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ORIGINAL RESEARCH ARTICLE

VALUE MANAGEMENT CONCEPT IN CONSTRUCTION PROJECTS DELIVERY IN KANO STATE

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ABSTRACT

Construction projects delivery play an important role in the economic development of any nation. Nevertheless, review of project documents in Nigeria and Kano State in particular indicates that, the design of these projects is such that the whole life-value is not achieved. One of the suitable tools for the compensation of this drawback is the use of Value Management (VM) technique. This paper presents that the use of organized framework for the VM technique in the initial phase of a project generates good ideas that has the capacity to increase the project value. The objective of the study is to investigate the application of the VM in public construction projects, identify the constraint factors limiting its application, and suggest ways to expand its use in the built environment. Questionnaire survey methodology, addressed to government ministries and agencies actively involved in construction and to project management consulting firms, was utilized. A total of 94 questionnaires responses were received from 7 ministries and agencies. Another 13 responses were received from randomly selected consulting firms. The data was analyzed using SPSS 23 version. It was found that value management as a formal programme is not applied to the development of construction projects in Kano State. Lack of knowledge about the value management technique and its financial and technical benefits was found to be among the constraint factors of its application. Furthermore, lack of government demand on VM, unfamiliarity with VM technique, and unavailability of experts to perform were determined to be the top constraint factors. Therefore, it is recommended that the promotion of value management use can be achieved by creating awareness among the construction stakeholders, gaining top management support, providing training programmes, guideline, and financial incentives to procurement administrators

1.0 Introduction

Construction projects play a significant role in the economic development of every nation. In most developed and developing nations, these projects absorb large sums of the capital asset investment in the state budget, and the construction industry in Nigeria is no exception (Dahiru and Bashir, 2017). From 1999 to 2017 thousands of billions of naira were invested exclusively in infrastructure projects development in Kano State. Regrettably, the survey conducted on these projects show that, in the design stage of the development, innovation is not considered. In Nigeria, since remuneration of consultants in the design phase is based on the percentage of

implementation costs, consultants incline to increase these costs (Leje et al., 2017). On the other hand, the owner tendency for faster operating of the project eliminates the possibility of innovation in the design stage. This leads to poor design and reduction of the project value. Therefore, it is required to use a suitable tool in order to compensate this drawback. For this purpose, Mesbah (2014) observed that use of the Value Management (VM) technique is one of the best tools designed to achieve the necessary functions of a project at the lowest resulting cost with optimum value for money. Akram et al. (2011) defined the technique as a tool concerned about the relationship between function, value, quality and cost, with functional analysis as its principal components. VM is a systematic approach for analyzing the functional requirements of products or services to obtain the essential functions at the lowest total cost (Rangelova and Traykoval, 2014; Musa et al., 2016). In fact, it aims to reduce overall project costs through identifying and eliminating unnecessary costs. In addition, the successful implementation of a VM practice can result in update of standards and policies, and quality improvement of products (Green and Liu, 2007). Based on available technical literature on the global network of information, VM techniques have been able to make significant changes in the integrative management of complex and large projects as an effective instrument (Spaulding, 2005; Suhaimi, 2014; Todorut and Tselentis, 2015; Musa et al., 2016).

Value management (VM) is a well-known and applied technique throughout the world. It is applied in construction as an efficient tool to achieve overall project success. Todorut and Tselentis (2015) emphasized that VM can be described as a systematic creative study performed on the project, aimed to achieve the project functions needed at the lowest possible cost without sacrificing quality, performance or reliability. The VM study can cover the architectural design of the project as well as the choice of its systems, materials and components (Rangelova and Traykoval, 2014). Suhaimi (2014) pointed out that the benefits of VM are well recognized, making its application necessary in almost all construction projects. However, the concept of value management is relatively new in Kano State but the extent of its awareness and application is investigated in this study.

1.1 Statement of Research Problem

The Public Procurement Act (2007) emphasized the application of value for money standards and practices in the delivery of public construction projects for improving service delivery. The best way of improving service delivery in the construction industry is through value management practice (Akram et al., 2011; Oke and Ogunsemi, 2011; Hayatu, 2015). To improve service delivery through the application of value for money standards in the Nigerian construction industry as contained in the Public Procurement Act (PPA) 2007, there is the need to adopt value management as it is at the forefront for achieving and enhancing value for money (Hayatu, 2015). However, value management has not been fully embraced in the Nigerian construction Industry (Oke and Ogunsemi, 2011; Dahiru, 2018; Bashir and Dahiru, 2018). It is in view of this that the study was carried out to assess the level of personnel knowledge and reasons/or constraints for not applying value management with a view to achieve value for money in project delivery. Bowen (2010) conducted a theoretical research and recognized that VM is suitable for application at the early state of project development. To maximize the benefits of VM, Bashir and Dahiru (2018) observed that government has the responsibility to enforce regulations on the VM application on public construction projects. However, the Kano State government is yet to fully embrace value management techniques despite its advocacy. Thus,

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there is the need to investigate the factors influencing the application of value management in Kano State so as to provide an understanding as to why value management is yet to be fully embraced and also provide a guide on the necessary steps for its adoption in the construction industry.

2.0 Methodology

Relevant literature was reviewed so as to discuss the development and application of value management. This was to provide an insight on the subject matter as well as the practice in the construction industry. The survey method used in this study was employed to reveal the opinion of architects, quantity surveyors and engineers regarding the constraint factors surrounding the application of value management technique in public construction project delivery. The data for the study was generated using a stratified sampling technique conducted with seven (7) government ministries and agencies heavily involved in the public construction projects in Kano State. Such ministries/or government agencies include: ministry of works and transport; ministry of land and housing development; ministry of education; ministry of local government; ministry of environment; ministry of health; and Kano Urban Protection and Development Authority (KNUPDA). On average, ten (10) respondents (architects, quantity Surveyors and engineers) were surveyed from each ministry/or public agency. A total of 120 questionnaires were administered to the respondents of which 94 (78%) response rate were returned and ready for the analysis. Similarly, 13 project management consulting firms were interviewed utilizing a similar questionnaire. The survey used the questionnaire to collect data from the two groups of respondents (public clients and project management consulting firms). The data inquired about the respondents' knowledge of VM and its application and the possible constraints against VM future application. These were analyzed using SPSS 23 version to assess the factors constraining VM application. Data on the importance of VM, its cost and expected savings as well as the suitable time for conducting VM study were obtained through interview method and assessed using tables with a view to seek the respondents' opinions on its relevance in achieving value for money projects.

3.0 Results and Discussion

Twenty-five (25) responses were received from the project participants mainly architects, quantity surveyors, and engineers working at the state ministry for local governments; works, land and housing development, education, health, environment, and Kano Urban Protection and Development Authority (KNUPDA) as shown in Table1. Ten (10) of the respondents supported that VM is important for all construction projects regardless of the size. Five (5) consider it important only for projects costing over 20 million naira. The remaining ten (10) respondents indicated that value management should be done on projects over N50 million (Table 2). This shows that all respondents consider value management necessary for public construction projects over N20 million. These findings corroborate with the findings of Todorut and Tselentis (2015) that VM techniques is an effective instrument for the development of both complex and large projects that attract high capital outlay.

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Table 1: Participants drawn from various ministries

Participants' ministries	Frequencies of responses by the respondents			Total
	Architects	Q/Surveyors	Engineers	
Ministry of works	2	2	1	5
Ministry of land & Housing Dev.	1	2	1	4
Ministry for local government	1	1	1	3
Ministry of education	1	2	1	4
Ministry of health	1	1	1	3
Ministry of environment	1	1	1	3
KNUPDA	1	1	1	3
Total responses	8	10	7	25

All of the respondents believed that a government regulation should enforce VM for public construction projects. However, only few thought that it should be enforced to all construction projects of all sizes. Six others believed that value management should not be enforced for projects of less than N20 million. The remaining five said that VM should only be enforced on projects over N50 million, which concludes again that all respondents believe that value management should be enforced in public construction projects over N20 million.

Table 2: Respondents' perception regarding the VM application on project value

Project value in Naira	Frequency of responses by the respondents			Total
	Architects	Q/Surveyors	Engineers	
Less than 10million	0	0	0	0
10million	3	4	3	10
20million	2	2	1	5
50million	3	4	3	10
Total responses	8	10	7	25

3.1 Level of personal knowledge about value management

Only 12% of respondents worked in government agencies indicated that they know the value management concept very well, while 74% of the management consulting firms indicated the same claim as shown in Table 3. The level of personal knowledge of VM among construction professionals working in public organizations is low in spite of the fact that most construction professionals worked in ministries and agencies indicated that they attended the VM workshops. However, construction professionals working in the management consultancy firms have adequate knowledge on value management as indicated on the same Table 3. Half of the management consultancy firms are medium sized firms employing between 6 -10 personnel and the other half are large firms employing more than 10 personnel. Table 3 indicates that the concept of value management has recently been introduced in Kano State and is still not well known to the state government construction professions. About 88% of these construction professionals working in government ministries and agencies who responded to the questionnaire knew little or nothing about value management. The value management concept is known to Nigerian built environment professionals by seminars and workshops conducted by

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the professional regulatory bodies such as NIQS, QSRBN, COREN, NIOB, CORBON, NIA, ARCON, etc. The level of knowledge about VM concept among the consulting firms is 74% higher compared to the government offices. The large consulting offices knew more about VM as compared to the small ones. The result implies that formal value management education in various ministries and agencies in Kano State is very limited.

Table 3: Level of personnel knowledge of Value Management

Level of knowledge	Government agency (%)	Management consultancy firms (%)
Never heard of it	39	11
Know little about it	49	15
Know it very well	12	74

3.2 Reasons for not applying value management

Majority of respondents (30%) involved in public construction projects works at government agencies indicated that they are not applying VM in their projects because the concept was never introduced to them. Table 4 shows that 22% of respondents revealed that time given for project design is usually very short and thus limiting the application of VM. Quite number of stakeholders (20%) did not understanding the benefits attached to VM application during the project design. Unavailability of experts to apply VM concept into the project design (17%) has become a constraint factor influencing the application of VM concept. Other respondents (11%) agreed that designs are usually done by best designers, so no need for VM as shown in Table 4.

Table 4: Reasons for not applying value management in government agencies

Reason for not applying VM	Public agencies response (%)
The VM concept of is not introduced practically	30
Lack of experts to apply VM concept in project design	17
Time given for project design is usually very short	22
Lack of understanding the benefits attached to VM application	20
Designs are usually done by best designers, so no need for VM	11
VM concept is not worthwhile	00

Table 5 indicates that 67% of the management-consulting firms indicated that they never conducted VM as they were never asked to perform such service by their clients for an additional fee. 12% of respondents claimed that the concept is not well known. Additionally, 11 % of respondents indicated that VM is just relevant for construction project delivery which they do anyway. Lack of experts to apply VM was agreed by the respondents (10%) as a constraint factor limiting its application. Nobody claimed that value management is not good in achieving value for money.

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Table 5: Reasons for not applying VM in consulting firms

Reason for not applying VM	Professionals in ministries/agencies responses (%)
VM is not adequately known by the majority of consultants	12
Never been asked to conduct VM during the design process for additional fee	67
VM lacks experts to apply it	10
It is just relevant for construction project development which they do anyway	11
It is not good in achieving value for money	00

3.3 Constraint factors limiting VM utilization

The questionnaire survey has a list of twenty (20) constraint factors limiting VM utilization. Respondents were asked to indicate their opinions on the degree of importance of each factor on a scale spanning from 'very important' to 'not important'. Index values were calculated for each factor based on the degree of importance and the frequency of response as shown in Table 6. The first constraint against value management application in public construction projects is that the concept is not well known and the unavailability of experts to apply it. Lack of government regulations to support the VM application and the lack of top management support are influential factors limiting the application of VM. The management-consulting firms indicated that 'the lack of demand on VM' is the top constraint factor limiting its application. Unfamiliarity with VM technique is the second constraint factor and the unavailability of experts to perform it is third factor. The two populations share common grounds in some respects. The following observations can be made: the main problem influencing the practice of value management lies with the government agencies. The top reason for this is lack of knowledge, even at top management levels in the government agencies (Table 6). The government agencies lack expert staff to conduct the value management study on their projects. The management consultancy firms claim that they do not apply VM as the government agencies do not demand for it. This has support the view of Oke and Ogunsemi (2011), Dahiru (2018), Bashir and Dahiru (2018) that value management has not been fully embraced in the Nigerian construction Industry. No government regulations to generally support VM studies and there are no provisions for financial incentives to use VM in the public construction projects.

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Table 6: Constraint factors limiting VM utilization

Constraints against VM application as indicated by professionals employed in ministries/agencies	Professions in ministries/agencies index	Constraints against VM application as indicated by consulting firms	Consulting firms index
VM concept is not well known	98	VM concept is not well known	46
VM is not worthwhile	12	VM is not worthwhile	10
Lack of experts to conduct VM study	76	Lack of experts to conduct VM study	48
Design is done by best designers so no need for VM	19	It is just good for construction project,	33
VM concept is complex in nature	26	VM concept is complex in nature	24
The concept is difficult to get started	36	The concept is difficult to get started	18
Lack of support by the top management	86	Never been asked to conduct VM in the	96
Not ready to conduct VM at the design	52	Not ready to conduct VM at the design	27
Government regulations don't support it	83	The clients will not buy the concept	16
VM will not succeed in Kano state	18	VM will not succeed in Kano	25

3.4 Importance of value management

Table 7 shows that majority of public owners (27%) indicated that VM is important and its application should be enforced on all projects. 26% of public clients indicated that the application should be enforced on projects above N20 million. While, 23% claim that, VM application is suitable for project above N50 million. Furthermore, 12% agreed that VM is suitable for project above N100 million. The remaining 10% agreed that, it is suitable to be applied for project above N150 million. On the other hand, 11% of the consultancy firms claim that VM is suitable to be enforced on all projects. 21% of the respondents agreed that the concept is suitable for project above N20 million. Majority of the respondents (26%) claim that VM is applicable for project above N50 million values. Other 16% agreed to be suitable for project above N100 million values. The remaining 23% of the respondents indicate that VM is relevant for application of project above N150 million worth value as the results are presented on Table 7.

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Table 7: Importance of VM for construction projects delivery

Construction project size	VM importance responses from ministries/agencies	VM enforcement Responses from ministries/agencies	VM enforcement Responses from consulting firms
All construction projects	27	22	11
Projects > N20 million	26	32	21
Projects > N50 million	23	21	26
Projects > N100 million	12	11	16
Projects > N150 million	10	13	23
VM is not important	02	01	03

3.5 Cost of value management study and expected savings

Table 8 indicates that 31% of the public clients are ready to spend 5% of the savings generated on conducting VM studies. Another 28% indicated readiness to spend 6 - 10%. Additionally, 22% of the clients claim their readiness to pay 11-20% of the savings realized while conducting VM studies. The remaining 19% of the public clients agreed to spend over 20% of the savings.

Table 8: Cost of VM study as indicated by public clients

Cost of VM (public clients who are prepared to pay to conduct VM)	Percent (%)
5% of the savings	31
6 - 10% of the savings	28
11 - 20% of the savings	22
Over 20% of the savings	19

When asked about the expected savings VM can achieve as a percentage of the total project cost, the majority of public clients (37%) indicated that VM has expected savings of about 5% of total project cost (Table 9). 35% of the clients revealed that expected savings of VM is about 10% of the total project cost. While 21% have the perception of saving from VM up to 15% of the total project cost (Table 9). The result implies that when VM is appropriately utilized, it has the expected savings ranging from 5 – 15% of the total project cost.

Table 9: Expected savings from VM study as indicated by public owners

Expected savings	Public owners' response (%)
I % of total project cost	4
2 - 5 % of total project cost	37
6 - 10% of total project cost	35
II - 15% of total project cost	21
Over 15% of total project cost	3

3.6 Suitable time for conducting VM study

The findings in Table 10 indicate that 76% of the public clients recognized that VM is suitable for application at the early state of project development. The perception of consulting firms (86%) on the application of VM at the early stage of project development is much higher than the

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public clients. 13% of public clients and 9% of consulting firms have agreed that VM can be applied up to the final design state of project development (Table 10). The results concerning the suitable time for VM application can be summarized by the following: More than 70% of public clients and above 80% of consulting firms agreed that the most suitable time to conduct value management is during the early and final design phase of the project development. This is in conformity with the previous findings of Bowen (2010) that, VM is suitable to be adopted at the design stage of project development.

Table 10: Suitable time for VM application

Suitable time	Public clients response (%)	Consultancy firms response (%)
During early stages	76	86
up to final design	13	09
After the design is awarded	11	05

4.0 Conclusion

The value management practice on construction projects delivery has been identified as the main challenges of the Nigerian construction industry especially at the states level. Several researches have been conducted at the national level to mitigate these challenges through different approaches and strategies and yet absolute resolutions have not been made. Therefore, the study examined these challenges on construction projects delivery in Kano State. Regrettable, results of the findings revealed that value management application is very limited in the state especially among the relevant government employees. The most important reason for not applying value management in the state is due to the unfamiliarity of the concept among the public sector clients as well as local consulting firms. Findings indicate that there are no incentives to the contractors or the consultants to adopt VM technique in public construction projects. Moreover, government agencies lack expert staff to conduct the value management study on their projects. The management consultancy firms claim that they do not apply VM as the government agencies do not demand for it. No government regulations to generally support VM application and there are no provision for financial incentives to use VM in the public construction projects delivery in Kano state. Therefore, it is recommended that training programmes are essential for procurement administrators in the state. Top management support is essential to introduce and operate a successful value management programme in government ministries and agencies. This will greatly help in improving the application of VM capable of improving projects value and reducing the high cost of construction projects in the state.

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