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BUSINESS PROCESS RE-ENGINEERING STRATEGY AND SERVICE DELIVERY: DOES THE MODERATING ROLE OF INFORMATION TECHNOLOGY INFRASTRUCTURE MATTER?

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Abstract

*The main objective of the study was to investigate the link between business process re-engineering strategy, information technology infrastructure and service delivery of companies manufacturing food in Kenya. Specifically, the study sought to determine the effect of information technology infrastructure on the relationship between business process re-engineering strategy and service delivery of companies manufacturing food in Kenya. The population of the study comprised of the company's manufacturing food in Kenya. A descriptive cross-sectional survey design was adopted in data collection and analysis. Primary data was collected from respondents using a structured questionnaire, while secondary data was collected from published firm's reports. Out of the 75 respondents targeted by the study, 44 respondents forming 56.67% response rate, which was considered adequate for analysis with good representation from all the subsectors in companies manufacturing food in Kenya. On hypotheses testing, it was established that 59.4% of variations in the firm's service delivery are explained by variations in the BPR strategy, information technology infrastructure and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype). The magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is 1.3% (59.4% - 58.1%); then study therefore accepts the alternate hypothesis (H_{A1}) that information technology infrastructure moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya. H_{A1} is therefore supported. In conclusion, the study confirmed that the magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is positive and statistically significant whereby 59.4% of variations in firm's service delivery is explained by variations in the BPR strategy, information technology infrastructure and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype).The results therefore*

support the anchoring theory of resource advantage and resource based view theories. This study has contributed in different areas including implications to theory, policy, management practice and methodological contributions as discussed in the subsequent paragraphs. First, this study has advanced frontiers of knowledge from the study findings; the role of information technology infrastructure on the relationship between BPR strategy and service delivery could not be generalized (Hammer and Stanton, 1995) in the replicated due to use of case studies and the role played by IT adoption as opposed to IT innovations must be implemented. Secondly, this research makes several noteworthy contributions to the existing theory: the empirical relationship testing how the relationship between BPR strategy and service delivery is moderated by IT infrastructure confirms the conceptual model that information technology infrastructure significantly moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya. Thirdly on the study's policy contributions: the manifestation of BPR strategy, IT infrastructure and service delivery dimensions had varied and mixed results on firm performance. The findings of this study offer suggestions that are beneficial to policy makers in the food-manufacturing sector in Kenya. Kenyan manufacturing firms have previously lacked fits well into the existing body of knowledge by holding that BPR strategy influence the firm's level of performance and vice versa. Lastly, key methodological contribution is the use of a quantitative composite index in computing the SD index, the use an integrated empirical model to test the relation between BPR strategies, IT infrastructure and service delivery; the study used a number of indicators to measure each construct, which improved the construct validity.

Index Terms: *Business Process Re-Engineering Strategy, Information Technology Infrastructure, Service Delivery, Companies Manufacturing Food and Kenya*

INTRODUCTION

Business process reengineering (BPR) became popular in the business world in the 1990s, inspired by an article called Reengineering Work: Don't Automate, Obliterate which was published in the Harvard Business review by Michael Hammer. Business Process Reengineering is a strategy that tears down and recreates business processes, with a goal to reduce manufacturing errors and expenses. BPR involves the radical redesign of core business processes to achieve dramatic improvements in quality, productivity and cycle times by redesigning functional organizations into cross-functional teams using technology to improve data dissemination and decision making. Unlike business process management or improvement, both of which focus on working with existing processes, BPR means changing the said processes fundamentally. Business Process Re-Engineering (BPR) strategy's contribution to service delivery speed is as a result of continuity of movement of work activities (Oberoi, 2016), business processes mechanization and automation (Laudon & Laudon; 2006), keeping the customer segments intact (Almashara, et al., 2001; Magutu, et al., 2010), connecting diverse areas (Zygiaris, 2000) and encouraging the correspondence between internal and external value chains (Al-Mashara, et al., 2001; Attaran, 2004; Slack, et al., 2007).

The influence of information technology (IT) infrastructure on firm performance can be tested by investigating the significant link between information technology infrastructure and firm performance, although some studies failed to show that association. Past studies have established that information technology infrastructure contributes to the firm's performance through improved productivity, enhanced value for customers and high profitability (Ramirez et al., 2010; Mithas et al., 2012).

IT infrastructure are characterized as the level or degree to which the firm has furnished itself with important IT aptitudes, information and experience, IT framework and the degree of IT activities, and the level of IT operations utilizations (Tippins and Sohi, 2003). Implementation is encouraged or empowered by a significant level of IT, experience and financially perceptive frameworks that are dependable for the firm to foresee its customer needs and eventually service delivery. The organization's ability to rapidly achieve innovation techniques for performance is controlled by a few components as IT infrastructure, experience and other elements of information technology (Slark 1997; Bhatt and Grover, 2005). There is a clear need for an extended study on IT infrastructure beyond adoption for some conceptual theory development on its moderating role on the effect of BPR strategies on service of companies manufacturing food in Kenya. This study shall not only assess the immediate link of business process re-engineering strategy to service delivery of companies manufacturing food in Kenya but in addition the impact of information technology infrastructure onto the connection between BPR strategy and the service of companies manufacturing food.

An integrated model to study the concepts of business process re-engineering strategy,

information technology infrastructure and service delivery of a firm relates to the Resource Based View theory usage, is therefore the most suitable theory.

Research Problem

As indicated, several past studies have tested the link the between business process re-engineering strategy, information technology infrastructure and service delivery (Bryson, Crosby & Bloomberg, 2014; Fragoso, 2015). The following research gap has been tended to in the investigation. Lately, there has a significant growth in demand and prevalence of sugar-free and fat-free products down to a more noteworthy familiarity of food allergens and other lifestyle choices with liberated alternative ingredients in the development of new product. To satisfy consumer demands, numerous brands are hoping to expel counterfeit fixings from their items. These are alluded to as 'perfect name' items. This complicates the replacement of ingredients in the original recipe by utilizing various fixings to accomplish a similar flavor with consistency and surface (World Bank, 2017; Chris, 2018).

The role of information technology infrastructure on the relationship between business process re-engineering strategy and service delivery could not be summed up in the generalized replica due to the use of case studies and the role played by information technology adoption as opposed to information technology innovations must be implemented. Hammer and Stanton (1995) believe that business process re-engineering is not an information technology initiative, rather it requires to bring organization-wide information technology resources together, to enhance service delivery and business performance, while some others, such as Hammer (1990) and Hammer and Champy (1993) contend that information technology infrastructure plays a critical role in process re-engineering strategy implementation.

The present study sought to consequently, determine the relationship between process re-engineering strategy, information technology infrastructure and service delivery of food processing companies in Kenya. In this way, the accompanying exploration addresses guided this investigation: Does information technology infrastructure moderate the relationship between process re-engineering strategy and service delivery of companies manufacturing food in Kenya?

Research Objectives

The general goal of this paper was to investigate the link the between business process re-engineering strategy, information technology infrastructure and service delivery of companies manufacturing food in Kenya.

Specifically, the study sought to determine the effect of information technology infrastructure on the relationship between business process re-engineering strategy and service delivery of companies manufacturing food in Kenya.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The section reviewed both theoretical and empirical literature relevant to the study. The relation of the study’s main variables were then summarized in a conceptual framework.

Theoretical Review

Resource-Based View clarifies the effect of organizational resources on supporting an upper hand for superior firm performance than their rivals (Barney, 1991; Fahy, 2000). Resource-Based View theory in business process re-engineering strategy implementation requires the firm to create and deploy strategic resources (assets and capabilities) for the realization of unrivaled competitive advantage. These strategic resources should be identified, categorized and prioritized in pursuant of enhanced competitive edge (Gottschalg and Zollo, 2007). MacLean et al., (2004) recommended that firms need to focus on resource competence as opposed to product market in the global turbulent business environment. Resource-Based View theory provides a better understanding on the interaction between BPR strategy, IT infrastructure and service delivery particularly those that manufacture food in Kenya.

The Resource-Advantage theory focuses on those mistakes made on organizational strategies while pursuing organizational advantage, which will eventually lead to the development of leaderships to deliver distinct product that competitors are unable to imitate through service development strategy. The advantage and improvement of organizational performance relies upon the company's capacity to convey particular and service development (Ferdinand, Widiyanto, and Sugiarto, 2012; Peranginangin, 2015). In the implementation of business process re-engineering, Resource-Advantage theory guides the improvements meant to service delivery of any organization. R-A theory as a process hypothesis of rivalry attests that organizations accomplish prevalent money related execution and competitive advantage in the market place positions by neutralizing their competitors using information technology to complement other major process innovations (Verganti and Buganza, 2005; Ja-Shen, Hung, & Astrid, 2009). R-A hypothesis gives a superior comprehension on the many-sided connections among business process re-engineering strategy, IT infrastructure and service delivery of companies manufacturing food in Kenya.

Empirical Literature Review on BPR Strategy, IT Infrastructure and Service Delivery

The empirical review underneath depends on the above theoretical review in an attempt to understand the integrated relationship between business process re-engineering strategy, IT infrastructure and service delivery of companies manufacturing food in Kenya.

BPR strategy deployments in most organisations are typically bolstered by IT, BPR definitely include update and data frameworks modifications. It’s apparent from the literature review and empirical literature that much substantial effort has been invested into researching the key organizational aspects and the operations management. However implicit that common ground and consensus are yet to conjecture on number of issues such as direct causal link between the impact of BPR strategy and firm performance (Brynjolfsson and Hitt, 2000; Ganesh, 2000).

Numerous studies have analyzed the connection between ICT and FP among services sector firms with mixed results and

conclusion (Broadbent et al., 1999; Brynjolfsson and Hitt, 2000). Broadbent et al., (1999) reported that the contribution of ICT to output growth is as high in the service sector as in the manufacturing sector using the ICT productivity paradox of 1980s.

After 1980s, countless number of studies on the connection between ICT and FP have "emerged at both the industry and firm level that have considerably improved our understanding on the role of IT infrastructure in BPR strategy implementation" (Ganesh, 2000). Lamentably most those investigations that have empirically examined the "useful roles of IT infrastructure in BPR are scarce in the literature, whilst most of these studies are case studies or case-based depictions". Broadbent et al. (1999) "demonstrated the critical role of IT infrastructure in BPR" while Hammer and Champy (1993) elaborated anecdotal case studies.

Causal ambiguity is also highlighted as a major concern on the role of IT on the relationship between SD and FP (Attaran, 2004). From literature, there is apparent lack of connection or integration of various aspects and combined effect on organizational performance outcomes rather than focusing separately the effects of these variables on FP. The integrated approach adopted by this study attempts to address the ambiguities in seeking to establish how they influences FP.

IT resources, according to Grover et al. (1995), consist of infrastructural IT, competence in IT, and expertise for IT-enabled work. The most key aspect among the above three is thus the IT infrastructure which encompasses both organizational and technical capabilities that are commonly used for purposes of sharing information resources in an organization.

According to Ganesh, (2000) and Brynjolfsson & Hitt, (2000) there is need to provide a precise succinct theoretical model that integrates BPR strategy, IT infrastructure and SD by putting priority on the technical perspective of IT infrastructure, against the other IT resources dimensions that combine the technical and organizational resources. This empirical study focused on IT infrastructure since BPR strategy implementation depends more on the IT infrastructure than IT competency.

Proposition I: IT infrastructure significantly moderates the relationship between BPR strategy and service delivery.

Table 1: Summary of Knowledge gaps on BPR Strategy, IT Infrastructure and Service Delivery

Author(s)/ Year (s)	Study/Research Focus & Gaps	How Gaps Could be Addressed & Proposed Remedy
Broadbent et al., (1999)	BPR strategy is not related to any IT initiative in the most case-based descriptions	Need to avoid case-based descriptions by testing the moderating role of IT infrastructure where BPR strategy is linked to SD.
Ganesh, (2000)	Examined the effects of industry contextual factors and information intensity contextual factors of IT infrastructure and BPR whereby data integration did not significantly affect the BPR deployment dimensions. This was done in a developed economy in USA. It did not relate the two concepts of BPR strategy, IT Infrastructure and service delivery.	IT Infrastructure was an independent variable. Need to use all the four dimensions in one model Need to test the moderating role of IT infrastructure where BPR strategy is linked to SD
Hammer & Champy, (1993)	IT has a critical role to play on BPR strategy implementation although it was never linked service delivery not generalizable and not replicable beyond the specific case	This has necessitated the need to the role of IT infrastructure on the casual link between BPR strategy and SD to enable replication beyond the specific case
Hammer & Stanton (1995)	BPR strategy can not be integrated with any IT strategy and never related the service delivery	This has necessitated the need to test the effect of IT infrastructure where BPR strategy is linked to SD

Conceptual framework and Hypotheses Development

It is apparent from the literature that a lot more needs to be done than has already been done with regard to cementing the conceptual framework for establishing the causal link between BPR Strategy, IT infrastructure and service delivery. This study through the conceptual model develops analysis and synthesis of the current literature as an attempt at filling this gap.

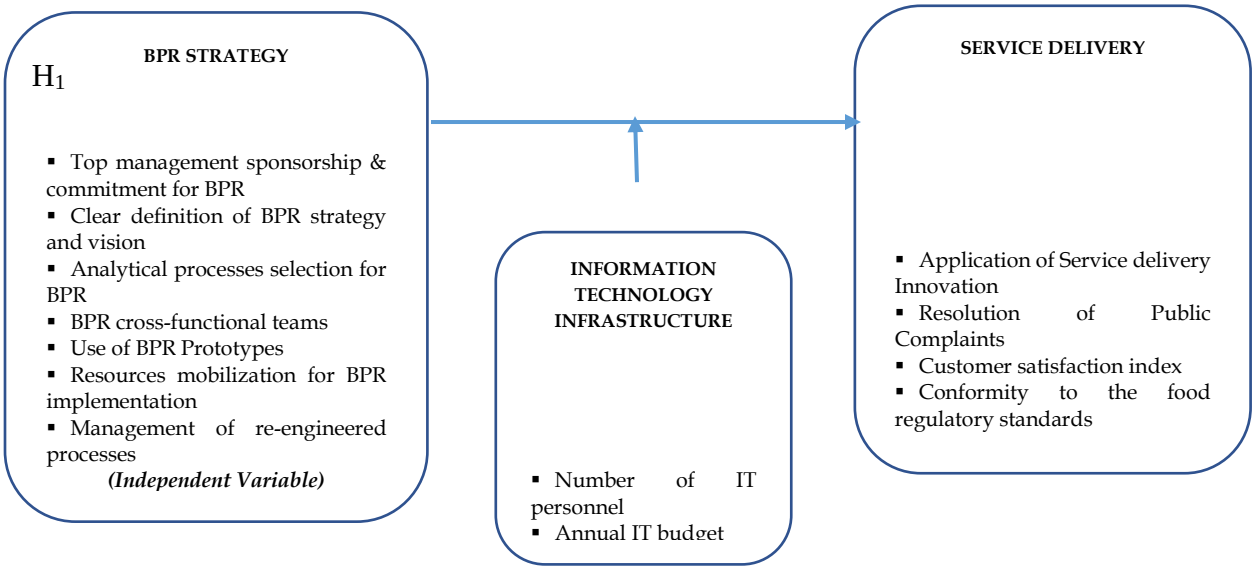

Figure 1 Conceptual Model

Source: Researcher", 2020

H_{A1}= Information technology infrastructure significantly moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya.

RESEARCH METHODOLOGY

The section highlighted the research methodology adopted that ensured the research objectives are addressed conclusively. This covered the research design, target population, sample size and sampling techniques, research instruments, data collection procedures, and data analysis.

A positivist philosophy was used guide this study. This is based on observations made by Babbie, (2010) and Ravitch & Riggan, (2012) who noted that a positivism philosophy is quantitative as opposed to phenomenology which is basically a qualitative approach and also the positivist orientation is guided by realism existing though as a result of limitations of humanity it may be known imperfectly and the realism within the context of probability can be discovered by researchers.

The study adopted a descriptive cross sectional design. Information about the subjects that was gathered represented a snap shot of what was going on at that point in time. Emmel, (2014) posit that cross-sectional studies empowers the research analyst to establish if critical association and connection among variables exist and the quality of these relationships. The study was guided by the reason for the examination, the sort of examination, the degree of analyst association, the phase of information in the field and the kind of investigation. This design has been used successfully by Magutu, Mbeche, Njihia and Nyaoga, (2016) and Ongore & Kusa, (2013) to test

hypothesis and draw conclusions. In view of the breadth of the study through the utilization of cross-sectional survey, the researcher was afforded the opportunity to capture data on BPR strategy, IT infrastructure and service delivery of companies manufacturing food in Kenya.

The study population-cum-unit of analysis of the study was seventy-five (75) companies manufacturing food in Kenya. These food-manufacturing companies were classified into companies offering: cereals manufacturing, food manufacturing consultancy, food flavours manufacturing, food hygiene, sugarcraft supplies, food preparation, food processing and food packaging. The target respondents and informants were the chief executive officer (CEOs) and with their permission, the production or operations managers depending on the structure of the particular company. The respondents were picked to represent all the stratas of 75 food manufacturing firms

Through a methodological triangulation method, both primary and secondary data, which reinforced each other, were gathered by utilizing a poll & survey questionnaire strategy with open-ended and closed questions well aligned with the study objectives and hypothesis based on the literature reviewed as well as theories anchoring the study (Emmel, 2014; Saunders et al, 2007). Sekaran, & Bougie, (2013) who applauded it because of its ability to maximize the benefit of standard and descriptive data that the interviews generate used this approach.

The questionnaire was divided into three sections. Whereby section I collected data on BPR Strategy, Section III on IT Infrastructure and Section III on Service Delivery.

To compute service delivery index, weighted scores (adopted from GoK, 2018) with an average of five years was computed as follows:

Step 1: Determine the Actual Achievement for each service delivery ***indicators***, $X_{\text{year 1-5}}$

Step 2: Find the ***average Score*** of the five-year Actual Achievement for each service delivery ***indicators***, ***Average Score*** = $(X_{\text{year 1}} + X_{\text{year 2}} + X_{\text{year 3}} + X_{\text{year 4}} + X_{\text{year 5}})/5$

Step 3: Compute the Weighted Score by Multiplying the weight (assigned to the indicator as a percentage) by the ***Average Score*** to obtain the Weighted Score, i.e. **Weighted Score** = Indicator ***Weight*** as a percentage * ***Average Score***

Step 4: Compute the ***Composite Score*** of each food manufacturing company by ***summation of weighted scores*** for indicators to obtain the ***Service Delivery index.***

After the computation of service delivery index, the researcher used multiple regression analysis to test the research hypothesis. See table 2 on summary of objective, hypothesis and analytical model.

Table 2: Summary of Objectives, Hypotheses and Analytical Model

Objective	Hypothesis	Analytical model	Test Statistics	Analytical method	Interpretation
To determine the effect of information technology infrastructure on the relationship between BPR Strategy and service delivery of companies manufacturing food in Kenya; and	**H_{A1}=** Information technology Infrastructure moderates the relationship between BPR Strategy and service delivery; and	$Y_2= \alpha+ \beta_1X + \varepsilon$ $Y_3= \alpha+ \beta_1X+ \beta_2Z+\varepsilon$ $Y_4= \alpha+ \beta_1X+ \beta_2Z+\beta_3 X.Z + \varepsilon$ α =constant (intercept), β_1, β_2, β_3= coefficients Y_2, Y_3 andY_4 = service delivery; X= BPR Strategy, Z= Information technology Infrastructure ε= Error term; X.Z=BPR Strategy and Information technology Infrastructure	Mean, t-value, Pearson's correlation, R, R^2 F-Ratio, P-values.	Hierarchical Regression analysis	R^2 for goodness-of fit ; F-test for overall significance ; t-test for individual significance ; and Marginal changes R^2 depicts model fitness and explains the changes in dependent variable. P-value, F-ratio and t-statistic explains the significance of the model constructs

Source: Author, 2020

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

Introduction

This section presents the fundamental study findings and interpretations based on field-data collected from the target study participants. The presented findings constitute a basis towards drawing the study conclusions and recommendations.

Out of the targeted 75 respondents; however, the researcher received response from 44 respondents forming 56.67% response rate, which was considered adequate for analysis. All subsectors of the food-manufacturing manufacturing companies in Kenya were all proportionately represented in this study, avoiding any

chances of bias or misrepresentation.

The study found out that majority (53%) of the food manufacturing companies have been in operation for more than fifty (50) years while there are new entrants which are between 1- 10 years old. This confirms that food processing in Kenya is more than 50 years old and majority of these firms are highly likely to re-engineer in order to deliver value to their customers.

Diagnostic Tests

Service delivery had the highest reliability coefficient of 0.974(α = 0.974) followed by information technology infrastructure had α = 0.895while business process re-engineering strategy had α = 0.759. The study adopted a cut-off point of 0.5 as indicators for reliable data. "Normality was tested using the Shapiro-Wilk test and the results showed that all the variables were above 0.05 ($p > 0.05$) hence confirming data normality". Thus, p-values for the Sharipo-Wilk tests were 0.22 for BPR strategy, 0.28 for IT infrastructure and 0.31 for service delivery.

The variables of the study indicated VIF values of between 1.53 and 9.73 which is less than the 10 (a figure recommended by the rule of thumb). This indicated that the data set displayed no multicollinearity. P-values of Levene's test for homogeneity of variances were less than 0.05. The test therefore was significant at α= 0.05 meaning that the group variances are unequal hence no homogeneity.

Hypothesis Testing

The research hypothesis was tested at 95% (α=0.05) confidence level using multiple regression analysis, hence decision points to reject or fail to reject hypothesis were based on the p-values. Where $p<0.05$, the study failed to reject the hypotheses, and where $p>0.05$, the study rejected the hypotheses".

The study sought to determine the effect of information technology infrastructure on the relationship between BPR Strategy and service delivery of companies manufacturing food in Kenya. The hypothesis was:

H_{A1}=Information technology Infrastructure moderates the relationship between BPR Strategy and service delivery of companies manufacturing food in Kenya.

Table 3: Variables Entered/Removed on the Effect of IT Infrastructure on the Relationship between BPR Strategy and Service Delivery

Model	Variables Entered	Variables Removed	Method
1	Resources Mobilization for BPR	Nil	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
2	IT Budget*BPR Prototype, Resources Mobilization for BPR, Sponsorship and Commitment, Number of IT Personnel, BPR Cross functional Teams, Analytical Processes Selection, Annual IT budget , Management of Re-engineered Processes, BPR Prototypes, Clear BPR Definition and Vision[b]	Nil	Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

a. Dependent Variable: Service Delivery Index

Source: Research Data (2020)

From the findings on table 3, all the seven indicators of BPR strategy (resources mobilization for BPR, sponsorship and commitment, BPR cross functional teams, analytical processes selection, BPR prototypes, management of re-engineered processes, clear BPR definition and vision), two indicators of information technology infrastructure (number of IT personnel and annual IT budget) and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype) were included in the multiple regression analysis testing the effect of information technology infrastructure on the relationship between BPR strategy and service of companies manufacturing food in Kenya. Further the model goodness of fit using the adjusted R^2 (coefficient of determinations) done in the next table.

Table 4: Model Goodness of Fit on the Effect of Information Technology Infrastructure on the Relationship between BPR Strategy and Service Delivery

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	.720a	.518	.507	12.16493
2	.783b	.613	.594	11.03407

a. Predictors: (Constant), Resources Mobilization for BPR

b. Predictors: (Constant), IT Budget*BPR Prototype, Resources Mobilization for BPR, Sponsorship and Commitment, Number of IT Personnel, BPR Cross functional Teams, Analytical Processes Selection, Annual IT budget , Management of Re-engineered Processes, BPR Prototypes, Clear BPR Definition and Vision

Source: Research Data (2020)

From the results in Table 4, the adjusted R^2 also keeps on improving from 0.507 to 0.594. Although all models are significant, the stepwise model number two is a good predicator of the significant moderating effect of information technology infrastructure on the relational effect of BPR strategy on performance of food manufacturers in Kenya.

From the results in Table 5 and table 5, it can be observed that as one moves from stepwise model number one to two, the standard error of the estimate keeps decreasing from 12.16493 to 11.03407 as so does the F values from 45.163 to 32.473.

As presented in stepwise regression model number two (2) in Table 4, 59.4% (Adjusted R^2 = 0.594) of variations in firm's service delivery is explained by variations in the BPR strategy, information technology infrastructure and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype).

A moderation effect states that the effect of BPR strategy on service delivery (Y_2) depends on the magnitude of information technology infrastructure. The most significant indicators of (X*Z) were *IT Budget*BPR Prototype (*new dummy variable for *information technology infrastructure and BPR strategy)*. Hence, the need to test whether the interaction effect exists where this variable gives a significant value for service delivery improvements in the firm. The BPR strategy and information technology infrastructure explain 59.4% of the changes in the firm service delivery. Although the BPR strategy alone explains 58.1% of the variance in the firm's service delivery, when combined with the information technology infrastructure they explain 59.4% of the variations in the firm's service delivery. The magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is 1.3% (59.4% - 58.1%).

Table 5 presents that the model is statistically significant in explaining the effect of information technology infrastructure on the relationship between BPR strategy and firm's service delivery, F (10, 33) =7.29, P>0.000.

Table 5: Model Overall Significance on the Effect of Information Technology Infrastructure on the Relationship between BPR Strategy and Service Delivery

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig./P-Value**
1	Regression	6683.528	1	6683.528	45.163	.000[b]
	Residual	6215.392	42	147.986		
	Total	12898.921	43			
2	Regression	7907.139	2	3953.569	32.473	.000[c]
	Residual	4991.782	41	121.751		
	Total	**12898.921**	**43**			

a. Dependent Variable: Service Delivery Index

b. Predictors: (Constant), Resources Mobilization for BPR

c. Predictors: (Constant), Resources Mobilization for BPR, IT Budget*BPR Prototype, Sponsorship and Commitment, Number of IT Personnel, BPR Cross functional Teams, Analytical Processes Selection, Annual IT budget , Management of Re-engineered Processes, BPR Prototypes, Clear BPR Definition and Vision

Source: Research Data (2020)

The coefficients of this predicative model aimed at addressing the effect of information technology infrastructure on the relationship between BPR strategy and firm's service delivery are given in Table 6.

Table 6: Regression Coefficients on the Effect of IT Infrastructure on the Relationship between BPR Strategy and Service Delivery Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig./P-Value
		B	Std. Error	Beta		
1	(Constant)	-17.446	5.810		-3.003	.004
	Resources Mobilization for BPR	11.408	1.698	.720	6.720	.000
2	(Constant)	-15.079	27.064		-.557	.581
	Resources Mobilization for BPR	12.973	3.445	.819	3.766	.001
	Annual IT budget	2.355	2.517	.276	.936	.356
	BPR Cross functional Teams	6.491	6.346	.244	1.023	.314
	Management of Re-engineered Processes	6.024	10.107	.150	.596	.555
	Sponsorship and Commitment	3.696	3.740	.149	.988	.330
	Clear BPR Definition and Vision	-1.662	16.793	-.045	-.099	.922
	IT Budget*BPR Prototype	-.323	1.004	-.111	-.321	.750
	Number of IT Personnel	-1.633	2.024	-.130	-.807	.426
	BPR Prototypes	-5.055	7.311	-.301	-.692	.494
	Analytical Processes Selection	-12.553	18.321	-.320	-.685	.498

a. Dependent Variable: Service Delivery Index

Source: Research Data (2020)

As presented in Table 5.20, using standardized coefficients: resources mobilization for BPR has a very strong positive effect on the firm's service delivery (β= 0.819, t= 3.766, P>0.001); annual IT budget has a strong positive effect on the firm's service delivery (β= 0.276, t= 0.936, P>0.356); BPR cross functional teams has a strong positive effect on the firm's service delivery (β= 0.244, t= 1.023, P>0.314); management of re-engineered processes has a strong positive effect on the firm's service delivery (β= 0.150, t= 0.596, P>0.555); sponsorship and commitment has a strong positive effect on the firm's service delivery (β= 0.149, t= 0.988, P>0.330); clear BPR definition and vision has a very weak negative effect on the firm's service delivery (β= -0.045, t= -0.099, P>0.922); IT Budget*BPR Prototype has a moderating negative effect on the firm's service delivery (β= -0.111, t= -0.321, P>0.750); number of IT personnel has a weak negative effect on the firm's service delivery (β= -0.130, t= -0.807, P>0.426); BPR Prototypes has a weak negative effect on the firm's service delivery (β= -0.301, t= -0.692, P>0.494); and analytical processes selection has a very strong negative effect on the firm's service delivery (β= -0.320, t= -0.685, P>0.498).

The relationship derived on the effect of information technology infrastructure on the relationship between BPR strategy and firm's service delivery is statistically significant.

The regression equation derived was thus as follows:

Y = 0.819 RMFBPR + 0.276 AITB + 0.244 BPRCFT + 0.150 MREP + 0.149 BPRSC - 0.045 BPRDV - 0.111 ITB*BPRP - 0.130 NITP - 0.301 BPRP - 0.320 BPRAPS

Where:

RMFBPR =Resources Mobilization for BPR

AITB = Annual IT budget

BPRCFT =BPR Cross functional Teams

MREP =Management of Re-engineered Processes

BPRSC =Sponsorship and Commitment

BPRDV = Clear BPR Definition and Vision

ITB*BPRP = IT Budget*BPR Prototype

NITP =Number of IT Personnel

BPRP = BPR Prototypes

BPRAPS = Analytical Processes Selection

The product variable of *IT Budget*BPR Prototype (*new dummy variable for *information technology infrastructure and BPR strategy)* is the measure of whether information technology infrastructure has any moderating effect on the relationship between BPR strategy and firm's service delivery. Given that the dummy product variable of *IT Budget*BPR Prototype* is included in the model which has the net positive magnitude (β= -0.111, t= -0.321, P>0.750) of 1.3%, then study therefore accepts the alternate hypothesis (H_{A1}) that information technology infrastructure moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya. H_{A1} is therefore supported.

Discussion of the Research Results and Findings

This section discusses the results of this study in line with the research objective and the hypothesis formulated based on existing literature, both conceptual and empirical, and led to the development of conceptual model, which outlined the relationships between the variables. The results from the test of hypotheses are compared on how they fit into the existing body of knowledge and previous studies. Further, this section discusses the implications of the current research findings' provision of new insights and support of existing theory on which the study was founded.

The study determined how information technology infrastructure conceptualized as a moderating variable affects the relationship between BPR strategy and service delivery of companies manufacturing food in Kenya. In order to test for this influence, a corresponding hypothesis H_{A1} that states that Information technology infrastructure moderates the relationship between BPR Strategy and service delivery of companies manufacturing food in Kenyawas formulated.

A moderation or interaction effect states that the effect of BPR strategy on firm performance (Y_1) depends on the magnitude of information technology infrastructure. The most significant indicators of (X*Z) were *IT Budget*BPR Prototype (*new dummy variable for *information technology infrastructure and BPR strategy)*. The study finding established that although the BPR strategy alone explains 58.1% of the variance in the firm's service delivery, further 59.4% (Adjusted $R^2 = 0.594$) of variations in firm's service delivery is explained by variations in the BPR strategy, information technology infrastructure and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype). Hence the magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is 1.3% (59.4% - 58.1%). These findings are have cleared the causal ambiguity highlighted by Attaran, (2004) where the role of information technology on the relationship with any strategy construct could not be conceptually linked to service delivery and firm performance.

These results are consistent with earlier empirical evidence by Bhatt & Grover, (2005) and Tippins & Sohi (2003) effective IT infrastructure utilization enables the smooth implementation of the BPR strategy for improved service delivery. The Information technology (IT) infrastructure plays a very critical role in BPR findings have added to the scanty literature that has gone beyond case study based on the recommendations of Broadbent et al. (1999) and Hammer & Champy (1993) for the need to empirically test the strategy implementation although empirical studies examining the useful roles of IT infrastructure in BPR and service delivery, whilst addressing Ganesh, (2000) concerns that most of these studies are case-based descriptions but the current study has empirically regressed the moderating effect of IT infrastructure on service delivery by critically demonstrating the critical role of IT infrastructure in BPR strategy implementation and service delivery beyond

the anecdotal case-studies.

The finding have further provided new insights on the role of IT infrastructure on the implementation of BPR strategy through IT personnel and budgetary allocations which will be blended as IT Budget*BPR Prototype for improved firm performance. The new insight of IT Budget*BPR Prototype advanced Brynjolfsson and Hitt, (2000) ideas that many studies have focused on the services sector firms and examined the relationship between ICT and firm performance but not service delivery.

Further insights from manufacturing firms has provided better insight report to the proposals by Broadbent et al., (1999) that the contribution of ICT to output growth is as high in the service sector as opposed to the manufacturing sector. The current study has given new frontiers based on the recommendation of Broadbent et al., (1999) for an empirical study within the manufacturing sector, which has substantially improved the understanding of the relationship between ICT and firm performance.

Conceptually, the empirical relationship testing how the relationship between BPR strategy and service delivery is moderated by IT infrastructure confirms the conceptual model that information technology infrastructure significantly moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya. The findings have empirically addressed Ganesh, (2000) and Brynjolfsson & Hitt, (2000) recommendations on the need to empirically provide a succinct and precise theoretical model between BPR, IT infrastructure and service delivery by focusing on the technical dimension of IT infrastructure, instead of IT resources dimensions which is combination of the technical and organizational resources. The findings are supported empirical by the resource advantage theory where food-manufacturing firms should focus on IT infrastructure for BPR strategy implementation to yield improved service delivery.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the study's summary of findings on thematic areas, conclusions, recommendations, limitations and suggestions for further studies. The summary of findings is based on each and every indicator used in the study while the conclusions and recommendations are based on the generalized views under each objective area.

Summary of Findings

Primarily, the discussions laid focus on the results and whether they were consistent or contradicted other empirical studies. It also covered suggestions on areas of keen interest. On hypotheses testing, it was established that 59.4% of variations in firm's service delivery is explained by variations in the BPR strategy, information technology infrastructure and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype).The magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is 1.3% (59.4% - 58.1%); then study therefore accepts the

alternate hypothesis (H_{A1}) that information technology infrastructure moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya.H_{A1} is therefore supported. The table below provides the summary of results, summary of hypotheses testing and decision.

Table 7: Summary of the Results of the Hypothesis

Objective	Hypothesis	R	R^2	Adj. R^2	F	Sig./P-Value	Decision
To determine the effect of IT infrastructure on the relationship between BPR Strategy and service delivery of companies manufacturing food in Kenya;	**H_{A1}:**Information technology Infrastructure moderates the relationship between BPR Strategy and service delivery;	.783b	.613	.594	32.473	.000[c]	Accept

Source: Researcher (2020)

Conclusion

In conclusion, the study confirmed that the magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is positive and statistically significant whereby 59.4% of variations in firm's service delivery is explained by variations in the BPR strategy, information technology infrastructure and product variable between BPR strategy and information technology infrastructure (IT Budget*BPR Prototype).The results therefore support the anchoring theory of resource advantage and resource based view theories.

Contributions of the Research Findings

This study has contributed in different areas including implications to theory, policy, management practice and methodological contributions as discussed in the subsequent paragraphs.

First, this study has advanced frontiers of knowledge from the study findings; the role of information technology infrastructure on the relationship between BPR strategy and service delivery could not be generalized (Hammer and Stanton, 1995) in the replicated due to use of case studies and the role played by IT adoption as opposed to IT innovations must be implemented. This study found out that the magnitude of information technology infrastructure's moderating effect on the relationship between BPR strategy and firm's service delivery is positive and statistically significant. These findings are have cleared the causal ambiguity highlighted by Attaran,

(2004) where the role of information technology on the relationship with any strategy construct could not be conceptually linked to service delivery and firm performance.

Secondly, this research makes several noteworthy contributions to the existing theory: the empirical relationship testing how the relationship between BPR strategy and service delivery is moderated by IT infrastructure confirms the conceptual model that information technology infrastructure significantly moderates the relationship between BPR and service delivery of companies manufacturing food in Kenya. The findings have empirically addressed Ganesh, (2000) and Brynjolfsson & Hitt, (2000) recommendations on need to empirically provide a succinct and precise theoretical model between BPR, IT infrastructure and service delivery by focusing on the technical dimension of IT infrastructure, instead of IT resources dimensions which is combination of the technical and organizational resources. The findings are supported empirical by the resource advantage theory where food-manufacturing firms should focus on IT infrastructure for BPR strategy implementation to yield and improved service delivery.

Thirdly on the study's policy contributions: the manifestation of BPR strategy, IT infrastructure and service delivery dimensions had varied and mixed results on firm performance. The findings of this study offer suggestions that are beneficial to policy makers in the food-manufacturing sector in Kenya. Kenyan manufacturing firms have previously lacked fits well into the existing body of knowledge by holding that BPR strategy influence the firm's level of performance and vice versa.

Lastly on the methodological contributions: key methodological contribution is the use of a quantitative composite index in computing the SD index, the use an integrated empirical model to test the relation between BPR strategies, IT infrastructure and service delivery; the study used a number of indicators to measure each construct, which improved the construct validity. Based on this, the ground has been set for replication whereby questionnaires were used as a useful tool for data collection, which allowed the respondents privacy and chance to express themselves freely without fear and shyness. This is therefore a methodological contribution compared to the commonly used interviews and lab experiments. Consequently, the use of simple, multiple and hierarchical analytical tools and technique more especially on moderating and joint effect gave various statistical reports that guided this study on statistical significance to support or not support the various hypotheses. It allows drawing of conclusions based on verifiable empirical evidence. If another choice of analytical tool was to be used, the statistically significant results may change to be statistically insignificant.

Limitations of the study

The study had a number of limitations. This study drew its sample from companies manufacturing food in Kenya, and further research should include a broader perspective of all manufacturing firms or large scale manufacturing firms. The same can be

applied to the service firms and industry. The information that was sought from the companies manufacturing food in Kenya were voluntary, but out the fifty questionnaires that were returned, there were some outliers hence only forty four (44) questionnaires were used in the correlation and regression analysis of this study.

A cross-sectional survey approach method was used for the study and data was collected was collected at only one point in time which may bias the findings and given that, the study was done within companies manufacturing food in Kenya, which has certain peculiarities. A single respondent was used in data collection, which may bias or determine the nature of responses.

The study had another challenge to do with covering all companies manufacturing food in Kenya with geographically dispersed towns requiring a lot resources and time. The analytical limitations arose from the multiple measures that were used to measure BPR strategies, IT infrastructure and service delivery. These called for the use of both quantitative and qualitative measures, which were restricted to a period of five years requiring a lot to be done before the actual report writing.

Suggestions for Further Research

The current study was done in food manufacturing setting in Kenya. Future studies can therefore be done on the service industry given that BPR strategy and IT infrastructure are for both service and manufacturing. This can compare the BPR strategy and IT infrastructure that apply to service and manufacturing settings in a developing economy. Furthermore, BPR is expected to achieve radical performance improvement in time, cost, service and quality. The interaction between the BPR strategy and IT infrastructure could be investigated in relation to cost performance for greater understanding of how they can jointly/individual affect the cost performance.

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