“Business process reengineering and operational costs of selected Nigerian airline companies”

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BUSINESS PROCESS REENGINEERING AND OPERATIONAL COSTS OF SELECTED NIGERIAN AIRLINE COMPANIES

Abstract

Continuous cost management is considered vital for the sustainability of any business enterprise in modern society. Over the years, the Nigerian airline industry has been experiencing rising operational costs, probably due to inadequate business process reengineering. Based on the assumptions of the value chain model, this article investigates the effect of business process reengineering on operational costs of selected indigenous airline companies in Nigeria. The descriptive survey research design was adopted for the study. The population was 1,938 employees of key professional departments of the selected Nigerian indigenous airline companies. The sample size was 699 staff of the selected departments with 84% response rate. The copies of the questionnaire were administered using trained research assistants. The study adopted a mixed sampling method. Proportionate sampling was used to determine the sample size for each of the three airlines; stratified sampling was used to select the specific units within the organization, while random sampling was used to select the respondents. The data collected were analyzed using descriptive and simple linear regression methods. The descriptive analysis revealed that the overall average and standard deviation for business process reengineering were 2.80 and 0.57, while operational costs were 4.29 and 0.54 respectively. The inferential result showed a positive and significant effect of the business process reengineering on operational costs ($R^2 = 0.024$, $\beta = 0.147$, $t = 3.709$, $p < 0.05$). Thus, the study concluded that business process reengineering affects the operational costs of the selected indigenous airline companies in Nigeria.

Keywords airlines, Nigeria, Africa, information technology, input, organization, output, value chain model

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INTRODUCTION

The Nigerian aviation industry, as one of the most important drivers of the national economy and development, comprises the providers of navigational aids, ground-based facilities, and eight airline companies. Besides, the rapidly expanding indigenous airline companies registered in Nigeria as reported by Phillip consulting group in Daramola and Fagbemi (2019) had contributed over ₦184 billion to the Nigerian Gross Domestic Product and supported 254,500 jobs. Nevertheless, the airlines sector of the Nigerian aviation industry is facing serious problems connected with rising operational costs resulting in poor business performance such that as at 2016 more than forty-seven airline companies, which amounted to about 80% of the Nigerian indigenous airline companies, had liquidated their operations and went into extinction (Joji, 2016).

While over the years, various countries of the world made concerted efforts to reduce the operational costs of airlines, the Nigerian airlines' multiple statutory charges coupled with the high cost of aviation fuel (Jet A1) have resulted in rising operational costs of the indigenous

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airline companies in Nigeria (Eze, 2017; Shadare, 2017). Additionally, there were high costs of foreign exchange required to undertake overseas technical training of personnel, procure aircraft spare parts/supplies from overseas, and embark on mandatory MRO services in oversea nations. All these have resulted in Nigerian indigenous airlines generating high operational costs, ranging from 70% to 85% from 2012 to 2016 (Security and Exchange Commission Annual Reports, 2017). The high operational costs generated by the Nigerian indigenous airlines are inimical to the airline companies' profitability and continued existence (Eze, 2017). This was substantiated by the Asset Management Corporation of Nigeria (AMCON) ferocious acquisition of Aero Contractor Airline on 5th of February 2016 and Arik Air on 9th of February 2017 (Nwauzor, 2017; Okon, 2017; Tumba, 2017).

Business process reengineering has been investigated concerning business performance in countries like Kenya, Nigeria, Pakistan, Ethiopia, and Croatia (Auka, Bosire, & Matern, 2015; Makokha, Ujunju, & Wepukhulu, 2013; Nadeem & Ahmad, 2016; Oluwasanya, 2014; Orogbu, Onyeizugbe, & Onuzulike, 2015; Ringim, Razalli, & Hasman, 2011, 2012; Segetun, Ensermy, & Moorthy, 2013). These studies looked at performance variables such as sustainable competitive advantage, financial management system, information technology, and organizational performance while ignoring operational costs in the airline industry.

Most time, managers attempt to address the questions on how to reorganize the way the company does business to provide the best-quality, lowest-cost goods or services to customers within a reasonable time (George & Jones, 2012; Zairi, 1997). It is acclaimed that meeting the customers' expectations at an acceptable price will prevent their shifting to the producers of other products or services (Sungau & Ndunguru, 2015). The Nigerian airlines' multiple statutory charges, high cost of aviation fuel, high costs of foreign exchange have resulted in high operational costs probably due to inadequate business process reengineering. These issues aroused the researchers' curiosity on the essence of the effect of the business process reengineering on the operational costs of Nigerian indigenous airline companies. The main objective is to examine the effect of business process reengineering on operational costs of the selected indigenous airline companies in Nigeria. The following sections present the literature review conceptually, empirically, and theoretically, followed by the methodology. The results are presented and discussed, followed by the conclusion, recommendations, and suggestions for the further studies.

1. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1.1. Business process reengineering

Different definitions have been proposed by different scholars (Chen, 2001). Stoddard and Jarvenpea (1995) defined the business process as a set of activities that transform a set of inputs into outputs using people and equipment. It is also considered as activities that are logically arranged in three stages: inputs are transformed into outputs (Sungau & Ndunguru, 2015). Business processes are activities such as order processing, inventory control, and product design, which are vital to the quick delivery of goods and services to the customers and promote high quality at a lower cost (George & Jones, 2012). It is seen as the string of steps layout for the production of a specific good or service. According to Sungau and Ndunguru (2015), reengineering takes care of the organization's reorganization through remodeling and eliminating the sections that are not adding the required value and adjusting processes to achieve the required standard. Therefore, new innovative ways of arranging the business activities are established, and existing arrangements are often removed to meet customer needs (George & Jones, 2012). Business process reengineering (BPR) is, therefore, the totality of fundamentally changing a part of an organization. Davenport and Short (1990) defined BPR "as a set of logically related tasks performed to achieve" defined business actions. George and Jones (2012) view BPR as a change strategy that aims to alter how an organization views its activities and the employees who perform the activities.

Consequently, business process reengineering strives at improved speed by reducing the cycle of time, reduced cost, and improved quality of service (Hammer & Champy, 1993). Besides, Magutu, Nyamwange, and Kaptoge (2010) advanced the use of information technology to achieve business process reengineering.

Futhermore, Widigbo, Fahmi, and Beik (2016) see business as a collective of actions that are structured in nature and aimed at producing a product or service. These actions are "logically related entities that makes use of organisational resources" (Islam & Ahmed, 2012). Solaimurugan (2011) further stated that the business process involves the use of both people and tools to change a set of inputs into output in the form of goods and services and it was further stated that the process is essential for transforming materials into finished products to meet the customers' needs (Milan et al., 2014). Considering the various definitions, it can be concluded that business process reengineering involves getting the best product or service to the customers of an organization by improving the activities involving all the stages of production from materials to processing and, ultimately, the output. Every activity aims to satisfy the customers of the organization by giving quality products at a reduced cost.

1.2. Operational cost

Operational cost is the cost per unit of a product or service or the annual cost of an organization. Accordingly, Covert (1997) defines operational costs as those expenditures on materials, labor, and facilities under the direct control of a manager. Similarly, Sungau and Ndunguru (2015) claimed operational costs are those disbursements generated by equipment, systems, and communication charges. As a result, the firm's management strives continuously to reduce operational cost to provide the goods and services demanded by the customers since not meeting the customers' expectations will lead to their shifting to other product producers. These definitions, though portray the intent of operational costs, are not sufficient. Therefore, there was an improvement when Setegn, Ensermu, and Moorthy (2013) defined operational costs as the charges that are related to the activities of a business, or the working of a device, component, or facility. Operational costs can be measured objectively or subjectively. The objective measure of operational cost can be affected by determining the cash spent on each activity, while the subjective measure can be achieved through the opinion of the manager involved in the apportionment of cost. Given the literature review's opinions and positions above, the researcher defines operational costs as the expenses incurred in the course of carrying on the primary activity of a business.

An efficient firm operational cost improves as the everyday expenditures incurred in administering the business like supplies, labor, inventory, material, and facility costs are minimized. Operational cost evaluation has the advantage of assisting management in determining business process improvement to approve and implement. The reduction of the operational cost of an organization, in the long run, enables the business to grow and survive. However, operational costs reduction could cumulate into demerits of adversely interfering with business process improvement and flexibility. Continuous operational costs reduction may stifle continuous process improvement and hinder innovation when cost thresholds are set.

1.3. Business process reengineering and operational costs

Nadeem and Ahmad (2016) studied the impact of business process reengineering on the performance of banks in Pakistan and found a significant positive relationship between business process reengineering and performance. In the same vein, Osano and Okwena (2015) examined the factors influencing the performance of business process reengineering projects in Kenya Commercial Bank and found that employees in KCB are committed to BPR and the performance improved. The study of Orogbu et al. (2015) on business process reengineering in the automobile firms in Nigeria established a positive relationship between the variables. Likewise, H. N. Nzewi, U. C. Nzewi, and Moneme (2015) investigated the relationship between business process reengineering and performance of courier service organizations in Anambra state, Nigeria. It was concluded that there exists a significant relationship between BPR factors used and the performance of the selected courier service firms.

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Besides, Awolusi and Onigbinde (2014) assessed the critical success factors for BPR in the Nigerian oil and gas industry. The study findings revealed that management systems, project management and planning, support and competence management, IT infrastructure, and organizational culture were critical success factors in business process reengineering. Similarly, Setegn et al. (2013) undertook a study on assessing the effect of business process reengineering on organizational performance. The study used the Bureau of Finance and Economic Development (BoFED), Oromia regional state, Ethiopia as a case study. The findings revealed that customers of the Bureau of Finance and Economic Development (BoFED) in Oromia regional state, Ethiopia were satisfied with the speed of service delivery, quality of service, and cycle time. There was a significant impact of business process reengineering on organizational performance.

Furthermore, Sungau and Ndunguru (2015) investigated the use of business process reengineering as a panacea for reducing operational cost in service organizations in Dar es Salaam city – Tanzania. The study aspired to explain and assess the effects of business process reengineering on operational costs using a positivist paradigm. The study found that business process reengineering (BPR) and delivery speed do not directly affect operational cost; rather, the costs are affected when mediated with service quality. Thus, BPR first impacts both service quality and delivery speed for it to affect the operational cost of the service organization. Similarly, Oluwasanya (2014) studied the effect of business process reengineering on organizational performance with Wema Bank Plc in Nigeria used as a case study. The analysis revealed that business process reengineering has a significant positive effect on reducing operating costs and enhancing business performance. The research work of Odede (2013) focused on the necessary factors for successful business process reengineering implementation in Kenya Revenue Authority. The findings showed that business process reengineering results in cost reduction, revenue growth, and improved customer service.

However, the study of Altinkermer, Chaturvedi, and Kondareddy (1998) reported that the effect of the business process reengineering on the financial performance of the organization is not evident. The authors also suggest that business process reengineering should not be evaluated alone but with other strategic issues. In the same vein, Sungau and Ndunguru (2015) also reported that BPR does not directly affect operational cost; rather, the operational cost can be affected if there is a mediation of another variable such as service quality.

Given the divergent results, the null hypothesis is formulated to test the effect of business process reengineering on operational cost.

$H_0$1: Business process reengineering has no significant effect on the operational costs of the selected indigenous airline companies in Nigeria.

1.4. Value chain model

Professor Michael Porter (1947 – date) propounded the value chain model in 1985. Porter (1985) tags the strategic framework in which the value chain resides as 'activity-based view'. Porter's value chain model was built upon the understanding that an organization is more than an arbitrary arrangement of people, machinery, money, and equipment. It is only when these items are systematically arranged and activated that it is possible to produce goods and services that the customers valued and are willing to offer a price. Michael Porter opined that the capability to perform particular activities and control the relationships between these activities is a competitive strength that leads to competitive advantage. According to the proposition of Porter (1985), the two alternative ways by which a firm can improve it cost position are by either the managers reconfiguring the firm's value chain through new and different ways of production, sales, product servicing or through the improvement in the manager's coordination of activities through the manipulation of activity level drivers. Thus, value chain analysis is a useful approach in developing a strategy that helps businesses recognize potential sources of competitive advantage. In view of Michael Porter, activities are a key interface separating resource holdings and strategic positions (Sheehan & Foss, 2009). Porter's (1985) value chain model, therefore, assumes that each corporation has its internal value chain of

activities that can be classified into five primary activities, which are inbound logistics, operations, outbound logistics, marketing and sales, service; and four support activities, which are infrastructure, human resource management, technology development, and procurement. The value chain theory tracks the influence made on a product by every business process from the raw materials handling and warehousing to the delivery of the product to the hand of the customer through sales.

However, David (2011) criticized the value chain model for the requirement of extraordinary judgment for the consummation of value chain analysis, as different activities within the value chain may positively or negatively affect other activities. Consequently, the relationship the value chain results in is sometimes complex. Though Shank and Govindarajan (1992) used the value chain to examine firm costs, little is known about the value chain's original roots and path dependencies. Nevertheless, Ghemawat (2008) argued that while business managers were still using the scale and learning drivers, Porter (1985) developed additional drivers to explain used to explain why some activities generate higher willingness to pay or have lower costs when compared to the rivals. In the same vein, Day and Wensley (1988) maintained that Porter drew ideas from the field of scientific management, economics, activity analysis, and strategy to arrive at what is known as 'the value chain', which can be used by professionals to enhance their competitive positions. Thus, Porter's value chain theory awakens those sections in the value chain that craves adjustment or flexibility to create a competitive advantage (Barney & Hesterly, 2008).

2. METHODS

The study adopted a cross-sectional survey research design. The method has been used by previous scholars such as Awino (2015), Hussain and Abdul-Hadi (2017), Mantey and Naidoo (2016), Olajide (2014), Walala, Waiganjo, and Njeru (2015), and Quik (2016). The study population consisted of 1,938 employees of key professional departments such as flight operations, ground operations, finance and accounts, operations control center, and engineering units of the selected Nigerian indigenous airline companies with their operational headquarters in Lagos.

The sample size of 515 was determined using the Krejcie and Morgan (1970) formula for sample size determination. To compensate for non-response or wrongly filled questionnaire, 30% of the sample was added to bring up the sample size to 669 (Shokefun, 2013). A stratified random sampling technique was adopted for the study. A structured questionnaire was adapted to gather information.

The questionnaire was divided into three sections. Section A dealt with the demographic information of respondents, section B consisted of items on business process reengineering, while section C consisted of questions on operational costs. The instrument was a modified Likert type scale that ranged from very low (VL) = 1, low (L) = 2, moderately low (ML) = 3, moderately high (MH) = 4, high (H) = 5, very high (VH) = 6. The instrument was validated, and the reliability was ascertained with Cronbach's alpha coefficient of more than 0.7, which is the acceptable threshold. The construct validity was ascertained through the Kaiser-Meyer-Olkin (KMO) test for sampling adequacy, and the result ranged from 0.847 to 0.908, which is greater than the recommended threshold of 0.5. This implies that the items can adequately measure the variables. Furthermore, Bartlett's test of sphericity significance level 0.000, which is lower than the 0.05 standard index, attested to a deeply significant association among the variables. This implied usefulness and validity of the data in the factor analysis.

The response rate was 84%, and data were analyzed using the descriptive statistics (percentage, mean, and standard deviation), while the hypothesis was tested using inferential statistics (simple linear regression). The hypothesis was tested for significance at a confidence interval of 95%, and the significance level was set at 0.05.

3. RESULTS

In this section, results for the descriptive analysis and the test of the hypothesis are presented. Tables 1 and 2 present the descriptive analysis, while Table 3 presents the hypothesis test.

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Table 1. Descriptive statistics analysis for business process reengineering

Source: Field survey result (2019).

Items	Very high	High	Moderately high	Moderately low	Low	Very low	Missing	Descriptive statistics	
	%	%	%	%	%	%	%	Mean	Standard deviation
Sequence of activities	0.0	0.5	26.3	62.5	8.9	0.7	1.1	3.14	.69
Competitiveness	0.0	4.8	18.9	12.7	37.3	25.2	1.1	2.38	1.21
Speed of service delivery	0.0	0.2	18.7	66.1	13.6	0.1	1.3	3.01	.67
Breaking work to simple task	0.5	3.9	14.1	44.1	35.0	1.1	1.3	2.83	.91
Creating values	0.4	3.0	11.4	34.6	46.8	2.7	1.1	2.63	.90
Overall average	–	–	–	–	–	–	–	2.80	0.57

Table 1 presents the result of the descriptive statistics on respondents' opinions on business process reengineering features. By summing responses under very high, high, and moderately high collectively as high and summing the responses under moderately low, low, and very low in unison as low. The findings in Table 1 show that 26.8% of the respondents averred that the sequence of activities in the selected airlines is high, while 72.1% of the respondents claimed that the sequence of activities in the selected airlines is low. However, 1.1% of the participants did not respond to this item as displayed by the missing column. The mean of 3.36 implies that, on average, the respondents' averred sequence of activities is moderately low in the selected airlines. At the same time, the standard deviation of 0.69 signifies the responses of participants converged around the sequence of activities being moderately low in the selected airline companies. Besides, 23.7% of the respondents averred competitiveness is high in the selected airlines, while 75.2% of the respondents asserted competitiveness is low in the selected airlines. However, 1.1% of the participants did not respond to this item as displayed by the missing column. The mean of 2.38 implies that, on average, the respondents asserted that competitiveness is low in the selected airlines, while the standard deviation of 1.21 connotes the respondents' opinion on competitiveness being low was widely distributed. Also, the result of the descriptive statistics reveals that 18.9% of the respondents indicated speed of service delivery is high in the selected airline companies, while a total of 79.8% of the respondents claimed speed of service delivery is low in the selected airline companies. But 1.3% of the participants did not respond to this item as displayed by the missing column. The mean value of 3.01 implies that on average, the respondents affirmed speed of service delivery in the selected airlines is moderately low, and the standard deviation of 0.67 signifies there were the participants' responses around the mean.

Furthermore, 18.5% of the respondents believed breaking work to simple tasks is high in ed airlines, while 80.2% of the respondents stated that breaking work to simple tasks is low in the selected airlines. However, 1.3% of the participants did not respond to this item, as shown in the missing column. The mean of 2.83 connotes that on the average majority of the respondents claimed that the business process reengineering feature of breaking work to simple tasks in the selected airlines is moderately low. Simultaneously, the standard deviation of 0.91 implies weak convergence of the participants' responses around the opinion that breaking work to simple tasks in the selected airlines is moderately low. Finally, 14.8% of the respondents claimed that the business process reengineering feature of creating values is high in the selected airlines, while 84.1% of the respondents asserted that creating values in the selected airlines is low. However, about 1.1% of the participant did not respond to this item as flaunted by the missing column. The mean of 2.63 signifies that, on average, the respondents affirmed that the business process reengineering feature of creating values in the selected airline is moderately low, and the standard deviation of 0.90 connotes there was weak convergence of the participants' responses around the mean. On a six-point scale, the result in Table 1 on business process reengineering yielded the overall average mean of 2.80 and a standard deviation of 0.57, which implies that there was strong convergence in the respons-

Table 2. Descriptive statistics analysis for operational costs

Source: Field survey result (2019).

Items	Very high	High	Moderately high	Moderately low	Low	Very low	Missing	Descriptive statistics	
	%	%	%	%	%	%	%	Mean	Standard deviation
Fueling cost of aircrafts	35.7	57.2	5.5	0.7	0.2	0.0	0.7	5.25	.76
Ticket sales cost	7.1	30.4	60.2	1.4	0.2	0.0	0.7	4.40	.75
Ground operations cost	0.0	28.8	58.6	11.3	0.7	0.0	0.7	4.13	.73
Outsourcing cost	3.6	13.6	29.8	24.3	27.0	1.1	0.7	3.36	1.19
Flight crews' cost	4.1	49.3	30.7	8.2	5.9	1.1	0.7	4.31	1.04
Overall average	–	–	–	–	–	–	–	4.29	0.54

es of the respondents towards business process reengineering features being moderately low in the selected airlines.

Table 2 displays the descriptive analysis of respondents' opinions on operational costs. By summing responses under very high, high, and moderately high collectively as high and summing the responses under moderately low, low, and very low together as low. The findings in Table 2 show that 98.4% of the respondents pointed out high fuelling cost of aircrafts, while only 0.9% of the respondents indicated fuelling cost of aircrafts is low with a mean of 5.25 and standard deviation of 0.76, but 0.7% of the respondents did not respond to this item as presented in the missing column. The mean of 5.25 in respect of fuelling cost of aircrafts, connotes that on the average the participants claimed fuelling cost of aircrafts is high in the selected airlines, and the standard deviation of 0.76 shows the respondents' opinion converged around fuelling cost of aircrafts being high in the selected airlines. Moreover, 97.7% of the respondents claimed ticket sales cost is high, while merely 1.6% of the respondents asserted low ticket sales cost in the selected airlines with a mean of 4.40 and a standard deviation of 0.75. However, 0.7% of the respondents did not respond to this item, as shown in the missing column. The mean of 4.40 signifies that on the average majority of the respondents affirmed ticket sales cost is moderately high in the selected airlines, and the standard deviation of 0.75 shows the convergence of the respondents' opinion around the mean. Likewise, the response rate on the ground operations cost shows that 87.3% of the respondents claimed high ground operations cost, while 12.0% of the respondents affirmed low ground operations cost in the selected airlines, amidst a mean of 4.13 and standard deviation of 0.73. Nevertheless, 0.7% of the respondents did not respond to this item as flaunted by the missing column. The mean of 4.13 connotes that on the average, the respondents affirmed ground operations cost is moderately high, and the standard deviation of 0.73 indicated convergence of the respondents' opinion around ground operations cost is moderately high in the selected airlines.

Furthermore, 47.0% of the respondents confirmed outsourcing cost is high in the selected airlines, while 52.4% of the respondents indicated outsourcing cost is low in the selected airlines with a mean of 3.36 and a standard deviation of 1.19. However, 0.7% of the respondents did not respond to this item, as presented in the missing column. The mean of 3.36 implies that the average majority of the respondents affirmed a moderately low cost of outsourcing in the selected airlines, and the standard deviation of 1.19 indicated the respondents' responses were widely distributed. Finally, the response rate on operational costs dimension shows that only 84.1% of the respondents averred flight crews cost is high in the selected airlines, while 15.2 % of the respondents asserted flight crews cost is low in the selected airlines. Though, 0.7% of the participants did not respond to this item as flaunted by the missing column. The mean of 4.31 and a standard deviation of 1.04 signify that, on average, most respondents indicated flight crews cost is moderately high in the selected airlines, and the respondents' opinions were widely distributed. On a six-point scale, the result in Table 2 yielded an overall average mean of 4.29 and standard deviation of 0.54 for operational costs, which connotes that on the average the participants claimed

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operational costs in the selected airline companies are moderately high, and there was convergence in the responses of the respondents towards moderately high operational costs.

In conclusion, the findings in Table 2 pointed out moderately high operational costs dimensions of ticket sales cost, ground operations cost, and flight crews' cost, except for fuelling cost of aircrafts that were indicated to be high. In contrast, Table 1 revealed moderately low business process reengineering features of the sequence of activities, speed of service delivery, breaking work to simple tasks, and creating values, except for competitiveness dimension, which was declared low. By linking the results of Tables 1 and 2, it can be construed that business process reengineering had a similar pattern of escalation as operational costs, for an upsurge in business process reengineering results in improvement of operational costs. Thus, it was found that business process reengineering has a positive effect on operational costs in the selected Nigerian indigenous airline companies. These findings answer the research question and also enable the researcher to achieve the objective of this study.

Table 3 presents a detailed summary of the regression analysis results on the effect of business process reengineering on the operational costs of the selected Nigerian indigenous airline companies. The results, as displayed in Table 3 ($\beta = 0.147$, $t = 3.709$, $p = 0.000$), show that business process reengineering has a positive and significant effect on the operational cost of the selected Nigerian indigenous airline companies. This analysis results in conformity with the a priori expectation of an improvement in business process reengineering leading to amelioration of operational costs. This finding is supported by *a p*-value of 0.000, which is less than the significant level of 0.05 ($p < 0.05$) adopted. The *t*-value is a test of whether the regression coefficient is significantly different from zero. The correlation coefficient *R* is the correlation between the observed and predicted values of operational costs. The *R*-value of 0.155 in the model summary indicates that business process reengineering has a positive effect on operational costs. The model R^2 (that is the goodness of fit for the regression between business process reengineering and operational costs) was 0.024. The model coefficient of determination $R^2 = 0.024$ indicates that about 2.4% of the variations that occur in operational costs were accounted for by the business process reengineering of the selected Nigerian indigenous airline companies. While the remaining 97.6% changes in operational costs that occur in the Nigerian airline industry is accounted for by other variables not captured in the model. This calls for inquiry through research to determine the other variables that influence operational costs in the Nigerian airline industry. The simple regression model explaining the variation in operational costs due to business process reengineering is thus expressed as follows:

$$OC = 3.880 + 0.147BPR, \quad (1)$$

where OC – operational costs, BPR – business process reengineering.

The above regression equation formulated shows that when all other factors are held at constant zero, operational costs of the selected Nigerian indigenous airline companies would be 3.880. The data analyzed further show that the regression coefficient of business process reengineering was 0.147 ($\beta = 0.147$). This is a positive progression, signifying that when business process reengineering is improved by one unit,

Table 3. Summary of the simple linear regression between business process reengineering and operational costs ($n = 560$)

Source: Researcher's SPSS version 22 regression output (2019).

Model $y_5 = \beta_0 + \beta_5 x_5 + e_i$		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
1	(Constant)	3.880	.113		34.282	.000
	Business process reengineering	0.147	.040	.155	3.709	.000

Notes: a. Dependent variable: operational costs, b. $R = 0.155$, $R^2 = 0.024$.

operational costs of the selected Nigerian indigenous airline companies will be positively affected by an improvement of 0.147 units. With the significant value in the model standing at 0.000, the significance level is less than 0.05 ($p < 0.05$). This means that business process reengineering significantly predicts operational costs. Overall, the result shows that business process reengineering has a weak positive and significant effect on the selected Nigerian indigenous airline companies' operational costs. Therefore, the null hypothesis one ($H_0 1$), which states that business process reengineering has no significant effect on operational costs of the selected Nigerian indigenous airline companies, is hereby rejected.

4. DISCUSSION

The findings of other authors support the findings of this study. Moreover, several studies support the finding that business process reengineering has a significant effect on operational costs (Nadeem & Ahmad, 2016; Nzewi et al., 2015; Oluwasanya, 2014; Sungau & Ndunguru, 2015). The findings of this current study corroborated the research of Nadeem and Ahmad (2016) on the impact of business process reengineering on the performance of banks in Pakistan, in which it was discovered that the outcomes of implementing business process reengineering in different operations of banks in Pakistan were significant and business process reengineering had significantly increased the efficiency and performance of the banks in Pakistan. Likewise, the research work of Sungau and Ndunguru (2015) on using business process reengineering as a panacea for reducing operational cost in service organizations in Dar es Salaam city – Tanzania, found out that business process reengineering (BPR) and service delivery speed do not directly affect operational cost; rather, operational costs were affected when mediated with service quality. Thus, BPR first impacts both service quality and delivery speed for it to affect the operational cost of service organizations. In the same vein, Oluwasanya's (2014) study on the effect of business process reengineering on bank performance in Nigeria revealed its significant positive effect on performance. Nevertheless, the empirical study of Nzewi et al. (2015) on the effect of business process reengineering and performance of courier service organizations in Anambra state, Nigeria, revealed positive relationships between business process reengineering and the criterion variable, but change management that has a negative relationship.

Besides, the findings of this study are supported by the value chain model propounded by Porter (1985). Porter's (1985) value chain model was built upon the understanding that an organization is more than an arbitrary arrangement of people, machinery, money, and equipment. It is only when these items are systematically arranged and activated that it is possible to produce goods and services that the customers valued and are willing to offer a price. Michael Porter opined that the capability to perform particular activities and control the relationships between these activities is a competitive strength that leads to competitive advantage. The value chain model tracks the influence made on a product by every business process from the raw materials handling and warehousing to the delivery of the product to the hand of the customer through sales. Therefore, an efficient review of a company's individual value chain activities will result in a better discernment of the company's weaknesses and strengths.

Consequently, the current study concludes that business process reengineering has a significant effect on the operational costs of the selected Nigerian indigenous airline companies. Based on the findings of this study supported by the findings from contemporary literature, this study rejects the null hypothesis of the study ($H_0 1$), which states that business process reengineering has no significant effect on operational costs of the selected Nigerian indigenous airline companies.

CONCLUSION

The various business process reengineering attributes need to be acquired to redress the rising costs of airlines operation in Nigeria. The study highlighted operational costs to be minimized to ensure a safe and profitable airline business. Business process reengineering features of creating values, sequence of

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activities, competitiveness, speed of service delivery, and breaking work to simple tasks enhances ticket sales cost, ground operations cost, outsourcing cost, and flight crews cost. Finally, the business process reengineering affects the operational costs of the selected Nigerian indigenous airline companies. Therefore, an appropriate business process reengineering is desirable to reduce operational costs in the business. The business manager should adopt a business process reengineering to achieve a reasonable top and bottom line.

RECOMMENDATIONS

Situated on the findings of this study, business process reengineering has a positive and significant effect on the operational costs of the selected indigenous airline companies. The study revealed that operational cost in respect of fueling the aircrafts is high, while the operational cost of outsourcing is moderately low in the selected Nigerian indigenous airline companies. The management of the Nigerian indigenous airline companies, in collaboration with the Federal Government of Nigeria should initiate policies to reduce the cost of Jet A1 fuel that is used to fly aircraft in Nigeria. The Nigerian indigenous airline companies should outsource more activities such as catering services and cleaning services to reduce operational costs. However, security services should not be outsourced to not compromise and contravene the ICAO security and recommended practices (SARPs). Besides, business process reengineering is found to positively influence operational costs in the selected airlines. As a consequence, the airline companies' management should improve on their speed of service delivery, sequencing of activities, value creation, and competitiveness through the vigorous reformation of business process reengineering. In consonance with the finding of this study, improving the business process reengineering of the Nigerian indigenous airline companies will most likely result in reduced operational costs and an increased proportion of the Nigerian aviation industry total market that goes to the Nigerian indigenous airline companies.

SUGGESTION FOR FURTHER STUDIES

This study analyzed the effect of business process reengineering on operational costs of selected airlines in Nigeria. The quantitative research method and cross-sectional survey research design were adopted with the help of a questionnaire. However, future studies can be conducted empirically in another developing country with vibrant airline companies such as Kenya or Ethiopia to test for geographical scope. Besides, this research work recognizes the fact that several variables other than the business process reengineering contribute to the reduction of operational costs in the selected Nigerian indigenous airline companies. Future studies should adopt a conceptual research model that relates multiple independent variables with a dependent variable. Future research work in this area could also employ a mixed research method of quantitative and qualitative along with a questionnaire and oral interview as a research instrument for data gathering to provoke deeper insights that will enrich this field of study.

AUTHOR CONTRIBUTIONS

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