

Exploratory Study on the Adoption of Value Management for Construction Development Projects in North Central Nigeria

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Abstract

The dearth of input resources in construction development has necessitated the adoption of value management (VM) techniques for the optimization of available construction resources. This exploratory study assesses the level of awareness, level of adoption, and the prospects and challenges of Value Management in selected states of North Central Nigeria. The study involved descriptive survey research methodology in which structured questionnaires were purposively administered to a study population of 80 construction industry stakeholders in the nation's states of Niger, Nassarawa, Kogi, and the Federal Capital Territory. 59 valid questionnaires were retrieved representing 74% response rate. Mixed technique involving descriptive and inferential statistics were employed in data analysis. Study's findings revealed a general low awareness and low adoption of VM techniques in Nigeria construction projects. Considering prospects, the study recommends increased awareness of VM through government policies, academic curriculum emphasis, and capacity building by professional bodies.

Keywords

Construction Development, Projects, Nigeria, Value Management

Introduction

The concept of Value management (VM) emerged during the Second World War as a result of deficiencies arising from use of crude materials and manpower. General Electric (GE) company, then directed some members of staff, namely- Lawrence Miles, Henry Erlicher, and Jerry Leftow, to seek for alternative materials and human resources without compromise on performance - cost, quality and utility (Vitalis, Agbaeze, Joseph, & Solomon, 2019). The problem of balancing functionality with cost constituted the greatest challenge to Miles and his colleagues, as the primary objective of their employer -General motors (GE) was to ensure high quality and functionality at least cost, owing to input material scarcity, that period in history (Kassa, 2018). Value management concept according to Kissi, Boateng, & Badu (2016), seeks to explain the interdependence and

nexus between functionality and cost. The prospects of efficiency and value propelled several organisations to explore the use of VM in their routine operations and processes. The perception was that VM adoption in organisations led to better solution to customer needs while also meeting predetermined organisational goals and success factors (Bruno, Fadhlin, Zuhaili, & Wallace, 2018).

According to Walker & McDonald, 2013; Rangelova, 2014, 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. 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). 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 Luvara (2017). According to Maznan (2012), the confused perception of value management 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.

According to Ayodeji (2012), the practice of value management has not been fully adopted in Nigerian construction industry as only very few numbers of value management workshops have been organised on the subject while many were concluded prematurely. This assertion is collaborated by the earlier study of Olanrewaju (2007), which observed that VM has also been implemented in Nigeria's construction industry to an extent. Olanrewaju (2007) empirical study showed that the awareness level among a study population of some construction industry personnel were quantity surveyors (36%), engineers (30%), architects (11%), and estate managers (19%) respectively.

Ogunsanmi (2014) based on VM findings in Nigeria advocates the needs for a VM awareness campaign in the nation's construction industry in order to imbibe the practice for future projects. On the part of the project organisation, VM confers enormous benefits including clarity of business decisions, understanding of end-user needs, better understanding of goals by team members, improved internal communication and networking among project team members, increased understanding of organisational success factors (The Institute of Value Management, 2008). Thus, organisations that apply VM stand to gain from its enormous value-driven potentialities. In particular, VM adoptions enhanced staff motivation, promotion of skills and innovation, ensured collectivity of ideas and synergy (Ndu, Agbaeze, Arisi-Nwugballa, & Okwo, 2019). A delphi study conducted by Ojo & Ogunsemi (2019) assessed the critical drivers of value management in Nigeria's construction industry. The study revealed the following as the major drivers of VM- adequate understanding of the benefits of VM, higher/postgraduate studies on VM techniques, and possession of previous experience about VM.

Problem Statement / Justification of Study

The Federal Government of Nigeria in 2007 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). Ahmed (2016) study states that the problem of most construction projects usually involves change, which can be related to the seeming conservative system of political governance and economy of Nigeria. Many countries across the globe have embraced VM as critical competency to ensure value for money in their capital development projects including product manufacturing. Oke (2015) declared that VM is a very useful tool especially in developing countries like Nigeria in providing value for money for clients and in the enhancement of savings in construction cost. Many concluded studies on the adoption of Value Management abound at national level. Nigeria is a nation made-up of six (6) geo-political zones, comprising viz: North East, North Central, North West, South East, South South, and South West. This study is unique in the sense that it concentrated its energy on a single geopolitical zone, the North-Central, which is home for the centre of governance- The Federal capital territory (FCT). Hence, it was crucial to conduct a study on the level of awareness, prospects and challenges of value management technique in this major geo-political zone. The result from studies in this zone will serve as a reference point for policy enactments on VM at regional level. Also, this study considering its novelty and specific attributes may spur further research, and replication of study in other five geopolitical zones. An aggregation of the respective regional study outcomes may generate informed decisions at national scale. This study is therefore very unique and original since it is perhaps, a pioneer research on VM adoption in the construction industry at regional level. Hence, a justification for the study.

Aim of Study

In view of the above, this study aims at assessing the status of the value management awareness, level of implementation at project development stages, and the prospects and challenges of VM in Nigeria's Construction industry.

Objectives of Study

1. To assess the level of value management awareness in construction projects in North-Central Nigeria
2. To examine the extent of value management application in construction project development cycle in North-Central Nigeria
3. To evaluate the prospects and challenges of value management adoption in construction projects in North-Central Nigeria

Literature Review

Value Management - A review of Concept and Global Application 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). Oke (2015), states that Value management plays a great role in delivering economic sustainability in construction by achieving value for money when properly implemented. Viewed from a service perspective, Rangelova & Traykova (2014) describes VM as a mechanism that compares and evaluates the decisions made by clients and customers at the different developmental stages of a project. Rangelova & Traykova (2014) further stated that VM emphasizes better quality, positive business image, and value driven profitability. The core principles of value management emphasize the functional and operational performance of projects, without loss of quality at the least possible cost.

Karim, Rahmin, Adawiyah, Danuri, & Mohammed (2014) asserts that VM is gaining tremendous ground the globe as a best practice tool for project cost reduction without forfeiture of quality and performance.

According to Ogunsanmi (2014), value management concept has been applied to many project endeavours including but not limited to hardware, building, civil, commercial and military engineering works, highways, water and waste treatment, health care, and other environmental services, whenever value and functional improvements are required.

VM competency has thus, become a prerequisite for public and commercial projects in many parts of the globe. For example, construction firms operating in Hong Kong have applied VM techniques to reduce costs and improve the quality of projects (Fong, 1999). Various studies also indicate the use of the value management techniques outside the USA where it originated (Ndu, et.al,2019), for instance Australia, Indonesia, Korea, Europe, Australia, Hong Kong and Japan (Fong, 1999), France, Germany, Japan and Australia (Kelly, 2001).

According to Srinath (2003), there is evidence of successful application of VM techniques to all types of

construction, from buildings to offshore oil and gas platforms, and for various 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, New Delhi, India which resulted into cost savings of 8%; and a cost savings of 6.6% for a higher secondary school building project in Najafgarh, New Delhi, India. The US Department for Transport (DfT) made VM adoption compulsory for projects costing USD100,000 or more. VM is also mandatory for US government projects ranging from 2 million USD (Kaur, 2012). Also, the South Korea Ministry of Land, Transport and Maritime Affairs directs the application of VM technique on projects costing KRW 10 billion or more (Kim, Lim, Kim, & Cheon (2010). Additionally, Karim, et.al. ((2014) study revealed a directive from the Japanese government to its project-based parastatals to adopt VM technique on projects with cost, ranging from JPY 175 million, similar to that issued by the Government of Australia on projects ranging from 5 million AUD.

In spite of the apparent infancy of VM in Malaysia, the Economic Planning Unit (EPU), through Circular 3/2009 authorised all public projects exceeding RM50 million to undertake a mandatory VM study in order to achieve cost optimisation (Jaapar, Maznan, & Zawawi (2012).

Sari (2015) stated that almost all of real estate development practitioners in Surabaya (a city in Malaysia) confess that they applied value management in their real estate projects. There is also an increased adoption of VM technique in India and South Korea through aggressive sensitization programmes in the print and electronic media complimented with focused group talk shows, seminars, workshops (Vitalis, et.al, 2019).

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). The scholar further stated that for over three decades, value management methodology has had a notable history as an effective savings mechanism and decision-making tool for agencies and construction projects.

Nnadi (2018), asserts that VM is useful in handling construction risks and uncertainties that may arise during in the course of a project, whereas, Aigbayboa (2016), declares VM as a business strategy tool to determine if the construction of a facility will render the best function at the least possible cost.

Charles, Nasiri, & Hammad (2017); Aghimien, Oke, & Aigbavboa (2018), variously aver that although VM competency has gained so much grounds in the fields of architecture, building technology, quantity surveying, construction management, project management, and in engineering construction disciplines; its major emphasis is the striking of required balance between function and cost without compromise on quality and safety. Charles, et.al (2017) and Aghimien, et.al (2018) added that VM underlying principles can be extended to other sectors like manufacturing and industrial processing. Oke, Aghimien, & Olatunji (2015), Verhoef, Doorn, & Dorotic (2015) remarked that the perceived delineation of VM to project disciplines is unfortunate and not deliberate. Ogunsanmi (2014), opines that the level of awareness of VM concept by construction practitioners is slightly higher than the unaware, but observed that the adoption is less, in practice.

Vitalis, et.al. (2019) declared that a typical Nigerian organisation lack the culture of value management for competitive advantage. According to Vitalis, et.al. (2019) the non-existence of significant worth administration unit in most organisations is indicative of the leadership inability to acknowledge the aggressive nature of present day businesses in the face of current day realities. Olawuyi (2009) study, also revealed that the practice of VM is not rampant amongst construction practitioners in Nigeria. Ajator (2004) advocates that the Nigerian construction industry should imbibe a value management culture when delivering public sector projects to ensure cost optimization.

In a bid to ensure that the practice of value management was standardised, a guideline for implementation was published for construction industry stakeholders (Jaapar, 2012). Value analysis and assessment constitute to ensure projects deliver expected value. Ogunsemi (2015) states that value management is in most cases practiced in the form of an in-depth workshop usually conducted by an independent experienced team acting as clients' consultants.

The aforementioned studies amply corroborate the assertion that 'performance of construction projects is improved and optimized' by the process of value management. Aigbavboa (2016) advise that construction practitioners orientate themselves with VM practices and strive for its full adoption and implementation in construction projects to achieve best value; while Luvara (2017) opines that efforts should be made to create awareness of VM in the construction industry through the introduction of value clauses in the Conditions of Contract, to support value management.

Value Management Adoption in the Nigerian Construction Industry

Till date, the use of value management in Nigeria has been limited (Ndu, et.al, 2019). The Nigerian construction industry occupies a leading position considering its socio-economic importance in employment generation, contribution to the nations' gross domestic product (GDP), as well constituting a fulcrum to the take-off of other sectors of national economy. Value management has not been fully embraced in the Nigerian construction industry, and just a few value managements workshops have been implemented (Oke, 2015). Aghimien (2018) argues that construction professionals have a considerable expanse of knowledge as regards VM practice, however, the level of usage of the practice is on the average. Oke (2015) states that VM aids in achieving functional projects and urges Nigerian construction industry practitioners to be well-informed with the discipline to enhance competitive advantage.

Studies by Oke and Ogunsemi (2011) revealed that concepts of value management and value engineering are practiced minimally in the construction industry in Nigeria.

Aghimien (2015) states that VM implementation aims towards achieving a more effective design, identification of alternative construction methods, and favourable adjustments to the construction timeline.

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) 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 in most of these instances external teams are consulted to implement the methodology for the project life cycle. Aghimien (2015) observed that value management identifies and removes unnecessary costs associated with projects, hence leading to maximum cost saving.

Saifulnizam (2011) notes that the involvement of contractors and application of VM at early stages of a project provides greater opportunity to enhance project delivery through knowledge sharing between the contractor and the value management team at critical junctures.

Ashworth (2000) states that the application of value management during concept development and the initial design stages helps to minimize time with the ability to significantly influence project deliverables,

however, findings by Coetzee (2009) reveals that certain practitioners tend to mislead clients by declaring that the project will be value managed upon initiation without having the technical know-how to apply the methodology.

Wandahl (2003) viewed value management as a concept that promotes effectiveness and efficiency which are key indicators of innovation and development, while, Ashworth (2005) asserts that in order to gain the maximum benefits from VM, it is important that at least half of the participants be drawn from outside the immediate project management team as it helps to ensure that decisions made by the project team are appropriately reviewed, and divergent ideas stimulated.

Prospects and Challenges of Value Management in the Nigerian Construction Industry

Al-saleh (2010), states that there is potential for applying VM to deliver sustainable value-driven construction. The most direct benefits derivable from VM are improved plans and budgets 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).

Ahmed (2016) states that implementation of VM brings about the simplification of methods and procedures, thus resulting in minimal recurrent cost and efficiency in processes, better communication and understanding of the projects objectives, and creation of opportunities for clients to formally participate in the processes. Aghimien (2018) declared 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. Olanrewaju (2013) identified further benefits of VM adoption as reduction of project failure, lower cost, shorter completion time, improved quality, functionality, better performance, enhanced safety and product reliability.

Olawunmi (2016) reiterates that VM enables the process of cost reduction and achieving 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 incorporating value management into Nigeria construction projects: encourages use of local materials in construction, adoption of new construction techniques/innovation, cost effectiveness, aids conflict management, improves

work quality, and gives the true worth or value of money to the clients.

Challenges facing the construction industry include non-completion within time, budget, and to the required quality; hence, clients of the construction industry are oftentimes dissatisfied with quality of services provided (Olatunji, 2006).

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) study outlined the following challenges of VM adoption: 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, factors that impend the application of value management are broadly classified into practical barriers and behavioural barriers, namely; lack of awareness about VM, misperception about the integration of sustainability and VM, passive behaviour among VM practitioners, lack of training and education in VM, high cost of VM study, procurement and regulatory issues.

Al-yami (2010) states that barriers to implementing value management include; lack of information, leadership, time, awareness and client commitment. Kim (2016) notes four components of VM challenge, namely; lack of qualified personnel to implement VM, inherent difficulties in VM workshops, lack of awareness of VM, and lack of VM application documents.

Olawunmi (2016) outlined that factors influencing the implementation of value management in Nigerian construction industry as; inadequate training and education, the lack of receptiveness to new ideas, and lack of proper regulatory framework.

Ogunsanya (2015) study also revealed that the following factors have impacted negatively on the adoption of value management in the Nigeria construction industry: unstable economy, government policies, professional incompetence, and poor management.

Methodology

The study is a descriptive survey research with structured questionnaire as the research instrument. The population frame comprised four major construction industry stakeholders including construction companies, construction consultancy firms, construction client organizations, and construction finance companies, located in four selected states of Nigeria's North Central geopolitical zone, namely- Niger, Nasarawa, Kogi and the Federal Capital Territory. The organisations involved in this study represent a cross section of small to medium organisations with ownership structure ranging from private to public corporations, with a retained workforce ranging from 8 - 35 on permanent employ. The organisations are involved in private and public sector projects in the areas of mass housing provisioning, industrial buildings, office complexes, recreation centres, roads, bridges and highway engineering, etc. 60 % of the organisations undertake projects limited to the North-Central geo-political zone, while 42% of the firms have operations extending beyond the geo-zone. . The states were purposively selected from the seven states that make up the north -central geopolitical zone. The questionnaire solicited responses from a study population of 80 Nos construction industry personnel judgementally selected from 5 No professional groups comprising -architects, quantity surveyors, engineers, builders, and estate managers. The possession of professional registration in a chosen specialization was a stated prerequisite for selection in the study. Each of the four states studied, received 20 Nos questionnaires, which was subsequently distributed to the 5 No professional groups in the employ of the four construction stakeholder organisations. The essence of the registration requirement was to ensure that only professionally qualified construction personnel gave informed opinions on responses sought, to avoid frivolous submissions considering the high premium placed on this research. A total number of 67 questionnaires were retrieved from the 80 respondents, out of which 59 were successfully completed, with 8 No questionnaires discarded on grounds of confusing, multiple, inconsistent, and mutilated entries, hence, an 74% success rate. The return rate was deemed adequate and consistent levels prescribed by Bowen, Cattell, Edwards, & Jay (2010), Perera, Hayles & Kerlin (2011), while Moser & Kalton (1971), stated that response rates lower than 30-40% are subject to bias and of little value. Thus, the study's return rate was considered adequate and representative of the sample population, and could reasonably form basis for data presentation and analysis, conclusion and recommendation for policy. The questionnaire

comprised two major divisions, namely- respondents bio-data, and enquires related to study objectives. The later solicited responses on the level of awareness of value management in the construction industry, the extent of value management adoption at different stages of a project development cycle, as well as the prospects and challenges of value management in construction projects. Themes used in this study were developed from robust literature review of related studies, and extracted from test results of pilot studies conducted on a focused group. The study metrics employed the Likert 5-point scale which solicited responses on the extent of agreement to identified variable factors under measure, from 'low' to 'high' viz- For objective No.1: to a no extent, to a fair extent , to a moderate extent, to a considerable extent , to a great extent. For objective Nos 2 and 3, the response scale was: strongly disagree, disagree, undecided, agree, strongly agree. Both descriptive and inferential statistics were used in the study analysis with the aid of statistical package for social sciences (SPSS), version 10.0. Cronbach Alpha Test (CAT) was also conducted on the study to ascertain research instruments reliability. Also, Shapiro-Wilk normality test (SWT) was conducted in order to determine the normality of the data gathered. CAT yielded 0. 921. This coefficient was adjudged high and eminently attests to the reliability and consistency of the survey instruments. Also, SWT conducted on the 59 valid samples (in this case, less than 2000), yielded 0.0015, thus, satisfied Ghasemi & Zahediasi (2012) requirements for sample size normality. Observably, this study's methodology followed procedures established by earlier studies of Olanrewaju (2007), Ghasemi & Zahediasi (2012), Olanrewaju & Anahve (2015), Aghimien, Aigbavboa, Ncobo & Thwala (2019). Analysis for this study also followed the pattern established by Olanrewaju & Anahve (2015) study, employing Average Relative Index (ARI).

Thus,

$$ARI = \frac{\sum_{i=0}^5 a_i x_i}{5 \sum_{i=0}^5 x_i} \quad (0 \leq ARI \leq 1)$$

Defined, thus:

a_i =the index of a group; a constant expressing the weight given to the group;

x_i = frequency of response; $i = 1, 2, 3, 4, 5, x_1, x_2, x_3, x_4, x_5$, corresponding to $a_1=1, a_2=2, a_3=3, a_4=4, a_5=5$ (a constant expressing the weight given to the group) respectively.

0 (zero) = lowest possible score, whereas,

1 (one) = highest possible score.

This study lasted six (6) months from the point of questionnaire issuance by mid-April, 2019 to response retrieval by early October, 2019. Access to online survey was severely impeded by the poor network and internet connectivity constraints for construction personnel working in remote locations across the

selected states of Niger, Nasarawa, Kogi and the Federal Capital Territory, in the North-central geopolitical zone. This was a major limitation to the study as the researchers had to physically distribute and retrieve questionnaire from remote and geographically dispersed locations with attendant logistic challenges.

Table 1. Demographic features of the respondents (Construction Professionals) (Source: Authors' Field Survey, 2019)

		Frequency	Percentage
Gender	Male	44	74.58
	Female	15	25.42
	Total	59	100.00
Experience	0-4	8	13.56
	5 - 9	13	22.03
	10 – 14	16	27.11
	15 – 19	10	16.95
	Above 40	12	20.35
	Total	59	100.00
	Level of Education		
	HND/ First degree	34	57.63
	Master's degree	10	16.95
	PhD degree	4	6.77
	Others	11	18.65
	Total	59	100.00
Disipline	Engineer	16	27.12
	Quantity Surveyor	10	16.95
	Architect	12	20.34
	Builders	14	23.72
	Estate Managers	7	11.87
	Total	59	100.00

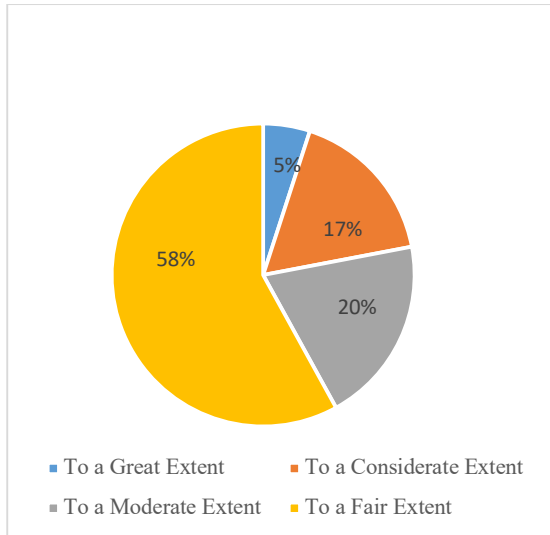


Figure 1. Extent of Value Management Awareness in Nigeria Construction industry (Source: Authors' Field Survey, 2019).

Results and Findings

Objective 1

To assess the level of value management awareness in construction projects in North-Central Nigeria.

Discussion of Findings

Figure 1 of the study's results 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. In sum, the results of the study show a

relatively low-level awareness rate of VM in Nigeria going by the results of this study corroborate the earlier findings of Luvara (2017), who opined that efforts should be made to create awareness of VM in the industry. Liu (2005) study also avers that inadequate knowledge constituted challenge to VM adoption. Studies by Olawuyi (2009) further corroborates, having stated that a key limitation to the implementation of value management is attributed to the low awareness of the utilization of the relevant techniques amongst practitioners in the construction industry. Also, various studies by Abidin, 2007; Fan, 2007; Furthermore, Noor, 2015 noted lack of knowledge as a major factor militating the application of value management in the construction industry. Al-yami, 2010 study and research conducted by Kim (2016) also revealed lack of awareness of VM as a major factor constraining its adoption in construction projects. The study's finding and those of other scholars variously indicate that construction industry stakeholders urgently need to up-scale the current low awareness level of VM technique as only 22% of the respondents are considerably aware and this is well below the minimum permissible awareness level of 50%. The poor awareness rate in the current study clearly underpins the fact that not much have been achieved overtime in addressing this problem, and as such, a fundamental challenge to construction industry stakeholders.

Objective 2

To examine the extent of value management application in construction project development cycle in North-Central Nigeria.

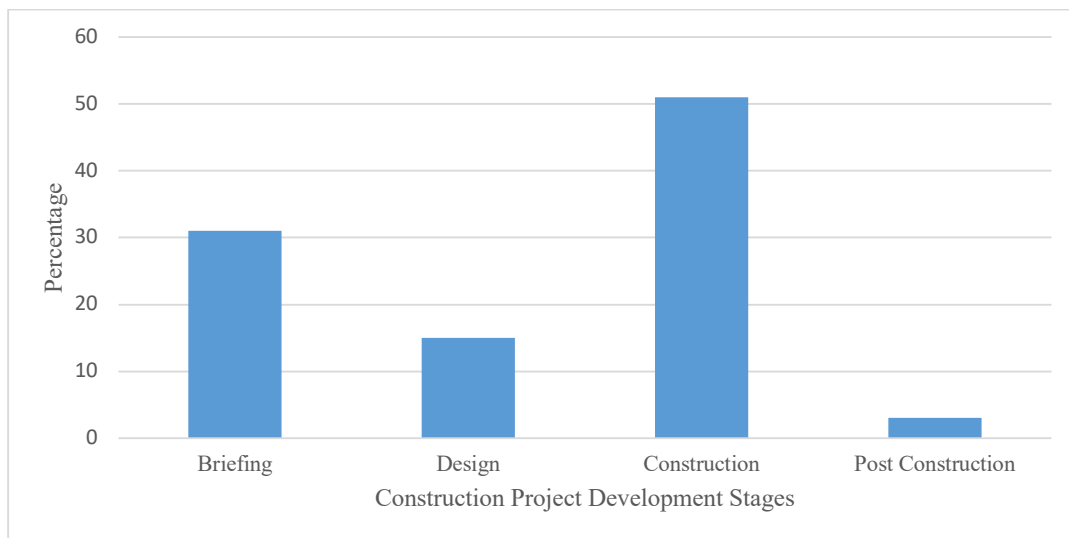


Figure 2. Response on extent of Value Management application in construction project development cycle in North-central Nigeria (Source: Authors field survey, 2019).

Findings of figure 2 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 of the study indicate a general low-level adoption of value management at the various stages of construction project development cycle in Nigeria, especially at the design and post construction stages. Ashworth (2000) stated that the application of value management during concept development and the initial design stages, will improve value, minimize time and effort, with the overall ability to significantly influence project deliverables. Liu (2005) study apparently explains the relatively low adoption of VM at project initiation stages covering the project briefing and design stages, which in the current study recorded 31% and 15% respectively. Going by Lius' proposition, the poor adoption of VM recorded at all stages of construction development cycle, could apparently be explained by the poor interest shown by

clients on its adoption for the execution of their projects. The study's results also align with Ogunsanmi (2014) study which stated that 'although the level of awareness of the concept of construction practitioners is slightly higher than the unaware populace, the methodology has a lesser rate of adoption to practice'. If this declaration is anything to go by, the apparently low adoption statistics of VM as recorded across all stages of the construction development is somewhat expected. The results of the study further aligns with the poor level of awareness of VM earlier shown and variously corroborated by previous scholars. Hence, the need to vigorously improve awareness for improved adoption of the technique in the nation's construction industry.

Objective 3

To evaluate the prospects and challenges of value management adoption in construction projects in North-Central Nigeria.

Table 2. Prospects of implementing Value Management in construction projects in North -Central Nigeria (Source: Authors field survey, 2019)

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	3 rd
Improved value and quality of project	0	0	9	30	20	247	2 nd
Increased engagement of project team	0	0	12	20	27	251	1 st
Development of a multi-disciplinary approach	0	0	7	37	15	244	4 th
Reduction in irrelevant cost	0	0	14	32	13	235	6 th
Improved stakeholder satisfaction	0	0	8	33	18	246	3 rd
Timely identification of risk/uncertainties	0	0	9	40	10	237	5 th
Promote Creativity /innovation amongst project team	0	0	6	39	14	244	4 th

Table 2 above identified 8 no major prospects of VM implementation in construction projects in North-Central Nigeria. Each of the five (5) metrics namely: Strongly Disagree, Disagree, Undecided, Agree, and Strongly Agree, were used to assess the strength of respondents on the extent to which the identified variable factors constitute prospects for VM implementation in the geo-political zone. The results show that of the 8 no identified major prospects studied, increased engagement of project team (WT-251), and improved value and quality of project (WT-247) ranked 1st and 2nd respectively. The study also

revealed that improved functional requirement and improved stakeholder satisfaction had a tie, each with a weighted total (WT) of 246 and ranked 3rd. Oke and Ogunsemi (2011) averred that VM promotes team work, and also enhances quality performance of construction projects. By this, the prospects of increased engagement of project team, and improved value and quality of project which ranked 1st and 2nd respectively in the study's results are further corroborated. The prospects of 'improved value and quality of projects' which ranked 2nd underscores the strategic importance of VM prospects for value

addition. Oke (2015) stated that VM is a very useful tool in providing value for money for clients and enhance great saving of construction cost especially in developed countries. VMs potential for improved functional requirement and improved stakeholders' satisfaction, which tied at 3rd position, aligns with the

research findings of Aghimien (2018) which stated some of the benefits of VM as including - ability to identify possible complications early, and Ahmed (2016) which posited that VM aids in creating opportunities for improved communication between parties.

Table 3. Challenges of implementing Value Management in construction projects in North- Central Nigeria (Source: Author's field survey, 2019)

Identified Challenges of Value Management implementation	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	6 th
Organizational resistance to change	2	3	5	34	15	234	3 rd
Lack of qualified value management practitioners	5	5	5	29	14	211	9 th
Time Consuming and delay factors	4	3	11	26	15	222	7 th
Fear of incurring additional cost due to value management study	7	4	9	30	9	207	10 th
Inadequate training and management support	4	0	4	43	8	228	5 th
Lack of commitment to implement value management	2	3	9	39	6	217	8 th
Inadequacy of VM emphasis in tertiary education curriculum/relatively weak advocacy by professional bodies	2	2	4	45	6	277	1 st
Stakeholders resistance to its introduction and implementation	2	0	12	26	19	237	2 nd
Lack of collaboration amongst project team/stakeholders	1	4	8	33	13	230	4 th

Results shown in Table 3 examined 10 no. factors that constitute major challenges in the implementation of value management in construction projects in North-Central Nigeria. Similar response metrics to those of Table 2 were used. The 5-point Likert scale assessed the strength of respondents' agreement on the extent to which the identified variable factors constitute challenges to VM implementation in the geo-political zone. The results of the study showed that inadequacy of VM emphasis in tertiary education curriculum/relatively weak advocacy by professional bodies as a combined factor ranked 1st with a weighted total value of 277. This result is variously corroborated by studies which are underpinned to education curriculum and/or professional bodies, namely- Aduze (2014) -lack of knowledge about VM, Oke (2015) -lack of proper understanding by concerned professionals, Liu (2005)-inadequate knowledge, lack of qualified practitioners, Olawuyi (2009)-low awareness of the utilization of the relevant techniques amongst practitioners, Abidin, 2007; Fan, 2007; Noor, 2015 - Lack of Training and Education in VM, Al-yami (2010) -lack of qualified personnel to implement VM, inherent difficulties in

VM workshops, lack of awareness of VM and lack of VM application documents, Olawunmi (2016)-inadequate training and education, Ogunsanya (2015)-professional incompetence, and lack of proper regulatory framework.

Stakeholders resistance to VMs introduction and implementation ranked 2nd with a weighted total value of 237. This result is corroborated by studies of Luvara (2017) which stated that value management has been termed 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. Stakeholders resistance to VMs introduction and implementation is further supported by studies of Ogunsanya (2015) - government policies, Olawunmi (2016)- lack of receptiveness to new ideas, misperception about VM, and Aduze (2014) - client's negative reception.

Organizational resistance to change ranked 3rd, with WT value of 234. This study result is averred by Olawunmi (2016) study which stated - Lack of receptiveness to new ideas and passive behaviour among VM practitioners constitute key challenges of

VM implementation in Nigeria construction industry. Al-yami (2010) study also corroborated 'organisational resistance to change' by listing organisationally related challenges of leadership, time, awareness and client commitment to VM. The result of the study as shown in Table 1 however, revealed that although 'Lack of awareness/ knowledge of VM' as a identified variable factor ranked a far 6th position, the results can be attributed to certain explanatory factors like those of 'inadequacy of VM emphasis in tertiary education curriculum/ relatively weak advocacy of VM by professional bodies'. It could therefore be deduced that the respondents were more concerned with the cause rather than the effect, hence the seeming remote ranking of lack of awareness/ knowledge of VM against its causative agents of inadequacy of VM emphasis on tertiary curriculum /lack of advocacy by professional bodies.

Conclusion

Inspite of the positive impacts of VM adoption in the construction industry across the globe, the major challenge in Nigeria construction industry is the low awareness level, thus VM is currently poorly understood by construction stakeholders in Nigeria. In consequence, its adoption in the nations' construction industry would take considerable effort in terms of orientation, learning, and advocacy. Also, to expedite value management adoption in Nigeria, it will have to be introduced and committedly embraced by all stakeholders of the nations' construction procurement and delivery chain. Thus, this study has revealed the current low level awareness of value management among construction industry personnel in North central Nigeria region. The study also revealed a general low application of VM at the various stages of construction project development cycle, especially the design and post construction stages. The study revealed inadequacy of VM emphasis in tertiary education curriculum/ and a relatively weak advocacy of VM competency by professional bodies as the major challenges hindering its adoption in the construction industry. The study however, showed prospects of increased engagement of construction stakeholders and others to push for an improved awareness of VM and pacify its current low-level adoption at all stages of a construction development cycle for optimum value.

Recommendations

Arising from the findings and conclusion of this study, the following recommendations are made;

1. The curriculum of tertiary institutions offering construction industry courses together with the certification curriculum programme of the professional institutes should promote an in-

depth study and understanding of value management in order to improve the present low-level awareness.

2. Construction industry stakeholders should promote the adoption of VM concept y at all stages of a project development cycle.

The Nigerian government should enact a policy that compels all ministries, departments and agencies (M.D.A) to adopt value management techniques in the development of public infrastructures in Nigeria.

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