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ESSENTIAL STRATEGIES FOR VALUE MANAGEMENT ADOPTION AND IMPLEMENTATION IN NIGERIAN CONSTRUCTION INDUSTRY

Baffa Yahaya Sabiu[1*], Sarajul Fikri Mohamed[2], Wan Mahmoud Wan Yusoff[3], Mohd Saidin Misnan[4]

[1] Department of Quantity Surveying, Universiti Teknologi Malaysia, Malaysia
Email: bysabiu.qs@buk.edu.ng
[2] Department of Quantity Surveying, Universiti Teknologi Malaysia, Malaysia
Email: sarajul@utm.my
[3] Department of Quantity Surveying, Universiti Teknologi Malaysia, Malaysia
Email: b-wyusof@utm.my
[4] Department of Quantity Surveying, Universiti Teknologi Malaysia, Malaysia
[*] Corresponding Author

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Abstract:

This paper aims to examine the constraints of value management (VM) adoption and implementation in Nigeria's construction industry with a view to proffering possible measures that could tackle and minimise these constraints and eventually facilitate VM usage in the industry. The study adopts a survey approach. Data collection was based on a structured questionnaire from 300 registered construction professionals across the three most prominent states of northern Nigeria vis: Abuja, Kano and Kaduna States. The data collected were analysed using frequency, percentage, mean score and average index. The study revealed the most-rated constraints as Inadequate knowledge of the benefits of VM; Lack of knowledge and practice of VM; Lack of understanding; and Lack of involvement of specialists from the onset. On the other hand, 39 measures were identified that could tackle the constraints and eventually speed up the adoption of VM practice in the Nigerian construction Industry. The measures were categorised into five groups as related to professionals and professional bodies; government; clients and the community; materials and resources; and construction methodology. The study reveals the three most robust measures capable of tackling the constraints of value management implementation as enforcement of VM techniques by the government on construction projects; anti-corruption campaign; and clients' emphasis on the inclusion of VM methodologies in their construction projects. This research highlights the constraints of VM adoption in Nigerian construction industry and proffers possible measures that can be taken to facilitate the successful use of VM in the industry. It further categorised the

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measures as they relate to different stakeholders for easier implementation of actions.

Keywords:

Value Management, Construction Industry, Constraints, Measures

Introduction

The concept of Value Management (VM) was first discovered by Lawrence Miles of the General Electrical Company after the Second World War and has spread widely into the engineering, manufacturing and construction industries (Oke & Aghimien, 2018). The Navy Bureau of Ships introduced its value programmes in 1954, and later the Defence Department followed suit by introducing incentive clauses to its contractors and subcontractors to implement VE in their projects (Fong and Shen, 2000). VE was introduced into the construction industry by Dell 'Isola in the early 1960s and has since became a trend worldwide (Fong and Shen, 2000). Thereafter in 1972, the US General Services Administration obligated the inclusion of VE incentive provisions in all of its construction projects (Fong and Shen, 2000). After the 1970s, VM got more famous and has been adopted by various countries across the world such as Australia, Europe, India and Japan as the term 'Value Engineering' (Ramly and Shen, 2012). Since then, the VM applications (VE) has extended beyond the manufacturing industries into the construction and other industries (Oke & Aghimien, 2018). Islam *et al.* (2019) emphasised on decreasing FM costs and increasing building performance as a top priority for modern buildings.

VM methodologies have developed and been widely in use since its introduction into the US construction industry by Alphonse Dell'Isola (Fong and Shen, 2000). In 1993, the US congress passed two bills which made VM mandatory on all government projects, systems and products comprising the aggregate 80% of the budget of all government agencies (Fong and Shen, 2000). Karim *et al.* (2017) reported that VM has been widely acknowledged and carried out in many nations. VM has been adopted and used in various countries like the USA, UK, Australia, China, Saudi Arabia, Malaysia, Hong Kong and co. (Tanko *et al.*, 2017). Various authors reported the use of VM outside the USA, for instance Australia, Indonesia and Korea (Fong, 1999); Europe, Australia, Hong Kong and Japan (Fong and Shen, 2000); and France, Germany, Japan and Australia (Kelly *et al.*, 2004). Construction and infrastructure projects provide cases of use of the methods from Kuwait, Saudi Arabia and Hungary (Jay and Bowen, 2015). The VM method is also generally recognized, though at its infancy, in South Africa (Bowen *et al.*, 2009). In South Africa, (Oke & Ogunsemi, 2011) reported that clients demand the implementation of VM in their construction projects and such could be for the purpose of ensuring value for money which the VM methods guarantee. Generally, demand for value management all over the world is on the increase and Nigeria will soon be a part of it as stipulated by (Oke & Ogunsemi, 2011).

Considering the numerous benefits that VM offers to the construction industries of various developed and developing countries, Nigerian construction industry is still lagging behind in terms of adoption. In order to introduce aspects of VM into the Nigerian construction projects, various research efforts have been undertaken. In 2008, Olarenwaju (2008) carried out an assessment on the practice and prospects of VM in the NCI which revealed that VM is not

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formally practised in the NCI. Meanwhile in 2010, (Ibrahim and Musa-haddary, 2010) studied on the viability of attaining sustainable value for money using VM technique. In efforts to the adoption of VM into the NCI, (Oke & Ogunsemi, 2011) focused on determining the factors militating against the practice and implementation of VM in the NCI and its perceived benefits if adopted. Tanko *et al.* (2015) examined the need for VM in the NCI and revealed that VM success factors could address the challenges facing the NCI. Sabiu & Agarwal (2016) then identified thirty-nine (39) measures that could minimize the barriers of VM adoption in the NCI. Tanko *et al.* (2017) conducted a confirmatory factor analysis on the current practice of VM methods in the NCI and revealed a satisfactory goodness of fit among acknowledged determinants of a VM implementation model. In 2018, Oke & Aghimien (2018) determined the drivers of VM in the NCI and identified the most critical ones. All in efforts to facilitating the adoption of VM into the NCI, (Tanko *et al.*, 2018) then developed a framework for VM implementation in the NCI.

Despite all efforts to promote and facilitate the adoption of VM methodologies in the NCI by various researchers, Nigeria is still reluctant as reported by various researchers. Oke & Ogunsemi (2011) reported that VM has not been fully welcomed in the NCI and only a few VM workshops were reported to have been organised and unfortunately ended prematurely. Olarenwaju (2008) also reported that VM is not formally practised in the NCI. Ogunsanya *et al.* (2015) also revealed that the use of VM in Nigeria is still at its infancy. Much more need to be done in other to leverage on the full potential VM benefits in the Nigeria's Construction Industry.

A considerable amount of research has been conducted in this area, all in efforts to facilitate value management adoption and implementation in the Nigeria's construction industry (NCI) but to no avail. Previous researches on value management adoption in NCI mostly focused on constraints of VM adoption, the adoptability status of the industry, the drivers of VM and success factors of VM workshops. Little effort has been put to investigate and determine the measures that could be taken to tackle and minimise these barriers towards VM adoption and implementation in the NCI. Therefore, this paper aims to examine these constraints and proffer possible measures that could tackle them in view to facilitating adoption and implementation of VM in the Nigerian Construction Industry.

Literature Review

This study aims to examine the constraints of VM adoption in NCI and to proffer measures that could tackle the constraints and hence facilitate its adoption and successful implementation in the industry. The study started with a review of the literature which was used to give a general overview of value management methodologies and practice. The constraints of value management adoption in Nigeria's construction industry were also identified from previous studies. Information from the literature also guided the formation and design of the questionnaire. A survey approach was employed for this study and was carried out in the North-western part of Nigeria. Three states were selected from the region vis – Abuja (FCT), Kaduna and Kano states due to the high volume of construction works in the cities. Abuja being the federal capital territory and the headquarter of Economic Community of West African States (ECOWAS) has a significant level of output of construction projects. The study was limited to these three states for financial reasons and insecurity issues in other states of the region. The target respondents were clients, contractors and consultants only, in the construction industry. Other industry stakeholders like foremen, labourers, health and safety workers etc were not

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considered for the study. A total of three hundred (300) questionnaires were administered to the target respondents based random sampling and the criteria for the selection was based on the premise that they must have been involved in the delivery of public construction projects before and for the consultants, their membership status with their respective professional bodies to ensure high quality and reliable responses.

Out of the 300 questionnaires administered, a total of 96 were retrieved, showing a response rate of 32 per cent, which is ascertained fit for analysis as shown in Table I. Previous researches in the construction industry revealed that a response rate of 20-30 per cent and above can be considered fair and acceptable (Akintoye, 2002; Dulaimi and Hwa, 2003), otherwise, it is bias and of little significance. The data collection lasted a period of 3 months. Some questionnaires were self-administered while some were sent soft copies (google forms).

Table 1: Questionnaire Distribution and Response Rate

	No. of questionnaires		%
Profession	**Sent**	**Returned**	**returned**
Quantity Surveyors	103	36	34.95
Architects	80	27	33.75
Civil Engineers	66	18	27.27
Services Engineers	45	14	31.11
Others	06	1	16.67
Total	**300**	**96**	**32.00**

The questionnaire was designed in two sections. The first section gathered general information of the respondents, respondents' perception of value management and the current status of value management in the NCI. The second section was designed to examine and assess the constraints of VM adoption in the NCI and to proffer suggestions on the possible measures that could tackle/minimise the constraints in view to facilitating a speedy and successful adoption and implementation. From the review of literature, 31 factors were identified and considered constraints for VM adoption and implementation in Nigeria's construction industry as shown in Table 4. These constraints were presented in the questionnaire to the respondents for assessment base on a 5-point Likert scale from 'Not Contributing' to 'Very High Contributing' constraint. On the other hand, the respondents were given opportunity in an open-ended question to proffer measures that could tackle the constraints and eventually facilitate a speedy and successful adoption and implementation of VM in the NCI.

The survey instrument was tested through pilot study before the actual data collection was carried out. 12 construction professionals from the industry as well as the academia were involved in the pilot study process. They were asked to review the survey instrument for structure, readability, ambiguity and completeness (Kumar, 2011) in view to improving it and determining the time required to complete it. From the pilot study, corrections were suggested, one of which requested that the open-ended question seeking respondents to proffer measures to tackle VM constraints be modified or rather removed. The suggestion was that, the measures should be identified from literature and presented to the respondents for examination and assessment, which was effected. Thus, the measures were identified and categorised into 5 main groups as related to Government; Professionals & Professional Bodies; Construction Methodology & Planning; Clients & Institutions; and Materials & Resources. These were presented to the respondents for assessment based on a Likert scale of 1-5 ranging from "Very

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Weak Measure" to "Very Strong Measure". The reviewed questionnaire was again sent to 2 construction experts and 1 researcher from the academia to validate the corrections from the pilot survey. This was done to ensure the validity of the research instrument that could elicit the opinions of the industry experts on the constraints of VM adoption and possible measures that could minimise them in (Kumar, 2011; Creswell, 2012). Hence, the final draft of the questionnaire was adjusted based on the suggestions from the pilot study.

Table 2: Constraints (C) of Value Management Adoption in NCI

Code	Constraints of VM Adoption in NCI	References
C1	Inadequate knowledge of benefits of value management	AI-Yami (2008), Jaapar et al. (2009), Norton and McElligott (1995
C2	Lack of knowledge and practice of VM	Aigbavboa et al. (2016), Hayatu (2015)
C3	Lack of understanding among professionals	Chhabra and Tripathi (2014), Jaapar et al.(2009), Woodhead and Downs (2001)
C4	Lack of involvement of specialists right from the onset	Kim et al. (2016)
C5	Poor management especially on the part of the client	AI-Yami (2008), Hogg (1999)
C6	Lack of trained professionals in value management	Aigbavboa et al. (2016), Hayatu (2015)
C7	Use of quack professionals for construction works	Kim et al. (2016)
C8	Lack of total quality management principle in construction firms	Coetzee (2009)
C9	Lack of information	Sabiu and Agarwal (2016)
C10	Greediness of the contractors and consultants	Abidin (2005), Stevens (1999)
C11	Problem of technological advancement	Coetzee (2009)
C12	Government policy	Al-Yami (2008), Assaf et al. (1996), Cheah and Ting (2005)
C13	Inadequate finance/funding	Assaf et al. (1996), AI-Yami (2008), Hogg (1999)
C14	Unstable economy	Al-Yami (2008), Cheah and Ting (2005)
C15	Conflicts of objectives by different project stakeholders	Chhabra and Tripathi (2014), Jaapar et al. (2009)
C16	Ambiguous design	Sabiu and Agarwal (2016)
C17	Government factor	Al-Yami (2008), Cheah and Ting (2005), Daddow and Skitmore (2005)
C18	Human factor	Sabiu and Agarwal (2016)
C19	Communication gap	Coetzee (2009), Kisii et al. (2016)
C20	Construction methodology	Kissi et al. (2016)
C21	Professional incompetence	Abidin (2005), Stevens (1999)
C22	Time of completion/delay	Abidin (2005), Daddow and Skitmore (2005), Kissi et al. (2016)

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C23	Lack of professionals for construction works	Kim et al. (2016)
C24	Procurement style	Clark (2000), Kissi et al. (2016)
C25	Not suitable for low cost projects	Sabiu and Agarwal (2016)
C26	Conflict management	Aghimien et al. (2018)
C27	Interruption to normal work schedule	Abidin (2005), Daddow and Skitmore (2005), Kissi et al. (2016
C28	Lack of training opportunities in value management	Aghimien et al. (2018)
C29	Too expensive to carry out VM	Abidin (2005), Daddow and Skitmore (2005), Kissi et al. (2016)

Frequency and percentage were used to analyse the first section of the questionnaire i.e. respondents' information, perception on value management, as well as current status of value management implementation in Nigeria's construction projects. For the second section, Average Index analysis (AII) was used to analyse the respondents' assessment of the constraints of VM adoption as well as the possible measures that could minimise the constraints to speed up VM adoption and implementation. Factor analysis was then used to group them into more manageable and significant size.

Findings and Discussion

General Information of Respondents

Table 3 shows results for the general information of respondents. From the table it can be deduced that most of the respondents of this research survey are from Kaduna state representing 50% of the total respondents. Abuja with 27% and the least represented is Kano with 23%.

The result also shows that most of the respondents for this survey have vast experience in the construction industry as 75% of them have spent six or more years working in the construction industry. Thus, they have the necessary experience to carry out this research survey. The result further shows a 25% of the respondents as having below 6 years of experience in the industry.

Table 3 further shows the various professions of the respondents in the construction industry. It is apparent that quantity surveyors and architects constitute the majority with 38 and 28 percent of the respondents respectively. Civil and services engineers constitute 19 and 13 percent respectively, while others are 2 percent.

Table 3: General Information of Respondents

Category	Classification	Frequency	Percentage
Respondents' workplace (state)	Abuja	26	27.08
	Kaduna	48	50.00
	Kano	22	22.92
Respondents' experience	0-5 years	24	25.00
	6-10 years	36	37.50
	11-15 years	20	20.83
	15-20 years	9	9.38
	Above 20 years	7	7.29
Respondents' profession	Quantity Surveyors	36	37.50
	Architects	27	28.13

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Civil Engineers	18	18.75
Services Engineers	14	14.58
Others	1	1.04

Current State of Value Management Application among Professionals in NCI

The results reveal that most of the respondents are aware of value management techniques and methodologies (Table 4) but with a high abundance of misconceptions and misunderstanding of the VM. In order to testify that, the respondents were misled, as some questions were asked to test their understanding of VM as shown in Table 5 on a Likert scale of 1-5 from strongly agree to strongly disagree. It can be said that the respondents have some basic understanding of VM which is good for the start and recommendable. However, the construction professionals need some enlightenment on the concept and knowledge of VM to clear their misconceptions and misunderstandings.

Among the 96 respondents, only 6 have ever applied or participated in value management studies in their construction Projects (Table 2). Majority (94%) of the respondents had never been engaged in value management workshop. This shows that value management practice in Nigeria is at the very low or is not being practised at all. This corroborates the results of Umar (2015) and Olarenwaju (2008). The result also revealed only 6 of the respondents to have applied VM on between 1-5 construction projects which is just about 6.25%.

Table 4: Level of Awareness and Application of VM among Construction Professionals in Nigeria's Construction Industry

Category	Classification	Frequency	%
Awareness of VM	YES	82	85.42
	NO	14	14.58
Source of awareness	Professional seminars	21	21.89
	Publications/Journals	21	21.89
	Colleagues/Friends	18	18.75
	Read as course/subject	30	31.25
	Already applied	6	6.25
	Others	0	0.00
Involvement in VM workshop	YES	6	6.25
	NO	90	93.75
No. of projects VM was applied	1 – 5	6	6.25
	6 - 10	0	0
	11 - 15	0	0
	Above 15	0	0

Table 5: Respondents' Perception of Value Management

Description	Average rating	Rating scale
Increases function and life cycle cost	3.516	Agree
Increases function at same cost	3.233	Neutral
Decreases life cycle cost	2.967	Neutral
Merely cost cutting technique	2.897	Neutral

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Constraints of Value Management Adoption and Implementation in NCI

The findings of the survey reveal that awareness of VM among the construction professionals is high. However, the professionals' experience in VM application is meagre. It further identified 39 possible measures that could tackle the constraints of VM adoption in the NCI. Emphasis must be laid on the fact that survey results represent only 96 respondents and hence may not accurately reflect the actual situation in the NCI.

In efforts to determine the constraints of value management (VM) adoption and implementation in the Nigeria's construction industry, 29 constraints of VM were identified from the review of literature. The 29 constraints were reviewed by experts in the construction industry for ambiguity, repetitiveness and relevance, result of which 20 constraints were finalised and presented in a questionnaire to respondents for assessment. The respondents were asked to assess these constraints on a Likert scale of 1-5 from "very low contributing (VLC)" to "very high contributing (VHC)". The assessed constraints are as shown in Table 6.

The result from the table shows 15 of the constraints as "highly contributing (HC)" and 5 to be "moderately contributing (MC)" constraints. The highest ranked constraints as revealed by the result are: Inadequate knowledge and awareness of the benefits of value management, inadequate training and education on value management methodologies and lack of government's commitment to impose the use of VM on construction projects. From the result, the two highest ranked constraints can be attributed more to knowledge and training on VM. Perhaps, with adequate knowledge and training on value management methodologies and enlightenment on its enormous benefits, VM adoption in NCI could be facilitated. Government's factor is also highly ranked among the constraints. Government is the major client in NCI. Hence, it is evident that, without the government's support and commitment in ensuring the use of VM in its construction projects, its adoption and implementation would most likely remain a dream. This is in line with the case of several other countries like the USA and Malaysia towards implementation of VM in their construction industry. In 1972, the US General Services Administration obligated the inclusion of VE incentive provisions in all of its construction projects (Fong & Shen, 2000). The Malaysian government in December 2009, also imposed the use of VM on all construction projects that exceed RM50million (Maznan *et al.*, 2012).

The result further reveals that, the top highly contributing constraints are directly related to the professionals' knowledge on VM, i.e., Inadequate knowledge and awareness of the benefits of VM, and inadequate training and education on VM methodologies with rating of 3.970 and 3.938 respectively. This testifies the earlier result on the 'respondents' perception of VM' which revealed that the respondents have abundant misconceptions and misunderstandings of VM. This finding corroborates the result of (Aghimien *et al.*, 2018) which revealed that misconception of the technique due to lack of training, knowledge and proper awareness of relevant stakeholders is a major challenge for VM activities in the industry. The 5th (lack of involvement of specialists right from the onset) and 6th (poor management especially on the part of the client) assessed constraints relate more with clients' responsibilities. In NCI, (Sabiu and Agarwal, 2016) observed that, in most construction projects in Nigeria, clients fail to provide adequate information needed right from the onset. This attitude is in contrast with the requirements of VM of having ample information of the project for VM to be successfully implemented and the perceived benefits achieved.

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Table 6: Assessment of The Constraints of VM Adoption/Implementation in NCI

Constraints of VM adoption/implementation	Average Index	Rating Scale	Rank
Inadequate knowledge and awareness of the benefits of VM	3.970	HC	1
Inadequate training and education on VM methodologies	3.938	HC	2
Lack of government's commitment to impose the use of VM	3.921	HC	3
Poor understanding and cooperation among stakeholders	3.909	HC	4
Lack of involvement of specialists right from the onset	3.906	HC	5
Poor management especially on the part of clients	3.900	HC	6
Lack of trained professionals in value management	3.781	HC	7
Use of quack professionals for construction works	3.781	HC	8
Lack of total quality management principle in construction firms	3.774	HC	9
Inadequate information from clients	3.774	HC	10
Greediness of the contractors and consultants	3.667	HC	11
Problem of technological advancement to use electronic VM workshop	3.594	HC	12
Clients' reluctance to fund VM exercise	3.563	HC	13
Conflict of objectives by various project stakeholders	3.533	HC	14
Ambiguous design	3.500	HC	15
Too expensive to carry out VM	3.431	MC	16
Poor communication among relevant stakeholders	3.290	MC	17
Lack of procurement method flexible enough to accommodate VM	3.061	MC	18
Not suitable for low-cost projects	2.968	MC	19
Interruption to normal work schedule	2.806	MC	20

The least ranked constraints of the 20 presented, are: lack of procurement method flexible enough to accommodate VM, not suitable for low-cost projects and interruption to normal work schedule. The absence of a flexible procurement method to accommodate VM, could be attributed to the clients' (government inclusive) reluctance to impose the inclusion of a VM clause in their construction projects. The clients, by so doing, can facilitate the formation or establishment of a new or amended procurement method that could accommodate the use of VM including all peculiarities attached with it. Kissi *et al* (2015) revealed that, the procurement method used for the projects is very essential towards the implementation of VM in construction projects. They added that, most procurement methods used in the Ghanaian construction industry are so rigid to accommodate VM. The next from the least ranked constraint is 'interruption to normal work schedule' as seen by some professionals. It is evident that, benefits of VM are best achieved when it is applied as the earliest time possible during the inception of the project. Hence, why the respondents ranked this constraint in the far down the pecking order.

Strategies for Value Management Adoption and Implementation in NCI

The respondents suggested numerous measures that could tackle and minimise the constraints of VM adoption in the NCI from which 39 were finalised after a heuristic reasoning, and categorised into five main groups as shown in Table 7. The 39 measures were then presented in a second questionnaire for assessment by the respondents to determine the strongest and most effective ones. The assessment reveals five of the measures to be *'Very Strong Measures*

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(VSM)' from which the top three directly relate to the clients (both government and private). These are: enforcement of value management technique on construction projects; anti-corruption campaign; and Clients' emphasis on the inclusion of value management methodologies in their construction projects. This shows that, for VM to be adopted and implemented successfully in NCI, the clients hold more responsibility and need to make the first step, others follow suit. If the government, being the biggest client in the industry enforces the use of VM on its construction projects, then VM implementation can become a reality in the NCI. This strategy actualised VM implementation in several other countries like the United States in 1972 (Fong and Shen, 2000), Malaysia in 2009 (Jaapar *et al.*, 2012) and many other countries. The second strongest measure is 'anti-corruption campaign'. Corruption has invaded the NCI so much that VM implementation may remain a dream and cannot be actualised until it is curbed since from procurement to the final completion of the projects. The result also reveals the need for a high level of cooperation among professionals and practitioners in the industry. VM is a team-oriented decision-making approach, as such lack of a sound cooperation among stakeholders would jeopardise the implementation of VM and achieving its maximum benefits.

Table 7: Measures That Could Tackle the Constraints of VM Adoption in The NCI

CATEGORY	MEASURES	AI	RS
Government	Enforcement of value management technique on construction projects	4.67	VSM
	Government should set guidelines for achieving low life cycle cost	2.41	NM
	Forming a press group that can influence government policy	2.40	NM
	Government policy be stabilized	3.78	SM
	Government to discourage the use of quarks in construction projects	3.94	SM
	Anti-corruption campaign	4.65	VSM
Professionals & Professional Bodies	Promotion of value management as a separate specialization	3.67	SM
	Encourage specialization within professionals in the same discipline	3.30	NM
	Professional bodies should equip their members with VM skills	3.60	SM
	Value management should be vigorously taught to professionals	3.06	NM
	Conduct research, seminars, workshops and publications on VM importance and value	3.58	SM
	Training in the field of cost analysis	3.56	SM
	Engagement of competent and qualified professionals	4.52	VSM
	Improve prequalification of contractors	2.97	NM
	Encourage more cooperation among the professionals and practitioners in the industry	4.55	VSM
	Adequate communication should be established between consultants for modification on projects	3.79	SM
Clients & Institutions	Value management should be highly advocated	3.55	SM
	VM/VE be introduced as a course/subject in institutions	3.48	NM
	Enlightenment programs	3.50	SM
	Sensitize potential clients on dangers of quackery	3.38	NM
	Clients' emphasis on the inclusion of value management methodologies in their construction projects	4.60	VSM
	Improve communication between stakeholders	3.91	SM

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	Improve education on benefit of life cycle cost	3.43	NM
	Great awareness on the need and benefits of VM/VE to clients, contractors and professionals	3.77	SM
Construction Methodology & Planning	Making every building and infrastructural design to have alternative VM/VE option	3.77	SM
	Incorporating VM processes in the procurement/design process	3.78	SM
	Keeping abreast of the development and understanding the technological requirements overtime	3.03	NM
	Keeping abreast of the value technology	2.88	NM
	Update on construction techniques	3.29	NM
	Introduction of life cycle policy for designs	3.48	NM
	Sustainable planning	3.28	NM
	Detail design be available before construction starts	3.53	SM
	Eliminate unnecessary design	3.00	NM
Materials & Resources	Having the in-depth knowledge of the building materials	3.56	SM
	Update on the construction materials	3.18	NM
	Keeping abreast of the development in the building materials quality	2.81	NM
	Having the knowledge of the periodic maintenance requirements	3.10	NM
	Proper management of resources	3.09	NM
	Realistic and adequate cash flow	3.29	NM

Conclusion

From the findings, the three significant measures capable of tackling the constraints of value management implementation in Nigeria are: *enforcement of VM techniques on construction projects; anti-corruption campaign; and clients' emphasis on the inclusion of VM methodologies in their construction projects*. This shows that adoption and implementation of VM techniques lies more on the clients i.e., the govt and other private clients. Once these clients enforce the implementation, all other stakeholders follow suit. The findings further revealed that; all construction stakeholders have their respective roles to play in tackling the constraints of value management adoption in the Nigeria's construction industry. It is believed that the findings of this study will assist in the speedy facilitation of value management adoption and implementation in the Nigeria's construction industry. A further study should be carried out in other locations in the country as this research was limited to the three major states of northern Nigeria (Abuja, Kano & Kaduna) only.

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