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# FACTORS INFLUENCING OUTSOURCING OF FUNCTIONS AS EFFECTIVE MANAGEMENT STRATEGY BY TELECOMMUNICATIONS FIRMS IN NIGERIA

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## ABSTRACT

**Purpose:** With the fierce competition in the global market, outsourcing is seen as one of the management strategies and major avenues for many firms to improve their competitiveness. Telecommunications firms have therefore used this model to achieve some critical telecommunications infrastructures. As such, this study identified, assessed and categorised into a smaller number of groups the factors influencing outsourcing of functions as effective management strategy by telecommunications firms in Nigeria.

**Design/methodology/approach:** The study used the survey research design. A two-stage sampling procedure was used for the study. Firstly, the telecommunications firms that took part in the study was selected using a stratified random sampling and secondly, the employees of these selected firms who are directly involved with outsourcing of functions were selected using the random sampling approach. In all, a total of one hundred and eighty (180) copies of questionnaire were administered and of this number, fifty-three (53) respondents returned complete copies of questionnaire. This study identified 18 factors influencing outsourcing of functions.

**Findings:** The results show that all the factors identified have means greater than 3 which shows that majority of the respondents agree that those factors are the ones actually influencing outsourcing of functions by telecommunications firms in Nigeria. 'Lower costs', and 'allow resources to focus on core business function' are rated very high as the factors influencing outsourcing of functions. Through the use of factor analysis technique, these factors were reduced and grouped into a smaller number with the dictates of what is obtainable in telecommunications firms in Nigeria. These groups are 'cost and flexibility related factors', 'quality and time related factors', 'allow resources to focus on core competency factors', and 'innovation related factors'.

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**Originality/value:** The study concluded that the research is illuminating in the sense that it reveals more regarding the identification, categorisation/grouping of the factors influencing outsourcing of functions by telecommunications firms in Nigeria.

**Keywords:** Factor analysis; facilities management; infrastructure; Nigeria; outsourcing; telecommunications firms.

## 1. INTRODUCTION

Outsourcing is contracting with another company or person to carry out a particular function (Rodriguez & Diaz, 2008). That is, the act of delegating responsibility for performing a task to some other entity (Krell, 2006). Outsourcing has no doubt taken the world by storm, becoming one of the major avenues for many firms to improve their competitiveness. It has been a pervasive trend over the past 20 years in the world. For example, outsourcing has been successfully implemented within the manufacturing industry (Gilley & Rasheed, 2009). It has also emerged as a major trend in many service industries, such as, telecom operator Zain (now Airtel in Nigeria) signed a deal with Ericsson to outsource the management of its network and field operations in Nigeria for a five-year term, in a bid to improve its operations in the country (Field, 2009). Outsourcing arose as a management tool of a compelling need for organisations to be more productive, more competitive and profitable (Olowa, 2009). To buttress this, Udoudoh (2015) is of the view that poor management may inhibit infrastructures from performing even to optimum level with telecommunications infrastructures not an exception.

Telecommunications market in Nigeria is a vital engine of the economy and an essential infrastructure that promotes the development of other sectors such as agriculture, education, industry, health, defense, banking, transportation and tourism (Arzika, 2000). Nigerian Telecommunications industry has witnessed significant growth over the last fourteen years, following the successful take-off of digital mobile telephone services in the country, using the Global System for Mobile communications (GSM) technology (Hassan, Oluwaranti, and Isola, 2009). From less than 500,000 fixed telephone lines as at mid-2001, the total number of fixed and mobile telephone lines increased to about 67.8 million lines as at June, 2009 (NCC, 2012). Up till the year 2001, Nigeria was classified as one of the Africa's most under-served telecommunications market, but today, Nigeria is one of the world's fastest growing telecommunications market (Ndukwe, 2006). Most of the activities, especially infrastructural development aspect, of this industry are being outsourced.

Outsourcing, on the other hand, has received increasingly attention in scientific research circle, but so far it has mainly been theoretical in nature and relied mostly on anecdotal evidence to support assertions (Shy & Stenbacker, 2003; Benjaafar, Elahi & Donohue, 2007). Moreover, most of them focus on very specific industries, for example, call centre (Ren & Zhou, 2008), information technology (Jae-Nam, Miranda & Yong-Mi; 2004), manufacturing (Dekkers, 2000), logistics (Alp, Erkip and Güllü, 2003; Ellram & Billington, 2001), facilities management (Ikediashi *et al*., 2012; Ikediashi, Ogunlana, & Odesola, 2015). However, few empirical investigations of outsourcing (Gilley, 2009), especially in specific regions or countries have been conducted (Bush, Tiwana, and Tsuji 2008; Baily, Masson, and Raeside, 2002). For example, Bush et al. (2008) has attempted to empirically study the drivers of software outsourcing decisions

and Baily et al. (2002) makes a survey into the outsourcing activities. They focused on the outsourcing in Japan and in Edinburgh and Lothians, United Kingdom.

However, documented scientific research evidence in the area of outsourcing of functions by telecommunications firms in Nigeria suggests that it has received little or no attention within this research enclave. And as such, it is imperative to know the factors influencing outsourcing of functions by these firms. This is with a view to drawing lessons that will aid in developing a body of outsourcing of functions knowledge in the Telecommunications industry in Nigeria in order to unravel and uncover local realities. Specifically, the objectives of this study are to:

i. develop a list of factors influencing outsourcing of functions by telecommunications firms in Nigeria.
ii. assess those factors and categorise them into a smaller number of groups using factor analysis approach.

The paper is therefore structured with introduction as the first section. This is followed by the theoretical concepts underpinning the study. The third section reviews the related literature. The fourth section gives the research methods used for the study. Following on, the fifth section analyses and discusses the result of the findings. Finally, the sixth section concludes the paper and offers some recommendations for further study.

## 2. THEORETICAL UNDERPINNING OF THE STUDY

Outsourcing may briefly be defined as 'the strategic and ongoing operational use of outside resources to perform activities traditionally handled by internal staff and resources' (Syska Hennessy Group, 2005). Outsourcing decisions require a firm to determine which activities they should vertically integrate and perform using internal resources ("in-source") and which activities they should procure from a third party supplier ("outsource") (Syska Hennessy Group, 2005). Outsourcing has become more important in today's increasingly competitive telecommunications environment (Chase, Jacobs, & Aquilano, 2004; Kakabadse & Kakabadse, 2003; Lankford & Parsa, 1999; Talluri & Narasimhan, 2004). Existing theory identifies the role that outsourcing can play in developing a competitive advantage for a firm. Three views of competitive advantage explain the role that outsourcing can play in increasing firm competitiveness; they are transaction cost economics (TCE), the resource-based view, and the knowledge-based view (Williamson, 1975, 1985). TCE posits that firms adopt governance structures which minimize the transaction costs (Williamson, 1975, 1985). In an outsourcing context, TCE predicts that firms will make an outsourcing decision when outsourcing results in a reduction in firm size that leads to an overall reduction in the required transaction costs (Aubert, Rivard, & Patry, 2004; Holcomb & Hitt, 2007; Kern & Willcocks, 2002; Murray & Kotabe, 1999; Schniederjans, Schniederjans, & Schniederjans, 2005). The *resource-based* view states that unique firm resources such as capital assets, capabilities, and processes enable a firm to execute strategies which can lead to efficiency and effectiveness improvements (Barney, 1991). The *knowledge-based* view opines that a core capability is a knowledge set that distinguishes one group from another and provides a competitive advantage (Leonard-Barton, 1992a). The knowledge set may take the form of employee knowledge or skills, technical systems, managerial systems, or norms and values.

## 3. REVIEW OF RELATED LITERATURE

Consistent with the existing literature, the motivation, objectives, and goals of a firm's outsourcing effort related to its activities as the factors influencing firm's supply chain (Fisher, Ramdas, and Ulrich, 1999; Heikkila and Cordon, 2002; Kakabadse and Kakabadse, 2000). Factors influencing outsourcing are the direct outcome of the operationalisation of a firm's competitive priorities into action plans. A thorough literature review of existing research was conducted to identify the most important factors influencing outsourcing functions by firms (Benjaafar, Elahi, & Donohue, 2007; Choi & Hartley, 1996; Frohlich & Dixon, 2001; Gottfredson et al., 2005; Insinga & Werle, 2000; Kakabadse & Kakabadse, 2000; Koh & Venkatraman, 1991; Lee, 2004; Leonard-Barton, 1992b; Loh & Venkatraman, 1992; McFarlan & Nolan, 1995; Min & Galle, 1991; Narasimhan and Das, 1999; Smith, Mitra, & Narasimhan, 1998; Weber, Current, & Benton, 1991).

For example, industry experts identified cost savings as the leading factor influencing outsourcing decisions (Gottfredson *et al*., 2005; Schniederjans *et al*., 2005). Outsourcing often improves cost competitiveness because a firm can eliminate unproductive assets, reduce capital spending, and partner with a firm that can perform an activity at a lower cost. Cost related outsourcing factors include the selection of a partner that offers lower total, logistics, regulatory, and/or legal costs to perform an activity. Firms may also be driven to select a partner that allows access to a new market, thus increasing sales volume which leads to economies of scale. Firms that focus on flexibility when making outsourcing decisions are influenced to effectively respond to changing customer requirements (Frohlich & Dixon, 2001). Changing requirements may take the form of demand fluctuations or changes in the required product characteristics (Schniederjans *et al*., 2005). Outsourcing factors that support flexibility include a desire to increase process responsiveness and the ability to change production volumes and supply chain activities in response to changing market demands (Choi & Hartley, 1996; Lee, 2004; Loh & Venkatraman, 1992; Narasimhan and Das, 1999; Weber *et al*., 1991). Outsourcing an activity to multiple vendors can improve a firm's preparedness to react flexibly to the uncertainty of the service provider environment.

Hoecht and Trott (2006) opine that firms that emphasise innovativeness when making outsourcing decisions focus on rapidly delivering products featuring new technologies and novel features. Outsourcing can improve innovativeness by allowing a firm to access skills and expertise not available in-house (Hoecht & Trott, 2006; Schniederjans *et al*., 2005). Similarly, firms may consider in-sourcing activities if it allows them to leverage unique skills and expertise not available to competitors. To accomplish this goal, factors influencing outsourcing related to innovativeness focus on the selection of sources that provide access to new technologies and expertise related to new technologies (Gottfredson et al., 2005; Leonard-Barton, 1992a; Loh & Venkatraman, 1992; McFarlan & Nolan, 1995; Weber *et al*., 1991).

Focusing on quality when making outsourcing decisions requires a firm to consider both the conformance and performance quality of products (Bozarth et al., 1998; Frohlich & Dixon, 2001; Gottfredson *et al*., 2005; Leonard-Barton, 1992a; Loh & Venkatraman, 1992; McFarlan and Nolan, 1995). The outsourcing of activities may be influenced by the availability of a vendor with superior expertise that can improve the conformance and/or performance of an activity for a firm (Schniederjans *et al*., 2005). A firm with superior in-house skill sets may be driven to in-source an activity if its ability to perform an activity in a higher quality manner leads to an advantage over competitors. A focus on time when making outsourcing decisions implies that a firm is competing on the ability to perform

activities more quickly or speedily with better on-time performance (Frohlich & Dixon, 2001). To improve product delivery speed and the ability to develop and deliver products on-time, a firm is influenced to choose sources that can conduct activities with less lead time compared to other potential sources (Narasimhan and Das, 1999; Weber et al., 1991). A firm may choose a source that offers comparatively faster process capability and reduced cycle times (Weber *et al*., 1991).

Based on the review above, this study identified 18 distinct, common factors influencing outsourcing. These 18 factors represent the most commonly cited factors influencing outsourcing decisions; however, they do not represent a comprehensive inventory of every possible outsourcing factor. The list of these factors is shown in Table 1.

**Table 1:** Factors influencing outsourcing of functions

| Factors influencing outsourcing of functions | Authors |
|---|---|
| 1. Allow resources to focus on core competency – low cost | Gottfredson *et al.* (2005) |
| 2. Increase volume through new market penetration | Gottfredson *et al.* (2005) |
| 3. Lower total costs | Schniederjans *et al.* (2005) |
| 4. Reduce logistics costs | Gottfredson *et al.* (2005) |
| 5. Reduce regulatory and legal | Schniederjans *et al.* (2005) |
| 6. Improve process responsiveness | Choi and Hartley (1996) |
| 7. Increase supply chain flexibility | Lee (2004) |
| 8. Increase volume capability | Loh and Venkatraman (1992) |
| 9. Multiple sourcing for uncertainty preparedness | Frohlich and Dixon (2001) |
| 10. Allow resources to focus on core competency – flexibility | Schniederjans *et al.* (2005) |
| 11. Access to specific labour and/or technology expertise | Safizadeh *et al*. (1996) |
| 12. Gain access to new technology | Gottfredson *et al*. (2005) |
| 13. Allow resources to focus on core competency – quality | |
| 14. Improve conformance quality | Frohlich and Dixon (2001) |
| 15. Improve product performance design quality | Frohlich and Dixon (2001) |
| 16. Allow resources to focus on core competency – time | Frohlich and Dixon (2001) |
| 17. Improve process capability and cycle times | Weber *et al.* (1991) |
| 18. Improve process lead times | Weber *et al.* (1991) |

## 4. RESEARCH METHODS

After due consideration of the research problem, the scientific method of inquiry which seems most appropriate to the research has been decided in accordance with the opinion expressed by Dixon (1994). The study made use of the survey research design and this is adjudged to be appropriate because the research is exploratory and descriptive in nature. It is descriptive because it involves collection of data and analysis to test hypothesis. The target population for the study includes all the telecommunications firms in Nigeria. These consist of GSM/Fixed wireless/CDMA operators and major telecommunications vendors with their head offices in Lagos. The names and addresses of these firms were extracted from the list of accredited telecommunications firms being maintained by the NCC. A two-stage sampling procedure was used for the study. Firstly, the telecommunications firms that took part in the study was selected using a stratified random sampling and secondly, the

employees of these selected firms who are directly involved with outsourcing of functions were selected using the random sampling approach. In choosing the sample size for the study, the recommendation of Boll and Gall as given in Adetoro (1997) was used that sample size should be determined by percentage based on the population size. They suggested that 20% should be used for up to 1,000 population, 10% for up to 5,000 population, and 5%for up to 10,000 population. For the purpose of this research the sample size for the study was determined using Boll and Gall method mainly because it is very easy to use. This method was applied to fixed wireless/CDMA operator firms. All the GSM operator firms and major vendors were sampled since they are not many (Table 2).

**Table 2:** Sample size for telecommunications firms in Nigeria

| | **Population** | **Sample size** |
|---|---|---|
| GSM operator | 5 | 5 |
| Fixed wireless/CDMA | 33 | 7 |
| Major vendors | 6 | 6 |
| **Total** | **44** | **18** |

The sample size that was used for the study is 18 (Table 2). The number of questionnaire that were administered to each of these 18 firms were determined by the number of employees in the firms that are directly associated with outsourcing of functions. A well-structured questionnaire was designed and administered on the employees of each of the firms sampled randomly. The number of employees in each of the firms who answered the questionnaire was determined by Boll and Gall method using percentage of total number of staff in the firms that are directly involved with outsourcing of functions. This arrangement implies that questionnaire was administered in two stages. The first stage was to find out number of employees that are directly involved with outsourcing of functions for the determination of representative sample that answered the questions. Tables 3 and 4 show the questionnaire distributed and summary of response rate respectively. The response rate for this study is 29.4%. Though, it small, one cannot totally say that it is too small for this kind of study.

**Table 3:** Questionnaire distribution

| Telecommunications firms | Questionnaire distributed | Questionnaire returned |
|---|---|---|
| GSM operator 1 | 10 | 4 |
| GSM operator 2 | 10 | 3 |
| GSM operator 3 | 10 | 5 |
| GSM operator 4 | 10 | 8 |
| GSM operator 5 | 10 | 5 |
| Fixed wireless/CDMA operator 1 | 10 | 3 |
| Fixed wireless/CDMA operator 2 | 10 | 5 |
| Fixed wireless/CDMA operator 3 | 10 | 2 |
| Fixed wireless/CDMA operator 4 | 10 | 1 |
| Fixed wireless/CDMA operator 5 | 10 | 2 |
| Fixed wireless/CDMA operator 6 | 10 | 1 |
| Fixed wireless/CDMA operator 7 | 10 | 3 |
| Vendor 1 | 10 | 3 |
| Vendor 2 | 10 | 1 |
| Vendor 3 | 10 | 1 |
| Vendor 4 | 10 | 4 |
| Vendor 5 | 10 | 1 |
| Vendor 6 | 10 | 1 |
| ***Total*** | ***180*** | ***53*** |

**Table 4:** Summary of response rate

| Telecommunications firms | Questionnaire distributed | Number of responses | Percentage response |
|---|---|---|---|
| GSM operators | 50 | 25 | 50.0 |
| Fixed wireless/CDMA operators | 70 | 17 | 24.3 |
| Vendors | 60 | 11 | 18.3 |
| ***Total*** | ***180*** | ***53*** | ***29.4*** |

# 5. RESULTS AND DISCUSSION OF FINDINGS

## 5.1. Respondents characteristics

Table 5 illustrates the results obtained. Question was asked if the respondents have been involved with some outsourcing projects before and the result shows that all the respondents (100%) have been involved with one or more outsourcing projects before. This shows that all the respondents are qualified to participate in the survey. Respondents were also asked to indicate whether or not they have managed some outsourcing projects before, the results (Table 5) show that 42 respondents out of 53 representing 79% indicated that they have managed outsourcing projects before. The implication of this is that majority of the respondents that took part in the survey are well knowledgeable about the subject matter. Respondents were also asked whether or not they have been involved in decision making in some outsourcing projects.

The result as shown in Table 5 indicates that about 60% of the respondents are decision makers regarding outsourcing projects. The remaining 40% are not involved with any decision making regarding outsourcing projects. The implication of this is that above average of the respondents are decision makers when it comes to outsourcing projects in Nigeria.

Table 5 further shows the highest academic qualifications of the respondents. 51% of the respondents indicated that master's degree is the highest level of education they possess. 34% of the respondents indicated that they hold bachelor's degree as their highest qualification, 9% indicated that Postgraduate Diploma (PGD) is their highest academic qualification, while the remaining 6% holds Higher National Diploma (HND). This shows that over 90% of the respondents hold bachelor's degree and above. The implication of this is that majority of the respondents have required academic qualification to be knowledgeable about the subject of the survey. Also, Table 5 shows the position of the respondents in their different organisations. The results indicate that 53% of the respondents are middle level managers, 28% are lower level managers, and 15% holds technical position, while the remaining 4% are top level managers. The implication of this result is that all the respondents participated in the study are holding managerial and/or technical positions. Additionally, Table 5 reveals the classification of the respondents' organisations. The results show that 47% of the respondents are working for GSM operators, 32% are working for fixed wireless/CDMA operators, while the remaining 21% are working in vendor organisation.

**Table 5:** Respondents' background information/general questions

| | No of Responses | Percentage |
|---|---|---|
| **Involved with some outsourcing projects** | | |
| Yes | 53.0 | 100.0 |
| No | 0.0 | 0.0 |
| Total | 53.0 | 100.0 |
| **Involved with managing some outsourcing projects** | | |
| Yes | 42.0 | 79.2 |
| No | 11.0 | 20.8 |
| Total | 53.0 | 100.0 |
| **Involved with decision making in some outsourcing projects** | | |
| Yes | 32.0 | 60.4 |
| No | 21.0 | 39.6 |
| Total | 53.0 | 100.0 |
| **Highest qualifications** | | |
| HND | 3.0 | 5.7 |
| BSc | 18.0 | 34.0 |
| PGD | 5.0 | 9.4 |
| MSc | 27.0 | 50.9 |
| PhD | 0.0 | 0.0 |
| Total | 53.0 | 100.0 |
| **My organisation can be classified as** | | |
| GSM operator | 25.0 | 47.2 |
| Fixed wireless/CDMA operator | 17.0 | 32.1 |
| Vendor | 11.0 | 20.8 |
| Total | 53.0 | 100.0 |
| **My position in the organisation** | | |
| Top level manager | 2.0 | 3.8 |
| Middle level manager | 28.0 | 52.8 |
| Lower level manager | 15.0 | 28.3 |
| Technical position | 8.0 | 15.1 |
| Total | 53.0 | 100.0 |

## 5.2. Analysis of factors influencing outsourcing of functions by telecommunications firms in Nigeria

A preliminary examination of the distribution indicating the mean and standard deviation is shown in Table 6. The results obtained indicate that all the identified factors have means greater than 3 which shows that majority of the respondents agree that those factors are the ones actually influencing outsourcing of functions by telecommunications firms in Nigeria. It is worthy of note to say that 'lower costs', and 'allow resources to focus on core business function' are rated very high as the factors influencing outsourcing of functions.

In a bid to fulfil objective two of this study, factor analysis approach was used in order to have a closer look at those factors influencing outsourcing of functions by telecommunications firms in Nigeria. Factor analysis enables a researcher to replace a larger data matrix which may have very little theoretical meaning with much smaller and

manageable one which tends to make sound theoretical sense. Thus, factor analysis also helps to achieve parsimony in data description.

### *5.2.1 Factor extraction*

Table 7 shows the total variance analysis for each of the 18 identified factors influencing outsourcing of functions by telecommunications firms in Nigeria. In order to determine the number of factors that will be needed to represent the data, the percentage of total variance explained by each of the factors is examined. The total variance is given by the sum of the variance of each factor which totalled 18. Two approaches have been successfully used. Chan and Tam (2000), and Rustom and Amer (2006) made use of Eigenvalue and Screeplot approaches. Eigenvalue approach is used in this study.

**Table 6:** Preliminary examination of factors influencing outsourcing of functions

| Factors influencing outsourcing of functions | N | Mean | Standard deviation |
|---|---|---|---|
| 1.Allow resources to focus on core competency – low cost | 53 | 4.60 | 0.566 |
| 2. Increase volume through new market penetration | 53 | 3.68 | 0.850 |
| 3. Lower total costs | 53 | 4.47 | 0.668 |
| 4. Reduce logistics costs | 53 | 4.47 | 0.696 |
| 5. Reduce regulatory and legal costs | 53 | 4.30 | 0.696 |
| 6. Improve process responsiveness | 53 | 4.09 | 0.658 |
| 7. Increase supply chain flexibility | 53 | 4.02 | 0.720 |
| 8. Increase volume capability | 53 | 4.06 | 0.691 |
| 9. Multiple sourcing for uncertainty preparedness | 53 | 3.91 | 0.766 |
| 10 Allow resources to focus on core competency - flexibility | 53 | 4.49 | 0.639 |
| 11. Access to specific labour and/or technology expertise | 53 | 4.15 | 0.632 |
| 12. Gain access to new technology | 53 | 3.45 | 0.607 |
| 13. Allow resources to focus on core competency - quality | 53 | 4.58 | 0.570 |
| 14. Improve conformance to quality | 53 | 3.45 | 0.607 |
| 15. Improve product performance design quality | 53 | 3.38 | 0.686 |
| 16. Allow resources to focus on core competency - time | 53 | 4.58 | 0.497 |
| 17. Improve process capability and cycle times | 53 | 3.38 | 0.686 |
| 18. Improve process lead times | 53 | 3.42 | 0.663 |

In Eigenvalue approach (Table 7), only the factors that account for a variance greater than 1 (Eigenvalue greater than 1) are extracted out. Seventy-three percent (73%) of the total variance is attributed to the first 4 factors where these factors have an Eigenvalue greater than 1. Other 14 factors account for only about 26.7% of the total variance. In the literature reviewed, these 18 factors are mapped into five groups namely: Cost related

factors, flexibility related factors, innovativeness related factors, quality related factors, and time related factors. This research has identified that these five groups cannot work for telecommunications firms in Nigeria and that the 18 factors can be grouped into four.

### *5.2.2 Factor Rotation*

The question of how the set of individual factors identified relate with each other has to be answered. It should be emphasised that one cannot interpret the un-orthogonal factors extracted at this stage as doing so may not yield accurate results. And so, having estimated the communalities (Table 8), inserted them in the main diagonal of the correlation matrix and extracted the un-orthogonal factors, one will have to proceed to rotate these factors so as to obtain factors which are more easily interpretable. This means that in factor analysis, the rotation of the factor matrix is highly essential.

**Table 7:** Total variance analysis

| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| Component | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 5.505 | 30.585 | 30.585 | 5.505 | 30.585 | 30.585 | 4.757 | 26.426 | 26.426 |
| 2 | 3.615 | 20.083 | 50.668 | 3.615 | 20.083 | 50.668 | 3.719 | 20.661 | 47.088 |
| 3 | 2.795 | 15.526 | 66.194 | 2.795 | 15.526 | 66.194 | 3.088 | 17.155 | 64.243 |
| 4 | 1.280 | 7.110 | 73.304 | 1.280 | 7.110 | 73.304 | 1.631 | 9.062 | 73.304 |
| 5 | .976 | 5.420 | 78.725 | | | | | | |
| 6 | .777 | 4.316 | 83.040 | | | | | | |
| 7 | .684 | 3.802 | 86.842 | | | | | | |
| 8 | .505 | 2.804 | 89.646 | | | | | | |
| 9 | .444 | 2.466 | 92.112 | | | | | | |
| 10 | .332 | 1.842 | 93.954 | | | | | | |
| 11 | .288 | 1.598 | 95.552 | | | | | | |
| 12 | .200 | 1.113 | 96.666 | | | | | | |
| 13 | .159 | .882 | 97.548 | | | | | | |
| 14 | .123 | .683 | 98.231 | | | | | | |
| 15 | .114 | .636 | 98.867 | | | | | | |
| 16 | .097 | .538 | 99.405 | | | | | | |
| 17 | .068 | .379 | 99.784 | | | | | | |
| 18 | .039 | .216 | 100.000 | | | | | | |

Rotation helps to eliminate medium loadings by maximizing the number of high and low loadings. These make interpretation more accurate. Several rotation techniques are available e.g. Oblimin and Varimax rotation methods. This study made use of Varimax technique because it is an orthogonal rotation, resulting in uncorrelated factors which are usually preferred most researchers because it assures that the factor loadings obtained are uncorrelated and independent of each other.

From Table 9, one can see that the factor analysis procedure with Varimax rotation applied to the data yielded a four-dimensional solution. The communalities (Table 8), which can be regarded as indications of the importance of the variables in the analysis are generally high (all above 48.2%). This shows that the variables selected for this study are appropriate and relevant.

**Table 8:** Communalities

| Variable | Initial | Extraction | Variable | Initial | Extraction |
|---|---|---|---|---|---|
| 1. Allow resources to focus on core competency – low cost | 1.000 | .904 | 10. Allow resources to focus on core competency - flexibility | 1.000 | .605 |
| 2. Increase volume through new market penetration | 1.000 | .870 | 11. Access to specific labour and/or technology expertise | 1.000 | .491 |
| 3. Lower total costs | 1.000 | .701 | 12. Gain access to new technology | 1.000 | .814 |
| 4. Reduce logistics costs | 1.000 | .674 | 13. Allow resources to focus on core competency - quality | 1.000 | .839 |
| 5. Reduce regulatory and legal costs | 1.000 | .882 | 14. Improve conformance to quality | 1.000 | .725 |
| 6. Improve process responsiveness | 1.000 | .665 | 15. Improve product performance design quality | 1.000 | .844 |
| 7. Increase supply chain flexibility | 1.000 | .482 | 16. Allow resources to focus on core competency - time | 1.000 | .570 |
| 8. Increase volume capability | 1.000 | .703 | 17. Improve process capability and cycle times | 1.000 | .851 |
| 9. Multiple sourcing for uncertainty preparedness | 1.000 | .734 | 18. Improve process lead times | 1.000 | .839 |

**Table 9:** Rotated component matrix

| Variable | Component | | | | Variable | Component | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | | 1 | 2 | 3 | 4 |
| 1.Allow resources to focus on core competency – low cost | .026 | .041 | **.949** | -.021 | 10.Allow resources to focus on core competency - flexibility | -.174 | -.036 | **.734** | .185 |
| 2.Increase volume through new market penetration | .198 | .114 | -.016 | **.904** | 11.Access to specific labour and/or technology expertise | **.492** | -.403 | -.051 | .290 |
| 3.Lower total costs | **.768** | -.044 | -.324 | .070 | 12.Gain access to new technology | .008 | .512 | .088 | **.737** |
| 4.Reduce logistics costs | **.788** | .170 | -.150 | .038 | 13.Allow resources to focus on core competency - quality | -.012 | -.070 | **.913** | -.010 |
| 5.Reduce regulatory and legal costs | **.875** | .022 | -.335 | .071 | 14.Improve conformance to quality | .035 | **.850** | -.028 | -.035 |
| 6.Improve process responsiveness | **.810** | .056 | .049 | .065 | 15.Improve product performance design quality | .062 | **.897** | -.057 | .178 |
| 7.Increase supply chain flexibility | **.684** | -.115 | .027 | .012 | 16.Allow resources to focus on core competency - time | -.135 | -.079 | **.731** | -.100 |
| 8.Increase volume capability | **.787** | .220 | -.039 | .184 | 17.Improve process capability and cycle times | .084 | **.909** | -.049 | .125 |
| 9.Multiple sourcing for uncertainty preparedness | **.822** | .202 | .115 | -.068 | 18.Improve process lead times | .142 | **.881** | -.066 | .194 |

*Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization*

### *5.2.3 Grouping of the Factors*

The four factors which altogether accounted for 73.3% of total variance in the 18 original factors may be regarded as composite factors influencing outsourcing of functions by telecommunications firms in Nigeria.

**Factor 1** accounted for 30.585% of the total variance (Tables 7 and 9) and it is without doubt the most important factor. Of the 18 factors included in the analysis, eight of them loaded positively and significantly on this factor (Table 9). They included lower total costs (factor 3), reduce logistics costs (factor 4), reduce regulatory and legal costs (factor 5), improve process responsiveness (factor 6), increase supply chain flexibility (factor 7), increase volume capability (factor 8), multiple sourcing for uncertainty preparedness (factor 9), and access to specific labour and/or technology expertise (factor 11). The above-mentioned factors are the ones that are loaded strongly, positively and significantly, except factor 11 (access to specific labour and/or technology expertise) that didn't load strongly (0.492), though it loaded positively and significantly. This factor is therefore named 'cost and flexibility related factor'.

**Factor 2** accounted for 20.083 percent of the total variance (Table 7). Associated with it are four factors which loaded strongly, positively and significantly. These are factors 14, 15, 17, and 18 (Table 9). Two of the factors are quality related and the other two are time related and it can be seen that all of them are strongly loaded (the minimum being 0.850), this factor will, however, be named 'quality and time related factors'.

**Factor 3** accounted for 15.526 percent of the total variance (Table 4.3). These factors loaded highly on four factors. They are 'allow resources to focus on core competency-low cost', 'allow resources to focus on core competency-flexibility', 'allow resources to focus on core competency-quality', and 'allow resources to focus on core competency-time'. This factor is therefore named 'allow resources to focus on core competency related factors'.

**Factor 4** is found to account for 7.11 percent of the total variance in the original data matrix. These are factors 2 and 12. That is, 'increase volume through new market penetration' and 'gain access to new technology'. These two factors loaded highly and the factor is named 'innovation related factors'. This is because new market penetration and new technology are issues related to the innovativeness of the firms.

While carrying out the review of literature, the researcher identified 18 factors which was mapped into five groups namely by the researcher as 'cost related factors', 'flexibility related factors', 'innovativeness related factors', 'quality related factors', and 'time related factors'. This research has, however, identified that these five groups cannot work for telecommunications firms in Nigeria and that the 18 factors can be re-grouped into four based on the outcome of this research. These are 'cost and flexibility related factors', 'quality and time related factors', 'allow resources to focus on core competency factors', and 'new market penetration/technology related factors'.

## 6. CONCLUSION

This study identified, assessed and categorised into a smaller number of groups the factors influencing outsourcing of functions by telecommunications firms in Nigeria. In the survey conducted, 18 telecommunications firms (involving five GSM operators, seven fixed wireless/CDMA firms, and six major vendors) participated. Findings from the study indicate that all the factors identified have means greater than 3 which shows that majority of the respondents agree that those factors are the ones actually influencing outsourcing of functions by telecommunications firms in Nigeria. Particularly, 'allow resources to focus

on core competency – low cost', 'allow resources to focus on core competency – quality', 'allow resources to focus on core competency – time', 'allow resources to focus on core competency – flexibility' and 'lower costs' are the first five most rated factors influencing outsourcing of functions.

The findings of this study is illuminating in the sense that the study reveals more regarding the categorisation/grouping of the factors influencing outsourcing of functions by telecommunications firms in Nigeria. Through the use of factor analysis technique, these factors were reduced and grouped into a smaller number with the dictates of what is obtainable in telecommunications firms in Nigeria. These groups are 'cost and flexibility related factors' consisting of the following factors: lower total costs, reduce logistics costs, reduce regulatory and legal costs, improve process responsiveness, increase supply chain flexibility, increase volume capability, multiple sourcing for uncertainty preparedness, and access to specific labour and/or technology expertise. The 'quality and time related factors' group have the following as the sub-factors: improve conformance to quality, improve product performance design quality, improve process capability and cycle times, and improve process lead times. The 'allow resources to focus on core competency factors' group has 'allow resources to focus on core competency-low cost', 'allow resources to focus on core competency-flexibility', 'allow resources to focus on core competency-quality', and 'allow resources to focus on core competency-time' as sub-factors, while the 'innovation related factors' group has 'increase volume through new market penetration' and 'gain access to new technology' as sub-factors.

The outcomes of this study have wider implications for practice and research. Firstly, this research has provided illumination and insight into the factors influencing outsourcing of functions by the telecommunications firms in Nigeria and other developing nations can draw lessons from this in order for them to unravel and uncover their own local realities. Secondly, the findings have the capability of advancing theory in the subject by adding to the pool of existing literature in the subject. This will at the same time spur research activities within this research enclave that have received limited attention among researchers in the study area.

While this research sheds new light on the outsourcing of functions in the telecommunications firms in Nigeria and one of the areas that researchers need to give proper attention is congruence between competitive priorities and outsourcing decisions. This can still be for telecommunications firms, but it is recommended that this kind of study can be expanded beyond telecommunications firms. Further, a wider study with focus to similarities and differences in the impact of outsourcing and business performance across a variety of industries with regards to infrastructure outsourcing is recommended.

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