



Construction Firms' Satisfaction on Outsourced Services at Construction Phase of Building

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Authors' contributions

This work was carried out in collaboration among all authors. Author ICO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors OO and AM managed the analyses of the study. Author AL managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Across the globe, outsourcing services has become more complex and sophisticated. The aim of this study is to establish the level of satisfaction of Nigerian construction firms on outsourced services at construction phase of building with a view to assisting construction firms in their decision on whether to outsource a particular work section or not.

Study Design: Survey Research Design.

Place and Duration of Study: The study took place in Ogun State, Nigeria, between June 2019 and December 2019.

Methodology: The study focused on outsourcing and targeted at outsourcing services offered during construction phase of building. The research combined a wide-ranging literature review and questionnaire survey. A well-structured questionnaire was designed and distributed to construction

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firms in Ogun state. A total of 73 of the survey questionnaires were administered out of which 47 representing 64.4% were adequately filled and returned. Data obtained were analysed using frequency, percentage, mean, relative importance index and ranking.

Results: Findings from the study revealed that piling is the most often outsourced work during construction phase of building, followed by electrical installation, cladding and mechanical installation. The results of the study revealed major reasons for outsourcing to include specialization, technology advancement and core competences. Ability to meet changing needs, service-level contract agreement with outsourcer and excessive dependence on vendor reliability were revealed to be the major challenges that affect the ability of the Nigerian construction firms to successfully outsource services. It was also established that Nigerian construction firms have high level of satisfaction on the outsourced services during the construction phase of building.

Conclusion: The study suggested that Nigerian construction firms should give consideration to piling, cladding, basement and mechanical installation in outsourcing and concreting, formwork, plumbing installation and roofing in in-house.

Keywords: Building; construction phase; in-house services; Nigerian construction firms; outsourcing services.

1. INTRODUCTION

From the beginning of time, buildings are being created to give shelter and comfort. As stated by [1], building has changed through centuries, from living in caves to high rise buildings and then to smart buildings. Building industry is an important economic sector that infuses other sectors as it converts numerous resources into economic, physical and social infrastructure essential for socio-economic development [2]. The industry account for a large part of the Gross Domestic Product of a nation and a key contributor to employment generation [3]. Fundamentally, buildings undergo three main phases namely, design, construction and operation phases which involves the inputs of teamwork of many professionals and skilled workers. According to [1], the construction phase of building project is the site production stage during which much of the principal cost is acquired.

The output of the construction (building) is characterized by variety of technological and methodological inputs of varying complexity. The diversity of the technical know-how requirements of building construction projects determines exact demands which a construction firm has to be met while matching competences. And this factor leads various construction companies to engage expertise in specific types of operation. The provision of outsourcing services in the construction industry has necessitated different construction firms in reviewing the sources of their core functions or value-added and contracting out non-core functions. According to [4], the decision to outsource is extremely resulting from the fact that, it is capable to

sustain jobs that can be finished quicker without compromising quality at cheaper and rational cost. [5] Stated that, project managers are progressively facing difficulties to make the right sourcing decision because the consequences or penalties can be substantial.

In-house services are refers to operations or work activities conducted within a firm using its own employees and time, instead of relying on outsourcing [6]. Outsourcing services on the other hand, has been defined as “the strategic use of outside resources to perform activities traditionally handled by internal staff and resources” [7]. Outsourcing is one of the best concepts that allow several firms to pay more attention on what they do best and outsourcing what others can do better, cheaper, higher quality and faster [8]. According to [4], the important of any outsourcing attempt is to guarantee that its process will help fulfill the organisation’s mission and long-term goals and objectives. The trend now is that firms balances the possible benefits of outsourcing with its possible costs so as to establish the ratio of in-house to outsourcing that will best attain the organization’s objectives [9]. According to [5], good outsourcing decisions brings about costs reductions, whereas poor outsourcing decisions lead to several problems like disordered service, business failure and costs escalation. [9] Further explained that, inappropriate proportion of in-house to outsourcing can lead to business failures/not achieving the client’s satisfactions; hence, it is imperative that organization identify all in-house and outsource service costs and benefits in order to make a reasonable and successful judgment. According to [10], the

benefits enjoyed from outsourcing are not always steady but depend on the distinctiveness of the firms and the industry in question. Apart from the benefits derived from outsourcing services, its practice can cause the following problems; too much reliance on supplier enterprises, in short or long term, development of communication problems, losing flexibility, negative effect on staff, price pressure of the suppliers, and losing control over relevant processes [11].

Across the globe, outsourcing services has become more complex and sophisticated. Outsourcing decisions are majorly strategic and tactical in nature. According to [11], costs is the major reason in tactical decisions, other benefits and risks are not considered, while strategic outsourcing decisions are more detailed and include reasonable decision making process. Strategic outsourcing should be seen as a long term action stipulated to guarantee the survival and prosperity of a business [12]. This means that the major goal of strategic outsourcing is to build core skills to fortify obstacles of opening for survival of new companies. And focusing on core skills and using capable service providers to execute works that are not firm's area of specialty; the firm's risk can be reduced and shared accordingly. [5] opined that poor outsourcing practices lead to unplanned loss of good reputation. [11] pointed out that, the viewpoint of organisations when deciding on outsourcing should be strategic and long termed for it to be a success venture.

Several studies have been done on outsourcing. Many researchers have done work on outsourcing in facilities management [4,7,9,11,12]. Many others have looked at the performance of outsourcing [2,3,10,13,14,15]. Other studies have focused on the relevance of outsourcing [8,16]. The study of outsourcing construction activities in the construction phase of building is scarce. This paper attempts to make a significant contribution to the management of the construction phase of building project by discovering the level of satisfaction of construction firms on the issue of outsourcing non-core competences. Above all, the study addresses the following research questions: What are the motives for outsourcing non-core competences? What are the services outsourced during construction phase of building? What are the challenges that affect the ability of the construction firms to successfully outsource services? What is the frequency of use of outsource services? Thus, the aim of this

study is to establish the level of satisfaction of construction firms towards outsourced services at construction phase of building in Nigeria with a view to assisting construction firms in their decision on whether to outsource or not. Even though this study applies particularly to the construction firms of Nigeria, same approach can be used in other countries that are interested in determining the satisfaction level of construction firms regarding outsourced services at construction phase of building.

2. LITERATURE REVIEW

2.1 The Concept of Outsourcing

Outsourcing is a phenomenon initiated in the 1950s [13], started in America and then the useful ideas spread across the globe [8], but was formally identified as a business strategy in 1989 [5]. Since then outsourcing develop into a common practice in most countries [3]. According to [17], organisations are outsourcing to influence production in order to attain cost-cutting measure. According to [14], Outsourcing is among the most essential managerial subject in the new era because it offers cost reduction opportunities. Theoretically, the outsourcing concept has been fully discussed in previous studies that provided with many definitions [5]. In simpler way, outsourcing means outside-resource-using. Outsourcing is the practice of shifting works normally done by a firm to another organization/firm [5,6,15,17]. According to [7], outsourcing is an approach by which organisation contracts out most important job activities to expert service providers, who becomes valued partners. The meaning of outsourcing comprises both domestic and foreign contracting which include off-shoring which is described as an organisation taking a function out of their business and transferring it to another country [2].

According to [6], in a globalization era, outsourcing is among the fast spreading ways of international trading and is characterized by enormous growth in terms of gripping and familiarizing new technology. [14] opined that, outsourcing offers viable advantage and is a significant driver of economic growth and globalization across the globe. Table 1, summarizes the reasons for outsourcing as reviewed by past researchers. Important issues like selection, contract negotiation, and shifting of resources to organisation have to be considered as soon as the decision to outsource has been made [6].

Table 1. Reasons for outsourcing

No	Outsourcing motivations	Reviewed by Authors						
		[6]	[8]	[13]	[4]	[17]	[7]	[16]
1	Cost reduction	X	X	X	X	X	X	X
2	Administrative task	X						X
3	Core competence	X	X	X	X	X	X	X
4	Technology advancements	X		X	X	X		X
5	Specialization	X	X	X			X	X
6	Resources management	X			X		X	X
7	Risk management	X	X		X		X	X
8	Lack of internal resource	X					X	X
9	Economies of scale	X				X	X	X
10	Cooperation	X			X			X
11	Drive organizational change	X			X			X
12	Enhance capacity for innovation	X		X	X	X	X	X
13	Higher quality		X		X			X

Basically, outsourcing decisions are categorized into two, namely; (i) tactical – a short-term solution, and (ii) strategic – a long-term partnership. Outsourcing is tactical if the motive is to resolve a practical problem (KHK, 2015). According to [11], the main reason in tactical decisions is cost followed by other advantages, risks are not considered. Fluctuations in demand for services or goods can necessitate tactical outsourcing decisions. On the other hand, strategic outsourcing decisions are highly detailed and comprise of a reasonable decision making process [11] and it entails comparing the possible cost savings against the cost of a loss over the service or product [6]. By using strategic outsourcing decisions, construction firms can gain long-term benefits and reduction in overhead costs. [11] pointed out that, the viewpoint of organisations when deciding on outsourcing should be strategic and long termed for it to be a success venture.

Outsourcing strategy is undergoing constant development; first, its practice for costs reduction, secondly, as an avenue to offer external competences or skills essential for diversity benefit and thirdly, as an avenue to generate new business models that aimed at more flexible and adaptive business [13]. However, there is still lack of confident in value perception in many industries of developing countries towards this type of business concept [8]. Outsourcing can take the following forms or types; service outsourcing, procurement outsourcing, offshore outsourcing and legal process outsourcing (LPO). According to [5], LPO is apply to law firm acquiring lawful support services from external law firm, the practice is referred to as offshoring if the outsourced

company resides in different country. [5] outlined four fundamental types of offshore outsourcing to include; (i) ITO – Information Technology Outsourcing (Technology process outsourcing); (ii) BPO – Business Process Outsourcing; (iii) Software R&D – Offshore Software Development; and (iv) KPO – Knowledge Process Outsourcing. According to [2], these types of offshore are sometimes known as engagement models for sourcing. The concept of outsourcing in literature has often been mentioned as a synonym of subcontracting; though refer to other situations [5]. The difference between subcontracting and outsourcing in a business according to [2] is that, outsourcing entails extensive reorganising of a specific activities which involve relocating of personnel from a host organisation to a specialist firms whereas subcontracting is engaging of contractor for a specific type of activities and thus developing long-term relationship with such firms to balance the organisation's capabilities.

Past research works have revealed that firms gain many benefits when they outsourced. It has been revealed that, by outsourcing, organisations frequently attain cost advantages [3]. Table 2, summarizes the advantages/benefits for outsourcing as reviewed by past researchers.

Despite these numerous benefits, problems do immanent on the course of outsourcing. Outsourcing reduces an organisation's control over how definite works are delivered and may elevate the organisation's legal responsibility exposure [5]. [3] noted that outsourcing can result to loss on the whole business performance. When outsourcing, potential risks such as operational risks, loss of privacy and

control and strategic risks should be well thought-out [17]. Table 3 summarizes the disadvantages/problems/challenges related to outsourcing as reviewed by past researchers.

2.2 Outsourcing at Construction Phase of Building

Outsourcing was incorporated in the construction industry in the 1990s, ever since then it has turned out to be very vital factor to the general success of organisations [13]. This concept is presently used by the construction firms in Nigeria [2]. According to [2], construction firms outsource a wide range of goods, works and services during project delivery and some of

these activities are not outsourced in its entirety, but a part of the whole is given out which is referred to out-tasking. The construction industry consists of many careers, professions, consultants and companies in alliance with subcontractors, contractors and clients all having a specific part to play in delivering quality projects [3]. As stated by [18] outsourcing of architectural services and civil engineering services is common and the construction industry, by nature, has many processes that are not suited for outsourcing. It seems that no literature has discussed outsourcing at construction phase of building, or better still; the study of outsourcing at construction phase of building is scarce.

Table 2. Benefits of outsourcing

No	Benefits of outsourcing	Reviewed by Authors						
		[8]	[6]	[13]	[3]	[17]	[5]	[11]
1	Cost Saving	X	X	X	X	X	X	X
2	Reduces administrative		X					
3	Capital exchange		X					
4	Specialization/Expertise	X	X				X	
5	Production economies		X		X			
6	Labour wage	X	X					X
7	Access to Innovation		X	X	X			
8	Fast delivery	X			X		X	
9	Risk-sharing	X					X	X
10	Access to new Technology			X		X		
11	Quality Improvement					X	X	
12	Bringing value to the end customer					X	X	
13	Increase in Operating Cash Flow					X	X	

Table 3. Challenges of outsourcing

No	Challenges of outsourcing	Reviewed by Authors					
		[6]	[8]	[13]	[17]	[11]	[7]
1	Loss of managerial control	X		X	X	X	X
2	High exit barriers	X					
3	Conversion costs	X			X		
4	Increased executive management involvement	X					
5	Excessive dependence on vendor reliability	X				X	
6	Concerns with long-term flexibility	X				X	
7	Ability to meet changing needs	X		X			
8	service-level contract agreements with outsourcer	X					
9	Risk of exposing confidential data and technology		X	X	X		X
10	Lower quality in manufacturing		X	X	X		
11	Many Hidden costs		X	X	X	X	
12	Lack of customer focus		X				
13	Cultural issues (Mismatch between cultural values and norms)				X		
14	Loss of loyal employees				X	X	
15	Increased Lead Time in supply chain				X		X

Construction phase of building comprises of several activities of specialty including basement, piling, concreting, formwork, mechanical installations, electrical installations, plumbing installations, cladding, roofing, tiling, windows, doors and painting work. It is important to understand that the client satisfaction is the key determinant of success. [7] Outlined significant areas for a successful outsourcing to include (i) understanding company goals and objectives; (ii) strategic vision and plan; (iii) selecting the right and high quality supplier; (iv) properly structured, effective contract and contract monitoring; and (v) good relationship with the supplier. Outsourcing concept is gradually been adopted by companies, with most of the companies optioning to concentrate on core competencies and laying off activities that are considered non-core [5]. [10] noted that, there is some evidence that outsourcing can increase productivity. According to [14], firms have preference to outsource works that are not very important for supporting their spirited advantage and focus on their core works. Outsourcing is known to be a reduction of costs of raw materials and labour, resulting in reduced production costs [8]. The main reasons of outsourcing in construction phase of building include but not limited to costs reduction, quality improvement, core competencies, and access to new technology, innovations and skills which are not available in-house.

Construction has become very diverse and sophisticated with new designs, technology, methodology and products being adopted in the procurement of construction works, this has invariably forced the construction firms to take the critical decision of focusing on their core responsibility and competencies where they have a lot of technical expertise and enough material and plant resource at their disposition [2]. According to [7], sourcing decision is essential because it influences costs, also defines the limits an organisation draws around its functions. Construction firms have frequently subcontracted to benefit from resources that are not within their reach, either for technology, skills, materials, people or products [16]. Organisations have frequently engaged special contractors for particular work, or to lessen their workload and have developed long-term relationship with organizations whose competences match theirs [7]. Generally, outsourcing is defined in terms of long-term relationships, whereas traditional subcontracting is within the time of a particular project [16].

3. METHODOLOGY

The study focused on outsourcing and targeted at outsourcing services offered during construction phase of building in Nigeria. To achieve the aim and objectives of the study, the research combined a wide-ranging literature review and questionnaire survey. A research of construction firms' view on outsourced service satisfactory at construction phase of building in Nigeria was conducted. A well-structured questionnaire was designed and distributed to construction firms in Ogun state. The reason for the selection of the study area is because the state is one of the fast developing states in Nigeria in terms of construction activities with a considerable number of registered construction companies. The questionnaire comprised of seven sections. The first part asks questions about the background information of the participants, the second section was designed to collect characteristics of responding companies, the third section focused on motives for outsourcing, fourth section focused on challenges of outsourcing, fifth section focused on in-housed and outsourced services during construction phase, sixth section focused on the frequency of outsource services, whereas the seventh section is concerned with the level of satisfaction of the outsourced services. The survey used Snowball sampling method due to absent of list of registered construction firms in Ogun state. Snowball Sampling method is a non-probability sampling method which is helpful in meeting population that is not readily available [19,20]. A total of seventy-three (73) of the survey questionnaires were administered out of which forty-seven (47) representing 64.4% were adequately filled and returned. The main issues addressed in the study include: benefits of outsourcing, motives for outsourcing, challenges of outsourcing, frequency and satisfaction of construction firms on outsourcing services at construction phase of building in Nigeria.

3.1 Method of Analysis

Some of the questions in the questionnaire entail measuring some variables of outsourcing on a 5-point Likert's scale. Using Cronbach's alpha test, the Likert scale questions were tested for reliability. Result obtained with the use of SPSS shows a 0.708 value, which was considered acceptable for the scale internally, and the questionnaire was accepted to be reliable. Table 4 and 5 shows 5-point Likert rating scale values assigned to different options used in the

questionnaire. Data obtained were analysed using frequency, percentage, mean, relative importance index and ranking.

Table 4. Ordinal scales for data measurement (For Reasons and Challenges of Outsourcing)

Likert scale	Weights
Very irrelevant	1
Irrelevant	2
Fairly relevant	3
Relevant	4
Very relevant	5

Table 5. Ordinal scales for data measurement (For Extent of use of the Outsourcing services)

Likert scale	Weights
Never	1
Rarely	2
Sometimes	3
Often	4
Very often	5

3.2 Procedures Employed in the Data Analysis are as Follows

3.2.1 Computation of the Relative Importance Index (RII)

The analysis utilized Relative Importance Index, which is used in measuring and determining the relative importance of variables considered in this study. To compute this, mean scores for each variables were calculated by summing up the scores by the various participants. The Relative Importance Index, as given by [1], was computed using equation (1).

Relative Importance Index (RII) is given by:

$$\frac{\sum fx}{\sum f} \times \frac{1}{k} = \frac{\bar{x}}{k} = \text{Equation (1)}$$

Where Mean = $\bar{x} = \frac{\sum fx}{\sum f}$

Where k = Highest point on the Likert's scale (in this case, k is 5)

x = Points on the Likert's scale (1, 2, 3, 4, 5)

f = Frequency of respondents' choice of each point on the scale x

4. RESULTS AND DISCUSSION

The results of the analysis of the data collected for the study are presented as follows:

4.1 Respondents' Background Information

The summary of the respondents' background information are shown in Table 6. The percentage distribution of the respondents based on age in Table 6 shows that more than 91% of the total respondents are above 30 years old, which shows that most of the respondents are mature to partake in the study. The majority (57.45%) of the respondents were project managers, followed by site engineers (21.28%) and design and costs managers having the same percentage (10.64%). Hence, the study concluded that the respondents are well-informed regarding outsourcing services and the management approaches of their companies. Civil engineers constitute the highest population (36.17%) of the respondents, followed by builders (25.53%), indicating their commitment in the construction sector of Nigeria. Masters degree holders constitute the highest population (46.81%) of the respondents, followed by B.Sc./B. Tech degree holders (44.68). More than 82% of the respondents have their years of working experience above 10 years in construction works as at the time of gathering these data. This shows that the respondents are qualified and considered suitable for this study.

4.2 Characteristics of Responding Firms

Table 7 shows that 40.43% of the responding companies are limited liability company, followed by sole proprietorship with 36.17%. More than 89% of the responding companies have been practicing in the Nigerian construction industry for more than 10 years. This is highly important given that frequently outsourced services are highly dependent on experience. As such, it could be concluded that the level of experience among the Nigerian construction stakeholders would contribute towards outsourcing non-core competences. Most of the construction companies operate a fully indigenous company (70.21%) and about 79% of the responding companies have workers ranging from 1 to 49, denoting small and medium size. Majority of the responding companies are building and civil engineering contractors (74.47%).

4.3 Motives for Outsourcing

To investigate the motives or reasons why construction firms outsourced non-core competences, the mean of the motives for outsourcing were analysed using Relative

Importance Index (RII) and ranked separately. The results are presented in Table 8.

Table 8 shows that the level of relevance of the motives for outsourcing non-core competences factors is “very high” for one out of the thirteen factors ($RII \geq 0.80$). It is “high” for the remaining twelve factors. However, specialization was ranked first by the level of relevance, with $RII = 1.02$. Technology advancement was ranked second with $RII = 0.78$ and core competence with $RII = 0.77$ was ranked third. These results in Table 8 indicate that the most reasons construction firms outsourced non-core competences during construction phase are for specialization, technology advancement and core competence.

4.4 Challenges of Outsourcing

To investigate the challenges that affect the ability of the construction firms to successfully

outsource services, the mean of the challenges of outsourcing were analysed using Relative Importance Index (RII) and ranked separately. The results are presented in Table 9.

Table 9 shows that the level of relevance of the challenges of outsourcing factors is “high” for thirteen out of the fifteen factors ($RII < 0.80$). It is “low” for the remaining two factors. However, ability to meet changing needs was ranked first by the level of relevance, with $RII = 0.77$. Service-level contract agreement with outsourcer was ranked second position with $RII = 0.71$, and excessive dependence on vendor reliability was ranked third position with $RII = 0.70$. These results show that, the top three challenges that affect the ability of the construction firms to successfully outsource services are: ability to meet changing needs, service-level contract agreement with outsourcer and excessive dependence on vendor reliability.

Table 6. Respondents’ background information

Respondents’ background information	Frequency	Percentage (%)
Age bracket		
21 – 30 years	4	8.51
31 – 40 years	13	27.66
41 – 50 years	21	44.68
51 years and above	9	19.15
Total	47	100
Designation		
Project Manager	27	57.45
Costs Manager	5	10.64
Site Engineer	10	21.28
Design Manager	5	10.64
Total	47	100
Professional background		
Architect	7	14.89
Quantity Surveyor	9	19.15
Builder	12	25.53
Civil Engineer	17	36.17
Other	2	4.26
Total	47	100
Highest academic qualification attained		
HND	3	6.38
B.Sc./B. Tech.	21	44.68
Masters	22	46.81
PhD	1	2.13
Total	47	100
Years of experience in construction		
Less than 5yrs	2	4.26
5 – 10yrs	6	12.77
11 – 15yrs	15	31.91
16 – 20yrs	11	23.40
More than 20yrs	13	27.66
Total	47	100

Table 7. Characteristics of responding firms

Responding company	Frequency	Percentage (%)
Ownership of contracting company		
Sole proprietorship	17	36.17
Partnership	8	17.02
Limited liability company	19	40.43
Public limited company	3	6.38
Total	47	100
Years of existence of company		
5 – 10yrs	5	10.64
11 – 15yrs	8	17.02
16 – 20yrs	13	27.66
More than 20yrs	21	44.68
Total	47	100
Company ownership and management		
Fully indigenous	33	70.21
Fully expatriate	5	10.64
Partly expatriate/indigenous	9	19.15
Total	47	100
Company's workforce (site/head office)		
1 – 49 workers	37	78.72
50 workers and above	10	21.28
Total	47	100
Company's operation/activity		
Building	9	19.15
Civil engineering	3	6.38
Building and civil engineering	35	74.47
Total	47	100

Table 8. Relevance of motives/reasons for outsourcing non-core competences

S/No	Motives/Reasons for outsourcing	Weighting (x)/Response frequency (f)					Σf	\bar{X}	RII	Rank
		1	2	3	4	5				
1	Specialization	1	2	6	24	13	47	5.08	1.016	1
2	Technology advancements	1	4	8	19	15	47	3.91	0.782	2
3	Core competence	0	4	8	25	10	47	3.87	0.774	3
4	Enhance capacity for innovation	1	5	9	19	13	47	3.81	0.762	4
5	Higher quality	1	8	6	16	16	47	3.81	0.762	4
6	Resources management	0	6	9	21	11	47	3.79	0.758	6
7	Risk management	1	6	12	19	9	47	3.62	0.724	7
8	Lack of internal resource	1	6	12	21	7	47	3.57	0.714	8
9	Economies of scale	1	3	19	19	5	47	3.51	0.702	9
10	Cooperation	1	7	13	23	3	47	3.42	0.684	10
11	Drive organizational change	2	10	12	16	7	47	3.34	0.668	11
12	Administrative task	2	11	10	18	6	47	3.32	0.664	12
13	Cost reduction	10	6	8	15	8	47	3.11	0.622	13

1 = very irrelevant; 2 = irrelevant; 3 = fairly relevant; 4 = relevant; 5 = very relevant

Source: Field Survey (June – August 2019)

4.5 In-Housed and Outsourced Services during Construction Phase

To determine the services outsourced during construction phase of building, the

percentages of the services (activities during construction phase) for in-housed and outsourced were evaluated and separately ranked. The results are demonstrated in Table 10.

Table 9. Relevance of challenges of outsourcing

S/No	Challenges of outsourcing	Weighting (x)/Response frequency (f)					Σf	\bar{X}	RII	Rank
		1	2	3	4	5				
1	Ability to meet changing needs	0	4	6	30	7	47	3.85	0.770	1
2	Service-level contract agreements with outsourcer	1	5	12	25	4	47	3.55	0.710	2
3	Excessive dependence on vendor reliability	1	6	12	24	4	47	3.51	0.702	3
4	Concerns with long-term flexibility	1	8	11	21	6	47	3.49	0.698	4
5	Increased Lead Time in supply chain	1	10	9	20	7	47	3.47	0.694	5
6	Risk of exposing confidential data and technology	2	9	11	17	8	47	3.42	0.684	6
7	Many Hidden costs	4	5	13	21	4	47	3.34	0.668	7
8	Conversion costs	3	8	12	21	3	47	3.28	0.656	8
9	Lack of customer focus	2	11	14	14	6	47	3.23	0.646	9
10	Increased executive management involvement	2	12	10	20	3	47	3.21	0.642	10
11	Loss of loyal employees	2	12	12	18	3	47	3.17	0.634	11
12	Cultural issues (Mismatch between cultural values and norms)	4	7	17	16	3	47	3.15	0.630	12
13	Lower quality in manufacturing	3	14	13	15	2	47	2.98	0.596	13
14	High exit barriers	6	17	7	14	3	47	2.81	0.562	14
15	Loss of managerial control	15	15	6	8	3	47	2.34	0.468	15

1 = very irrelevant; 2 = irrelevant; 3 = fairly relevant; 4 = relevant; 5 = very relevant

Source: Field Survey (June – August 2019)

Table 10. Ranks of the in-house and outsource services of the selected construction activities

S/No	Activities during construction phase	Total (F)	In-House			Outsource		
			F	%	Rank	F	%	Rank
1	Basement	47	16	34.0	11	31	66.0	3
2	Piling	47	8	17.0	13	39	83.0	1
3	Concreting	47	32	68.1	1	15	31.9	13
4	Formwork	47	31	66.0	2	16	34.0	12
5	Mechanical installation	47	18	38.3	10	29	61.7	4
6	Electrical installation	47	21	44.7	8	26	55.3	5
7	Plumbing installation	47	30	63.8	3	17	36.2	11
8	Cladding	47	12	25.5	12	35	74.5	2
9	Roofing	47	27	57.4	4	20	42.6	10
10	Tiling	47	25	53.2	7	22	46.8	7
11	Windows	47	26	55.3	5	21	44.7	8
12	Doors	47	21	44.7	8	26	55.3	5
13	Painting	47	26	55.3	5	21	44.7	8

Source: Field Survey (June – August 2019). F = Number of respondents

The analysis of the percentages of in-house and outsource services in Table 10 revealed that the in-housed concreting is the highest, followed by in-housed formwork and in-housed plumbing installation while the in-housed piling is the least.

Also, Table 10 revealed that the outsourced piling is the highest, followed by outsourced cladding and outsourced basement while the outsourced concreting is the least. These results show that construction firms' preference for in-

housed and outsourced services during construction phase of building varies from one construction activity to another and that construction firms do not rely only on in-house or outsource during the construction phase; rather they use their staff to execute some construction activities and outsource non-core competences.

4.6 Frequency of Outsource Services

To determine the level of frequency of outsourced activities during construction phase of building, the mean of the outsourced services (activities during construction phase) were evaluated and separately ranked. The results are demonstrated in Table 11.

In Table 11, it was revealed that piling is the most often outsourced work during construction phase of building, followed by electrical installation, cladding and mechanical installation. This could be that most people specialized in these areas of construction works. Hence

most construction firms often outsourced such works.

4.7 Satisfaction Level of the Outsourced Services

To determine the level of satisfaction of outsourced activities during construction phase of building, the percentages of the level of satisfaction were evaluated and separately ranked. The results are demonstrated in Table 12.

The evaluation of the percentages of the level of satisfaction of outsourced services in Table 12 revealed that thirty out of the forty-seven survey participants representing 63.8% have high level of satisfaction on the outsourced services during the construction phase of building. These results indicate that construction firms have high level of satisfaction on the outsourced services during the construction phase of building in Nigeria, thereby encouraging the outsourcing of non-core competences.

Table 11. Ranks of the level of frequency of outsourced services of the selected construction activities

S/No	Activities during construction phase	Weighting (x)/Response frequency (f)					Σf	X̄	Rank
		1	2	3	4	5			
1	Piling	3	6	9	11	18	47	3.745	1
2	Electrical installation	3	7	12	13	12	47	3.511	2
3	Cladding	3	8	8	18	10	47	3.511	2
4	Mechanical installation	3	7	12	14	11	47	3.489	4
5	Plumbing installation	3	10	13	9	12	47	3.362	5
6	Roofing	2	12	10	13	10	47	3.362	5
7	Windows	6	11	5	10	15	47	3.362	5
8	Doors	5	12	6	10	14	47	3.340	8
9	Tiling	5	10	9	13	10	47	3.277	9
10	Painting	7	11	7	8	14	47	3.234	10
11	Basement	6	10	11	13	7	47	3.106	11
12	Concreting	9	11	9	9	9	47	2.957	12
13	Formwork	13	10	6	9	9	47	2.808	13

1 = never; 2 = rarely; 3 = sometimes; 4 = often; 5 = very often. Source: Field Survey (June – August 2019)

Table 12. Ranks of the level of satisfaction of outsourced services

S/No	Level of satisfaction	Frequency	Percentage	Rank
1	Very low	3	6.4	4
2	Low	3	6.4	4
3	Average	4	8.5	3
4	High	30	63.8	1
5	Very high	7	14.9	2

Source: Field Survey (June – August 2019)

5. CONCLUSION

This paper has demonstrated that in-house and outsourcing services is a feature of the building construction process. The study revealed that the most reasons construction firms outsourced non-core competences during construction phase are for specialization, technology advancement, core competence, resources management, enhance capacity for innovation and higher quality. Despite the enormous benefits that are associated with outsourcing services, this study shows that construction firms are being confronted with challenges. The findings revealed top five challenges that affect the ability of the construction firms to successfully outsource services as follows; ability to meet changing needs, service-level contract agreement with outsourcer, excessive dependence on vendor reliability, concerns with long-term flexibility and increased lead time in supply chain. This study has immensely contributed to literature on the in-house and outsourcing during the construction phase of building by revealing the activities outsourced or in-housed when they are adopted. This study shows that construction firms' preference for in-housed and outsourced services during construction phase of building varies from one construction activity to another, and that construction firms do not rely only on in-house or outsource during the construction phase, rather they use their staff to execute some construction activities and outsource non-core competences. The study also discovered that piling is the most often outsourced work during construction phase of building, followed by electrical installation, cladding and mechanical installation. Results from the study propose necessitate for construction firms to engage a combination of in-housed and outsourced services in construction phase of building process. In implementing this, it is recommended that construction firms should give consideration to piling, cladding, basement and mechanical installation in outsourcing and concreting, formwork, plumbing installation and roofing in in-house. Finally, it was established that construction firms have high level of satisfaction on the outsourced services during the construction phase of building in Nigeria. Hence, outsourcing is being encouraged, particularly in outsourcing non-core competences.

6. SUGGESTION FOR FURTHER STUDIES

The study could not investigate the effect of in-house and outsourcing services on the overall

project success. Thus, the study recommends further studies on the influence of the in-housed and outsourced services on construction project success.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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