EFFECTS OF SUB-CONTRACTORS' SUPPLY CHAIN MANAGEMENT PRACTICES ON CONTRACTORS' PERFORMANCE IN PROJECT DELIVERY IN GOMBE STATE, NIGERIA

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Abstract

The study assessed the effects of sub-contractors' supply chain management practices on contractors' performance in project delivery in Gombe metropolis. One research question was formulated to guide the study, the study area is Gombe state North-east Nigeria, the research design was survey. Simple random sampling technique was used for the study, questionnaire was used for data collection, the instrument was validated by three experts. The reliability of the instruments was determined using Cronbach alpha to test the internal consistency of the instruments. The data was collected with the help of research assistant. Data collected was analyzed using statistical package of social sciences (SPSS Version, 25) for the mean, relative important index was also used. The findings of the study revealed that: Trust based relationship, Long Term Collaboration/Integration and Strong Financial Flows were ranked extremely important. Transparency in Financial Management, Long-Term Partnering Working Experience and Supplier Relationship Management were ranked as important. Management Support/Leadership, Information flow, Dedication to Common Goals, Early Appointment of Key Members, Relationship Development, Equipment and Material Support Chain, Human Resource Supply Chain, Supply Chain Integration and Appropriate Deployment of Information were all ranked as moderately important while Incentive-Based Contracting and Use of Information Technology were ranked as least important. Based on the findings it was recommended that Construction supply chain best practices should be encouraged among construction stakeholders as the objective of construction supply chain is to create the most value, not solely for sub-contractors but for the whole supply chain network.

Keywords: Contractors' performances, Management practice, Sub-contractors Supply chain, Project delivery

Introduction

The Nigerian construction industry has continued to occupy an important position in the nation's economy and with the current liberal global economic order, it is challenging for the Nigerian firms in the construction sector to remain competitive. Most of the firms within the Nigerian construction industry have been bedevilled with difficulty in delivering value to their customers and on schedule (Amade, 2017).

The main task of construction supply chain management is to coordinate and integrate material, financial and information flows between customers, suppliers, builders, contractors, material manufacturers, retail and wholesale companies, to control and automate construction and logistics processes (Stenmark, 2021). The use of one or more integrated computer systems and the standardization of processes allows construction companies to save time, avoid

mistakes, reduce staff numbers and increase the efficiency of the construction process. Ensuring a smooth process of design, construction, planning the logistics, ordering materials and production reduces the sum of workers and specialists needed, shortens construction time and optimizes costs (Monk & Wagner, 2012).

The construction supply chain has become increasingly fragmented for the reasons outlined above. Increased fragmentation brings increased transaction volumes at lower average values and inevitably higher levels of opportunism, particularly in the context of low barriers to entry. The industry had become less trusting, more self-interested and adversarial. The adversarial attitude in the construction industry has been a recognised problem for many years. Performance and innovation in construction are significantly hindered by adversarial relationships and fragmented processes. In order to minimise their own exposure to risk, each party in the supply chain attempts to extract maximum reward for minimum risk that is normally achieved by means of non-legitimate risk transfer (passing risk down to the next level in the supply chain). This way of thinking has resulted in an industry structure with various interfaces, which are points of tension and conflict, which eventually leads to increased cost and reduced efficiency (Mohd Nawi, Baluch & Bahaudin, 2014). The characteristics of a specific project, and hence its degree of uniqueness, is determined by a number of factors. Consequently, the assessment of these project features determines the resources needed for a project, and selection of the most appropriate supply chains needed to deliver clusters (Aiyewalehinmi, 2013) of resources and services for the project as a whole.

Construction supply chain management is an emerging area of practice. It is inspired by but differs substantially from manufacturing supply chain management, where the emphasis is on modelling volume production. construction supply chain management is more concerned with the coordination of discrete quantities of materials (and associated specialty engineering services) delivered to specific construction projects. The organization and sourcing of materials is becoming increasingly complex across the global construction industry. Mounting emphasis on construction supply chain management is due to both global sourcing of materials and assemblies provided by advances in transportation technologies as well as a shortage of craft labour (reaching crisis proportions in many parts of the world) that force increasing amounts of value-added work to be conducted off -site deep in the supply chain. At the same time, construction clients are demanding faster, more responsive construction processes and higher-quality facilities. These demands generally involve both more responsive production chains and closer coordination between the owner and the construction team. For all these reasons, effective construction project execution will mean effective construction supply chain management (Hope, 2012; MullaAneesa, Gupta & Desai, 2015).

Supply chain management is the planning, execution and coordination of the moving of goods and services from the point of origin to where they are to be further processed into finished goods or consumption. Supply chain management involves the management of Interconnected, interlinked and interrelated networks of human resources, software, projects, activities, tasks, capital, machinery and information that are deployed in the movement of a product or service from a supplier to customers. Goods are transformed in the process and delivered as a finished or semi-finished products or services to the end users (Peter et al., 2020). Akintoye, Mcintosh and Fitzgerald (2000) in their own view stated that supply chain management can be seen as an example of evolutionary and cumulative innovation that is always seen to have emanated from internal programmes that are aimed at improving overall effectiveness. The main focus of supply chain management according to them is not limited to the internal efficiencies of an organization alone, but has extended to methods of eliminating waste and adding value within the supply chain. Lonngren, Rosenkranz and Kolbe (2010) opined

that supply chain management seeks to improve on performance via the better use of internal and external capabilities in order to form a seamlessly coordinated supply chain thereby elevating inter-company competition to inter-supply chain competitors.

Research Question

The study will be guided by this research question:

1. What are sub-contractors' construction supply chain management practices in curtailing constraints within the construction supply chain in Gombe State.

Research Methodology

The study adopted quantitative method and is a combination of exploratory and descriptive research. In common with other types of field study, this type of research contributes to the advancement of scientific knowledge in different ways (Forza, 2009). The study was conducted in the North east of Nigeria, which was also delimited to effects of sub-contractors' supply chain management practices on contractors' performance in project delivery in Gombe state, Nigeria. The target population for this study was construction managers with background in Architecture, Building, Quantity surveying and Civil engineering in Gombe State. Th study used face-to-face self-administered questionnaire method in the distribution of questionnaires. The data was collected through questionnaires which according to McNabb (2015), are the most appropriate means to obtain data (information) for descriptive methods; and the research data will be collected through primary and secondary sources. The respondents were explored to respond to questions to have their perspectives using 5-point likert rating scale of 4.21 - 5.00 very high level represent 1, while 3.41 - 4.20 high level represent 2, while 2.61 - 3.40 medium level represent 3, while 1.81 - 2.60 low level represent 4 and 1.00 - 1.80 very low level represent 5. The study used Cronbach alpha to determine the reliability of the instruments. Cronbach's alpha test of reliability indicates a value of 0.8 and this translates into acceptable internal consistency reliability for the variables used in this study

Data collected was analysed using statistical package of social sciences SPSS (version 25) statistical tool, descriptive statistics gives numerical and graphic procedures to summarize a collection of data in a concise manner. The result of the mean was ranked, mean scores are indicators to establish a rank order of importance for the factor. For instance, if the mean score of particular variables is 3.2, then it could be interpreted that the variable is perceived to be between moderately important and important but tends more towards being moderately important. Likewise, for level of proficiency tend towards good and very good.

Inferential analysis provides procedure to draw inferences about a population from a sample. Inferential statistics are techniques that allow us to use these samples to make generalizations about the populations from which the samples were drawn. Relative importance index was used to measure the importance of items as indicated by the respondents on a five-point likert scale. The RII is calculated using the following formula; $RII = \Sigma W / A*N$; Where W is the weight assigned to each variable by the respondents ranging from 1 to 5; A is the highest weight = 5; and N is the total number of respondents (116) for this study. Relative importance index has been used by other researchers in construction management (Aibinu & Jagboro, 2002; Amade et al., 2015).

Ranking of the items under consideration was based on their RII values. The item with the highest RII value is ranked first (1) the next (2) and so on. The rating of all the factors for degree of significance was based on the value of their respective relative importance index (RII).

Results

The results were presented in order in which the research question was raised as follows;

What are sub-contractors' construction supply chain management practices in curtailing constraints within the construction supply chain in Gombe State.

The table below shows respondents' perception level on the importance of the sub-contractors' construction supply chain management practice in Gombe State. This sub-section assessed sub-contractors' construction supply chain management practices in curtailing constraints within the construction supply chain in Gombe using sixteen items presented to the respondents.

ITEMS	SD	RII	RANK	IMPORTANCE LEVEL
Trust Based Relationship	1.87	0.81	1	Extremely Important
Long Term Collaboration/Integration	1.87	0.81	1	Extremely Important
Strong Financial Flows	1.80	0.77	3	Extremely Important
Transparency in Financial Management	1.79	0.70	4	Important
Long-Term Partnering Working Experience	1.76	0.70	4	Important
Supplier Relationship Management	1.82	0.69	6	Important
Management Support/Leadership	1.79	0.65	7	Moderately Important
Information Flow	1.71	0.64	8	Moderately Important
Dedication to Common Goals	1.69	0.61	9	Moderately Important
Early Appointment of Key Members	1.69	0.60	10	Moderately Important
Relationship Development	1.70	0.60	10	Moderately Important
Equipment and Material Support Chain	1.70	0.60	10	Moderately Important
Human Resource Supply Chain	1.68	0.59	13	Moderately Important
Supply Chain Integration	1.69	0.57	14	Moderately Important
Appropriate Deployment of Information	1.69	0.54	15	Moderately Important
Incentive-Based Contracting	1.60	0.44	16	Least Important
Use of Information Technology (IT)	1.60	0.42	17	Least Important

From the table respondents responded that Trust based relationship and Long Term Collaboration/Integration were ranked 1st both with RII of 0.81 and SD of 1.87, followed by Strong Financial Flows which was ranked 3rd with RII of 0.77 and SD of 1.80, respondents Transparency in Financial Management and Long Term Partnering Working Experience were tied at 4th with RII of 0.70 and SD of 1.79 and 1.76 respectively, respondents on Supplier Relationship Management was ranked 6th with RII of 0.69 and SD of 1.82. Respondents rated as moderately important, Management Support/Leadership Which was ranked 7th with RII of 0.65 and SD of 1.79, followed by Information flow was ranked 8th with RII of 0.64 and SD of 1.71. Dedication to Common Goals was ranked 9th with RII of 0.61 and SD of 1.69. Three items, Early Appointment of Key Members, Relationship Development and 56 Equipment and Material Support Chain were tied and ranked 10th with RII of 0.60 and SD of 1.69, 1.70 and 1.70 respectively. Human Resource Supply Chain was ranked 13th with RII of 0.59 and SD of 1.68 and Supply Chain Integration with an RII of 0.57 and SD of 1.69 was ranked 14th. Appropriate Deployment of Information, Incentive-Based Contracting and Use of Information Technology (IT) ranked 15th, 16th, and 17th with an RII of 0.54, 0.44 and 0.42 and SD of 1.69, 1.60 and 1.60 respectively.

Discussion of Findings

The sub-contractors' construction supply chain management practices in curtailing constraints within the construction supply chain within the construction supply chain in Gombe using seventeen items presented to the respondents. All items were rated as significant with three items rated as extremely important by the respondents. Respondents are aware of practices that can be used to curtail constraints in application of construction supply chain management. Respondents adjudged trust-based relationship as the most significant practice in the curtailing of constraints within the construction supply chain management practice. This is the belief that an individual's word would be relied upon and as such that individual will fulfil all obligations. As the degree of trust between the different construction Supply Chain partners matures, there is a strong tendency for a mutual flow of materials and information between the sub-contractors and their suppliers.

Trust according to AdTalib and Hamid (2014) is a major hindrance to the collaborative tendencies of most Supply Chain partners if the issue of trust is not properly instituted and clearly defined from the onset. A properly developed long-term relationship with suppliers within the construction supply chain will help in developing a well-managed supply chain that will have an effect on the competitiveness of the entire chain. Matsoso and Benedict (2014) opined that a long-term relationship with few suppliers will enable effective communication and if the relationship is strategically coordinated, will have a positive impact on both the financial performance of the subcontractors as a result of a well-integrated industrial relations that precipitates into speedy delivery of projects. This is in agreement with Amade (2017) and AdTalib and Hamid (2014) who both established the validity of trust-based relationship as a curtailing factor in overcoming constraints within construction supply chain management practice. Collaboration and co-operation with suppliers are the key to improve efficiency if one actor fails to take on the responsibility that has been allocated, a domino effect often occurs through the production chain that affects the overall project performance.

Long-term strategic collaborations are used to promote mutual supply chain benefits over the longer term and such long-term collaboration/integration can be secured through selecting capable and reliable suppliers on the basis of evidence, engaging those who will be capable of providing value for money through a competitive and effective procurement process within the construction supply chain. Construction organizations are establishing less adversarial and more collaborative

relationships more than they were decades back. Furthermore, long term collaboration ensures a reliable and predictable supply. Without reliable supply within the construction supply chain to meet agreed-upon service levels may cause project delay or outright failure. Long term collaboration is with suppliers by subcontractors has been a tradition in the study area. This has enabled them to secure materials even in times of weak financial flows. This practice is in concurrence with the findings of (Chen & Paulraj, 2004; Matsoso & Benedict, 2014; Moneke & Echeme, 2016).

Conclusion

Based on the findings of this study it was concluded that there is a high level of awareness among sub-contractors on construction supply chain management. Also, the level of awareness and practice of construction supply chain management has a significant effect on contractors' performance in construction industry.

Recommendation

In view of the above study's findings, this study has established that; there is a significant level of awareness and practice of construction supply chain management among sub-contractors in the study area and it was also inferred that performance in terms of project delivery is significantly affected by sub-contractors' level of awareness and practice. Hence, the study made the following recommendations;

1. Conscious efforts should be made towards creating awareness of construction supply chain management among all stakeholders in the construction value chain so as to foster collaboration and trust-based relationship toward the realization of prompt project delivery.

2. Construction supply chain best practices should be encouraged among construction stakeholders as objective of construction supply chain is to create the most value, not solely for sub-contractors but for the whole supply chain network

3. Construction professionals should take conscious efforts towards creating awareness and adopting the best practices all through the construction value chain.

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