended to measure. There are different types of validity: content validity, criterion-related validity and construct validity. Content validity is determined by the experts and the existing literature without any statistical analysis. Criterion-related validity relates to the predictive nature of the research instrument to achieve the objective outcome. Construct validity measures the extent to which the items in the scale measure the same construct [38].

Each item of the questionnaire was critically reviewed by five university academics and by five business and IT managers from different Saudi Arabian Telecommunication companies in order to establish criterion validity.

Construct validity is the most complex and the most critical to substantiate theory testing of the different properties which can be assessed from measurement.

3.4 Bivariate Correlation Analysis

The hypotheses require testing the strength of the relationship between two factors, such as the relationship between creating a good business PM and SQ, creating a good business PM and BPT, creating a good business PM and BPC, creating a good business PM and CS etc. The bivariate correlation analysis is used to test these relationships in the first four hypotheses [39].

In order to estimate the magnitude of the correlation, between for example creating a good business PM and SQ which would be found in the population, confidence intervals were generated. Statistical Package for the Social Sciences (SPSS) program uses a bootstrap re-sampling method to construct confidence intervals. The bootstrap consists of repeatedly randomly re-sampling from the original sample, a large number of times, in this case 10,000. In the first bootstrap sample, for example, the first observation might be sampled five times, the second two times, and the third observation not at all. In this way, the sampling distribution of the correlation coefficient can be constructed empirically.

3.5 Multivariate Multiple Linear Regression

Bivariate correlation analysis does not take into account the inter correlation between SQ, BPT, BPC and CS. As shown in table 3, these four variables are strongly and significantly associated with each other. For example, there is a strong relationship between SQ and CS as the value of Pearson's correlations coefficient (r) is greater than 0.6 and it is statistically significant at the $p < 0.001$ level. There is a strong relationship between SQ and BPT as the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. There is a strong relationship between BPC and CS as the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level.

Table 3: Pearson's correlations coefficient (r) between SQ, BPT, BPC and CS

Factors		SQ	CS	BPC	BPT
SQ	Pearson correlation	1			
	Sig.				
CS	Pearson correlation	0.697**	1		
	Sig.	< 0.001			
BPC	Pearson correlation	0.485**	0.493**	1	
	Sig.	< 0.001	< 0.001		
BPT	Pearson correlation	0.516**	0.558**	0.540**	1
	Sig.	< 0.001	< 0.001	< 0.001	

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

Therefore, multivariate multiple linear regression was used to examine the multivariate relationship [40] between creating a good business PM and the other four factors simultaneously, taking the inter correlation into account. This technique was performed using the General Linear Model (GLM) procedure of SPSS.

4. Variable Construction & Description

Internal consistency analysis was performed separately using the SPSS program, which is software developed by IBM used for statistical analysis, of variables and items.

To calculate internal consistency, one item is removed from the items and Cronbach's alpha is used for the remaining items. If the calculated alpha is more than the alpha for all other items, this means that reliability has increased; therefore, this item is removed. Conversely, if the calculated alpha is less than the alpha for all other items, this means that reliability has decreased; therefore, we retain the item. We repeat this procedure for each item.

Tables 4 shows the results of internal consistency of the items relating to creating a good business PM, SQ, BPT, BPC and CS, showing the correlation between the item and the total measure of internal validity.

The value of Cronbach's alpha for each item (if the item was removed), with the exception of BPM6, is less than the total value, which indicates the internal consistency of each

item. The value of Cronbach's alpha for BPM6 if this item was removed is lower than the total alpha, suggesting that this item should be removed. Also, the item-total correlations (the correlation between each item and the total scale) are all greater than 0.30, with the exception of BPM6, which indicates the reliability of the other items.

Furthermore, the value of Cronbach's alpha for each item (if the item was removed), for each item with the exception of SQ6, is less than the total value, which indicates the internal consistency of the item on SQ. All correlations are 0.30 or greater which indicates the reliability of the items, however deleting item SQ6 would increase the total alpha from .893 to .914, suggesting that item this be deleted. Also, the value of Cronbach's alpha for each item (if the item was removed), with the exception of BPT3, is less than the total value which indicates the internal consistency of the items on BPT. All item-total correlations are considerably greater than 0.30.

Table 4: Consistency, Validity and Descriptive Statistic for the statements on all factors

STATEMENTS	CORRELATION BETWEEN ITEM & TOTAL	CRONBACH'S ALPHA IF ITEM DELETED	MEAN SCORE	STD. DEVIATION
BPM1	0.612	0.799	4.12	0.64
BPM2	0.530	0.812	4.13	0.58
BPM3	0.696	0.783	3.83	0.76
BPM4	0.700	0.783	3.84	0.77
BPM5	0.749	0.779	4.22	0.61
BPM6	0.257	0.852	3.52	0.64
BPM7	0.504	0.816	3.93	0.70
BPM		0.828	3.93	0.70
SQ1	0.753	0.871	3.60	0.85
SQ2	0.769	0.869	3.54	0.84
SQ3	0.742	0.872	3.50	0.88
SQ4	0.816	0.862	3.51	0.95
SQ5	0.815	0.862	3.55	1.01
SQ6	0.300	0.914	3.53	0.97
SQ7	0.641	0.885	3.50	0.86
SQ		0.893	3.60	0.85
BPT1	0.813	0.814	3.78	0.87
BPT2	0.858	0.772	3.68	0.90
BPT3	0.682	0.929	3.67	0.94
BPT		0.888	3.71	0.90
BPC1	0.816	0.867	3.76	0.82
BPC2	0.858	0.852	3.78	0.78
BPC3	0.788	0.878	3.65	0.73
BPC4	0.698	0.911	3.64	0.85
BPC		0.905	3.71	0.80
CS1	0.839	0.857	3.68	0.87
CS2	0.837	0.858	3.68	0.84
CS3	0.778	0.879	3.60	0.84
CS4	0.697	0.911	3.52	0.93
CS		0.904	3.62	0.87

The value of Cronbach's alpha for each item (if the item was removed) is less than the total value, with the exception of BPC4, deletion of which would lead to a very slight increase in total alpha. This indicates the internal consistency of the items on BPC. All item-total correlations are considerably greater than 0.30. The value of Cronbach's alpha for each item (if the item was removed) is less than the total value, with the exception of CS4, deletion of which would lead to a very slight increase in total alpha. This indicates the internal consistency of the items on CS. All item-total correlations are considerably greater than 0.30.

5. Results of Descriptive Statistics & Bivariate Correlation Analysis

6.

5.1 Descriptive Statistics

To study the degree of importance of each statement, in tables 4, we classify the responses to the items on creating a good business PM, SQ, BPT, BPC and CS, respectively. In addition, we calculate the mean score and standard deviation by value present the mean of the overall response.

The overall mean response to most of the items on creating a good business PM is 'Agree', which indicates that the overall response of the study sample is "Agree" on creating a good business PM. The results in table 4 suggest that the most important aspects in creating a good business PM are managing customer power (BPM5), security (BPM2) and ensuring better alignment between business and IT staff (BPM1), in descending order of priority, based upon the ordering of the mean scores, although there are only slight differences between the means.

The overall response to most of the items on SQ is 'Agree', which means that the overall response of the study sample is 'Agree' on SQ. The results in table 4 indicate that the most important items on SQ are: the employee follows up a customer's request in a timely manner (SQ1), the employee offers personalized services to meet the customers' needs (SQ5), employees provide high quality assistance to customers (SQ2), employees can tell customers exactly when the services will be performed (SQ7), the employee provides a very high quality service (SQ4) and the employee responds to customers' complaints promptly (SQ3), in descending order of priority. The standard deviation for items SQ5, SQ7 and SQ4 were slightly higher than those for the other items, however examination of frequency histograms did not show any major departure from normality.

The overall response to all the items on BPT is 'Agree', which means that the overall response of the study sample is 'Agree' on BPT. The results in table 4 indicate that the most important items on BPT are: reducing the time that the customer has to wait to be served (BPT1), having a shorter cycle time to create a new service (BPT2) and improving the company's services in a short time (BPT3), in descending order of priority.

The overall response to all the items on BPC is 'Agree', which means that the overall response of the study sample is 'Agree' on BPC. The results in table 4 indicate that the most important items on BPC are: offering a flexible price for different services (BPC2), offering a reasonable price (BPC1), reducing the operational cost (BPC3) and offering a

competitive service and price (BPC4), in descending order of priority.

The overall response to all the items on CS is 'Agree', which means that the overall response of the study sample is 'Agree' on CS. The results in table 4 indicate that the most important items on CS are: meeting the customers' expectations easily (CS1) and the customer is satisfied with the service of the employee (CS2) where these two items have the same weighted mean of 3.68. The third and fourth most important items are: only receiving a few complaints (CS3) and the company is the first choice for customers (CS4), in descending order of priority.

5.2 Bivariate correlation analysis

In this study, bivariate correlation analysis is used to test the hypotheses. The hypotheses developed in current study actually relate two sets of variables for which the above analysis is useful. When discussing the results of the bivariate correlation analysis, careful attention should be given to magnitude of the bivariate correlation coefficient and the level of statistical significance. In the following four sections, all four hypotheses will be discussed.

- *The First Hypothesis (H1)*

Hypothesis (H1) tested whether the business PM is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is greater than 0.6 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .529 to .732, which means that it is 95% confident that the true population correlation is between .529 and .732. The result indicates that there is a strong relationship between the business PM and SQ.

Table 5: Pearson's correlations coefficient (r) between Creating a good business PM and SQ (H1)

Factors	SQ	SQ1	SQ2	SQ3	SQ4	SQ5	SQ6
BPM	0.638**	0.505**	0.550**	0.519**	0.526**	0.584**	0.512**
	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM1	0.492**	0.383**	0.388**	0.403**	0.411**	0.478**	0.438**
	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM2	0.289**	0.219*	0.207*	0.236**	0.189*	0.251**	0.278**
	0.001	0.012	0.018	0.007	0.031	0.004	0.001
BPM3	0.491**	0.351**	0.401**	0.394**	0.421**	0.488**	0.398**
	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM4	0.493**	0.353**	0.403**	0.396**	0.412**	0.499**	0.389**
	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM5	0.577**	0.470**	0.489**	0.437**	0.469**	0.530**	0.479**
	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM7	0.443**	0.375**	0.442**	0.386**	0.364**	0.313**	0.326**
	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

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

* Correlation is significant at the 0.05 level (2-tailed).

Hypothesis (H1-1) tested whether a business PM which results in better alignment between business and IT staff is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .365 to .604. The result indicates that there is a moderately strong relationship between a business PM which results in better alignment between business and IT staff and SQ.

Hypothesis (H1-2) tested whether a secure business PM is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is 0.289 and it is just statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .135 to .428. The result indicates that there is only a moderately weak relationship between a secure business PM and SQ.

Hypothesis (H1-3) tested whether a business PM which can manage the rapidly changing business environment is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .352 to .610. The result indicates that there is a moderately strong relationship between a business PM which can manage the rapidly changing business environment and SQ.

Hypothesis (H1-4) tested whether a business PM which can manage rapidly changing BPs is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .355 to .613. The result indicates that there is a moderately strong relationship between a business PM which can manage rapidly changing BPs and SQ.

Hypothesis (H1-5) tested whether a business PM which can manage customer power is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .450 to .689. The result indicates that there is a strong relationship between a business PM which can manage customer power and SQ.

Hypothesis (H1-7) tested whether a business PM where IT goals can easily be derived from business goals is positively associated with SQ. As shown in table 5, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .310 to .576. The result indicates that there is a moderately strong relationship between a business PM

where IT goals can easily be derived from business goals and SQ.

- *The Second Hypothesis (H2)*

Hypothesis (H2) tested whether the business PM is positively associated with BPT. As shown in table 6, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .414 to .722. The result indicates that there is a very strong relationship between the business PM and BPT.

Hypothesis (H2-1) tested whether a business PM which results in better alignment between business and IT staff is positively associated with BPT. As shown in table 6, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .342 to .618. The result indicates that there is a moderately strong relationship between a business PM which results in better alignment between business and IT staff and BPT

Hypothesis (H2-2) tested whether a secure business PM is positively associated with BPT. As shown in table 6, the value of Pearson's correlations coefficient (r) is 0.307 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .133 to .471. The result indicates that there is a moderate relationship between a secure business PM and BPT.

Hypothesis (H2-3) tested whether a business PM which can manage the rapidly changing business environment is positively associated with moderately strong. As shown in table 6, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .221 to .564. The result indicates that there is a moderately strong relationship between a business PM which can manage the rapidly changing business environment and BPT.

Hypothesis (H2-4) tested whether a business PM which can manage rapidly changing BPs is positively associated with BPT. As shown in table 6, the value of Pearson's correlations coefficient (r) is 0.396 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .214 to .556. The result indicates that there is a moderately strong relationship between a business PM which can manage rapidly changing BPs and BPT.

Hypothesis (H2-5) tested whether a business PM which can manage customer power is positively associated with BPT. As shown in table 6, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .358 to .666. The result indicates that there is a strong relationship between a business PM which can manage customer power and BPT.

Table 6: Pearson's correlations coefficient (r) between Creating a good business PM and BPT (H2)

Factors		BPT	BPT1	BPT2	BPT3
BPM	Pearson correlation	0.580**	0.559**	0.525**	0.492**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001
BPM1	Pearson correlation	0.488**	0.474**	0.440**	0.412**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001
BPM2	Pearson correlation	0.307**	0.289**	0.245**	0.297**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001
BPM3	Pearson correlation	0.404**	0.410**	0.387**	0.303**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001
BPM4	Pearson correlation	0.396**	0.398**	0.376**	0.304**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001
BPM5	Pearson correlation	0.523**	0.513**	0.509**	0.400**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001
BPM7	Pearson correlation	0.458**	0.406**	0.399**	0.436**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001

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

Hypothesis (H2-7) tested whether a business PM where IT goals can easily be derived from business goals is positively associated with BPT. As shown in table 6, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .311 to .583. The result indicates that there is a moderately strong relationship between a business PM where IT goals can easily be derived from business goals and BPT.

- *The Third Hypothesis (H3)*

Hypothesis (H3) tested whether the business PM is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .340 to .616. The result indicates that there is a moderately strong relationship between the business PM and BPC.

Hypothesis (H3-1) tested that a business PM which results in better alignment between business and IT staff is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .267 to .562. The result indicates that there is a moderately strong relationship between a business PM which results in better alignment between business and IT staff and BPC.

Table 7: Pearson's correlations coefficient (r) between Creating a good business PM and BPC (H3)

Factors		BPC	BPC1	BPC2	BPC3	BPC4
BPM	Pearson correlation	0.485**	0.420**	0.401**	0.403**	0.485**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM1	Pearson correlation	0.423**	0.360**	0.345**	0.348**	0.435**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM2	Pearson correlation	0.253**	0.213*	0.203*	0.236**	0.241**
	Sig.	0.004	0.015	0.020	0.007	0.006
BPM3	Pearson correlation	0.401**	0.332**	0.342**	0.326**	0.412**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM4	Pearson correlation	0.387**	0.319**	0.329**	0.328**	0.389**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM5	Pearson correlation	0.480**	0.413**	0.396**	0.431**	0.456**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM7	Pearson correlation	0.279**	0.254**	0.221*	0.241**	0.268**
	Sig.	0.001	0.004	0.012	0.006	0.002

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Hypothesis (H3-2) tested whether a secure business PM is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is 0.253 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .092 to .405. The result indicates that there is a moderately weak relationship between a secure business PM and BPC.

Hypothesis (H3-3) tested whether a business PM which can manage the rapidly changing business environment is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is 0.401 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .240 to .545. The result indicates that there is a moderately strong relationship between a business PM which can manage the rapidly changing business environment and BPC.

Hypothesis (H3-4) tested whether a business PM which can manage rapidly changing BPs is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is 0.387 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .223 to .534. The result indicates that there is a moderate relationship between a business PM which can manage rapidly changing BPs and BPC.

Hypothesis (H3-5) tested whether a business PM which can manage customer power is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .299 to .639. The result indicates that there is a moderately strong relationship between a business PM which can manage customer power and BPC.

Hypothesis (H3-7) tested whether a business PM where IT goals can easily be derived from business goals is positively associated with BPC. As shown in table 7, the value of Pearson's correlations coefficient (r) is 0.279 and it is statistically significant at $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .131 to .426. The result indicates that there is a moderately weak relationship between a business PM where IT goals can easily be derived from business goals and BPC.

- *The Fourth Hypothesis (H4)*

Hypothesis (H4) tested whether the business PM is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .514 to .731. The result indicates that there is a strong relationship between the business PM and CS.

Hypothesis (H4-1) tested whether a business PM which results in better alignment between business and IT staff is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is almost 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .321 to .648. The result indicates that there is a moderately strong relationship between a business PM which results in better alignment between business and IT staff and CS.

Hypothesis (H4-2) tested whether a secure business PM is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is 0.263 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .099 to .415. The result indicates that there is a moderately weak relationship between a secure business PM and CS.

Hypothesis (H4-3) tested whether a business PM which can manage the rapidly changing business environment is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .476 to .699. The result indicates that there is a strong relationship between a business PM which can manage the rapidly changing the business environment and CS.

Hypothesis (H4-4) tested whether a business PM which can manage rapidly changing BPs is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant

at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .480 to .701. The result indicates that there is a strong relationship between a business PM which can manage rapidly changing BPs and CS.

Hypothesis (H4-5) tested whether a business PM which can manage customer power is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is greater than 0.5 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .448 to .678. The result indicates that there is a strong relationship between a business PM which can manage customer power and CS.

Hypothesis (H4-7) tested whether a business PM where IT goals can easily be derived from business goals is positively associated with CS. As shown in table 8, the value of Pearson's correlations coefficient (r) is 0.359 and it is statistically significant at the $p < 0.001$ level. As shown in table 9, the 95% confidence interval is .224 to .487. The result indicates that there is a moderate relationship between a business PM where IT goals can easily be derived from business goals and CS.

Table 8: Pearson's correlations coefficient (r) between Creating a good business PM and CS (H4)

Factors		CS	CS1	CS2	CS3	CS4
BPM	Pearson correlation	0.631**	0.541**	0.550**	0.581**	0.555**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM1	Pearson correlation	0.495**	0.416**	0.444**	0.502**	0.391**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM2	Pearson correlation	0.263**	0.179*	0.183*	0.269**	0.292**
	Sig.	0.003	0.042	0.037	0.002	0.001
BPM3	Pearson correlation	0.595**	0.542**	0.563**	0.501**	0.496**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM4	Pearson correlation	0.598**	0.553**	0.562**	0.501**	0.497**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM5	Pearson correlation	0.570**	0.502**	0.532**	0.475**	0.502**
	Sig.	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BPM7	Pearson correlation	0.359**	0.281**	0.239**	0.379**	0.364**
	Sig.	< 0.001	0.001	0.006	< 0.001	< 0.001

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

5.3 Multivariate Multiple Linear Regression

In this study, multivariate multiple linear regression analysis is used to test the fifth hypothesis. The hypothesis developed in current study actually relates two sets of variables for which the above analysis is useful. When discussing the results of the multivariate multiple linear regression analysis, careful attention should be given to magnitude of the R-squared (in this case the amount of variation in SQ, BPT, BPC and CS that is explained by creating a good business PM) and the level of statistical significance.

- *The Fifth Hypothesis (H5)*

Hypothesis (H5) tested whether the business PM is associated with business performance. As shown in table 10, creating a good business PM explains 52.8% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously) and this result was statistically significant at the $p < 0.001$ level.

Hypothesis (H5-1) tested whether a business PM which results in better alignment between business and IT staff is associated with business performance. As shown in table 10, creating a good business PM explains 34.3% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously) and this result was statistically significant at the $p < 0.001$ level.

Hypothesis (H5-2) tested whether a secure business PM is associated with business performance. As shown in table 10, creating a good business PM explains 12.2% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously).

Table 9: Pearson's Correlations Coefficient (r) Using Bootstrap Re-Sampling Method

Factors			SQ	BPT	BPC	CS
BPM	Pearson correlation		0.638**	0.580**	0.631**	0.485**
	Sig.		< 0.001	< 0.001	< 0.001	< 0.001
	BC a 95% Confidence Interval	Lower	0.529	0.514	0.414	0.514
		Upper	0.732	0.731	0.722	0.731
BPM1	Pearson correlation		0.492**	0.488**	0.495**	0.423**
	Sig.		< 0.001	< 0.001	< 0.001	< 0.001
	BC a 95% Confidence Interval	Lower	0.365	0.321	0.342	0.321
		Upper	0.604	0.648	0.618	0.648
BPM2	Pearson correlation		0.289**	0.307**	0.263**	0.253**
	Sig.		0.001	< 0.001	0.003	0.004
	BC a 95% Confidence Interval	Lower	0.135	0.099	0.133	0.099
		Upper	0.428	0.415	0.471	0.415
BPM3	Pearson correlation		0.491**	0.404**	0.595**	0.401**
	Sig.		< 0.001	< 0.001	< 0.001	< 0.001
	BC a 95% Confidence Interval	Lower	0.352	0.476	0.221	0.476
		Upper	0.610	0.699	0.564	0.699
BPM4	Pearson correlation		0.493**	0.396**	0.598**	0.387**
	Sig.		< 0.001	< 0.001	< 0.001	< 0.001
	BC a 95% Confidence Interval	Lower	0.355	0.480	0.214	0.480
		Upper	0.613	0.701	0.556	0.701
BPM5	Pearson correlation		0.577**	0.523**	0.570**	0.480**
	Sig.		< 0.001	< 0.001	< 0.001	< 0.001
	BC a 95% Confidence Interval	Lower	0.450	0.448	0.358	0.448
		Upper	0.689	0.678	0.666	0.678
BPM7	Pearson correlation		0.443**	0.458**	0.359**	0.279**
	Sig.		< 0.001	< 0.001	< 0.001	0.001
	BC a 95% Confidence Interval	Lower	0.310	0.224	0.311	0.224
		Upper	0.576	0.487	0.583	0.487

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

Hypothesis (H5-3) tested whether a business PM which can manage the rapidly changing business environment is associated with business performance. As shown in table 10, creating a good business PM explains 37.7% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously) and this result was statistically significant at the $p < 0.001$ level.

Hypothesis (H5-4) tested whether a business PM which can manage rapidly changing BPs is associated with business performance. As shown in table 10, creating a good business PM explains 37.7% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously) and this result was statistically significant at the $p < 0.001$ level.

Hypothesis (H5-5) tested whether a business PM which can manage customer power is associated with business performance. As shown in table 10, creating a good business PM explains 41.1% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously) and this result was statistically significant at the $p < 0.001$ level.

Hypothesis (H5-7) tested whether a business PM where IT goals can easily be derived from business goals is associated with business performance. As shown in table 10, creating a good business PM explains 26.9% of variation in business performance (SQ, BPT, BPC and CS measured simultaneously) and this result was statistically significant at the $p < 0.001$ level.

Finally, all six items in creating a good business PM account for 57.4% of the variation in business performance, all items measured simultaneously (all six BPM items and SQ, BPT, BPC and CS). This result was statistically significant at the $p < 0.001$ level.

Table 10: R-Squared between Creating a good business PM and Business Performance (H5)

Factors	P	R^2
BPM	< 0.001	0.528**
BPM1	< 0.001	0.343**
BPM2	< 0.003	0.122**
BPM3	< 0.001	0.377**
BPM4	< 0.001	0.377**
BPM5	< 0.001	0.441**
BPM7	< 0.001	0.269**

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

- *The Summary of Hypothesis Results*

Bivariate correlation coefficient analysis was used to test the first fourth hypotheses of this study to clarify the relationships between SQ, BPT, BPC, CS and creating a good business PM. Furthermore, multivariate multiple linear regression analysis was used to test the fifth hypothesis (examine the multivariate relationship between creating a good business PM and the other four factors simultaneously). The summary of the hypotheses results is shown in table 11.

7. CONCLUSIONS & FUTHER RESEARCH

The main purpose of the proposed research is to contribute to a better understanding of the relationships between SQ, BPT, BPC, CS and creating a good business PM as well as between creating a good business PM and business performance. In a narrower sense, the research sets out to answer the questions as to whether or not there exists any relationship between SQ, BPT, BPC, CS and creating a good business PM. These questions were answered by testing the hypotheses. The results showed that creating a good business PM is positively associated with SQ, BPT, BPC and CS.

Literature suggests that the indicators of creating a good business PM and the indicators of SQ, BPT, BPC and CS are interrelated. Hypothesis (H1) stated that there is a statistically significant relationship between the business PM and the high SQ. Hypothesis (H2) stated that there is a statistically significant relationship between the business PM and low BPT. Hypothesis (H3) stated that there is a statistically significant relationship between the business PM and low BPC. Hypothesis (H4) stated that there is a statistically significant relationship between the business PM and high CS. In summary, hypothesis (H5) stated that there is a statistically significant relationship between the business PM and high business performance.

Table 11: Summary of Hypotheses Results

Hypotheses	Results
H1: A good business PM is positively associated with SQ.	Strongly Supported
H1-1: A good business PM which results in better alignment between business and IT staff is positively associated with SQ.	Supported
H1-2: A secure business PM is positively associated with SQ.	Weakly Supported
H1-3: A good business PM which can manage the rapidly changing business environment is positively associated with SQ.	Strongly Supported
H1-4: A good business PM which can manage rapidly changing BPs is positively associated with SQ.	Supported
H1-5: A good business PM which can manage customer power is positively associated with SQ.	Strongly Supported
H1-7: A good business PM where IT goals can be easily derived from business goals is positively associated with SQ.	Supported
H2: A good business PM is positively associated with the BPT.	Strongly Supported
H2-1: A good business PM which results in better alignment between business and IT staff is positively associated with BPT.	Supported
H2-2: A secure business PM is positively associated with BPT.	
H2-3: A good business PM which can manage the rapidly changing business environment is positively associated with BPT.	Supported
H2-4: A good business PM which can manage rapidly changing BPs is positively associated with BPT.	Supported
H2-5: A good business PM which can manage customer power is positively associated with BPT.	Strongly Supported
H2-7: A good business PM where IT goals can be easily derived from business goals is positively associated with BPT.	Supported
H3: A good business PM is positively associated with BPC.	Supported
H3-1: A good business PM which results in better alignment between business and IT staff is positively associated with BPC.	Supported
H3-2: A secure business PM is positively associated with the BPC.	Weakly Supported
H3-3: A good business PM which can manage the rapidly changing business environment is positively associated with BPC.	Supported
H3-4: A good business PM which can manage rapidly changing BPs is positively associated with BPC.	Supported

H3-5: A good business PM which can manage customer power is positively associated with BPC.	Supported
H3-7: A good business PM where IT goals can be easily derived from business goals is positively associated with BPC.	Weakly Supported
H4: A good business PM is positively associated with CS.	Strongly Supported
H4-1: A good business PM which results in better alignment between business and IT staff is positively associated with CS.	Supported
H4-2: A secure business PM is positively associated with CS.	Weakly Supported
H4-3: A good business PM which can manage the rapidly changing business environment is positively associated with CS.	Strongly Supported
H4-4: A good business PM which can manage rapidly changing BPs is positively associated with CS.	Strongly Supported
H4-5: A good business PM which can manage customer power is positively associated with CS.	Strongly Supported
H4-7: A good business PM where IT goals can be easily derived from business goals is positively associated with CS.	Supported
H5: A good business PM is positively associated with business performance.	Strongly Supported
H5-1: A good business PM which results in better alignment between business and IT staff is positively associated with business performance.	Supported
H5-2: A secure business PM is positively associated with business performance.	Weakly Supported
H5-3: A good business PM which can manage the rapidly changing business environment is positively associated with business performance.	Supported
H5-4: A good business PM which can manage rapidly changing BPs is positively associated with business performance.	Supported
H5-5: A good business PM which can manage customer power is positively associated with business performance.	Strongly Supported
H5-7: A good business PM where IT goals can be easily derived from business goals is positively associated with business performance.	Supported

This research provides both theoretical developments for academics and practical implications for business managers, business analysts and business process modellers. The results of this research provide important evidence for business managers that creating a good business PM can enhance SQ, BPT, BPC and CS. In other words, the results of this research provide important evidence for business managers that creating a good business PM can enhance the business performance. For business analysts, the results support the viewpoint that creating a good business PM can enhance SQ, BPT, BPC and CS. For business process modellers, the results support the viewpoint that in order to create a good business PM, it should ensure better alignment between business and IT staff, be secure, manage the rapidly changing business environment and BPs, managing customer power, be easily reengineered and be able to easily derive IT goals from business goals.

In interpreting the results of this survey, it is important to remember that the study was conducted only in telecommunication companies. Our questionnaires were answered only by IT and business managers in Saudi Arabian telecommunication companies. Therefore, our results cannot be used as a standard and might not be directly transferrable to any sized firm and any other country. Moreover, our results may be affected by common method variance as we collected our data from participants by using the same survey and at the same time.

Further research needs to contain more desirable statements for factors on SQ, BPT, BPC, CS and creating a good business PM. Furthermore, further research may expand the survey and test the questionnaires on other groups in order to reduce sample errors. Finally, further research should employ larger sample sizes, so that more complex statistical methods, such as structural equation modelling, can be used to further test the model.

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