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BARRIERS AND DRIVERS OF INNOVATION IN THE NIGERIAN CONSTRUCTION INDUSTRY

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ABSTRACT

The Nigerian construction industry is one of the largest construction markets in Africa. It consists of foreign and indigenous contractors, construction professionals, public and private clients and material manufacturers. However, gross dissatisfaction of clients as a result of poor work quality, cost overruns and time overruns is inhibiting the growth potentials of the industry. Innovation holds great potentials for improvements in the industry. However, there is a need to understand the drivers and barriers to innovation. This study assessed the drivers and barriers to innovation. This study adopted a quantitative research design with questionnaires distributed to construction professionals in consulting and contracting firms located in the Mainland area of Lagos State. Data from the survey were analyzed by descriptive statistics and presented in form of frequencies, charts and mean. The major drivers of innovation from the survey were clients' requirements, developments in ICT and design trends while the main barriers to innovation as perceived by the respondents from the study were lack of understanding of the benefits of innovation, perception that the industry is doing well without innovation and cost of innovation. If the industry must improve its growth potentials then, innovation is not negotiable. However, construction stakeholder will need to address the barriers to innovation identified in this study

Keywords: construction industry, design, information and communication technology, innovation, Nigeria, research and development.

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1. INTRODUCTION

The construction industry has a crucial role to play in socio economic development of countries. It contributes significantly to Gross Domestic Product (GDP) because of its linkages with other sectors. The industry also promotes social progress by generating employment for a large number of people. It provides basic infrastructure for the efficient functioning of society [1]. The industry has the potential of improving its size, market share and profitability, and innovation holds the key to the potentials of the construction industry. Innovation is a multidimensional concept which can be viewed from different perspectives. It can be described as the process of transforming an idea into a sellable good or service, or it could be the outcome of improvement on an existing good or service [2]. It can also be described as an idea, or a technique or a process, which may be new or old that is applied to the production of goods or services in a distinct way, thereby adding value to a system, process or product [3]. Certain factors drive innovation. Specifically, the factors that drive innovation in the construction industry are many and have been classified into four distinct categories namely: environmental concerns, technological knowhow, knowledge sharing and boundary spanning [4]. Clients play a critical role in driving innovation in the construction industry. Clients possess the capacity to exert pressure on consultants and contractors to adopt innovative processes [5]. Building components firms and building materials companies also play vital roles in driving innovation in the construction industry [6, 7]. Despite the identified drivers of innovation in the construction industry, the industry still lags behind in innovation [8]. Some factors have been identified as hindrances to innovation in the construction industry. [2] classified the barriers to innovation into four categories namely: financial system, regulations, organizational culture and organizational structure. Financial system can be a barrier to innovation, if company owners and shareholders do not see an immediate financial return from an innovation. The financial system can also pose a challenge if the cost of financing an innovation is more than profits form the business. Regulations refer to institutional frameworks that guide the operations of businesses. Regulations can be a barrier to innovation if it sets a limit to the market in which firms can operate. Organizational culture also can be a hindrance to innovation if the culture of an organization is risk averse. Innovation in itself is risky with outcomes that may be unintended. Hence, an organizational culture that is opposed to risk may not likely support innovation. The type of organizational structure prevalent in a firm can also serve as barrier to innovation. For innovation to thrive, a firm's structure should consist of high centralization, formalization and low complexity. The Nigerian construction industry is one of the most vibrant construction markets in Africa. It consists of foreign and indigenious contractors, construction professionals, public and private clients and material manufacturers. However, gross dissatisfaction of clients [9] as a result of poor work quality, cost overruns and time overruns is inhibiting the growth potentials of the industry. Adoption of innovation can increase the potentials of the Nigerian construction industry. However, the drivers and barriers to innovation must be understood. This paper sets out to identify the barriers and drivers of innovation in the Nigeria construction industry.

2. METHODOLOGY

The research used a quantitative research design technique based on questionnaire survey. One hundred questionnaires were sent to construction professionals working with consultants and contractors in the Mainland area of Lagos state, Nigeria. The consultants consisted of Architects, Builders, Quantity Surveyors and Services Engineers.

The questionnaire had three parts. Part A elicited general information from the respondents. Part B was on the drivers of innovation while Part C had questions on the barriers to innovation. Sections B and C were measured by means of a 5 point likert scale.

Eighty nine (89) questionnaires were returned and found to be usable for analysis. Data obtained from the survey was analyzed using descriptive statistics and were presented in the form of frequencies, charts and mean.

2.1. Characteristics of Respondents

2.1.1. Designation

Fig 1 depicts the designation of respondents in the study. The respondents comprised of 32 Architects, 29 Builders, 17 Services Engineers and 11 Quantity Surveyors.

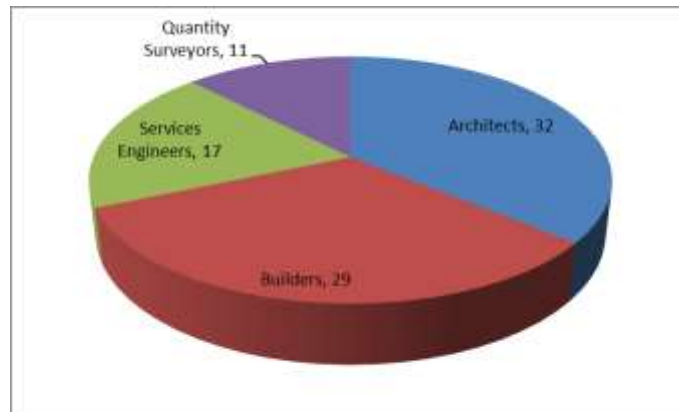


Figure 1 Designation of Respondents

2.1.2. Turnover in Billions

From Fig 2, the turnover of the firms that participated in the survey is given. Thirty four percent (34%) of the firms in the study had a turnover of between 0.51-0.70 Billion Naira, 31% of the firms had a turnover of between 0.21-0.50 Billion Naira, 30% of the firms had a turnover of < 0.20 Billion Naira, 4% of the firms had a turnover of 0.70-1 Billion Naira while only 1% of the firms had a turnover of > 1 Billion Naira.

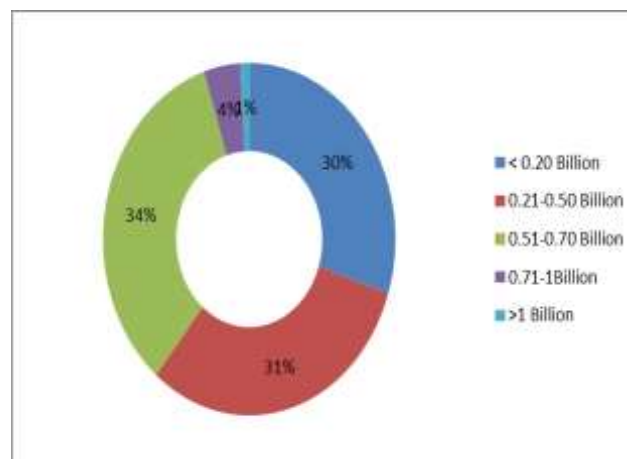


Figure 2 Turnover in Billions of Naira

2.1.3. Number of Employees

Fig 3 shows the size of the firms (in terms of number of employees) that participated in the study. Out of the 89 firms that partook in the survey 55 firms had less than 50 employees, 34 firms had between 51 and 100 employees, 11 firms had between 101-150 employees, while none of the firms had more than 151 employees.

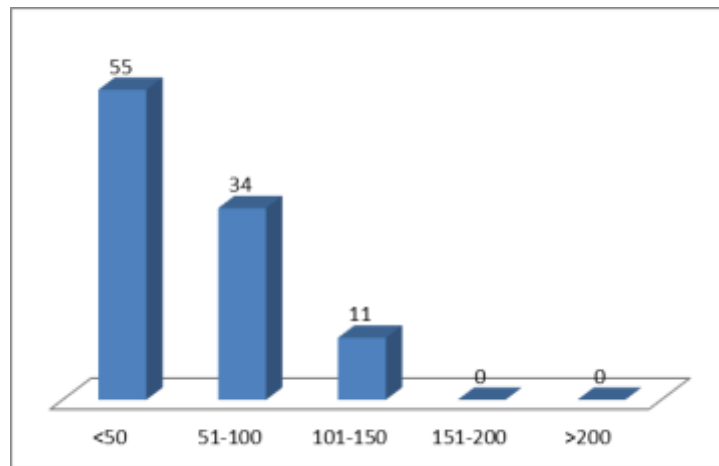


Figure 3 Number of Employees

2.2. Drivers of Innovation

From table 1, the drivers of innovation according to order of significance are clients' requirement (4.28), developments in ICT (4.24), design trends (4.21), productivity increase (3.90), reduction in cost (3.71), improved efficiency (3.64), environmental sustainability (2.34) and government regulations (2.30). As noted by [5] clients play an important role in driving innovation. They can exert pressure on the design and construction team to adopt innovative designs and construction methods so that they can have value for their money. The respondents ranked clients' requirements as the most significant driver of innovation. ICT facilitates innovation. Hence, developments in ICT can drive innovation. It was the second most significant driver of innovation. Trends in design can also drive innovation particularly when the design trend is innovative. Design trend was the third most significant driver of innovation. The need to increase productivity was identified as the fourth most significant driver of innovation according to the respondents. Reduction in cost was also found to be a driver of innovation but it was the fifth most significant driver. Environmental sustainability was the sixth most important driver of innovation while government regulation was the least significant driver of innovation. This may be because there are no regulations and frameworks that support or encourage innovation in the study area.

Table 1 Drivers of Innovation

Drivers of Innovation	N	Mean
Clients' requirement	89	4.28
Developments in ICT	89	4.24
Design trends	89	4.21
Productivity increase	89	3.90
Reduction in cost	89	3.71
Improved effectiveness	89	3.64
Environmental sustainability	89	2.34
Government regulation	89	2.30

2.3. Barriers to Innovation

The most important barrier to innovation as perceived by the respondents was a lack of understanding of the benefits of innovation. An understanding of the benefits of innovation is a strong motivation for innovation without which striving for innovation will be nothing but

an illusion. Hence, respondents rank lack of understanding of the benefits of innovation (4.39) as the most significant barrier to innovation. Following closely is the perception that the industry is doing well without innovation (4.38). This is not surprising because once there is a lack of understanding of the benefits of innovation then, the potentials of innovation for improving size, market share and profitability cannot be understood. Hence, stakeholders will believe that the industry is doing well without innovation. Cost of innovation (4.36) was listed as the third most significant barrier of innovation. Innovation will require some level of expertise, absence of which might inhibit innovation. The respondents rank poor technical knowhow (4.13) as the fourth most significant barrier to innovation. Innovation thrives under active research activities and funding is a necessity for research. Poor funding of research activities is a barrier to innovation. Poor funding for research and developments was ranked fifth barrier to innovation. A culture that resists change will not support innovation because innovation brings change. A culture that is averse to change (3.96) was ranked sixth barrier to innovation. Adversarial nature of the construction industry was ranked seventh barrier to innovation (3.95). The other barriers were: lack of regulations and frameworks that support innovation (3.80), lack of end user involvement (3.52), temporary nature of construction (3.48) and fragmented nature of construction (3.34).

Table 2 Barriers to Innovation

Barriers to Innovation	N	Mean
Lack of understanding of the benefits of innovation	89	4.39
Perception that the industry is doing well without innovation	89	4.38
Cost of innovation	89	4.36
Poor technical knowhow for innovation	87	4.13
Poor funding for research and developments	88	4.11
A culture that is averse to change	89	3.96
Adversarial nature of construction	88	3.95
Lack of regulations and frameworks that support innovation	89	3.80
Lack of end-user involvement	89	3.52
Temporary nature of construction	89	3.48
Fragmented nature of construction	89	3.34

3. CONCLUSION

The construction industry in Nigeria is a vibrant market comprising of foreign and indigenous players. The industry can increase its size, market share and profitability by adopting innovative designs and construction methods. The drivers and barriers to innovation were assessed in this study. The major drivers of innovation from the study were clients' requirements, developments in ICT and design trends. The main barriers to innovation as perceived by the respondents from the study are lack of understanding of the benefits of innovation, perception that the industry is doing well without innovation and cost of innovation.

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