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Impact of Materials Management Practice on Construction Project Delivery

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Abstract

Construction materials management process is a key success factor for most construction projects; the efficient procurement and handling of construction materials represent a key role in the completion of projects within the constraint of time, cost and quality. This recurring issue has generally led to poor project delivery in the Nigerian construction industry. The study is aimed at studying impact of material management practices on construction project delivery in Abuja. The methodology used involved descriptive survey and the research design was by structured questionnaire administered to a study population involving major construction industry practitioners with operations in Abuja. A total of 100 questionnaires were randomly distributed, out of which 87 returned. Findings showed that the impact of effective material management practices on construction site improves project delivery.According to analysis using spearman's correlation technique found a positive relationship between the effective material management and project delivery, with correlation coefficient of 0.347, and p value of 0.024.The paper recommends using proper planning of material management practices in a given order by a qualified and experience practitioners' to be in charge of material management and they must all be a specialist.Also, the study concludes that effective material management practice on construction sites will consequentially improve project delivery.

Keywords: construction projects, materials management, project delivery, and construction industry

1. INTRODUCTION

The needs to arrive at project delivery as at due date in right quality arises as much studies and new methodology of ensuring effective material management took larger part of project activities, planning and control. For this, the write up study vividly the impact of material management practices on construction project delivery. The idea of material management came into being in 1990 and was found to be a tool in addressing numerous negative issues associated with poor project performance and delivery [1]. Similarly, [2] revealed that, most construction project sites in the Northern region are characterized by emergency purchases of materials, inadequate storage, double handling of materials, material shortages and theft. Therefore, the study highlight major finding by assessing construction players on their material management methods for achieving successful project delivery. It is worth mentioning this to discover that proper management of materials does not eliminate all delays and cost overrun but lessen it to the manageable level. Thus, the objectives examine the impact of material management practice on construction project delivery in Abuja.

2. LITERATURE REVIEW

Material management is the process to provide right material at the right place, at the right time, in the right quantity to minimize the cost of the project [3]. Material management functions include planning and taking off materials, vendor evaluation and selection, purchasing, expenditure, shipping, material receiving, warehousing and inventory control, and material distribution [3]. Furthermore, the implementation of appropriate Information and Communication Technologies (ICT) could facilitate new management processes for complex projects. According to [4] construction material management is of central importance to the economic development of the construction industry. [5], the construction industry all over the world is continually growing due to its dynamic nature and high socio-economic impact on the economy of nations. [6] also identify material management as an integrated process of designing, constructing new structures or remodeling existing structures, using materials more efficiently with a great importance of contributing to construction industry's performance improvement as well as solving material waste management problems. The total cost of installed materials (or value of materials) may be 50% or more of the total cost.

[7] conducted a study on impact of materials management practices; The findings indicate that the main impacts of effective materials management practices are reduced cost of materials, good quality control, better field material control, better handling of materials, adequate storage of materials on site, improvements in productivity and completion of project on time. Based on the findings, it was concluded effective materials management practices improve the overall handling of materials for more efficiency and effectiveness on the construction site. According to [8] purchasing of materials, material planning method and transportation of materials are the most common practices of materi-

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Table 1: Measures to improve effectiveness of material management.

Practices	SA	A	U	D	SD	Mean	Rank
Placing of order	50	26	6	3	2	4.4	2
material handling	55	21	10	1	0	4.5	1
Quality Control	25	32	19	10	1	3.8	5
Logistics	35	32	13	4	3	4.1	4
Track record	22	25	27	9	4	3.6	6
Security agent	40	30	15	2	0	4.2	3

Table 2: Challenges of material management practices.

Challenges	SA	A	U	D	SD	Mean	Rank
Logistics	54	24	5	3	1	4.46	2
Security	52	28	2			4.61	1
Duplicated orders	49	27	5	2	1	4.44	3
Material handling	52	26	3	5	1	4.41	4
Quality control	33	20	15	14	5	3.71	6
Cash flow management	25	30	15	12	5	3.67	7
Field material control	31	42	12	2	0	4.17	5

als Management. The most severe problem militating against materials management was lack of proper work planning and scheduling while other problems include inadequate cash flow to contractors due to delayed payments, burglary, theft and vandalism. All these problems have associations with poor material management practices used on project sites. Although, effective management of materials can lead to a reduction in cost, enhance project delivery time, enhance quality and reduces health and safety problems on site resulting to a significant saving [9, 10]

3. METHODOLOGY

The research design involved the use of a structured questionnaire administered to construction industry stakeholders. The questionnaire fundamentally sought responses to examine the impact of materials management practices on construction project delivery,effectiveness of material management, and challenges of material management. The study's population comprises several construction industry practitioners including general manager, project manager, site engineer, construction engineer and store manager located in the city of Abuja, Nigeria. A total of 100 questionnaires were randomly distributed, out of which 87 returned, thus representing 87% response rate formed basis for data presentation, conclusion and recommendation of study. Consequently, a descriptive analysis of 87 valid responses was carried out using the Statistical Package for the Social Sciences (SPSS).

4. ANALYSIS AND DISCUSSION OF FINDINGS

5. Discussion on demographics of the respondents

Findings showed that 20% of the respondents are General Manager, 28% are Project Manager, 20% are Site Engineer, 16% are construction engineer and 18% are Store Manager. In addition 17% of the respondents have 0 – 5years of experience, 32% have 6 – 10years of experience, 28% have 11 – 15years experience, 15% have 16 – 20years experience and 8% have 20years above. According to analysis using spearman's correlation technique to test the relationship between effective material management and project delivery, there exists a positive relationship between the two variables with correlation coefficient of 0.347, and p value of 0.024.This implies that an important material management practice would consequentially lead to effective project delivery.

Based on practitioners responses, the measures to improve effectiveness of material management mostly is the Material handling with mean score of 4.5 which is observed to be the highest gravity followed by the placing of orders of materials with mean score 4.4, next to these are security agent (mean score 4.2), Logistic (mean score 4.1), Quality Control (mean score 3.8), and track record (3.6) respectively. This implies that personnel involved must be meticulous in placing orders to minimize error, handling those materials,and ensuring quality assurance on delivery. These, among other variables like effective logistics management, track records, and adequate security amount to effective material management.

The major challenges of material management practice in the construction industry are presented in Table 2 above. Security, logistics, duplicated orders, and material handling with mean values 4.61, 4.46, 4.44, 4.41 ranked first, second, third, and fourth respectively. Security challenges due to theft of construction materials is a major challenge, just as logistics and supply chain management. In addition, the issue of duplicated orders due to errors in placing orders is a major concern. Other challenges identified are field material control, quality control and cash-flow management.

6. CONCLUSION AND RECOMMENDATION

The objective of the study was to examine the impact of material management practice on project delivery. The findings of this study showed that the success of construction projects depend largely on effective management of materials by engaging professional practitioners in the procurement and handling of construc-

tion materials. Respondents of this study ranked 'placing of order', 'proper material handling', and 'quality control' 1st, 2nd and 3rd respectively as measures to increase effectiveness of materials management. The study also identified major challenges of material management practice in the construction industry as Security, logistics, duplicated orders, and material handling. Therefore, the paper recommends using proper planning of material management practices in a given order by a qualified and experience practitioners' to be in charge of material management and they must all be a specialist.

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