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# BOOK OF ABSTRACTS

THEME

## CHALLENGES OF THE AFRICAN BUILT ENVIRONMENT: A SEARCH FOR SUSTAINABLE SOLUTION

CHUKWUEMEKA ODUMEGWU OJUKWU UNIVERSITY,
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# EXPLORATORY STUDY ON THE ADOPTION OF VALUE MANAGEMENT FOR SUSTAINABLE CONSTRUCTION PROJECT DEVELOPMENT IN NIGERIA

[1]Ilenikhena, L. O, [2]Adindu, C. C,

Corresponding Author: lilyilenz@gmail.com

[1 and 2] Department of Project Management Technology

Federal University of Technology, Minna, Niger State, Nigeria.

## ABSTRACT

*The quest for maximum value for money in the execution of Nigerian construction projects is pertinent considering dearth of project resources. The adoption of value management (VM) leads to the optimization of construction resources. Value Management practice is predicated on meeting the objectives of time, cost and quality criteria. This study assesses the level of awareness, the level of adoption, as well as the prospects and challenges of Value Management in the Nigerian Construction industry in selected North Central states. The methodology of the study involved descriptive survey research in which structured questionnaires were purposively administered to a study population of construction industry stakeholders in the states of Niger, Nassarawa, Kogi and the Federal Capital Territory. Data obtained was analysed using descriptive and inferential statistical methods, and based on 74% response rate. Findings from the study revealed a low awareness (22%), general low level of VM adoption (25%) in construction project development cycle in Nigeria, especially at the design stage (15%) and post construction stage (3%). The study also revealed increased engagement of project team members (WT – 251, R - 1) as a major prospect of VM and further revealed that lack of adequate inclusion of VM in tertiary education curriculum/lack of strong advocacy by built environment professional bodies (WT – 277, R-1) constitute a major challenge to the adoption of VM in Nigeria. The study recommends increased awareness of VM through government policies, academic curriculum emphasis, and capacity building by professional bodies for sustainable and functional construction development in Nigeria.*

**Keywords** *: Value Management, Construction Industry, Sustainable Development, Nigeria*

## INTRODUCTION

Recent years has been characterised with a rising quest of value for money as a measure for assessing the performance of projects at the various stages of construction development ( Walker & McDonald, 2013; Rangelova, 2014). In developing countries there are trends suggesting the use of value management techniques to reduce the high costs of projects and utilize valuable resources to promote construction development without reducing the desired function while also adding value to the project (Mishra, 2019).

Abidin (2008) suggests that value management techniques, should be adopted throughout the stages of project development cycle to ensure that best value decisions are made without detriment to the project stakeholders and the environment. Luvara (2017) states that value management is a function oriented technique and an effective management tool for attaining improved design, construction and reduced cost wastages in various aspects of construction.

Jaapar (2005) states that many professionals in the construction industry confuse value management with cost reduction exercises. Maznan (2012) states that the confused perception is due to the lack of knowledge on the subject matter and further buttressed that although, value management and cost reduction exercises have some similarities, the methodologies employed, the objectives and goals are different in many ways.

Construction Excellence (2013) stipulates that value management incorporates a series of workshops, interviews and review processes by which project requirements are evaluated against the means of achieving them. In other words, Value management plays a broader role to support effective decision making in construction projects, increase the performance and quality of a project, moderate project objectives while managing expectations of the stakeholders (Wilson, 2005).

According to Ayodeji (2012) the concept and practice of Value management has not been fully adopted in Nigerian construction industry as only very few number of value management workshops have been organised on the subject while many were concluded prematurely. Regardless of these findings Olanrewaju, (2007) observed that Value Management has also been implemented in the Nigerian Construction industry to some extent where about 36%, 30%, 11% and 19% of the research population that are familiar with value management are quantity surveyors, engineers, architects and estate managers respectively.

Ogunsanmi (2014) based on VM findings in Nigeria advocates the needs for a Value Management awareness campaign in the nations construction industry in order to imbibe the adoption of value management practices for future projects. This aligns with the findings by Olawuyi (2009) stating that value management practices in the Nigeria is not rampant amongst professionals in the construction industry.


PROBLEM STATEMENT

The Nigerian construction industry plays an important role in contributing to Nigeria's economic growth and development, and is also responsible for a large portion of total fixed capital investments and a high rate of employment within the sector (Omole, 2000), however economic resources are often wasted in cost and time overruns, substandard work and inferior workmanship, client-contractor-practitioner's discordant relationships and non-performance of projects as envisaged by clients and end users (Olatunje, 2009). Ahmed (2016) also states that the problem of most construction projects usually involves change, which can be related with the system of political governance and economy of Nigeria. The study further iterates the need to adopt and implement value management techniques when managing projects closely related with the concerns of delivering value.

In 2007, the Federal Government of Nigeria proposed that procurement of public assets and services must be through the application of value for money standards and practices in order to

improve project delivery. Unfortunately despite this pronouncement, there exists a plethora of irrelevant and abandoned projects that lacks sufficient value due to the non adoption of value oriented project management techniques in the construction industry. Ogunsanya (2015) states that infrastructure deficit is one of the country's current challenges and underscores the need for government being the biggest construction industry investor to use its limited resources optimally and in a manner that delivers maximum value for money. Value Management (VM) has been proposed as a potential mechanism for delivering functional and sustainable construction projects (Manolaidis, 2012).

In view of the above, this study aims at assessing the current status of the value management awareness, level of implementation, and explores the prospects and challenges of VM in Nigeria's Construction industry. Therefore, the objectives of the study are:

1. To assess the level of value management awareness in Nigeria construction industry.
2. To examine the extent of value management adoption in Nigeria construction project development cycle.
3. To evaluate the prospects and challenges of Value Management adoption in Nigeria construction industry.

Thus, following research questions are pertinent:-

1. What is the level of value management awareness in Nigeria construction industry?
2. To what extent is value management adopted in Nigeria construction development cycle?
3. What are the prospects and challenges of value management in Nigeria construction industry?

## THEORETICAL REVIEW

### The Value Management Concept

The core principle of value management lays emphasis on functional analysis and management as it relates to the project without forfeiting quality at the least possible cost (Fong , 2001).

As stated by Jaapar (2012), The Government of malaysia acknowledged value management as a tool for achieving value for money in projects and made it mandatory for VM to be implemented on all large scale projects exceeding 50 million henceforth, (Maznan, 2012) presented a tabular illustration depicted the impact of implementing value management on 5 case studies in malaysia and its impact on the projects

As cited by Ogunsanmi (2014) Value management concept has been applied to many project endeavours of hardware, building, civil, commercial and military engineering works. Also, it has been used in highways, water and waste treatment, health care and other environmental services whenever value and functional improvements are required.

Gidado (1995) highlights that the Construction Industry in Nigeria is patterned after the United Kingdom Construction Industry, however, without its broadening and advancement to adopt best practices the industry will be poorly represented. Various studies indicate the use of the value management techniques outside the USA, for instance Australia, Indonesia and Korea;

Europe, Australia, Hong Kong and Japan (Fong, 1999); and France, Germany, Japan and Australia (Kelly, 1998).

According to Srinath (2003), there is evidence of VM techniques that have been successfully applied to all types of construction from buildings to offshore oil and gas platforms and for all types of clients from private industry to governmental organizations worldwide. Mansour (2015) highlights the application of VM in a seven storey building of the Institute of Pathology in New Delhi, India which resulted into cost savings of 8% while for a higher secondary school building project in Najafgarh, New Delhi, India, a cost saving of 6.6% was achieved.

## Value Management in the Construction Industry

The construction industry in recent decades have recognized the need to accomplish sustainable related-targets based on evolving concepts (Zuofa, 2017) further states that sustainability practices and initiatives during the life cycles of projects by construction firms have not been fully embraced. Oke (2015) states that when properly implemented, Value Management is a concept that plays a great role in delivering economic sustainability in construction while achieving value for money.

Value Management has become a prerequisite for public sector and commercial projects in hong kong (Fong, 1999) and its construction firms have adopted its application techniques to reduce costs and improve the quality of projects, (Al-saleh, 2010) states that there is potential of applying VM to deliver sustainable projects as well as the significance of sustainability in improving value in construction.

(Sari, 2015) mentioned that almost all of real estate development practitioners in Surabaya confess that they applied value management in their real estate project. But, they also mentioned that research on value management is still limited, especially that discusses about awareness of value management methods and its application in real estate development, and it is proved by buildings in Surabaya that indicated wasteful costs.

## Value Management Awareness in the Nigerian Construction Industry

Value Management has been termed as an excellent tool for projects but its use has waned in recent years due to perceived inadequate support by government agencies and various relevant entities, Luvara (2017) further states that for over 3 decades, value management methodology has had a notable history as an effective savings mechanism and decision making tool for agencies and construction projects. Oke (2015) also states that VM is a very useful tool especially in developed countries in providing value for money for clients and enhance great saving of construction cost.

Nnadi (2018) observes that effective VM application is a useful tool for handling risks and uncertainties that may arise during the course of the project and aids in improving the realisation of recommended risk responses and recommends that value management technique should be adopted as a risk management tool for effective project delivery. Aigbavboa (2016) states that VM is a business strategy tool to determine if the construction of a facility will render the best function at the least possible cost.

Ogunsanmi (2014) opines that the level of awareness of the concept of construction practitioners is slightly higher than the unaware populace but amazingly the methodology has a lesser rate of adoption to practice. This in turn indicates that level of awareness of value mnagement needs to improve which can also be supported by Olawuyi's (2009) finding that value management in Nigeria is not a rampant practice amongst construction practitionals. As one of the well-known techniques applied to assist in decision-makings processes (Abidin, 2007) stated that value management (VM) holds a strategic position which incorporates sustainability into construction projects, a potential that is yet to be fully realised by the practitioners, this despite the advocacies of (Ajator, 2004) for the Nigerian Construction Industry to imbibe a value management culture when delivering public sector projects to ensure cost maximization.

Aghimien (2018) avers that construction professionals evidently have a considerable expanse of knowledge as regards VM practice, however, the level of usage of the practice is still on the average. Oke (2015) states that VM aids in achieving functional projects and it is necessary for practitioners in the Nigerian construction industry to keep themselves well-informed with adequate details of the discipline which will enhance competitive advantage.


**Implementation of Value Management in the Nigerian Construction Industry**

The Nigerian construction industry continues to occupy an important position in the nation's economy, although it contributes less than oil manufacturing and other sectors. The contribution of the construction industry to the national economic growth includes improved project delivery in the industry by means of better project quality, in time and within allocated budget. This would certainly contribute to cost savings for the country as a whole (Aibinu, 2006). Value management has not been fully embraced in the Nigerian construction industry. Few value management workshops have been implemented but not to its fullest extent (Oke, 2015). However, the concept of VM is gaining ground in the construction industry of Nigeria as more professionals adopting the concept (Olanrewaju, 2007). Recent studies by Oke and Ogunsemi (2008) and Olawuyi (2009, 2010) have also revealed that both concepts of value management and value engineering are practiced minimally in the construction industry in Nigeria.

Aghimien (2015) states that VM implementation is aimed towards achieving a more effective design, identification of alternative construction methods and favourable adjustments to the construction timeline as the introduction of several alternatives might lead to a more effective design and considerable time reduction.

Hayatu (2015) suggests that Value management begins from its application at the strategic phase of the project, as it is the stage in which the need for the project is justified and its scope and objectives are well understood by the value team. (Rangelova, 2014) also opined that the most appropriate time to implement VM is in the early development phases on a project and that optimal benefits will be attained when applied on larger and more complex projects.

Ogunsanmi (2014) states that the implementation rate of value management in the construction industry is based on rare occurrence and most of these instances external teams are consulted to implement the methodology for the project life cycle. Aghimien (2015) also observed that value management identifies and removes unnecessary costs associated with the projects,

hence leading to maximum cost saving and identification of possible problems that may occur during implementation in order to experience a salient implementation process in the Nigerian Construction Industry.

Kolo (2010) states that the four core principles need to be established; people, process, issues and environment which could be further discussed as the relevant industry practitioners of value management, construction / institutionalized processes available, issues related to value management arising in the industry as well as the atmosphere of the construction industry generally in the country.

Igwe (2017) posits that the implementation of value management is a technique that can be used to mitigate the barriers involved in successfully implementing buildability assessment in the Nigerian construction industry.

## Prospects and Challenges Value Management in the Nigerian Construction Industry

The most direct benefits to come from the methodology of VM are the improved plans and budgets, this is as a result of the identification, evaluation and justification of all resources needed, rather than a deliberate increase or decrease in the budget (Sieben, 2010)

Nnadi (2018) suggests that value management and risk mangement should be integrated for a seamless implementation as both techniques share certain processes at certain stages of the project life cycle, and further proposes that methods selected for the process should be a conversant method for the participants and practitioners.

Ahmed (2016) posits that VM aids in the simplification of methods and procedures resulting in minimal recurrent cost and efficiency in processes, better communication and understanding of the projects objectives, creation of opportunities for clients to formally participate in the processes and improved communication between parties. Aghimien (2018) states that some of the benefits of the adoption of VM are; ability to identify possible complications early, eliminating unnecessary designs, reduce waste, and ensuring that the project is delivered in the most cost-effective way.

Olawunmi (2016) iterates that VM enables the process of cost reduction and achieveing value for money, Timely identification of uncertainties, challenging assumptions and developing innovative design solutions, enhanced value or benefits for end users, assessment of future probability, reduction of abandoned project, competitive edge for contractors/practitioners.

According to Oke and Ogunsemi (2011), the following are the perceived benefits of value management if fully incorporated into construction projects in Nigeria: Encourage use of local materials in construction, adoption of new construction techniques/innovation, Cost effectiveness, Aids conflict management, Improves quality of work, It gives the true worth or value of money to client, It enhances competitive edge for the contractor, It enhances quality performance of construction projects, Eliminates unnecessary design, Improves functional space quality of projects, Enhance economic investment, aid decision making, It will promote team work, Increase performance of the industry, Technological advancement, Effective project delivery services, reduced project abandonment.

Challenges facing the construction industry include the fact that construction projects are not completed on time, within budget and to the required quality and therefore clients of the construction industry are not satisfied with the services provided by the industry (Olatunji, 2006)

Based on study findings, Aduze (2014) states that the lack of government legislation and policy, client's negative reception, and lack of knowledge about VM are some of the factors impeding the application of VM in Nigeria. Oke (2015) also states that despite the existence of value management for decades in the construction industry, a major challenge to the adoption and application of the technique is the lack of proper understanding by concerned professionals. Liu (2005) mentions the following existing challenges based on survey findings: Lack of National Value Management Standards, Insufficient time for implementation, inadequate knowledge, lack of qualified practitioners, Defensive attitude of other professional teams, Extended project completion duration and interruption to normal work schedule. Olawuyi (2009) avers that a key limitation to the implementation of value management can be attributed to the low awareness of the utilization of the relevant techniques amongst practitioners in the construction industry.

According to (Abidin, 2007; Fan, 2007; Noor, 2015) as cited by (Olawunmi, 2016) factors that impend the application of value management are broadly classified in to practical barriers and behavioural barriers which include; lack of awareness about VM, Misperception about the integration of sustainabilityand VM, Passive behaviour among VM Practitioners, passive behaviour among VM practitioners, Lack of Training and Education in VM, The high cost of VM study, Procurement issues and regulatory issues.

Ogunsanya (2015) study revealed that the following factors have impacted negatively on the adoption of value management in the Nigerian Construction: unstable economy, government policies, professional incompetence and poor management. Studies further reveal that factors influencing the implementation of value management in Nigerian construction industry include inadequate training and education, the lack of receptiveness to new ideas and lack of proper regulatory framework (Olawunmi, 2016).


**METHODOLOGY**

The study's research design methodology involved descriptive survey, while the analysis utilised a combination of descriptive and inferential statistical methods. The questionnaire solicited responses on the level of awareness of value management, the extent of value management adoption as well as the prospects and challenges of value management in construction projects. The study population comprised of major construction industry stakeholders including construction companies, construction consultancy firms, construction client organizations, building materials manufacturing firms, and construction labour organisations located in selected states of the Nigeria's North Central geopolitical zone, namely- Niger, Nassarawa, Kogi and the Federal Capital Territory. A total of 80 questionnaires were purposively and evenly distributed, out of which 59 were returned, representing 74% success rate. The response was considered adequate for a zonal study of this nature. Thus, a total of 59 valid responses formed the basis for data presentation, analysis, conclusion and recommendation for the study.

# RESULTS/FINDINGS

Objective 1: To assess the level of value management awareness in Nigeria construction industry
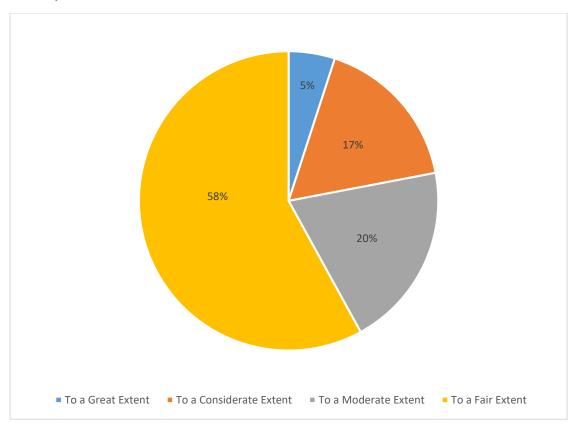


Figure 1:  Extent of Value Management Awareness in Nigeria Construction industry

(Source: Authors' Field Survey, 2019)

**Discussion of Findings:** The study shows that 3 out of 59 respondents representing 5% are greatly aware of value management concept, 10 respondents representing 17% were considerably aware, 12 respondents representing 20% are aware to a moderate extent and 34 respondents representing 58% are aware to a fair extent. The above findings indicates that the stakeholders of the construction industry needs to considerably step up the awareness level of value management technique as only 22% of the respondents are considerably aware and this is well below average awareness level of 50%.

Objective 2: To examine the extent of value management adoption in construction project development cycle in Nigeria
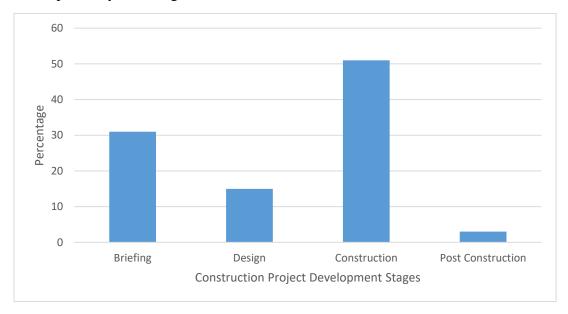


Figure 2: Response on Extent of Value Management Adoption in construction project development cycle. (Source: Authors field survey, 2019)

**Discussion of Findings**: The findings shows that 31% of respondents adopt value management at project briefing stage, 15% at project design stage, 51% at project construction stage and 3% at post construction stage. The results indicates that there is general low level value management adoption in construction project development cycle in Nigeria, especially at the design and post construction stages.

Objective 3: To evaluate the prospects and challenges of Value Management in Nigeria construction industry

Table 1: Weighted Total and Ranking of prospects of implementing Value Management in Nigeria Construction industry

| Identified Prospects of Value Management adoption in Nigeria Construction Industry | Level of Agreement | | | | | Weighted Total | Ranking Position |
|---|---|---|---|---|---|---|---|
| | 1 Strongly Disagree | 2 Disagree | 3 Undecided | 4 Agree | 5 Strongly Agree | | |
| Improved functional requirements | 0 | 0 | 6 | 37 | 16 | 246 | 3rd |
| Improved value and quality of project | 0 | 0 | 9 | 30 | 20 | 247 | 2nd |

| | 1 | 2 | 3 | 4 | 5 | Weighted Total | Ranking |
|---|---|---|---|---|---|---|---|
| Increased engagement of project team | 0 | 0 | 12 | 20 | 27 | 251 | 1st |
| Development of a multi-disciplinary approach | 0 | 0 | 7 | 37 | 15 | 244 | 4th |
| Reduction in irrelevant cost | 0 | 0 | 14 | 32 | 13 | 235 | 6th |
| Improved stakeholder satisfaction | 0 | 0 | 8 | 33 | 18 | 246 | 3rd |
| Timely identification of risk/uncertainties | 0 | 0 | 9 | 40 | 10 | 237 | 5th |
| Promote Creativity /innovation amongst project team | 0 | 0 | 6 | 39 | 14 | 244 | 4th |

**Discussion of Findings:** The study identified the above stated 8 no. factors as major prospects to be achieved upon the implementation of value management in Nigeria construction industry. For each factor, five (5) metrics namely:- 1 Strongly Disagree, 2 Disagree, 3 Undecided, 4 Agree, and 5 Strongly Agree , were used to assess the strength of respondents agreement on the rate to which the prospective factors contribute to the enquiry required. For factor 1 – Improved functional requirement, 6 out of 59 respondents were undecided, 37 respondents agreed while 16 respondents strongly agreed giving a weighted total of 246 and ranked 3rd (WT-246, R-3). Factor 2 – Improved value and quality of Project had a weighted total of 247 and ranked 2nd (WT- 247, R- 2). The weighted total and rank for other factors are:- Factor 3 – Increased engagement of project team (WT- 251, R – 1), Factor 4 - Development of a multi-disciplinary approach (WT -244, R- 4), Factor 5 - Reduction in irrelevant cost (WT – 235, R- 6), Factor 6 - Improved stakeholder satisfaction (WT – 246, R – 3), Factor 7 - Timely identification of risk/uncertainties (WT – 237, R – 5) and Factor 8 - Promote Creativity /innovation amongst project team (WT – 244, R – 4).

Table 2: Weighted Total and Ranking of Challenges that hinder the implementation of Value Management in Nigeria Construction industry

| Identified Challenges of Value Management adoption in Nigeria Construction Industry | Level of Agreement | | | | | Weighted Total | Ranking Position |
|---|---|---|---|---|---|---|---|
| | 1 Strongly Disagree | 2 Disagree | 3 Undecided | 4 Agree | 5 Strongly Agree | | |
| Lack of awareness or knowledge of value management | 2 | 4 | 9 | 31 | 13 | 226 | 6th |
| Organizational resistance to change | 2 | 3 | 5 | 34 | 15 | 234 | 3rd |
| Lack of qualified value management practitioners | 5 | 5 | 5 | 29 | 14 | 211 | 9th |
| Time Consuming and delay factors | 4 | 3 | 11 | 26 | 15 | 222 | 7th |
| Fear of incurring additional cost due to value management study | 7 | 4 | 9 | 30 | 9 | 207 | 10th |
| Inadequate training and management support | 4 | 0 | 4 | 43 | 8 | 228 | 5th |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Lack of commitment to implement value management | 2 | 3 | 9 | 39 | 6 | 217 | 8th |
| Inadequacy of VM emphasis in tertiary education curriculum coupled with relatively weak advocacy by professional bodies and institutions | 2 | 2 | 4 | 45 | 6 | 277 | 1st |
| Stakeholders resistance to its introduction and implementation | 2 | 0 | 12 | 26 | 19 | 237 | 2nd |
| Lack of collaboration and poor working relationships amongst project team | 1 | 4 | 8 | 33 | 13 | 230 | 4th |

**Discussion of Findings:** The study also identified the above stated 10 no. factors as major challenges experienced as a result of the implementation of value management in Nigeria construction industry. For each factor, five (5) metrics namely:-  1 Strongly Disagree, 2 Disagree, 3 Undecided, 4 Agree, and 5 Strongly Agree , were used to assess the strength of respondents agreement on the rate to which the challenging factors contribute to the enquiry required. For Factor 1 - Lack of awareness or knowledge of value management, 2 out of 59 respondents strongly disagreed, 4 disagreed, 9 were undecided, 31 agreed while 13 strongly agreed giving a weighted total of 226 and ranked 6th (WT – 226, R- 6). Factor 2 - Organizational resistance to change had a weighted total of 234 and ranked 3rd (WT- 234, R – 3). The weighted total and rank for other factors are :- Factor 3 - Lack of qualified value management practitioners (WT- 211, R- 9), Factor 4 - Time Consuming and delay factors (WT- 222, R- 7), Factor 5 - Fear of incurring additional cost due to value management study (WT – 207, R – 10), Factor 6 - Inadequate training and management support (WT – 228, R – 5), Factor 7 - Lack of commitment to implement value management (WT – 217, R -8), Factor 8 - Inadequacy of VM emphasis in tertiary education curriculum coupled with relatively weak advocacy by professional bodies and institutions (WT – 277, R- 1) Factor 9 - Stakeholders resistance to its introduction and implementation (WT – 237, R – 2) and  Factor 10 - Lack of collaboration and poor working relationships amongst project team (WT – 230, R- 4).

**CONCLUSION**

The construction industry is a major economic sector of most countries of the world. It contributes largely to a nation's gross domestic product through the provision of various sustainable and functional infrastructures that constitutes vital assets for the activity of other industrial sectors. The need for value management adoption for the optimisation of resource inputs at all stages of project development cycle to ensure value for money has become imperative.

Value Management is a concept that is still not completely understood by construction stakeholders in Nigeria and as such, would take considerable effort in terms of cost and time for its improved awareness and successful adoption in the construction industry. Also, for Value Management to succeed in Nigeria, it will have to be introduced to other sectors that

have a direct link to the industry such as the construction materials manufacturing industry and construction labour organizations alike.

The study revealed that the adoption of value management in Nigeria construction industry can be improved by increasing the present low level of stakeholders awareness on its benefits.

The prospects of VM includes increased engagement of project team members on its potentials for construction resource optimisation and waste minimisation in the industry. The challenges to Value Management adoption on construction projects include inadequacy of VM emphasis in tertiary education curriculum coupled with a relatively weak advocacy by professional bodies and institutions in Nigeria.

## RECOMMENDATIONS

Arising from the findings of this study, the following are therefore recommended;

1. Professional bodies and institutions in the construction industry should promote the awareness of value management
2. Construction industry stakeholders should promote the concept of value for money at all stages of a project development cycle.
3. The Nigerian government and its agencies should make the implementation of value management techniques a policy for all public sector construction projects to facilitate optimization of scarce resources for sustainable development.

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