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ASSESSMENT OF THE FACTORS PREVENTING VALUE MANAGEMENT PRACTICES IN THE CONSTRUCTION INDUSTRY IN ABUJA

BASHIR O. GANIYU; DANJUMA JACOB
Department of Quantity Surveying, Federal University of Technology, Minna, Nigeria.

Abstract

Value Management (VM) has played a broad role in supporting effective decision making to construction projects, increased project performance and quality, balance project objectives, and manage community expectations in many countries around the world. But applicability of VM in Nigeria especially in Abuja construction industry has experienced a set back as compared with rest of the world. It is on this basis that the study examined the factors responsible for the set back with a view to recommending sustainable solutions. Therefore, the study sampled 235 professionals across the construction firms in Abuja through simple random sampling technique. The study employed descriptive (mean) and inferential (factor analysis) methods of data analysis. The result revealed that through factor analysis technique, six most highly emphasized factors were identified which constituted about 65.690% variance in the original factors hindering value management application, which include technical and public policy factors, professional negligence, non-complacency and management defects, human factor and [redacted] inflexibility, lack of manpower and project focus, and poor knowledge. The study recommends that project managers should be proactive in addressing the aforementioned factors as they posed critical set back to value management implementation among Nigerian construction companies.

KEYWORDS: *Value management, project, construction industry.*

Introduction

The term 'value management' is a style of management particularly dedicated to motivating people, developing skills and promoting synergies and innovation, with the aim of maximizing the overall performance of an organization. This, however, has not been fully embraced in Nigerian construction

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industry (Oke & Ogunsemi, 2017). Construction industry all over the world has not been static and the reasons for this include clients' growing demand, complexity of construction projects, advancement in technology and introduction of new innovations amongst others. Olawumi *et al.,* (2016) describes value management as a process whereby the project is evaluated and scrutinized to obtain maximum value for money by following a prescribed methodology. It focuses on the value, rather than cost, in relation to the function of the elements of the project under consideration. Value management can improve the value of a property by providing the required project functions but at a lower cost, by providing additional functions without increasing the cost, and by providing additional functions and at the same time to lower the cost. For instance, if two or more designs of a project are compared, each producing the same functional and aesthetic requirements, then the difference would most likely be an unnecessary cost, which could be as a result of unnecessary components, materials, project build ability and life cycle costs. Demand for value management all over the world is on the increase as noted by Maro and Kikwasi, (2009) and Nigeria will soon be fully part of it. According to College of Estate Management (1995), value management is receiving an increasing amount of attention within the construction industry and international project management community that clients are insisting that value management should be applied to their construction projects and such could probably be attributed to the effectiveness of value management as a tool for ensuring value for money. Also clients are increasingly enquiring and demanding that it is used during the key stages of their construction projects and the existence of greater competition in the market place ever before, therefore it is vital that resources are applied as efficiently as possible and wastes in any form reduced to a minimum. Thus, in order to promote the application of VM practice in Nigerian construction industry, this study aims at identifying the factors hindering the successful implementation of VM among the firms in Nigerian construction industry.

Conceptual framework of Value Management

Ellis *et al.* (2005) stated value management (VM) is an emerging paradigm that focuses on continuously increasing the value provided to the client. Taking clue from the development of VM which has been widely accepted at international level as an important tool in the management of construction projects. Jaapar (2006) defined VM, as a multidisciplinary; team oriented, structured, analytical process and systematic analysis function, which seeks best value via the design

and construction process to meet client perceived needs. De-Leeuw (2006) opined that the process has more to do with "value" and "management" rather than "value" and "engineering". The primary role of the value manager as opined by Male and Kelly (2008) is to decide on structure and deliver a study style tailored to a particular value problem or value challenge, be it for a project, project programme, service or organizational function.

Value management is generally divided into three stages and they are value planning value engineering and value analysis (Finnigan, 2001; Oke & Ogunsemi, 2017). VM is also known as Value Engineering (VE) or Value Analysis (VA) (Save, 2014). Although some schools of thoughts tend to distinguish VM from VE and VA, VM is more widely accepted term that can be used to represent other related value methodologies (Shen & Liu, 2003). In advanced countries, VM, or more accurately, the value methodology, has been used to improve construction and transportation projects for more than 30 years. Traditionally, VM has been used by transportation agencies and municipal organizations to reduce or avoid excess capital construction expenditures. However, VM can play a broader role to support effective decision making to construction projects increase project performance and quality, balance project objectives, and manage community expectations (Wilson, 2005) Currently, VM has been widely practiced in many countries around the world. However, concepts and applications of VM do not seem to be well embraced in the construction sector of the majority of developing countries (Bowen et al., 2010). For example, in Malaysia and China, VM is still its infancy and it hasn't been well-accepted (Jaapar, 2009; Li and Ma, 2012). VM is rarely applied in the Southeast Asia construction industry (Cheah and Ting, 2005). It is also less widely practiced in South Africa. Malla (2013) found that concept of VM is very much new in Nepal. The practice of VM in Myanmar and Nigerian construction is very slow and its term is not popular among construction professionals (Phyo and Cho, 2014; Aduze, 2014). The concept of value management is also gaining ground among Nigerian construction professionals as revealed by Olanrewaju and Khairuddin (2007) where about 36%, 30%, 11% and 19% of the research population that are familiar with value management are quantity surveyors, engineers, architects and estate mangers respectively.

Factors Hindering the Sustainable Application of Value Management

Cheah and Ting (2005) conducted a survey to investigate VM awareness and applications in Hong Kong's construction industry and highlighted three most

important reasons for not using VM at work, including lack of knowledge to implement VM, no confidence to introduce VM to clients, and lack of time to implement VM. He found out that the low level of applications is probably associated with the low level of awareness of VM among senior management in clients' organizations. Lack of time to implement VM and lack of knowledge about VM are also two key causes in hindering VM application to Southeast Asia.

Lai (2006) identified ten factors hindering the application of VM in the Malaysian construction industry. The main factors are lack of knowledge about VM, lack of support from parties with authority such as government and owners, and lack of local VM implementation guidelines. Not surprisingly, the lack of knowledge about VM continues to be a key problem, whereas lack of time to implement VM is not a factor causing significant obstacles in Malaysia. For the case of China, Li and Ma (2012) also arrived at a similar conclusion that lack of time to implement VM is not a severe problem and main hindrance factors come from lack of expertise knowledge about VM, lack of technical norms and standards, and lack of VM experts.

The issues related to VM have received much attention in other countries as well, especially in developing countries. Perera and Karunasena (2004) showed that in Sri Lanka the application of VM in construction organizations is relatively new and very little evidence on its application in the construction industry. Some reasons for the absence of VM application could be lack of standard procedure for VM process, lack of encouragement, advice or guidance on projects for practicing VM from the construction industry regulatory body, and no guidance or knowledge about the benefits. According to AI-Yami (2008), lack of information such as specifications, standards, historical data, etc., lack of leadership, lack of time to implement VM, lack of awareness about VM, and client commitment were the five major obstacles hindering the application of VM in the Saudi public sector.

Fard *et al.* (2013) conducted an investigation on the context of Iran and found five items considered as the main factors hindering VM implementation in the construction industry, namely, outdated standards and specifications, habitual thinking and negative attitude, lack of local guidelines and information, lack of knowledge and practices, and change in owners' requirements.

Lately, Aduze (2014) has undertaken a study of the prospects and challenges of VM in the Nigerian construction projects. The study concluded that lack of policy as government legislation, client's negative reception, and lack of knowledge about VM are some factors impeding VM application. As a result discovered, lack

of awareness about VM in Saudi, Iran, and Nigeria could be noticed that it is not the most obstructing factor as found in Hong Kong, Malaysia, and China.

Malla (2013) made recommendations to promote VM application in the Nepalese construction industry instead of finding out the hindrance factors. The recommendations were given out such as incentive clause for VM re-proposal in contract documents, commitment from top management, forming a VM team with experienced members, and sufficient time to apply VM. Jaapar *et al*. (2009) investigated the impact of VM implementation in Malaysia and confirmed that lack of VM knowledge and practice, the resistance to change by the involved parties, and the conflicting objectives of the project among parties are the main problems faced during VM workshops.

Latief and Untoro (2009) studied the implementation of VM in the infrastructure services of Indonesia's public works department. They outlined 31 factors influencing the preparedness of implementing VM from various references and found five main factors, namely, the number of personnel with VM certification, VM implementation regulation, personnel composition, the comprehension level of VM technique and management, and personnel's level of education. Another study was also conducted on infrastructure projects by Whyte and Cammarano (2012). They used the semi-structured interview method to investigate the extent of VM implementation in the Western Australian engineering industry. The study indicated that time limitations, lack of understanding, and participation of individuals in the team will influence negatively the level of success of the VM workshop.

Each of the above-mentioned studies had different conclusions about hindrance factors. However, most of the studies revealed that the lack of knowledge and awareness about VM is one of the biggest obstacles for its limited application in the construction industry. Lack of time to implement VM has no consensus as one of the greatest hindrances compared between the studies. Some other noteworthy factors are lack of support from government and parties, especially owners, and lack of VM implementation guidelines.

The management and enhancement of value does not imply that there may be intentional "gold plating," conscious neglect of responsibility, or unjustifiable error or oversight by the design team. VM simply recognizes that social, psychological, and economic conditions exist that may inhibit good value. The following are some of the more common obstacles against VM practice in building projects as stipulated in different literature:

Wrong Choice of Procurement Route.

Wrong choice of procurement is a threat to value effectiveness. Majority of construction projects in Tanzania have been carried out using traditional methods with only a relatively small number of projects being implemented by other procurement systems (Maro, G. & Kikwasi, 2009). Strict distinctions between design and construction phases in traditional contracting methods have caused confrontational attitudes between design and construction teams, which are in fact major obstacles to apply VM successfully (Fong, & Shen, 2000).

Lack of Awareness about VM by Construction Industry Practitioners.

There is slight understanding of VM in the industry stakeholders such as clients and some consultants and contractors. So far in Tanzania construction industry very few people have put a hand to do research on VM (Fong, & Shen, 2000). In Tanzania there are no construction institutions that offer courses in VM except for Ardhi University and only in the School of Construction Economics and Management.

Failure to Admit Ignorance of Certain Specialized Aspects of Project Development

Most construction industry designers in Tanzania especially architects become conceited and uncooperative when they are advised to make design changes which would bring optimum design [Craig, 1996]. Mostly designers would think of one parameter i.e. architectural beauty and engineering aspects but take no attention in reduction of unnecessary cost. The principal aim of VM is to reduce unnecessary cost while maintaining or increasing the function of the structure.

Lack of Good Communication among Project Stakeholders.

As contended by (Cheah, & Ting, 2005) construction projects involve many people with different professionals as well as functions. These may be the client, consultants (architect, Quantity Surveyor, engineer, project manager and construction manager), and contractors . Others are subcontractors, material suppliers, bankers, insurance companies and other public agencies. Interactions of a team during design stage means exchange of information from one part or design profession to the other, this leads to involved decisions and may result into making better decisions on the designs (Craig, 1996).

During construction stage there has to be a flow of information either from the employer through his consultants or within consultants and contractors. Lack of good communication among project participants has been a barrier to VM. In early works i.e. pre-construction activities there is both an explicit and implicit charge that poor communication has been a core problem for many years (Cheah, & Ting, 2005)..

Communication within the construction team as seen to suffer because insufficient information was available, information was incomplete, rushed and not available in time therefore this would result to poor value of the project output.

In construction the information is usually prepared by individuals from diverse backgrounds, such as Architects, Quantity Surveyors, Engineers, Subcontractors and Specialist Suppliers, often using different terms and methods of graphical representation. Failure of information, poor quality of information or inappropriate communication modes between different participants in construction projects has been an obstacle to value effectiveness and the cause of poor quality of final product (Cheah & Ting, 2005). If there is no good communication among project participants then VM is blocked to be effective.

Other Obstacles.

Other obstacles as portrayed by (Luvara, 2010) are poor human relation, rigid application of standards and traditions without consideration of changing function, technology and value, lack of contractual provision to support VM, lack of trained value managers in construction industry and conflicts of interest among project participants.

Value management militating factors on the other hand, the following were suggested as the major impediments to the application of value management to construction projects in Nigeria according to (Odeyinka 2006). Ambiguous design; Time of completion/delay; Conflict management; Finance; Construction methodology; Inadequate knowledge of benefits of value management; Lack of involvement of professionals i.e. specialists right from the onset; Greediness of the contractors and consultants; Lack of total quality management principles in construction firms, Professional incompetence; Technology level; Finance/fund; Procurement style; Government factor; Human factor; Communication gap; Government policy; Unstable economy; Poor management especially on the part of the client; Lack of professional competence; Use of wrong/quack professionals

for construction works; Lack of understanding of the concept; and Lack of information.

METHODOLOGY

The population for this study comprises of construction firms in Abuja the capital city of the country. These construction firms comprises of built professionals within the built environment to include builders, architects, quantity surveyors, engineers and estate surveyors. Information relating to level of awareness of VM, the extent of the application of VM in building projects, barriers or factors hindering sustainable application of VM in construction projects. Primary data was collected from construction firms that comprises professionals within the built environment (builders, architects, quantity surveyors, engineers and estate surveyor) in Abuja through closed ended questionnaires. It is first hand information from construction firms on value management. The study employed purposive or census sampling techniques adopted to selected construction firms in Abuja. Purposive or census sampling is considered appropriate for construction firms. The number of questionnaires to be administered and the sample size for the study population (665) was determined using Yamma's formular model expressed as follows:

$$n = \frac{N}{1+N(e)^2}$$

Where;

n= Sample size

N= Sample population

e= confidence level

From the population of 665, the sample size is derived at 250 for the study. 250 questionnaires were administered and only 235 were retrieved which comprised 94% of total questionnaires.

RESULTS

Table 1 Professional Information of Respondents

The professional information of respondents is presented in table 4.1. 43.4% majority of the respondents had their first degree in their academic qualification; most of the respondents comprised of builders at 43% and followed quantity surveying at 30.6%. Most these respondents were corporate members of the professional institute and institution and 61.7% majority of the sampled respondent had over 21years work experience in the built profession. This

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information indicates that the sampled respondents were the right and qualified professional from which the right information on the subject matter was sought.

Information of Professional Respondent		Frequency	Percent
Educational Qualification	HND	73	31.1
	PGD	10	4.3
	B.sc/B.tech	102	43.4
	M.SC	8	3.4
	PhD	6	2.6
	ND	36	15.3
	Total	235	100.0
	Architecture	18	7.7
	Building	101	43.0
Profession of Respondent	Quantity surveying	72	30.6
	Civil Engineering	32	13.6
	Estate Surveying	12	5.1
	Total	235	100.0
	Graduate	10	4.3
Professional Qualification	Probationer	22	9.4
	Corporate	177	75.3
	Fellow	26	11.1
	Total	235	100.0
	below 5years	10	4.3
Year of Experience	6-10yrs	20	8.5
	11-20yrs	60	25.5
	21yrs and above	145	61.7
	Total	235	100.0

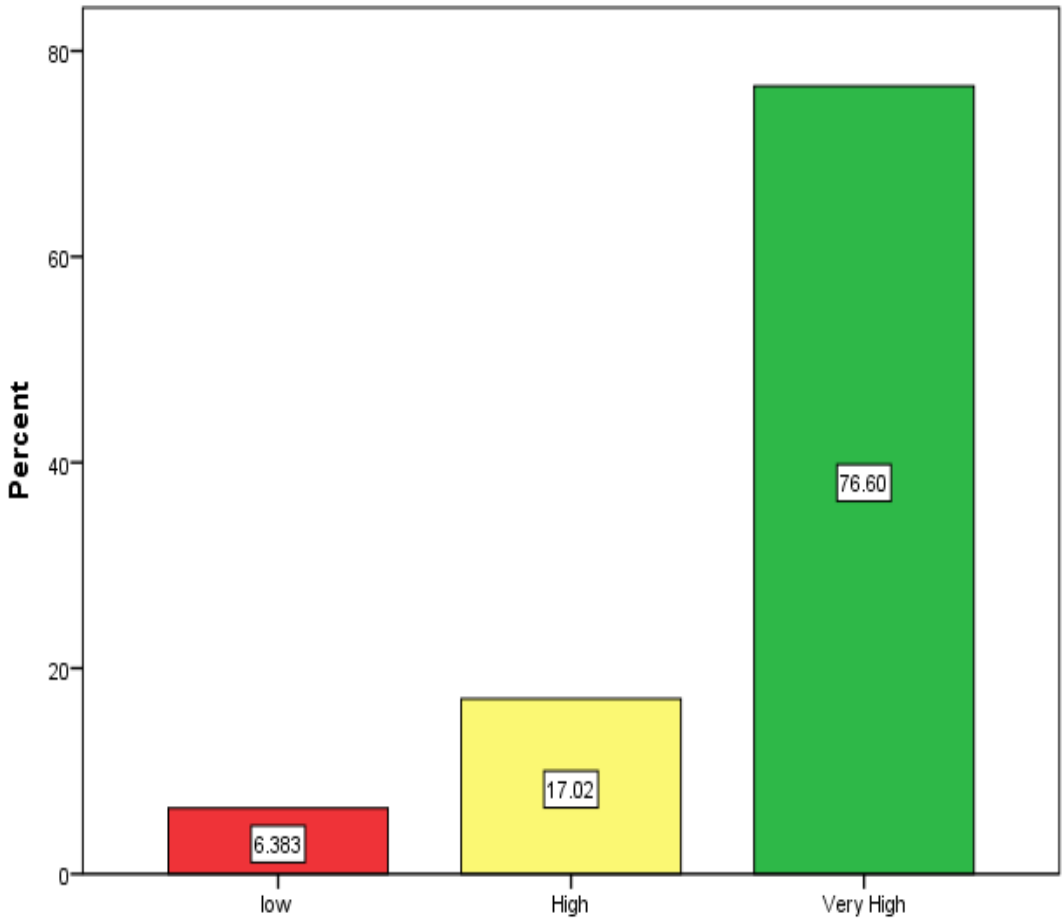
Source: Field Survey, 2019

Figure 1 Level of Awareness of Value Management

The information on the level of awareness of value management is presented in figure 1. The result revealed that 76.6% of the respondents had a very high level of awareness of value management in construction industry, 17.02% maintained high level of awareness and finally 6.38% had low level of awareness of value management in construction industry. This information further revealed that

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there is a very high of awareness of value management (VM) among the sampled professionals and VM is not new thing to the respondents.

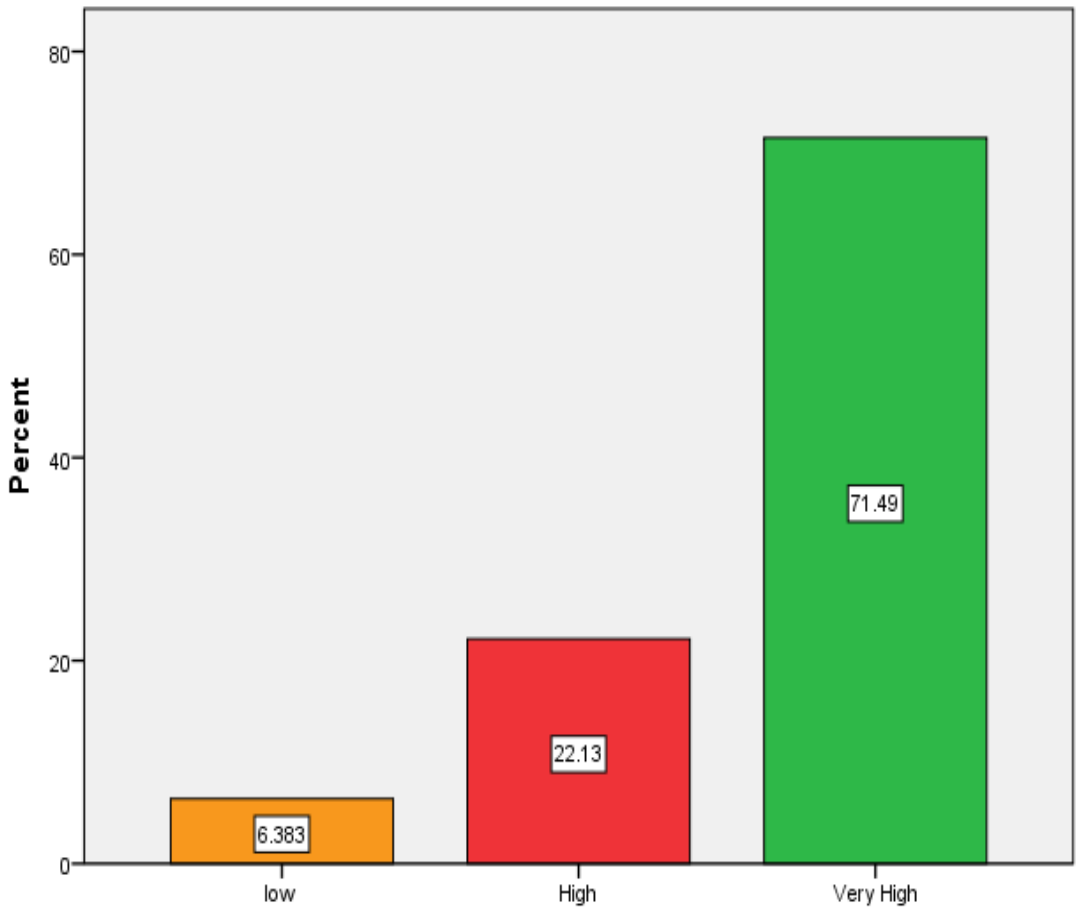


Source: Field Survey, 2019

Figure 2 Level of Involvement in Value Management Exercise

The respondent' level of involvement in value management is presented in figure 2. The result revealed that 71.49% of the respondents had a very high level of involvement in value management exercise, 22.13% maintained high level of involvement in value management exercise and finally 6.38% had low level of involvement in value management exercise in construction activities. This information further revealed that most the sampled respondents had participated and experienced the used of VM in their respective organization and the level of involvement in VM exercise is very high to majority of the sampled respondents in the built environment.

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Source: Field Survey, 2019

The result of descriptive analysis of awareness of value management application in construction presented Table 2 on three-point likert scale (very high-3, high-2 and low-1) showed the relative awareness index (RAI) of value management (VM) in the study area. The ranking of relative level of awareness index revealed that there were very high level of awareness of value management by the respondents and all the items maintained a very high relative awareness index (RAI). The relative level awareness of quality management control and cost effective measure in VM were ranked first and second the most tools in VM application at 95% and 92% relatively. The result of chi-square used to determine if the respondents' level of awareness were significantly related or not. The result revealed that chi-square statistics at 25.33 is significant since p-value at 0.000 is found less than 0.05 level of error (level of precision). Therefore the opinion of

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sampled respondents is on awareness of value management application in construction is significantly related.

Table 2 Awareness of Value Management Application in Construction

Awareness VM Application	N	Sum	Mean	RAI	Rk	Chi-sq	p-value
Level of awareness of value management Exercise	235	635	2.7021	0.90	4	25.33	0.000
Adoption of value management in your organization	235	641	2.7277	0.91	3		
Involvement in value management exercise	235	623	2.6511	0.88	5		
Cost effectiveness measure in VM	235	652	2.7745	0.92	2		
Safety and security measures in VM	235	616	2.6213	0.87	6		
Time management in VM	235	635	2.7021	0.90	4		
Quality and management controls in VM	235	668	2.8426	0.95	1		
Valid N (list wise)	235						

Source: Field Survey, 2019

The descriptive analysis of the factors hindering the application value management (VM) practice in construction presented table 3 on five-point likert scale (strongly agree-5 Agree-4, indifferent-3 disagree-2 and strongly disagree-1). The average benchmark at 3.00 (5+4+3+2+1=15/5=3.00) is minimum consideration for the each of the item to be considered as hindering factors. Therefore all the factors hindering the application VM practice were strongly considered as hindrance to value management.

Table 3 Factors **Hindering the Application VM Practice in Construction Industry**

Factors	N	Sum	Mean
Wrong choice of procurement route	235	1040	4.4255
Failure to admit ignorance in certain specialized aspects on project development	235	998	4.2468

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Lack of awareness of VM by practitioners in the construction industry	235	996	4.2383
Lack of contractual provisions to support VM	235	1049	4.4638
Poor human relation	235	1056	4.4936
Rigid application of standards and tradition without consideration of changing function, technology and value	235	989	4.2085
Lack of good communication among project stakeholders	235	1002	4.2638
Lack of trained value managers in construction industry	235	943	4.0128
Conflicts of interest among project stakeholders	235	917	3.9021
Ambiguous design;	235	1052	4.4766
Time of completion/delay;	235	1001	4.2596
Conflict management	235	1030	4.3830
Inadequate knowledge of benefits of value management	235	1019	4.3362
Lack of involvement of professionals	235	1038	4.4170
Lack of total quality management principles in construction firm	235	1088	4.6298
Greediness of the contractors and consultants	235	1057	4.4979
Lack of total quality management principles in construction firm	235	1089	4.6340
Professional incompetence	235	1050	4.4681
Poor management especially on the part of the client	235	1062	4.5191
Use of wrong/quack professionals for construction	235	1053	4.4809
Works	235	973	4.1404
Technology	235	993	4.2255
Level	235	1006	4.2809
Government policy	235	1045	4.4468
Lack of information	235	1243	4.2894
Lack of finance	235	1095	4.6596
Human factor	235	1031	4.3872
Communication gap	235	995	4.2340
Valid N (list wise)	235		

Source: field survey, 2019

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The result of total variance of factor analysis presented in Table 4 showed the result of total variance of extraction loading after rotation. The cumulative variance of the six the most correlated hindrance factor of value management in Abuja is presented in table 4.5. The eigen value in the table, and the total under eigen value revealed the amount of total variance in the original variable accounted for by each of the components. The variance which is simply the ratio of variance accounted for by each of the component to the total variance of the variables. The analysis required the first six components to be extracted form extracted solution and the most highly emphasized six the most correlated hindrance factor of value management in Abuja. The extraction of sum of the square loadings in the second section explained the variability in original 28 variables. The extracted components explained 65.690% variability in the original variables. therefore this study considerably reduce the data by selecting the extracted components as the most emphasized factors or components with the minimum of 34.31% loss of information.

Table 4: Total Variance of Hindrance Factors to Value Management.

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.078	28.851	28.851	8.078	28.851	28.851	4.084	14.587	14.587
2	3.300	11.786	40.637	3.300	11.786	40.637	3.484	12.444	27.031
3	2.385	8.519	49.156	2.385	8.519	49.156	3.383	12.082	39.112
4	2.082	7.435	56.591	2.082	7.435	56.591	2.886	10.306	49.418
5	1.387	4.953	61.544	1.387	4.953	61.544	2.845	10.161	59.580
6	1.161	4.146	65.690	1.161	4.146	65.690	1.711	6.110	65.690
7	.986	3.520	69.210						

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8	.892	3.184	72.394						
9	.852	3.044	75.438						
10	.800	2.856	78.294						
11	.727	2.598	80.892						
12	.679	2.425	83.317						
13	.637	2.276	85.593						
14	.511	1.825	87.417						
15	.480	1.713	89.130						
16	.462	1.650	90.780						
17	.363	1.295	92.075						
18	.341	1.216	93.291						
19	.292	1.044	94.335						
20	.271	.968	95.303						
21	.264	.944	96.247						
22	.217	.775	97.022						
23	.196	.702	97.723						
24	.178	.637	98.360						
25	.151	.538	98.898						
26	.112	.400	99.297						
27	.106	.379	99.677						

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28	.091	.323	100.000						
Extraction Method: Principal Component Analysis.									

The result of factor loading analysis of hindrance factors is presented in table 5, revealed that the six the most high emphasized factors were loaded which constituted about 65.690% variance in the factors hindering value management application. The cut-off point for this study is taken 0.5 and above as general rule of thumb applied. The most important factor one (1) is technical and public policy factors and it explained about 14.587% variance in the determination of factor hindering value management application. Factor (2) is professional negligence and it explained 12.444% variance in the factor hindering value management application, factor (3) is named as Non- complacency and management defect and it explained 12.082% variance in the determination of factor hindering value management application. Factor four (4) is named as Human factor and inflexibility, and it explained 10.306% variance in the determining the factor hindering value management application. Factor (5) is named as lack of manpower and project focus, and it explained 10.161% variance in the determination of factor hindering value management application. Factor (6) is named as poor knowledge, and it explained 6.11% variance in the determination of factor hindering value management application.

Table 5: Factor Loading Analysis of Hindrance factors to VM in Construction.

Factors	Factor loading	Eigen value	% of variance
Factor 1: Technical and public policy factors		8.078	14.587
Technology level	.713		
Government policy	.618		
Lack of good communication among project stakeholders	.657		
Conflict management	.655		
Lack of finance	.610		

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Factor 2: Professional negligence		3.300	12.444
Wrong choice of procurement route	.762		
Failure to admit ignorance in certain specialized aspects on project development	.856		
Lack of awareness of VM by practitioners in the construction industry	.797		
Ambiguous design;	.639		
Lack of involvement of professionals	.597		
Factors 3: Non- complacency and management defect		2.385	12.082
Lack of total quality management principles in construction firm	.675		
Greediness of the contractors and consultants	.664		
Lack of total quality management principles in construction firm	.797		
Poor management especially on the part of the client	.657		
Use of wrong/quack professionals for construction	.686		
Factor 4: Human factor and inflexibility		2.082	10.306
Lack of contractual provisions to support VM	.768		
Poor human relation	.713		
Rigid application of standards and tradition without consideration of changing function, technology and value	.596		
Factor 5: lack of manpower and project focus		1.387	10.161
Lack of trained value managers in construction industry	.765		
Conflicts of interest among project stakeholders	.845		
Factor 6: Poor Knowledge		1.161	6.110
Professional incompetence	.629		

Source: field survey, 2019

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Findings and Conclusion.

The study revealed that identified there high level of awareness of value management among the built professionals in Abuja. Furthermore the awareness of quality management control and cost effective measure in value management were important area of VM that constituted about 95% and 92% level of awareness. The study further identified six the most highly emphasized factors hindering the application of value management practice in Abuja, and the six factors constituted about 65.690% variance in the original factors. Technical and public policy, professional negligence, Non- complacency and management defects and human factor constituted four major factors at 14.587%, 12.444%, 12.082% and 10.161% variance respectively.

In the process of implementing value management, certain six hindering factors identified by the professionals posed a great danger to value management implementation, the first four most important factors include technical and public policy, professional negligence non- complacency and management defects, and human factors. The project manager is required to be proactive in addressing the aforementioned factors as they posed critical set back to value management implementation among Nigerian construction companies.

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