Online Journal of Arts, Management and Social Sciences (OJAMSS);
Vol.3 No.1, April 2018, pg.180 – 188 (ISSN: 2276 – 9013)

BUSINESS PROCESS REENGINEERING AND ORGANIZATIONAL PERFORMANCE OF RICE PRODUCTION FIRMS. EVIDENCE FROM SOUTH- EAST, NIGERIA.

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Abstract
This is a study on the Business Process Reengineering and Organizational Performance of Rice Production Firms in South East, Nigeria. Objective, research questions and hypotheses of the study were stated. The work is anchored on theory of constraints. Survey research technique was adopted for the study. The structured questionnaire was subjected to both validity and reliability tests using (SPSS) before distributing them. Multiple regression analysis was carried out to test all the null hypotheses. The analysis of the data resulted to some findings which are of great benefits. The findings from this work show that adoption of new technology, adoption of new processes and presence of process owners at production interfaces have 0.9673, 0.7232 and -0.6630 percentage effects respectively on the performance of rice production firms in South East, Nigeria. Based on the findings, the study concluded that if rice production firms in South East Nigeria should have improved performance, attention should be given to business process reengineering methodology. From the findings, the study recommends that Government, entrepreneurs and managers should provide modern rice processing equipment to rice firms in the region in order to enhance performance. All the stakeholders should work as a team to ensure that new methods of production and processing activities are introduced to replace old methods that are no longer cost effective and efficient. Managers should ensure that process owners are positioned at various interfaces of the production value chain in order to improve process efficiency and effectiveness. From the review of related literature, it is the opinion of the researcher that this is the first and only study done in South East, Nigeria seeking to solve performance problems of rice production firms using business process reengineering.

Key words: Business process reengineering and Organizational performance

INTRODUCTION

Organizations inability to pay attention to continuous improvement strategies has adversely affected performance of firms and businesses in South East, Nigeria. Some of these firms still use the old method and out-dated machineries in their productive activities. Changing processes and creating new processes are essential to adapting to technological change and competitive pressures. Automation helps to improve business processes that yield better products to satisfy the customers. The firms in this region are so much preoccupied with profit making that they pay less attention to process-oriented strategy that can lead to quality products and service. Lack of process-oriented strategy in these organizations results in physical, people and organizational problems that hinder performance. Large heap of defective products and poor service delivery due to machine breakdown and poor business process management strategy are of their negative business experiences. Machine breakdown results from lack of regular and scheduled maintenance of machines and equipment. Moreover, lack of streamlined procedure and mapped out time for evaluating the machine-performance to checkmate process variation is a strong constraint to the process performance.

Then, a review of related literature was carried out which indicated that no work has been done on business process reengineering and organizational performance in South- East, Nigeria. This problem results to high product defects, high production cost, low quality products, low productivity, long execution and delivery time which adversely affect organization's performance. To find solutions to these problems, the study factors in business process re-engineering methodologies that will enhance organizational performance in the are Most rice production firms in South East, Nigeria still use old method and out-dated machines in processing rice grains leading to grain damages and production of stone-filled rice. Rose, Aliou and Flifli (2014) are of the opinion that locally processed rice contains impurities and mixed colours due to the use of inappropriate post-harvest handling such as milling sorting, polishing and grading. Joke (2015) is of the view that when local rice is mentioned the picture that comes to mind is rice filled with stones and particles. These account for the low performance of rice production firms in this region. To solve the performance problems of these firms, Emordi and Dimelu (2012) point out that government and stakeholders have made concerted efforts to improve the domestic production of rice to meet the increasing demand. But these efforts have not yielded enough result, therefore, the problem of this study is to close the established gap by adopting business process reengineering methodology This study aims to examine the effect of business process reengineering on the performance of rice production firms in South-East, Nigeria. The specific objectives are to: (1) investigate the effect of adoption of new technology on the performance of rice production firms in South-East, Nigeria. (2) examine the effect of adoption of new processes on the performance of rice production firms in South-East, Nigeria. (3) find out the effect of presence of process owners on the performance of rice production firms in South-East, Nigeria. The research questions that guide this work are: (1) what is the effect of adoption of new technology on the performance of rice production firms in South-East, Nigeria.? (2) What is the effect of adoption of new processes on the performance of rice production firms in South-East, Nigeria.? (3)what is the effect of presence of process owners on the performance of rice production firms in South-East, Nigeria.? Hypotheses are: $H0_1$: effect of adoption of new technology on the performance of rice production firms in South-East, Nigeria is not significant. $H0_2$: effect of adoption of new processes on the performance of rice production firms in South-East, Nigeria is not significant. $H0_3$: effect of presence of process owners on the performance of rice production firms in South-East, Nigeria not significant. The findings from the study will benefit the entrepreneurs and managers whose firms have quality problems and high cost of production. The study is limited to the business process reengineering in rice production firms in South East, Nigeria.

REVIEW OF RELATED LITERATURE

Business Process Re-engineering

Johansson & Mchugh (2008) observe that business process re-engineering is a means by which an organization can achieve radical change in performance as measured by cost, cycle time, service and quality by application of a variety of tools and techniques that focus on the business as a set of related customer-related core business processes. To Jacob (2009) business process re-engineering as a panacea and subsequently noted that it is an informed, participative process resulting in new ways of doing business that position an entire organization for success, now and into the future. Hammer (1993) views business process re-engineering as the fundamental rethinking and radical redesign of business processes to achieve dramatic improvement in critical contemporary measures of performance such as cost, service, quality and speed. Tor & Wendi (1996) are of the opinion that business process reengineering was founded on the premise that significant corporate performance improvement requires continuous improvement-breaking away from the outdated rules and fundamental assumptions that underlie operations. Alder and Clark (1991) point out that capabilities can be significantly enhanced by adopting changes in new technology, processes and people.

Adoption of New Technology in Business Operations

Challenges in business environment and competitiveness have called for immediate redesign of business processes to achieve dramatic improvement in cost of business operations, service, quality and speed. This involves removing outdated processes and using modern information technology to manage business organizations. Hammer (2013) is of the view that dynamic business environment has called for innovation which is regarded as crucial to the sustainment of competitive advantage. Changing processes and creating new ones is essential to adapting to technological change and competitive pressures. The essence of new technology adoption is to ensure efficiency and effectiveness in operations management within an organization to maximize value and profitability through competitive performance. The re-engineering process deals with replacing the manual processes with automation and eliminating unnecessary bureaucracy and providing right information at right time to the right people, eliminating unnecessary work, reducing

unnecessary control, empowering every employee and getting it right the first time. Moreover, automation of key processes can improve the performance of business activities, improve productivity, increased profitability and enables the enterprise-wide monitoring and coordination. Automated process in certain key areas of production process will lead to reduction in cost of production and achievement of better quality products.

Adoption of New Processing Methods in Business Operations.

Janine & Kelvin (2013) view process improvement as the changing of the existing processes to enhance performance. Moreover, Bovee & Thil (2010) view process improvement as an on-going effort to reduce cost, defects, slash production and delivery time and also offer customers innovative products that are enough to improve the firms profit level.

Presence of Process Owners at Interfaces

Hinterhuber (1995) notes that process owners are experienced managers who are members of organization's decision making body charged with the responsibility of continuous improvement of their processes. Armistead (1996) is of the view that business process ownership is the champion of the business processes whose responsibility is to ensure process performance. These business process owners work at the interfaces between the major processes in the production activities. To Suter (2009) process owners must have the authority to take all measures necessary to coordinate and improve business process.

Organizational Performance

It is the actual output of an organization as measured against its intended goals and objectives. Kaplan & Norton (1992) Leans & Euske (2006) maintain that performance is a set of financial and non- financial indicators which offer information on the degree of achievement of objectives and results. Richards (2009) is of the opinion that organizational performance consists of financial performance, product market performance and stakeholders return. Based on this view point, Maik, Hamann, Frank, Lucia, & Thomas (2013) identify four organizational performance dimensions as profitability, liquidity, growth and stock market performance. Performance improvement in firms concerns improvement in resource requirement, process efficiency, outputs and outcome requirements. A firm improves its performance as long as its products are different from competing brands in the market place.

Theoretical Framework of the Study

This work is anchored on the theory of constraint (TOC) propounded by Goldratt in 1984.

Theory of constraints is a methodology for identifying the most important factor that prevents an organization from achieving its goal and then improving that constraint until it is no longer the limiting factor helps the organization from achieving its objectives. At least there is one constraint limiting the progress of an organization. Every manufacturing process consists of multiple linked activities and one of these activities acts as a constraint upon the entire system. The weakest link in the chain is the constraint activity. Internal constraints are production equipment, organization's employees and policy and these constraints are experienced when the market demands more from the system than it can deliver while external constraints exist when the system can produce more than the market will bear. Choice of the theory is based on the premise that milling and de-stoning activities are carried out with out-dated production equipment that work as clog in the wheel of production activities. Tor & Wendi (1996) are of the opinion that business process reengineering was founded on the premise that significant corporate performance improvement requires continuous improvement.

EMPIRICAL REVIEW

Gautami, Barney and Waleed (2004) carried out an empirical works on capabilities, business processes, and competitive advantage which examined the impact of firm-specific resources on the overall performance of a firm. Data for the study were collected through the use of a survey. In addition, some non-survey measures of customer service quality were used. Descriptive statistics was used to test both independent and dependent variables of research constructs while structural equation model was used to test the hypotheses of the study. Findings from this work showed that firms may possess competitive advantage in three out of five models. This suggests a positive advantage at the level of business processes but the managerial information technology knowledge was not reflected in a firms overall performance and customer service performance. Philip (2008) did a work on the relationship between technology innovation and firm performance using electronic business in Europe as a case study. The work aims at comparing the performance of innovative and non-innovative companies. The research context was Rotterdam Netherlands. In this work Performance is measured in terms of turn-over development, employment development and profitability. Dataset for the

investigation originated from Nov/Dec 2003 enterprises survey of the e-Business Market W@tech sponsored by the European Commission DG Enterprises and Industries. About 7302 firms were sampled for the investigation. Finding from the study showed that innovative activity was not necessarily associated with higher organizational performance. Kemal, Yasin, & Zafer (2011) carried out a study on productivity and performance effects of business process reengineering by doing firm level analysis. Objective of the work was to empirically investigate whether business process reengineering is associated with enhanced firm productivity and performance. Data for the study were collected from firms spanning from 1987-2008. The obtained data were analysed using fixed effect. Research methodology was differencing and standard methods that account for unobservable firm-level effects. Findings from the study showed that return-on-assets drop significantly during the project initiation year. Moreover, it was found out that performance and productivity measures improve in decreasing manner after project initiation, suggesting that business process reengineering indeed positively affects firm performance on average. Islam & Mohamed Bin (2011) carried out a study on impact of organizational innovation on firm performance drawing evidence from Malaysian-Based ICT Companies. The study investigated the effect of organizational innovation on company performance. The study hypothesized that organizational innovation is positively related to company performance which is measured in terms of both market and financial metrics. Data for the study were collected through electronic survey from 115 small and medium enterprises operating in the ICT industry in Malaysia. Findings from the study support the hypothesis that organizational performance has a significant influence on firm performance. Kabiru, Mohamed & Norlena (2012) did a work on critical success factors for business process management for small and medium banks and situated the work in Nigeria. The purpose of the work was to examine the effect of the critical success factors for business management on the performance of small and medium banks in Nigeria. These researchers carried out a survey of organizations in financial sectors and applied a rigorous research methodology in approaching the research problem. They found out five critical success factors of business process management implementation. These critical success factors are information technology investment, volume of financial activities, personnel commitment, strong capital base and effective reward system. Finding from the study showed that there is a significant relationship between information technology investment, personnel commitment, volume financial activities and overall organizational performance. Mura, Nilgun & Fulya (2013) carried out a study on the relationship between innovation and firm performance by using evidence from Turkish Automotive Supplier Industry. The purpose of the study was to examine the relationship between innovation and firm performance. The research context was Turkey. It was a survey research and data for the study was collected using questionnaire. The population of the study was top level managers from 113 firms operating in the automotive supplier industries in Turkey in 2011. The study used (SPSS) to analyse the obtained data for the study. The findings from the study showed that technological innovation such as product and process innovation have significant and positive impact on firms' performance.

METHODOLOGY

Research Design

Structured questionnaire was used in collecting data and correlational research design was adopted because correlational research design measures the closeness of the linear relationship between two variables as recorded by (Nduka & Ogolime (2000). The study was carried out in South East, Nigeria which comprises Abia, Anambra, Ebonyi, Enugu and Imo states. The study focused on this area because there are many rice production firms in this region. Primary data were used for the study since the firms under investigation are not quoted on Nigerian Stock Exchange. The population frame was all the rice production firms and the available records showed a total staff strength of 3200 workers and entrepreneurs. Taro Yemeni's formula was used to determine the sample size of 355 although 354 copies of questionnaire were returned. The population was stratified into strata because the rice production firms use different approaches to rice production.

Table 1: GEOGRAPHICAL DISTRIBUTION OF POPULATION AND SAMPLE

	Rice Firms in Abia State	Rice Firms in Anambra State	Rice Firms in Ebonyi State	Rice Firms in Enugu State	Rice Firms in Imo State.	Total
Population	190	1800	620	330	260	**3200**
Sample	21	200	68	37	29	**355**
Percentage	5.9 %	56.3 %	19.1 %	10.4 %	8.2 %	**100 %**

Experts on strategic and production management validated the instrument. The instrument was tested for reliability using (SPSS) and the reliability coefficients for business process reengineering and organizational performance were 0.892 and 0.831 respectively. The correlation is significant at the 0.01 level (2.tailed) and the analysis showed that the instruments were reliable since the reliability coefficients were above 0.5.

Apriori Expectations
It is theoretically expected that effective implementation of adoption of new technology, adoption of new processes and presence of skilled process owners will have positive effects on organizational performance.

Method of Data Analysis
Data collected for the study was analyzed using ML-Binary Logit (Quadratic hill climbing). The use of this analytical tool helps to determine the changes in dependant variables as a result of changes in independent variables using the result of the McFadden R-squared. The choice of this method of analysis offers opportunity for the LR-statistics value and its probability value to indicate whether the model used for the analysis is statistically significant at given levels of significance or not.

Model Specification and Justification
This research work is modelled to capture business process reengineering and this offers the researcher an opportunity to develop a model in line with the objectives and hypotheses of study. BPM: Business Process Reengineering Model 1. Expected performance of rice production firms is expressed as a function of business process reengineering.
BPR (ANT, ANP, PSPO) = OP
This can be expressed in structural equation form:
BPR (b0 + b1ANT + b2ANP + b3PSPO + μ) = OP
BPR =Business Process Reengineering
ANT = Adoption of new technology
ANP = Adoption of new processes
PPO = Presence of process owners
OP = Organizational Performance
Where bo is a constant or intercept. b1 + b2 + b3 are the coefficients of the explanatory variables. μ is stochastic variable.

PRESENTATION AND ANALYSIS OF DATA
Data collected from the field for this study were analyzed and the summaries presented in tables to highlight the findings. The presentation was sequentially done starting with the answers to the research questions and testing of hypotheses.

Research Questions 1

What is the effect of adoption of new technology on the performance of rice production firms in South- East Nigeria?

Table 1: Adoption of New Technology and Performance of Rice Production firms

Dependent Variable: Organizational Performance
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 343

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	*1.141644*	*0.127872*	*8.928021*	*0.0000*
ANT	*0.942640*	*0.285391*	*3.302977*	*0.0124*

The table 1 reveals a coefficient value of 0.9426, and p-value of 0.0124. The coefficient value of 0.9673 indicates that the use of new technology has about 0.94 percent influence on performance of rice firms in the South East, in Nigeria.

Research Question 2

What is the effect of adoption of new processes on the performance of rice production firms in South-East, Nigeria.?

Table 2: Adoption of New Processes and Performance of Rice Production firms

Dependent Variable: Organizational performance
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 343

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	*1.141644*	*0.127872*	*8.928021*	*0.0000*
ANP	*0.723178*	*0.295247*	*2.449399*	*0.0283*

The result reveals a coefficient value of 0.7232, and p-value of 0.0283. The coefficient value of 0.7232, indicates that the adoption of new process has positive influence of .7232 percent on the performance of rice production and processing firms in the South East Nigeria

Research Question 3

What is the effect of presence of process owners on the performance of rice production firms in South-East, Nigeria.?

Table 3: Presence of Process Owners and Performance of Rice Production firms Nigeria

Dependent Variable: Organizational Performance
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 343

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	*1.141644*	*0.127872*	*8.928021*	*0.0000*
PPO	*-0.663021*	*0.692587*	*-0.957310*	*0.3384*

The table 3 shows a coefficient value of -0.6630, and p-value of 0.3384. The negative coefficient value indicates that presence of skilled process owners in rice production and processing firm has negative influence of -0.6630 percent on the performance of rice production and processing firms in the South East Nigeria.

Testing of the Hypotheses

$H0_1$: Effect of adoption of new technology on organizational performance in South-East Nigeria is not significant.

Table 4: Level of significant effect of Adoption of New Technology on Organizational Performance**.**
Dependent Variable: Organizational Performance
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 343

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	***1.141644***	***0.127872***	***8.928021***	***0.0000***
ANT	***0.942640***	***0.285391***	***3.302977***	***0.0124***

The result reveals a coefficient value of 0.9426, and p-value of 0.0124. The coefficient value of 0.9673 indicates that the use of new technology has about 0.94 percent influence on performance of rice production and processing firms in the South East, in Nigeria. The probability value of 0.0124 shows that the use of new technology has 1% significant effect on performance of rice production and processing firms in the South East Nigeria. Based on the analysis result, the study reject the null hypothesis and accept the alternative hypothesis.

$H0_2$: Effect of adoption of new processes on organizational performance in South-East Nigeria is not significant.

Table 5: Table 5: Level of significant effect of Adoption of New Processes on Organizational Performance
Dependent Variable: Organizational Performance
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 343

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	***1.141644***	***0.127872***	***8.928021***	***0.0000***
ANP	***0.723178***	***0.295247***	***2.449399***	***0.0283***

The result reveals a coefficient value of 0.7232, and p-value of 0.0283. The coefficient value of 0.7232, indicates that the adoption of new process has positive influence of .7232 percent on the performance of rice production and processing firms in the South East Nigeria. The probability value of 0.0283 shows that the adoption of new process has about 5% significant effect on performance of rice production and processing firms in South East, Nigeria. Based on the result, the study rejects the null hypothesis and accept the alternative hypothesis.

$H0_3$: Effect presence of process owners will have on organizational performance in South-East, Nigeria is not significant.

Table 6: Level of significant effect of Presence of Process Owners on Organizational Performance.
Dependent Variable: Organizational Performance
Method: ML - Binary Logit (Quadratic hill climbing)
Sample: 343

Variable	*Coefficient*	*Std. Error*	*z-Statistic*	*Prob.*
C	***1.141644***	***0.127872***	***8.928021***	***0.0000***
PPO	***-0.663021***	***0.692587***	***-0.957310***	***0.3384***

The result reveals a coefficient value of -0.6630, and p-value of 0.3384. The negative coefficient value indicates that presence of skilled process owners in rice production and processing firm has negative influence of -0.6630 percent on the performance of rice production and processing firms in the South East Nigeria. The probability value of 0.3384 shows that the presence of skilled process owners in rice production and processing firm has no significant effect on performance of rice production and processing firms in South East, Nigeria. Based on the result, the study reject the alternative hypothesis and accept the null hypothesis.

Discussions on Research Findings

Adoption of New Technology and Organizational Performance

The findings from this study agree to some extent and also disagree to some extent with the previous work done by Gautami, Barney & Waleed in the year 2004. Since their finding shows a positive advantage of business process management as strategy for competitive advantage for firms applying it agrees with the present work in this regard. On the other side of the coin, the finding disagrees with the other aspect of their

finding. The findings of that study did not managerial information technology knowledge reflect in a firms overall performance and customer service performance.

Adoption of New Processes on Organizational Performance

The findings of this work agree with the findings of the work of Janis & Kevin in the year 2013 and Mura, Nilgun & Fulya in the year 2013; but, disagree with the findings from the study by Philip (2008).

Presence of Process Owners on Organizational Performance

The findings from this study partly agrees with the findings of the work of Kemal, Yasin & Zafer on productivity and performance effects of business process reengineering in the year 2011.

Conclusion

Based on findings, study concludes that business process reengineering methodology should be applied in the production of rice in South East Nigeria with a view to improving the performance of those firms.

Recommendations

Based on the findings, the study makes the following recommendations:

1. Government, entrepreneurs and managers should provide modern rice production equipment to rice firms in the region in order to enhance performance.
2. All the stakeholders should work as a team to ensure that new methods of production and processing activities are introduced to replace old methods that are no longer cost effective and efficient.
3. Managers should ensure that process owners are positioned at various interfaces of the production value chain in order to improve quality of processes and organizational performance.

Contribution to Knowledge

This is the premium study that provided a good insight into the benefits of business process reengineering and organizational performance in south East Nigeria.

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