

AN ASSESSMENT OF THE PARTICIPATORY ATTRIBUTES OF
CONSTRUCTION PROFESSIONALS FOR EFFECTIVE VALUE
MANAGEMENT

By

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DECLARATION

I declare that the work in this dissertation entitled AN ASSESSMENT OF PARTICIPATORY ATTRIBUTES OF CONSTRUCTION PROFESSIONALS FOR EFFECTIVE VALUE MAMAGEMENT has been carried out by me in the Department of Quantity Surveying. The information derived from the literature has been duly acknowledged in text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other institution.

YUSUF, AISHAT OLAIDE

Signature

Date

CERTIFICATION

This dissertation entitled AN ASSESSMENT OF THE PARTICIPATORY ATTRIBUTES OF CONSTRUCTION PROFESSIONALS FOR EFFECTIVE VALUE MANAGEMENT by Aishat Olaide Yusuf meets the regulations governing the award of the degree of Master of Science (Quantity Surveying) of the Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

Dr. Adama Baba Kolo
(Chairman, Supervisory Committee)

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Date

DEDICATION

This dissertation is dedicated to my parents, Mr O.R. Yusuf and Mrs K.F. Yusuf.

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I am grateful to ALLAH for giving me strength, wisdom, knowledge and, above all, good health for the duration of my program. My sincere gratitude goes to my supervisors, Dr. B. A. Kolo and Dr. K. J. Adogbo, for their efforts and assistance throughout the duration of this research work. My appreciation also goes to my lecturers; Prof. Y. Ibrahim, Prof. A. D. Ibrahim, Prof. Y. M. Ibrahim , Dr. K.J. Adogbo, Mr A. A. Ali, Dr. M. Abdulrazak, Dr. Y.G. Musa-Haddary, Dr. P.G. Chindo, the Librarians and all staff of the Department of Quantity Surveying for their immense contribution and advice during the period of my studies.

To my parents Mr and Mrs O.R. Yusuf, my friend and love, Prophet Yusuf (A.S.), I am sincerely grateful for your love and the support you have accorded me, I pray that Allah continues to bless you immensely for me. My deepest appreciation goes to my siblings and friends, thanks for being there.

ABSTRACT

Value management is a multidisciplinary team approach with a structured and analytical process for obtaining the best value. Studies carried out on Value management (VM) shows that the success of a VM study largely depends on the effectiveness of the VM team. The importance of team work can't be underestimated as VM has been identified as a team based process. Amongst the impediments to the success of a VM study is lack of multidisciplinary team with appropriate skill mix. Member personality and member ability were found to be attribute of construction professionals. Quantitative research was used and also a questionnaire survey was carried out. The data received was analysed using IBM SPSS 21.0., descriptive and inferential analysis were undertaken. The Pearson correlation and regression analysis was used to test for relationship amongst variables. Construction professionals' personalities and abilities were found to be mostly good with an exception to the listening and conflict resolution skills which they were found wanting which are also important for VM to be successful. The relationship between team composition factors; personality and ability and the skills required for the job plan stages of functional analysis and creativity were found to be positive and statistically significant enabling the researcher to draft a model which can be used during selection of VM team members in order to promote/increase the success of the VM studies. Good listening and conflict resolution skills should be developed to aid success of a value management study.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The attendant dwindling economic fortune of economies around the World has geared up the participant in these sectors (the client in particular) to take up the challenge of ensuring efficient use of their resources to obtain value for money in terms of performance (Eshofonre, 2008). Anyanwu (2013) stated that in Nigeria, many construction projects development have failed owing to the various technical and financial pressures of cost limit, quality and value optimization. Problems of poor project delivery are high and unabated in Nigeria. However, different attempts have been made to address these problems but unfortunately the problems still persists and unabated. However, current studies indicate that value management (VM) is capable of facilitating the achievement of the client's value system. According to Ashola (2008), too often the client value system in the Nigerian construction industry is not achieved. The failure of such clients in achieving their value systems causes them to be dissatisfied with their investment in the Nigerian construction industry. As an alternative to Nigeria's existing practice, the research proposed the application of value management (VM) in order to facilitate the achievement of the client value system in Nigeria. Abdullateef (2011) recommended the introduction of VM into the Nigerian construction industry in order to provide value added services and ultimate to improve the performance of the Nigerian construction industry. Oke and Ogunsemi (2009) recommended the need for professionals to encourage Nigerian construction clients (especially governments at all levels) in the adoption of value management in their projects.

There has been considerable research into the application of VM within the construction industry. These researches have addressed issues such as promoting the use of value management in construction (Kelly, Male and Graham, 2004); adoption of VM (Kolo and Ibrahim, 2010)

adoption rates, inhibitors and success factors for the adoption of VM in the construction industries of individual countries (Fong and Shen, 2000); VM methodologies and techniques (Spaulding, Bridge and Skitmore, 2005; Male and Kelly, 2007); VM performance measures (Lin and Shen, 2007); the relationship between VM and quantity surveying (Kelly and Male, 1988; Ellis, Wood, and Keel, 2005); group dynamics in VM (Leung, 2003); the use of VM to enhance value on public sector projects (Hunter and Kelly, 2003); managing value as a management style (Male, Kelly, Gronqvist and Graham, 2007); client value systems (Kelly, 2007); and hard versus soft VM (Green, 1999; Green and Liu, 2007); conflict stimulation in Value Management (Leung, Ng and Cheung, 2002); value management and sustainability (Pasquire and Abidin, 2007; Shen and Yu, 2012); implementation of Value Management (Bowen, Edwards and Catell, 2009, Jaapar, Zawawi, Ban and Ahmad, 2011); best practice & bench marking (Male, Kelly, Fernie, Gronqvist, Bowles, 1998); integration of Risk and Value Management (Dallas, 2006; Afilal and Smith, 2007); VM for managing the project briefing and design processes (Yu, Shen, Kelly and Hunter,2005); Key competencies of VM facilitators (Thurnell, 2002; Kaufman, 2006; Leung and Kong, 2008); Reasons for applying VM (Leung, 2009). According to Oke and Ogunsemi (2009), Value management has not been fully embraced in Nigerian construction industry as only very few number of value management workshops have been organised so far according to investigation and the workshops were even concluded prematurely. The adoptability of Value Management in the Nigerian Construction Industry was researched by Kolo and Ibrahim (2010) using a theoretical approach.

VM involves the structured, facilitated, multidisciplinary team approach to make explicit the client's value system using function analysis to expose the relationship between time, cost and quality (Kelly and Male, 2004). Value management (VM) is a multidisciplinary team approach with a structured and analytical process for obtaining the best value (Leung and Kong, 2008). Studies carried out on team dynamics in VM indicate ensuring effective team composition

(skills mix) as being the most influential (Bowen, Jay, Catell and Edwards., 2010). In terms of team composition, a key consideration when forming a team is to ensure that all the team members are qualified for the roles they will fill for the team. Wixson and Heydt (1991) commented on the importance of 'people', stating that it is the people involved in the team that have a direct bearing on the success of a value management study .Dawson (2002) stated that because of the 'process' nature of the job plan, little emphasis was placed on the human aspects of the workshop. Indeed, there was little need to do so, as the early field of Value Management had a technical bias as opposed to an executive/managerial one. Missing out on the human side meant ignoring the subtleties of communication, group dynamics and attitude. Tarricone and Luca (2002) identified interpersonal skills and appropriate team composition as part of the successful attributes needed for effective teamwork.

Organizational behaviour is an interdisciplinary field dedicated to understanding individual and group behaviour, interpersonal processes, and organizational dynamics. The field is particularly concerned with group dynamics, how individuals relate to and participate in groups, how leadership is exercised, how organizations function, and how change is effected in organizational settings. Topics such as change, leadership, teams and behaviour are just a few. It is a systematic study of the behaviour of individuals and groups within an organization. Membership and composition of the VM team is a factor that affects team dynamics or processes (Kelly et al., 2004). Hertel, Konradt and Voss (2006) stated that when hiring team members, be sure candidates can fulfill their team roles as well as technical requirements. Researches on team dynamics in VM have concentrated on different aspects of team dynamics making the general assumption that the members of the VM team have the right skills required to perform effectively in a VM. This study took a look at team dynamics in VM from an organizational behaviour point of view or perspective. This study seeks to access the attributes of construction professionals that will be future VM team members.

1.2 STATEMENT OF RESEARCH PROBLEM

Value Management is a team-based approach to problem management in the construction industry. The success of a VM largely depends on the effectiveness of the VM team. Since VM is a proactive team based approach used in identifying/determining the client value system, the attribute and quality of each participating member will bear upon the effectiveness of the VM process.

Amongst the impediments to the success of VM studies is lack of multidisciplinary team with appropriate skill mix. The participatory attributes of construction professionals (CP) given their significance to VM studies are yet unknown and may be responsible for the poor implementation of VM which underpins the assumption of previous studies. The lack of knowledge of construction professionals attributes thus makes the identification of areas for improvement in the implementation very difficult or impossible.

Amongst the variables considered for the effectiveness of teams is team composition (Robbins and Judge, 2013), of which membership has been identified to be an important aspect. There has been studies on issues with regards to teams in VM such as group dynamics (Fong et al., 2001; Leung et al., 2003; Yu et al., 2007), conflict stimulation in VM (Leung et al. , 2002). Bowen et al. (2009) identified team composition as one of the influential factors that affect team dynamics. According to Shen and Liu (2003), the CSF's for value management relating to the VM team were found to have the most significant influence on the success on the VM studies so more attention should be paid to the requirements of the VM team.

However these studies have assumed that the members within the team automatically have the qualities and attributes to effectively perform therein. The characteristics/attributes of members of the construction industry in terms of their participation in VM teams in Nigeria is yet

unknown. Hence this study will look into the capability of the construction professionals to effectively participate in VM team.

1.3 AIM AND OBJECTIVES

1.3.1 AIM

The aim of the study is to assess the participatory attributes of Construction Professionals within VM processes towards enhancing the outcomes of a VM study.

1.3.2 OBJECTIVES

- i. To identify participatory attributes required for VM studies within organizational behaviour framework.
- ii. To develop a theoretical framework that explains the link between organizational behaviour parameters and VM processes.
- iii. To determine the extent to which construction professionals exhibit the participatory attributes required during VM processes of functional analysis and creativity.
- iv. To determine the extent to which professionals demonstrate abilities required within VM processes of functional analysis and creativity.
- v. To establish the relationship between construction professionals participatory attributes and those of VM processes of functional analysis and creativity.

1.4 NEED FOR THE STUDY

From the research carried out by Bowen et al (2010), team dynamics are important in VM of which the composition of the team is also found to influence the effectiveness of a VM study. According to Kelly and Male (2004), the membership and composition of the team will influence behaviour dynamics and outcomes, which are a function of the similarities and differences within the team membership. Team performance depends on the knowledge, skills

and abilities of its individual members. In terms of team composition, a key consideration when forming a team is to ensure that all the team members are qualified for the roles they will fill for the team. This process often entails understanding the knowledge, skills, and abilities (KSAs) of team members as well as the personality traits needed before starting the selection process. This study will help the VM facilitator in choosing qualified team members for the VM study.

According to Oke and Ogunsemi (2009), there has been low implementation of VM in the Nigerian Construction industry and there is the need for professionals to encourage Nigerian construction clients (especially governments at all levels) in the adoption of value management in their projects. Also according to Kolo and Ibrahim (2010), amongst the requirements for VM are

- i. experience and knowledge
- ii. communication
- iii. public sector client
- iv. personalities and reputation
- v. ownership and commitment; all under the “*people*” category and;
- vi. skills and techniques under the “*process*” category;

requirements which the NCI is yet to meet. The study will help in finding out if construction professionals meet up with these requirements or not, aimed at improving implementation.

With the importance of the composition of the VM team and the benefits derived from participating in a VM study having been highlighted, there is a need to find out if the team members in this case the construction professionals have what it takes to effectively participate in a VM study with the aim of tapping into the benefits of VM and also to be able to provide

ways to which the requirements could be met if found wanting. Also the study will help towards developing integrated project teams (IPT).

1.5 SCOPE OF THE STUDY

The team effectiveness model presented by Robbins and Judge (2013) is made of up of 3 categories; context, composition and process. This research took into consideration only the composition category of the team effectiveness model. This is because it is only in the composition category that factors relating to individual members are listed. Also the definition of value management was delimited to those that incorporate its being a team oriented approach rather than other broad based definition of VM. This research work was extended only to construction professionals in FCT Abuja, Lagos, Kano and Kaduna state in the NCI and data obtained from these states served as representation of what is obtainable in other states with in the country.

1.6 LIMITATION OF THE STUDY

The limitations of the study include limited availability of respondents that have participated in a value management study, readiness and willingness of respondents, resource and time constraints. Also the geographical spread of the respondents poses as most of the respondents are not located in one area.

CHAPTER TWO

2.0 LITERATURE REVIEW.

2.1 VALUE MANAGEMENT (VM)

Value management is a structured analytical methodology that seeks to achieve the essential functions of a project at the lowest total cost, consistent with required levels of performance and quality (AZ/NZS 4183, 1994; Total Asset Management, 2000; Department of Housing and Works, 2005; The Facilities Society, 2014). According to Kelly et al (2004), Value management is a service that maximizes the functional value of a project by managing its development from concept to use through the audit of all decisions against a value system determined by the client. The underlying assumption to Value Management is that there are always many ways to achieve any function, and that an examination of alternatives may produce a better-value solution. It involves the structured, facilitated, multidisciplinary team approach to make explicit the client's value system using function analysis to expose the relationship between time, cost and quality (Kelly and Male, 2004). Value management is a team-based approach used to define the client's objectives and ensure that best value, whole-life solutions are selected to satisfy those objectives. Value management (VM) is a multidisciplinary team approach with a structured and analytical process for obtaining the best value (Leung and Kong, 2008).

There are many definitions of construction value management but all contain these key ingredients;

- i. Team orientation
- ii. Makes explicit the clients value system
- iii. Functionally driven

- iv. Proactive and creative
- v. Has an application at a number of stages during the construction process.

Underlying the Value Management theory is the principle that there is always more than one way to achieve project objectives and that examination of the alternatives will produce the most acceptable conclusion. At the core of the Value Management process is the analysis of functions from the point of view of the system as a whole (including the relationship or cost impact of design decisions on the project and/or scheme operation). This aspect distinguishes Value Management from other methods of improving value. Function analysis involves identifying what things actually do or perhaps more importantly, what they must do to achieve the objectives. Through the analysis of functions, wastage, duplication and unnecessary expenditure can be identified giving opportunity for value to be improved.

The functional analysis perspective not only enables Value Management to explore the project and/or program brief but also to test the assumptions and needs perceived by the author(s) of the brief.

2.1.2 HISTORY OF VALUE MANAGEMENT

Value management was developed by Lawrence Miles of the General Electrical Company in 1947, spread widely into the engineering and manufacturing processes of the USA. At that time it was referred to as value analysis. In 1954, the Navy Bureau of Ships introduced the technique, and later the Department of Defense introduced incentive clauses to its suppliers and contractors to implement this technique now renamed value engineering. In 1959 the formation of the Society of American Value Engineers (now SAVE International) formalized the term 'Value engineering', which is the term most used in the USA today. Value engineering was introduced into the construction industry in the early 1960s and it became a trend thereafter. In 1972 the US General Services Administration (GSA) required the inclusion of VE incentive

provisions in all of its construction contracts. Other government agencies, such as the Facilities Division of the National Aeronautics and Space Agency, also applied VE. Value engineering in the UK began in the 1960s manufacturing sector and led to the establishment in 1966 of the Value Engineering Association. This organization changed its name to the Institute of Value Management and value engineering to value management. The term value management is common used, and value engineering is seen as a subset to value management. Value management applied to construction became popular in the UK in the early to middle 1990s (Kelly, Morledge and Wilkinson, 2002). VM has come to be considered as an effective methodology for achieving "best value for money" for clients since its initial application in the construction industry: many countries around the world have observed the successful application of VM in the construction industry (Shen and Liu, 2003). Presently United States Government and many other nations such as United Kingdom, Japan, Korea, Australia, Malaysia, China, Saudi Arabia amongst others adopt Value Management technique to be applied for their Capital work projects.

2.1.3 THE VALUE MANAGEMENT STUDY

A value management study, as defined in BS12947, involves the application of value management to a particular business case identified within a VM programme. Value Management studies are typically led by a qualified facilitator, who should be independent of the design team, familiar with the design and construction process and with the roles of the various members of the design team. VM is a service with three primary core elements, namely, a value system or systems that interact and need to be made explicit in order for value-for-money decisions to be made appropriately, an associated team-based process, and, using function analysis to promote a greater and deeper understanding across value system(s) of why something is or is not required (Male et al, 2005). Appropriate representation of all stakeholders is crucial for creating a holistic perspective, technical expertise and the generation of wide-ranging ideas. It must be remembered that Value

Management is not an attempt to 'design by committee'. Value Management studies may achieve significant results through the consideration of issues such as:

- i. co-location;
- ii. non-build solutions;
- iii. reduction of unnecessary area;
- iv. concentration of expenditure on investment returns;
- v. revenue sources;
- vi. rationalisation;
- vii. risk;
- viii. combination; and
- ix. simplification.

Fig 1 presents the benchmarked interventions points for value studies at stages of the project life cycle. Here value opportunities are taken to mean specific points in the project life cycle for value management interventions. The studies conducted at value opportunity points are;

1. Strategic Briefing Study
2. Project Briefing Study
3. Charette (C) - undertaken in the place of the studies at points 1, 2 and 3
4. Concept Design Workshop.
5. Detail Design Workshop.
6. Operations workshop

a Project awareness	b Client development	A Inception	B Feasibility	C Outline proposals	D Scheme proposal	E Detail design	F Production Information	G Bills of quantities
↑ Pre-brief		↑	↑ Briefing	↑ Concept design		↑ Detail design		
1	2	C	3	4	5			

Fig 1 Value opportunities mapped out on a modified RIBA plan of work.

Source: Male *et al.* (1998). *The Value Management Benchmark* as cited in Kelly *et al.* (2004)

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1. Strategic Briefing Study
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6. Operations workshop

A Study Style was defined by Kelly *et al.* (2004) as an outcome of the stage in the project life cycle at which a value study is carried out and the manner in which the process is conducted.

An important starting point for identifying study styles is the fact that the Benchmarking Study identified a series of intervention points in projects, with associated approaches to studies in

terms of focus, value team composition, method and duration. Male and Kelly (2007) argued that the primary role of the value manager 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 organisational function. Generic study styles comprise (Male et al., 2005):

Study Style 1 (SS1); where an appointed value manager works with an existing multidisciplinary team of record, with the objective of challenging and introducing change into the project / organisation's value system.

Study Style 2 (SS2); where an appointed value manager brings together an independent tailored team of specialists for a value system audit study.

Study Style 3 (SS3); where an appointed value manager works with any existing multidisciplinary team using the structured VM process to assist the team in integrating and prioritising information, understand value problems, structure thinking and develop a way forward such that value systems are and remain in alignment.

Study Style 4 (SS4); where an appointed value manager brings together a tailored independent value team of specialist for a value system audit and subsequent reconfiguration. The analogy of crafting wood will be used to assist in clarifying the study styles

Pre-requisite for a value management study include willing participation, experienced facilitator, appropriate study team with right skill mix, senior management support, isolated workshop environment and presence of client decision takers (DeLeeuw, 2001; Kelly, Morlegde and Wilkinson, 2002; Perera Karunasena, Selvadurai, 2003).

2.1.4 PHASES IN THE VALUE MANAGEMENT PROCESS

Value Management is a service with three primary core elements: a value system, a team based process, with functional analysis providing understanding. According to Male and Kelly (2007), VM encompasses an underlying process with three generic phases; the Orientation and Diagnostic Phase, the Workshop Phase, the Implementation Phase. The studies conducted at value opportunity points using the below generic process;

The Orientation and Diagnostic Phase: This is where the value manager(s) and value team will be preparing themselves for the study, the value manager(s) will meet with the commissioning client, project sponsor, and key stakeholders involved in the study, reviewing documents and possibly conducting interviews and briefings. The study style chosen by the value manager may also include understanding and structuring the value problem in detail, exploring competing value problems, discussing possible solutions and exploring the way forward on completion of the Workshop Phase. The agenda for the Workshop Phase will be developed and the method and manner in which this will be conducted worked out. This phase will also, as a minimum consider, the implementation of options and solutions developed from the workshop phase.

The Workshop Phase: This is the stage where alternative and or complementary views on the value problem will be brought together to explore and reach a way forward, hopefully through agreement. A workshop/study report will normally be produced, including an Action Plan to ensure that value solutions and options will be implemented in the post workshop phase.

The Implementation Phase: This was targeted by the authors' international Benchmarking Study as one of the key areas where value management falls down. The authors have now adopted a variety of approaches to ensure this problem is minimised. Implementation meetings and workshops have been used. As a minimum, during the Orientation and Diagnostic phase

an implementation strategy will be discussed with commissioning clients and wherever possible those responsible for implementation will be interviewed and identified in the Action Plan at the close of the Workshop Phase.

2.1.5 THE JOB PLAN

Value management and value engineering have traditionally been built around the Job Plan, considered by the authors to be a good and effective decision making process, and the language of value management and value engineering normally involves discussion of that process. However, there are as many different Job Plans as there are authors on the subject. The Value Benchmarking Study by Male et al (1998) identified a common underlying process reflecting the similarities, differences and limitations of the different 'Job Plans'. The Job Plan, although widely adapted by many practitioners in different countries, retains the fundamental elements of Miles' original Job Plan. A job plan is a sequential process and strong proponents of it argued that it should be adhered to strictly. Effective, innovative, decision making may require adjustments to the process and the situation may dictate when this will happen. This is a matter of workshop tactics.

There are six stages in the Value Management process, regardless of which type of study is being conducted and they can generally be summarised as (Australian Standard (AS/NZS 4183),1994; De Leeuw, 2001; DHW,2005):

A. Information Phase

The initial segment of the study is devoted to developing a comprehensive understanding of the project and proposals. Brief presentations are made by the key stakeholders to ensure that the entire study group is fully aware of the rationale behind the project and the amount of planning and preliminary work completed to date. The information previously generated in getting the project to its current stage forms part of

the information underpinning the VM study and should be reviewed prior to the workshop

The VM process focuses on the analysis of objectives which the project must satisfy. The common ground already established, the decisions that are “locked in” and the constraints within which solutions must be found will be defined. The participants will be asked to spell out the project objectives, basic assumptions, underlying performance criteria, risks, assumed standards, etc. Opportunities and constraints are explored with regard to areas/issues which are not clearly defined or quantifiable, the analysis centres on establishing what actual performance, features, etc. are required so that appropriate specifications and/or recommendations may be developed.

B. Functional Analysis Phase

Function analysis is a systematic process of identifying functions and their associated cost and assessing the necessity of those functions based on established criteria for the project in the simplest possible way (Steven, 2004; Spaulding, Bridge, & Skitmore, 2005). It helps in identifying the scope of the project by showing the logical relationships of all functions (Canadian Society of Value Analysis, 2013). It is regarded to the quintessence and the heart of Value Management (Male & Kelly, 1989; Stevens 2004; Kelly, et al., 2004; Singh & Jannadi, 2006).

This phase includes functional analysis, establishing system links, testing parameters and rationalising data. Functional, rather than the physical characteristics, of a development is analysed. This phase is concerned with identifying those items/procedures, which most likely, through further investigation, would yield the required results. The purpose of this phase is to understand the project through the perspective function of project. It emphasizes the question of what exactly is to be achieved by the project compared to what is described (perception) during project

proposed. Function Analysis System Technique (FAST) is a method that commonly used in which the basic functions of the components of the project decomposed into a logic model (Jaapar, Maznan, Zawawi, 2012). Other techniques that are normally used in this stage to define functions of a project include SMART [Simple Multi Attribute Rating Technique] developed by Green (1994), Spatial Adjacency Analysis (Male et al. 1998) and Space Function Analysis (Che'Mat, 2004). Depending on the intervention point of value management study, function analyses conducted during early stage of a construction project provide foundation to identify project problems and offer possible solution for best value for money (Kelly, et al., 2004).

C. Creativity Phase

This phase is predominantly concerned with encouraging divergent ideas, lateral thinking and brainstorming, and generating alternatives for better value solutions. Concentrating on the objectives/functions identified during the previous phase, appropriate techniques are employed to assist the group to generate alternative ideas of achieving the required outcomes. In this segment of the study, the emphasis is on creating a large quantity of ideas with discussion and assessment held over to the next stage of the process. Creative problem solving, ability to think creatively, indulging in an 'out-of-the-box' thinking are indispensable elements of a value management study (Ellis, et al., 2005). The Australian methodology particularly prescribe that discussion and assessment be held over to the next phase as it would otherwise tend to inhibit the free flow of ideas. The process requires active participation from workshop participants to produce solutions while facilitator guide through the problem solving. Workshop participant are required to actively involved in discussing solutions for identified problems using sets of tools and techniques. According to Mohamad (2014), this phase uses some creative thinking techniques to guide and stimulate workshop participants in

discovering ideas and solutions to a problem. Some of these techniques include; Brainstorming, Gordon Technique, Morphological Analysis Technique, Evaluation Comparison Technique etc. Ellis et al. (2005) found that brainstorming technique is the most universally used compared to other approaches. The creativity phase (brainstorming phase) is probably the most important phase of a VM exercise but it should be emphasised that all phases should be properly dealt with.

D. Evaluation Phase – ideas are assessed, culled and prioritised, to identify viable alternatives. It is during this phase that detailed assessment of possible alternatives identified during the creativity phase takes place. Ideas are examined from a range of perspectives including capital cost, recurrent/maintenance costs, impact on service delivery, aesthetics, functionality and overall performance. According to study conducted by Fong, Shen and Cheng (2001) on value management framework, they found that there are two stages in Evaluation Phase that are critical in value management study. The first screening refers to the preliminary filtering of ideas from Creativity Phase that has not been evaluated. Ideas that are feasible will be kept and remaining will be discarded. The second stage is the critical evaluation of shortlisted ideas/solution using set of tools or techniques. The filtering process aimed to reduce ideas that do not add value to the existing problems of the study. Ideas to be recommended for implementation or for further investigation are identified with responsibility for such investigation allocated to the VM participants. The weighting technique is found to be commonly used technique during Evaluation phase of a workshop (Fong, et al., 2001; Male & Kelly, 2004; Dallas, 2006b; Green & Liu, 2007). Techniques such as Multi-Criteria Decision Making , Simple Multi Attribute Rating Technique, Simple Additive Weighting

Method (SAWM), Paired comparisons , Life Cycle Costing and Analysis Matrix are used to select the optimum solutions for further development.

E. Development Phase

Options and rationale are refined and documented into action plans, for recommendation to the appropriate project decision-makers. The ideas/alternatives identified in the evaluation phase are technically developed and analysed during the development phase by the participants and/or members of the professional team. The development phase is generally not a workshop activity but is dealt with in the office environment. The shortlisted solutions derived from the Evaluation Phase will be further developed into a workable document, Action plan and VM report to be presented to a client (NSW Treasury, 2004; Che'Mat, 2010). Documents such as drawings, specification, calculations, estimates, cost comparison, Cost-Benefit Analysis (Dell'Isola, 1982) and vendor information are included to support the ideas. A Development and Risk Management plan is developed for each alternative so as to ascertain the programming need for the solutions to take place (SAVE International, 2007). The outcome of this phase will produce a comprehensive report (i.e. value proposal) to ensure that the client and other key stakeholders understand the rationale of the proposed alternatives and also to generate interest that will sanction implementation

F. Reporting and recommendation Phase

In this phase of the VM study, the participants agree the outcomes and recommendations flowing from the study and identify the actions necessary to keep the project on track and to meet key milestones. Each recommendation is to be tested against the objectives determined earlier.

2.1.6 APPROACHES TO VALUE MANAGEMENT

According to Male and Kelly (1989), formal approaches to VM include 40h workshop, the charette, the VM audit, the concurrent workshop, the contractor's value management change proposal. Those of the most popular approaches are discussed below:

The charette: This approach is undertaken at the end of the compilation of the brief, after the appointment of the design team but before design commences. Client representatives and the design team meet under the chairmanship of the value manager for one or two days. The value manager acting as chairman is termed the value management team coordinator (VMTC). Initially the client explains the brief to the design team and answers questions on it. Subsequently the value manager directs the suggestion session, utilizing the brief as the basis in which ideas are generated to improve the cost effectiveness of the building. These ideas recorded by the value managers are either accepted or rejected. These ideas are either built into the brief or used by the design team for guidance.

The 40 hour workshop: The 40 hour, five day workshop is the most widely accepted formal approach to value management and is seen as being quick and economical. It comprises the formation of a second design team to review the design at 35% of design or sketch design stage and it is chaired by the Value Management Team Co-ordinator (VMTC). The VM team will work through the phases of the job plan with perhaps the exception of the information phase which will have been in process a few days/weeks before the workshop is conducted, depending on the complexity of the project.

The Value Management Audit: This follows the same procedure as either a charette or the 40 hour workshop. Its objective is to give a corporate or public client a clear indication of the worth of a scheme or development inspired by a subsidiary. The parent organization may then appoint a value manager to carry out a charette in consultation with personnel from the

subsidiary company and their design team. Alternatively, the parent company may appoint a value management team to carry out a full feasibility study after the proposed scheme has been developed to sketch design stage.

The concurrent workshop: it resolves the problems that could arise with the 40 hour workshop by using the existing design team under the chairmanship of a value manager. The group will meet together throughout the design stage to value analyse the emerging design.

The contractor's value management change proposal (VMCP): This is a change inspired by the contractor on a project once it has been let. If the VMCP is accepted by the design team, the contractor will then share in any cost saving. For a fixed price contract, the contractor would obtain 55% of the savings and for a cost reimbursable contract, the figure would be 25%.

2.1.7 FUNCTIONAL ANALYSIS

At the core of the Value Management process is the analysis of functions from the point of view of the system as a whole (including the relationship or cost impact of design decisions on the project and/or scheme operation). This aspect distinguishes Value Management from other methods of improving value. Functional analysis is a complex and many-faceted matter. Che' Mat (2007) explained that function analysis involves clearly identifying what things actually do, or what they must do to achieve the project objectives.

Functions can be split into primary and secondary function and detailed as such. Primary functions are functions that are critical to the success while secondary functions support the primary functions. If a function is not necessary then it may be eliminated. If a function is essential then other more cost effective methods may be found to perform the same function. Many facilitators use a verb/noun method of describing functions. The function of an item or a system is generally expressed in as concise a phrase as possible, generally using a single verb

and a single noun. The experienced facilitator will decide to what extent functional analysis is required in a specific circumstance. Whilst functional analysis certainly contributes to the understanding of the project and its constituent parts some techniques such as FAST (functional analysis systems technique) takes time to complete and there is a tendency to give up on partially completed FAST diagrams when difficulties are encountered or time runs out. This will have team members wondering why they started in the first place (DeLeeuw, 2001).

Through the analysis of functions, it is possible to identify the wastage, duplication and unnecessary expenditure thus providing the opportunity for value to be improved. The function analysis perspective not only enables Value Management to explore the project and /or program brief but also test the assumption and needs perceived by the author of the brief. Functional analysis aids clarity of thought and enables individuals to consider a wide range of solutions.

2.1.8 THE VALUE MANAGEMENT WORKSHOP

The workshop approach typically adopted for VM is intended to produce the brainstorming synergies obtainable from an interventionist assembly of relevant project stakeholders, and follows a format similar to the standard methodology proposed by SAVE International (Bowen et al.,2010). The Value Management workshop forms the pivotal element of the total process with all phases of the “job plan” being addressed either whole or in part. The Workshop reinforces the need to achieve a time commitment from key participants for the full workshop session. The Workshop process capitalises on the opportunity to explore the overlapping areas of knowledge and experience between the various disciplines and interests groups (TAM, 2000). A value management workshop is normally led by an independent, skilled and qualified value management facilitator. The same level of independence and skill is not required for a value engineering workshop which could be facilitated, for example, by a knowledgeable and appropriately skilled project manager or cost consultant

In following the process outlined earlier, there are no hard and fast rules regarding the duration of a formal Value Management study, other than sufficient time be allocated, to allow all phases and issues to be appropriately explored and addressed. The total study may take three to six weeks to complete, with the workshop, which is the key part of each study, generally taking between one and three days. Of course, less formal application of the principles of Value Management can be used in a much more immediate fashion, or integrated into the continued management over the entire life of a project, while still offering great benefits. As well as the inclusion of key stakeholders, the inclusion of the appropriate design professionals and technical experts contribute heavily to the success of Value Management studies. Their involvement, like senior stakeholders, or members of the community, may not cover the entire period of the study, but it is important that they are readily available, when required by the central study team.

The workshop provides the vehicle for bringing together the key stakeholders in a forum which:

- i. maximises their contribution;
- ii. draws on the combined knowledge of people from a variety of disciplines;
- iii. takes advantage of group dynamics, rather than relying on input from individuals in isolation; and
- iv. helps to bring into perspective the project as a whole, rather than as a collection of independent elements. (TAM, 2000; DHW, 2005).

For practical reasons, the number of participants should be actively managed so as to not become unwieldy, while maintaining a wide representation. For example, an appropriate number of participants for major public sector projects may be around 17 people. To gain the maximum benefits from the exercise, it is crucial that at least half of the participants be drawn from outside the immediate project management team. This helps to ensure that decisions made by the project team are appropriately challenged, and divergent ideas are encouraged.

2.1.9 THE VALUE MANAGEMENT TEAM

According to DHW (2005), selecting the right VM study team is extremely important to ensure that the study is successful and to achieve maximum implementation. The success of any Value Management workshop depends upon having the right mix of skills, key stakeholders, commitment and attitude among the participants. The client and the VM facilitator should discuss the composition of the VM study team. A broad representation of key stakeholders is important.

It is recommended to use selected members of the existing professional team augmented with other experts such as a facilities manager, independent property developers, specialist engineers, etc. A team can include users, suppliers, independent experts, regulators, stakeholders, and other affected parties. Some North American VM experts have the opposite view and are of the opinion that the professional team should only be used during the information phase but that the creativity phase should be comprised of outsiders (professionals) only. There are obvious advantages and disadvantages in employing the one or other participant selection. The typical value study team will convene at, or as near as possible, to the site.

The Value Study Team participates in the Workshop Session to provide the structure and independent level of enquiry, probing and discussion on the study topic. Typical roles of the Value Study Team members include facilitation, organisation, reporting, and technical independence (TAM, 2000). In addition to the multi-disciplinary team of professionals, a facilitator needs to be appointed to guide the team through the entire value engineering processes. The facilitator may be from the client's organization or an outsider, he may be a member of the team or an independent practitioner. The success of any value engineering workshop largely depends on the skills and competencies of the facilitator coupled with that of team members.

2.1.10 BENEFITS OF VALUE MANAGEMENT

The Institute of Value Management (2008) observed that the most visible benefits arising out of the application of value management include: better business decisions by providing decision makers a sound basis for their choice; improved products and services to external customers by clearly understanding, and giving due priority to their real needs; enhanced competitiveness by facilitating technical and organizational innovation; a common value culture, thus enhancing every member's understanding of the organization's goals; improved internal communication and common knowledge of the main success factors for the organization; simultaneously enhanced communication and efficiency by developing multidisciplinary and multitask teamwork; and decisions which can be supported by the stakeholders. These benefits are available to providers and consumers in all sectors of the society: the industrial sector including manufacturing, construction and processing; the services sector, both public and private; and the government, health, education and other public activities.

According to New South Wales Treasury (2004), benefits of a Value Management are:

- i. a better understanding of needs and the functions necessary to meet those needs
- ii. a better definition of program or project objectives
- iii. a better definition of quality and performance standards
- iv. clearer briefs
- v. reduced wastage of resources
- vi. capital funds savings
- vii. improved operational efficiencies
- viii. team building and strategies which
 - a) create a climate of shared understanding

- b) reduce conflict and risks
- c) foster joint ownership of problems and solutions
- d) create new ideas for improved outcomes
- e) enhance the skills of the participants
- f) save on project development time and ultimate service delivery to the community.

Value Management also aims to produce results creatively and economically by (DHW, 2005):

- i. identifying unnecessary expenditure;
- ii. challenging assumptions;
- iii. generating alternative ideas;
- iv. promoting innovation;
- v. optimising resources;
- vi. saving time, money and energy;
- vii. simplifying methods and procedures;
- viii. eliminating redundant features;
- ix. updating standards, criteria and objectives;
- x. improving team performance and other synergies; and
- xi. consideration of whole of life cycle costs.

Value Management principles can be applied to social and environmental factors in similar ways that it traditionally has to financial and economic factors. Strategic planning processes can also benefit from these principles, as well as from the information supplied as part of a Value Management study.

Other benefits that showcase the evolving nature of Value Management as something more than a sophisticated cost reduction tool (i.e. cost savings) are:

- i. improved communication, teamwork and cooperation;
- ii. increased awareness and ownership by stakeholders;
- iii. time savings through focus of effort;
- iv. aid to the briefing and approvals process;
- v. enhancement of risk management measures;
- vi. increased quality;
- vii. improved sustainability; and
- viii. promotion of innovative service delivery processes.

The benefits of Value Management techniques are greatest early in the development of a project, with improvement in value gained far outweighing the time and effort involved. This is particularly the case if applied during concept development and the initial design stages, with the ability to significantly influence final project outcomes diminishing rapidly, as the project progresses past the design development stage.

2.1.11 HINDRANCES/CHALLENGES TO VALUE MANAGEMENT

The main constraints in application of VM in the construction industry can be identified as:

- i. Lack of support from Clients (Perera et al, 2003; Fong and Shen, 2000)
- ii. Designers don't like to change their initial design concept.
- iii. Traditional cost methods are better than VM.
- iv. There is no standard procedure available for VM process.
- v. The construction industry regulatory body does not actively encourage the practice of VM in their documentation, advice or guidance on projects (Perera et al, 2003).

According to Whyte and Cammarano (2012), the following are also hindrances to VM;

- i. Time limitations
- ii. Lack of understanding
- iii. Faulty ambiguous drawings or non-standard drawings
- iv. Lack of commitment
- v. Lack of support
- vi. Confrontational relationships

Major problems encountered in a VM studies include (Fong and Shen, 2000)

- i. Inadequate briefing by the value management facilitator
- ii. Insufficient time/no time to carry out a detailed study
- iii. Lack of VM specialists
- iv. Defensive attitude of the original design team
- v. A prolonged design period
- vi. Interruptions to normal works

Maramaldo (2002) also gave the following as problems;

- i. Unforeseen constraints
- ii. Insufficient data
- iii. Ineffective communication between team members
- iv. Inability to establish effective measure of value
- v. Lack of resources /time
- vi. Lack of commitment by individuals
- vii. Resistance by third parties

Kelly et al. (2002) noted that impediments specific to the workshop environment include issues such as the lack of a multidisciplinary team with an appropriate skills mix; lack of suitable facilitation skills; failure to maintain a structured approach (e.g. straying too far from the standard procedural methodology); ignorance about VM and its purposes among workshop participants; lack of relevant decision-makers in the workshop group; failure to 'own' the workshop outcomes by some participants; failure to undertake or complete an appropriate functional analysis; lack of commitment and support for VM on the part of participants and senior management; and failure to plan for and monitor the implementation of the outcomes of the VM workshop.

2.1.12 APPLICATION OF VALUE MANAGEMENT IN CONSTRUCTION

Value management applied to construction became popular in the UK in the early to middle 1990s (Kelly, Morledge and Wilkinson, 2002). VM has come to be considered as an effective methodology for achieving "best value for money" for clients since its initial application in the construction industry: many countries around the world have observed the successful application of VM in the construction industry (Shen and Liu, 2003). Internationally, VM is an emerging paradigm that focuses on continuously increasing the value provided to the client and is widely accepted as an important tool in recent management of construction projects (Ellis et al, 2005). The construction industry is an important field for VM at the international level (Kelly et al., 2004) as it is also critical to the success of projects since it provides a basis for improving value for money in construction (Ashworth & Hogg, 2000). It focuses on value rather than cost and seeks to achieved an optimal balance between time, cost and quality

Consequently, the techniques spread to other countries such as Germany, France, India, Japan, Saudi Arabia, Hong Kong, Australia, New Zealand and Malaysia. Researchers from different countries have conducted actively cited researches on VM which have contributed

significantly to the development of VM. These researches covered both hard and soft elements of VM such as process improvement, technique innovation, exploration of current practices and the elements of human behaviour (Jaapar et al, 2011). There are varied VM applications across the construction industry that exemplifies the versatility of VM. Implementation has been in life cycle costing terms to ensure maximum value across the life cycle of the built facility, in sustainability to confirm that sustainable issues are addressed, and in procurement to ensure selection of the best procurement route available (Hunter and Kelly, 2004). VM is also used to improve particular aspects of the project such as; operations and communications amongst the project team, partnering relationships, the development of bid proposals, to aid the briefing process in client organisations, and the exploration of scope for business development. This range of applications highlights the diversity of the VM methodology. It should be noted that the types of application outlined are not all specific to the construction industry and could be initiated elsewhere.

Low implementation of Value Management in the Nigerian Construction Industry was established by Oke and Ogunsemi (2009). Kolo and Ibrahim (2010) theorized that Value Management is not adoptable in the Nigerian Construction industry. Oke and Ogunsemi (2009) recommends the need for professionals to encourage Nigerian construction clients (especially governments at all levels) in the adoption of value management in their projects. Furthermore, the Federal Government of Nigeria (FGN) had only recently decreed the enforcement of 'Application of value-for-money standards and practices for the procurement of public assets and services'. A well acclaimed means for achieving value- for- money is Value Management. Also Abdullateef (2011) and Ashola (2008) proposed the application of value management (VM) in the NCI in order to facilitate the achievement of the client value system in Nigeria and to provide value added services and ultimately to improve the performance of the Nigerian construction industry.

2.2 ORGANIZATIONAL BEHAVIOUR

Organizational Behaviour is the study and understanding of individual and group behaviour, and patterns of structure in order to help improve organisational performance and effectiveness (Mullins, 2005). Organisations are made up of their individual members. The individual is a central feature of organisational behaviour and a necessary part of any behavioural situation, whether acting in isolation or as part of a group, in response to expectations of the organisation, or as a result of the influences of the external environment.

Hellriegel, Slocum and Woodman (1998) as cited by Mullins (2005) suggested that: one way to recognise why people behave as they do at work is to view an organisation as an iceberg. What sinks ships isn't always what sailors can see, but what they can't see. The overt, formal aspects focus only on the tip of the iceberg (organisation). It is just as important to focus on what you can't see – the covert, behavioural aspects. Douglas (2003) said “Living as we do in a society that is technologically and scientifically extremely advanced, most kinds of professional advancement are close to impossible without the mastery of one or more specialised branches of systematic technical knowledge ... What is the downside? Organisations in most sectors – and especially in ones that are particularly demanding from a scientific or technical point of view – are operating in environments where collaboration, teamwork, and an awareness of the commercial implications of technical research are as important as scientific and technical skills themselves. Personnel with scientific and technical skills significantly disproportionate to their ‘people’ skills – by which I primarily mean people management capabilities and knowledge of how to work with maximum effectiveness as part of a team – are increasingly unlikely to be as much of an asset to their organisation as they ought to be”.

Wixson and Heydt (1991) commented on the importance of 'people', stating that it is the people involved in the team that have a direct bearing on the success of a value management study. As VM/VE is an intensive interdisciplinary group problem solving activity, it follows that this interdisciplinary group also must be a high performance team. They also stated that attention to the people side as well as the VE technique is imperative for good performance. Dawson (2002) stated that because of the 'process' nature of the job plan, little emphasis was placed on the human aspects of the workshop. Indeed, there was little need to do so, as the early field of Value Management had a technical bias as opposed to an executive/managerial one. Missing out on the human side meant ignoring the subtleties of communication, group dynamics and attitude. He observed that of recent times there is a greater understanding and appreciation of human synergistic.

2.3 TEAMS AND GROUPS

A group is a collection of individuals. A work group is a group that interacts primarily to share information and to make decisions to help each member perform within his or her responsibility (Robbins and Judge, 2013). According to Schein (1988) as cited by Mullins (2005), further defined a group to be any number of people who (a) interact with one another; (b) are psychologically aware of one another and (c) perceive themselves to be a group. All teams are groups but it doesn't follow that all groups are teams. A team is a cohesive coalition of people working together to achieve mutual goals. As defined by Robbins and Judge (2013), a work team is a group whose individual effort result in the performance that is greater than the sum of the individual inputs. According to Crainer (1998), "teams occur when a number of people have a common goal and recognize that their personal success is dependent on the success of others. They are all interdependent. In practice, this means that in most teams people

will contribute individual skills many of which will be different. It also means that the full tensions and counter-balance of human behaviour will need to be demonstrated in the team”.

The table below gives the difference between groups and teams

Table 1: Difference between Work Groups and Teams

Work Groups	Teams
Individual accountability	Individual and mutual accountability
Come together to share information and perspectives	Frequently come together for discussion, decision making, problem solving, and planning.
Focus on individual goals	Focus on team goals
Produce individual work products	Produce collective work products
Define individual roles, responsibilities, and tasks	Define individual roles, responsibilities, and tasks to help team do its work; often share and rotate them
Concern with one's own outcome and challenges	Concern with outcomes of everyone and challenges the team faces
Purpose, goals, approach to work shaped by manager	Purpose, goals, approach to work shaped by team leader with team members

Source: Robbins and Judge. Organizational Behaviour. (2013)

2.3.1 TYPES OF TEAMS

There are different types of teams. There are:

- i. Cross-functional teams: These are teams in which individuals/ employees from different areas/parts of the organization staff the team/come together to accomplish a task.
- ii. Virtual teams: These are teams in which members are not located in the same physical place. They use computer technology to tie together physically dispersed members in order to achieve a common goal.
- iii. Temporary teams: These are teams that address a specific issue/ problem until is resolved.
- iv. Problem solving team: This a group of 5 to 12 employees from the same department who meet in few hours for a week to discuss ways of the quality, efficiency of the work environment.
- v. Self-managed teams: This is a group of 10 to 15 people who take on responsibilities of their supervisors.

Construction project teams are temporary formal teams that bring together the knowledge and skills of people from various professional and business backgrounds to identify tasks and solve problems in the realization of the construction project. Project teams can comprise of people either from within the same organization (intra-organizational project teams) or from the different organizations (inter-organizational project teams). Value management teams may comprise both.

2.3.2 TEAM EFFECTIVENESS

Teams have come to be considered as a central element in the functioning of organizations. Teams provide diversity in knowledge, attitudes, skills and experience, whose integration makes it possible to offer rapid, flexible and innovative responses to problems and challenges, promoting performance and improving the satisfaction of those making up the team. Thus, the

success of organizations and the overall production of knowledge depend to a large extent on the effectiveness of teams (Wuchty, Jones & Uzzi, 2007).

2.3.2.1 TEAM EFFECTIVENESS MODELS

In an attempt to understand how teams work, a number of authors have proposed models of team performance. Each of these models presents several variables that the author(s) posit influence the effectiveness of teams. Some of the models highlight group structure and interpersonal dynamics, while others tend to focus on the talent and motivation of individual team members. Still others emphasize factors external to the team itself (e.g., a company's culture). Some models were proposed more than three decades ago; some were developed within the past few years.

Five frequently cited team models are:

- i. Rubin, Plovnick, and Fry (1977): This is one of the oldest models of team effectiveness. It is sometimes referred to as the "GRPI Model," which stands for Goals, Roles, Processes, and Interpersonal Relationships. The authors present their model in terms of a pyramid similar to Maslow's Hierarchy of Needs Theory (1954). However, unlike Maslow's theory, this model starts at the top of the pyramid.
- ii. Katzenbach and Smith (1993): Katzenbach and Smith (1993) assert most people realize the capabilities of teams, but there is a natural resistance to moving beyond individual roles, responsibilities, and accountabilities. Katzenbach and Smith depict these team basics in the form of a triangle (see Figure 3). There are three overarching goals in the Katzenbach and Smith (1993) model: (a) Collective Work Products, (b) Personal Growth, and (c) Performance Results. These outcomes are presented in the vertices of the triangle and indicate what teams can deliver. In contrast, the sides and center of the triangle describe the team elements required to make it happen – Commitment, Skills, and Accountability

- iii. LaFasto and Larson (2001): LaFasto and Larson (2001) developed a model of team effectiveness which they refer to as the “Five Dynamics of Team Work and Collaboration.” They theorize that there are five fundamental elements or components which must be understood and actively managed to increase the likelihood of team effectiveness. These elements include organization, environment, team leadership, team problem solving, team relationships, team member.
- iv. Hackman (2002): According to Hackman (2002), team effectiveness is measured by providing products or services that exceed customer expectations, growing team capabilities over time, and satisfying team member needs. Hackman (2002) goes on to clarify the five necessary conditions for team effectiveness as follows: A so-called real team , Possessing a compelling direction, An enabling structure, Supportive organizational context , Expert coaching .
- v. Lencioni (2005): One of the most interesting models of team effectiveness was developed by Lencioni (2005). According to him, all teams have the potential to be dysfunctional. To improve the functioning of a team, it is critical to understand the type and level of dysfunction. Again, a pyramid is used to demonstrate the hierarchical progression of team development. Similar to Maslow’s Hierarchy of Needs Theory (1954), there are five levels and each must be completed to move on to the next one. See Figure 6. There are five potential dysfunctions of a team in Lencioni’s model: Absence of Trust, Fear of Conflict, Lack of Commitment, Avoidance of Accountability, Inattention to Results.
- vi. Lombardo and Eichinger (1995): They originally developed the T7 Model to represent the key facets that influence the performance of work teams. Based upon their review of the research literature, they identified five factors inside the team and two factors outside the team which impact team effectiveness. Each one of the factors was named to begin with the letter “T”. Hence, the name T7 Model. The five internal team factors include: Thrust, Trust, Talent, Teaming Skills, Task Skills. The two external team

factors are: Team-Leader Fit – the degree to which the team leader satisfies the needs of the team members and Team Support from the Organization – the extent to which the leadership of the organization enables the team to perform.

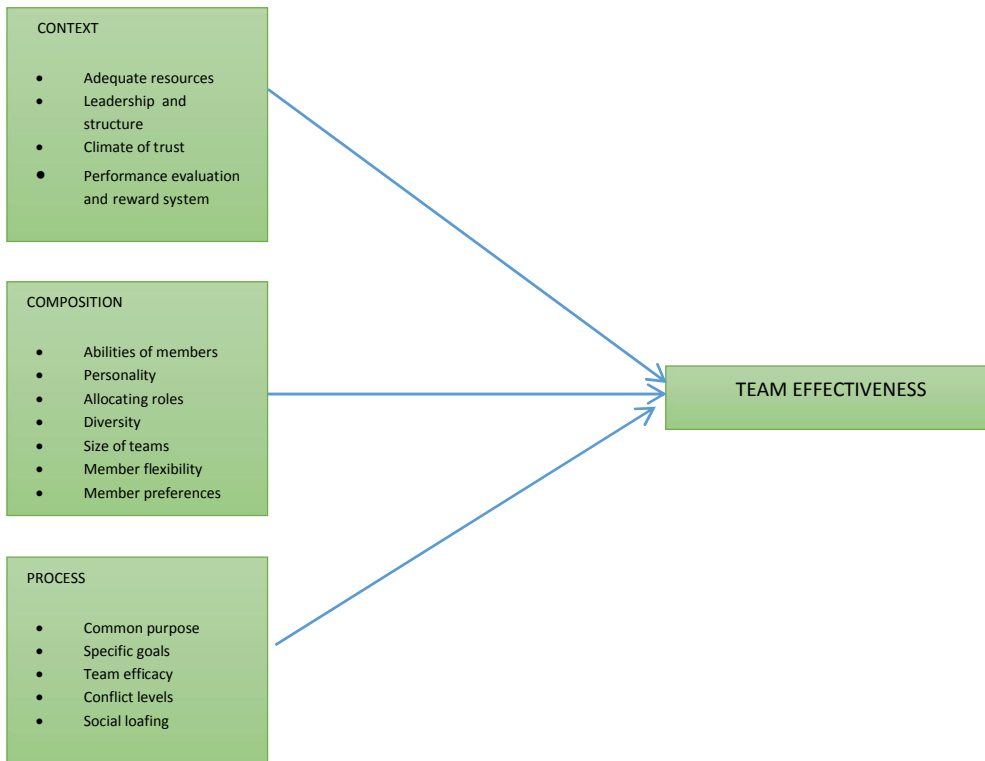


Fig 2. Team Effectiveness model

Source: Robbins and Judge (2013).

According to Robbins and Judge (2013), the key components of effective teams are in three general categories. First are the resources and other *contextual* influences that reflect team contributions that make teams effective. They include

- i. adequate resources
- ii. effective leadership
- iii. a climate of trust, and
- iv. a performance evaluation and reward system.

The second relates to the team's *composition*. Many researches have shown that the components of the team composition such as;

- i. abilities of members
- ii. personality of members
- iii. allocation of roles
- iv. diversity of members
- v. size of team
- vi. member preferences
- vii. member flexibility

have an impact on the performance of the team (DeMatteo et al. ; 1998; Curral et al., 2001; Lefine, 2003; O'Neill and Allen, 2011). Abilities of members and personality of members have been found to impact positively on the performance on teams and there were chosen as the attributes or characteristic of members of a team because of their ability to affect the outcome e.g. outcome of a VM study.

Finally, *process* variables are events within the team that influence effectiveness such as

- i. member commitment to a common purpose
- ii. establishment of specific team goals
- iii. team efficacy
- iv. a managed level of conflict
- v. and minimized social loafing.

In this model given by Robbins and Judge (2013), team effectiveness includes objective measures of the team's productivity, managers' ratings of the team's performance, and aggregate measures of member satisfaction. While designing effective teams, decisions have to be made about team composition (who should be on the team), team size (the optimal number of people on the team), and team diversity (should team members be of similar background, such as all engineers, or of different backgrounds (Saylor Academy, 2015). Teams are most

effective when they comprise members with the right skills for the tasks at hand, are not too large, and contain diversity across team members. In terms of team composition, a key consideration when forming a team is to ensure that all the team members are qualified for the roles they will fill for the team. This process often entails understanding the knowledge, skills, and abilities (KSAs) of team members as well as the personality traits needed before starting the selection process. Richards (2015) explained that there are two types of competencies required in a team; technical competence i.e. the technical skills of the members and personal competence i.e. qualities, skills and abilities of members that allow people to function in a team. Hertel et al. (2006) stated that when hiring team members, be sure candidates can fulfill their team roles as well as technical requirements. Some people already possess the interpersonal skills to be effective team players. Broustein (2015) identified ten qualities of an effective team player. He stated that an effective team player should;

- i. Demonstrate reliability.
- ii. Communicate constructively.
- iii. Listen attentively.
- iv. Function as an active participant.
- v. Share openly and willingly.
- vi. Co-operate and pitch in to help.
- vii. Exhibit flexibility.
- viii. Show commitment to the team.
- ix. Work as a problem solver.
- x. Treat others in a respectful and supportive manner.

2.3.3 TEAMWORK

Teamwork is important in any organisation but may be especially significant in service industries, such as hospitality organisations where there is a direct effect on customer satisfaction.

The increasing need for collaboration and teamwork together with recognition for the individual has highlighted the need for attention to social skills and effectively relationships among people. If people are not working together they are essentially a collection of individuals. Douglas (2003) refers to the importance of helping people to master the so-called 'soft' skills. Tarricone and Luca (2002) identified interpersonal skills and appropriate team composition as part of the successful attributes needed for effective teamwork.

Successful attributes needed for effective teamwork are as follows:

- i. Commitment to team success and shared goals - team members are committed to the success of the team and their shared goals for the project. Successful teams are motivated, engaged and aim to achieve at the highest level;
- ii. Interdependence - team members need to create an environment where together they can contribute far more than as individuals. A positive interdependent team environment brings out the best in each person enabling the team to achieve their goals at a far superior level. Individuals promote and encourage their fellow team members to achieve, contribute, and learn;
- iii. Interpersonal Skills includes the ability to discuss issues openly with team members, be honest, trustworthy, supportive and show respect and commitment to the team and to its individuals. Fostering a caring work environment is important including the ability to work effectively with other team members;

- iv. Open Communication and positive feedback - actively listening to the concerns and needs of team members and valuing their contribution and expressing this helps to create an effective work environment. Team members should be willing to give and receive constructive criticism and provide authentic feedback;
- v. Appropriate team composition is essential in the creation of a successful team. Team members need to be fully aware of their specific team role and understand what is expected of them in terms of their contribution to the team and the project; and
- vi. Commitment to team processes, leadership & accountability - team members need to be accountable for their contribution to the team and the project. They need to be aware of team processes, best practice and new ideas. Effective leadership is essential for team success including shared decision-making and problem solving.

According to Mickan and Rodger (2000), the characteristics of effective teamwork can be categorized into three. This can be seen in the table below

Table 2: Characteristics of effective teamwork

Organisational structure	Individual contribution	Team processes
Clear purpose	Self-knowledge	Coordination
Appropriate culture	Trust	Communication
Specified task	Commitment	Cohesion
Distinct roles	Flexibility	Decision making
Suitable leadership		Conflict
management Relevant members		
Social relationships Adequate resources		
Performance feedback		

Source: Australian Health Review, 2000

Team composition refers to the overall mix of characteristics among people in a team, which is a unit of two or more individuals who interact interdependently to achieve a common objective (Hackman and Wageman, 2005). It is based on the attributes among individuals that comprise the team, in addition to their main objective. Team composition is usually either homogeneous, in which all members are the same, or heterogeneous, in which team members all contain significant differences. It has also been identified as a key factor that influences team performance (Senior and Swailes, 2004).

Ability: The team composition determines the array of knowledge, skills, and abilities within a team. The compositional distribution of team members on any social or psychological attribute that potentially leads to the perception that team members differ from one another, are typically driven by how members process information, such as a diverse set of knowledge, skills, and abilities to solve complex problems (O'Reilly, 1998). Knowledge includes the facts and principles that apply to the domain of the team (Cheney et al, 1990). Skills can be either basic or cross-functional. Basic skills include developed capabilities that assist in the learning or faster acquisition of knowledge. Cross-functional skills assist in the ability to carry out tasks that occur across jobs. Skills can also be categorized into technical skills (adequate ability to do a variety of jobs), human skills (the ability to interact with others), and conceptual skills (the ability to learn and use newly acquired knowledge. Also we have problem solving skills, Decision making skills, listening skills and conflict resolution skills (Robins and Judge, 2013). Abilities are long-lasting individual traits that impact performance (Cheney et. al., 1990). Abilities can include multiple dimensions ranging from scope (general vs. specific) to origin (innate vs. learned) to focus (task vs. social) (Guzzo and Dickson, 1996). Among the factors studied in relation to work team effectiveness, one consistent predictor is team members' collective cognitive ability (Moreland et al, 1992). Diversity of abilities within a team offers the advantage of allowing members to learn from each other and to generate new ideas by

combining or merging their qualifications (Jackson, 1996). A team's performance is not merely the summation of its individual members' abilities. However, these abilities set limits on what members can do and how effectively they will perform on a team. Research reveals some insights into team composition and performance. First, when the task entails considerable thought (solving a complex problem such as reengineering an assembly line), high-ability teams—composed of mostly intelligent members—do better than lower-ability teams, especially when the workload is distributed evenly. That way, team performance does not depend on the weakest link. High-ability teams are also more adaptable to changing situations; they can more effectively apply existing knowledge to new problems. Finally, the ability of the team's leader also matters. Smart team leaders help less-intelligent team members when they struggle with a task. But a less intelligent leader can neutralize the effect of a high-ability team.

Personality: According to Robbins and Judge (2013), personality is the sum total of ways in which an individual reacts to and interacts with others. They describe it in terms of the measurable traits a person exhibits. . When psychologists talk of personality, they mean a dynamic concept describing the growth and development of a person's whole psychological system. Since the early 1990s, researchers have considered the effects of individual personality traits on team dynamics and performance to be an important team factor (Moreland et al, 1992). Robbins and Judge (2013) identified the Myers-Briggs Type Indicator (MBTI) and the Big Five Model, as the dominant frameworks for identifying and classifying personality traits. The MBTI may lack strong supporting evidence, but an impressive body of research supports the thesis of the Big Five Model—that five basic dimensions underlie all others and encompass most of the significant variation in human personality. Moreover, test scores of these traits do a very good job of predicting how people behave in a variety of real-life situations. The following are the Big Five factors:

- i. Extraversion: The extraversion dimension captures our comfort level with relationships. Extraverts tend to be gregarious, assertive, and sociable. Introverts tend to be reserved, timid, and quiet.
- ii. Agreeableness: The agreeableness dimension refers to an individual's propensity to defer to others. Highly agreeable people are cooperative, warm, and trusting. People who score low on agreeableness are cold, disagreeable, and antagonistic.
- iii. Conscientiousness: The conscientiousness dimension is a measure of reliability. A highly conscientious person is responsible, organized, dependable, and persistent. Those who score low on this dimension are easily distracted, disorganized, and unreliable.
- iv. Emotional stability: The emotional stability dimension—often labelled by its converse, neuroticism—taps a person's ability to withstand stress. People with positive emotional stability tend to be calm, self-confident, and secure. Those with high negative scores tend to be nervous, anxious, depressed, and insecure.
- v. Openness to experience. The openness to experience dimension addresses range of interests and fascination with novelty. Extremely open people are creative, curious, and artistically sensitive. Those at the other end of the category are conventional and find comfort in the familiar.

Many of the dimensions identified in the Big Five personality model are also relevant to team effectiveness. Although conscientiousness has been most frequently studied, some research suggests that other Big Five personality factors, such as extraversion (Barry and Stewart, 1997) and agreeableness (Neuman and Wright, 1999) may also play a role in determining work team effectiveness. The last decade has witnessed renewed interest in personality that has been examined the impact of team personality composition on team effectiveness. In general, this research has found a link between aggregate team member personality and team performance

(Moreland et al, 1992). Consistent with individual-level research, team-level conscientiousness appears to be a fairly potent positive predictor of team effectiveness (Neuman et. al., 1999). The recent emergence of the five-factor model as a robust taxonomy of personality (Barrick et. al., 1998) provides a comprehensive framework from which to examine personality and its relationship to both individual and team performance. It is evident that individual personality traits affect the team's processes and outcomes (O'Neill and Kline, 2008). Empirical support has shown the following: the presence of extraversion in team members leads to increased team viability and communication; the presence of conscientiousness leads to an increase in overall performance; the presence of agreeableness in team members leads to an increase in cohesion, communication, productivity, and overall performance; the presence of openness to experience in team members leads to an increase in communication; the presence of neuroticism in team members leads to an increase in cohesion and overall performance (Mathieu et. al., 2008). Specifically, teams that rate higher on mean levels of conscientiousness and openness to experience tend to perform better, and the minimum level of team member agreeableness also matters: teams did worse when they had one or more highly disagreeable members. Research has found that team-level conscientiousness is more strongly related to effectiveness for performance and planning tasks than it is for creativity and decision making tasks (Nueman and Wright, 1999) However, most of these studies have been conducted in laboratory settings using creativity as the performance criterion, meaning that they are disjunctive rather than asdditive tasks (Moreland et al, 1992). Even though the mechanisms by which team personality composition influences team performance require further investigation, it is abundantly clear that personality composition has important implications for team effectiveness.

2.3.4 TEAM DYNAMICS IN VALUE MANAGEMENT

Value management and value engineering are characteristically workshop-orientated management techniques using a facilitated team. According to RICS (2015), factors which affect team dynamics in both a value management and value engineering workshop situation are:

- i. *team size* - generally the larger the team the more difficult it is to manage;
- ii. *membership diversity* - the more organisations or stakeholder views represented within the team the more difficult they are to manage;
- iii. *team goals* - the greater the team members' understanding and sympathy with the goals of the workshop the easier the workshop is to manage;
- iv. *team cohesiveness* - if the team gels to form a cohesive body of knowledge then the output from the team will be effective and efficiently achieved;
- v. *leadership* - the presence of formal or informal leaders within the team can impact facilitation effectiveness;
- vi. *external environment* - the team works most efficiently within an environment where there are limited distractions.

Studies carried out on team dynamics in VM showing respondents' views about team dynamics factors that influence the outcome of VM studies has a heavy emphasis on leadership and cohesion (sharing a common purpose), as well as ensuring effective team composition (skills mix) as being the most influential (Bowen et al., 2010). The success of any Value Management workshop depends upon having the right mix of skills, key stakeholders, commitment and attitude among the participants (DHW, 2005). This all bores down to the membership of the VM team i.e. team composition. Membership and composition of the VM team is a factor that affects team dynamics or processes (Kelly et al., 2004).

2.3.5 REQUIREMENTS FOR THE COMPOSITION OF A VALUE MANAGEMENT TEAM

Members of the VM team should be chosen for their ability to contribute information and enable and undertake decision taking. Kelly et al (2004) suggested the use of the ACID test as a tool to selecting team members:

- i. **Authorise:** include those who have the authority to take decisions during the workshop process.
- ii. **Consult:** include those who have to be consulted during the workshop process without whose consultation the workshop would be suspended.
- iii. **Inform:** exclude those who merely have to be informed of the outcome of the workshop.
- iv. **Do:** include those who have to translate the actions of the workshop into action.

For a professional to function effectively in any value management workshop, there is a need to possess basic competencies and personal skill attributes. These competencies/skills include (Ojelade, 2009, Oke and Ogunsemi, 2013);

Creativity: Creativity has to do with the ability to develop new ideas, create new concepts and find solutions to problems of any type. It is the ability to generate innovative ideas and manifest them from thought into reality. The process involves original thinking and then producing. Creativity involves the generation of new ideas or the recombination of known elements into something new, providing valuable solutions to a problem. According to Ojelade (2009), creativity “is a fundamental feature of human intelligence in general. It is grounded in everyday capacities such as the association of ideas, reminding, perception, analogical thinking, searching a structured problem-space, and reflecting self-criticism. It involves not only a

cognitive dimension (the generation of new ideas) but also motivation and emotion, and is closely linked to cultural context and personality factors.”

The three ways of creative thinking used for generating novel ideas as discussed by Ojelade(2009) are:

- a) The “combinational” creativity that involves new combinations of familiar ideas.
- b) The “exploratory” creativity that involves the generation of new ideas by the exploration of structured concepts.
- c) The “transformational” creativity that involves the transformation of some dimension of the structure, so that new structures can be generated.

All these form of creativity are very relevant in a value management study.

Mental alertness: This is the ability to react quickly, strongly and favourably to situations, suggestions, ideas and innovations. This implies ability to think very quickly and notice things quickly. Members of VM team are expected to be able to generate alternative design ideas quickly and carry out function analysis.

Leadership-transformational: Leadership is the ability to guide, direct or influence people. This can either be transformational or transactional in nature. The former has to do with changing something completely especially by improving appearance or usefulness while the latter is a kind of leadership where any activity affects and influence both the leader and the follower. Transformational leadership skill is highly essential for VM team members especially the facilitator. This has to do with the task of reconstructing organization and its functioning principles from the scratch. It is based on objective review and evaluation of the status quo of the organization and provision of direction for advancement.

Listening skills: This is the ability to concentrate on ones hearing by paying necessary attention. This is mostly influenced by the environment in which one finds himself and available facility for effective listening ability. This includes ability to hear, understand and comprehend. Members of VM team should possess high listening skills. Listening can be either passive or active. The type of listening that VM team members should practice is the active one. This entails:

- i. receiving the sounds and sights from the other person's voice and the body and transmitting them via our auditory and optic nerves to our brain.
- ii. recognizing the codes (words, jargon, phraseology, etc) used by the other person to communicate to us what is in their mind.
- iii. Integrating the codes in two ways : first ,integrating them so that the individual bits of information form a coherent message; second, integrating this message with information already in our brain enabling us, for example, to appreciate, analyse, agree, disagree etc
- iv. Storing the bits of information in such a way that we can recall them at will and link them up with other bits of information so that they can be used for many different purposes.

Conflict management-collaborate: In a team-based study like value management workshop, ability to manage differences in opinion is highly essential. Members of the team should possess conflict management and resolution skills. There are five recognised ways of resolving conflicts according to Sigle et al (2000), and they are competition; compromise; negotiation/co-operation, avoidance and accommodation. It was further stressed that negotiation/co-operation is the preferred management style due to the following guidelines:

When the differences are very important to both parties and no one is willing to give in; When a close, continuous and interdependent relationship with the other party exists; When there is sufficient time available to deal with the problem (This approach can require a great deal of time); When both parties know precisely what they want to achieve and are also willing to spend time and energy on its achievement and When both parties are articulate, willing to listen to one another and skilled in the solution of problems.

Social style-expressive: Members of a VM team are expected to be expressive and interactive. Social styles according to Sigle et al (2000) are expressed in four categories, namely being an extrovert, a supporter, a driver or an analyser. An extrovert is an outgoing person while Microsoft Encarta (2009) as cited by Oke and Ogunsemi (2013) defined such person as sociable and self-confident. This constitutes a very good skill of any value manager. A supporter can be seen as one who gives needed help or encouragement. A driver can be seen as one who provides the necessary impetus or motivation for a team or individual. An analyser can be seen as one that examine something in detail in order to understand it better or draw conclusions from it. It can be concluded that the four categories of social style are useful and necessary for a VM team member.

Innovation: Innovation entails such things as receptive to others' ideas; initiating change; improvising or changing existing ideas; introducing new way of doing things; and being willing to experiment for continued improvement.

Adaptability: This is the ability to suit, fit and adjust to different conditions or purpose at different times.

Self-motivation: This is the ability to be energetic and ambitious, and so able to make plans and get things done without being directed by others. (Microsoft Encarta, 2009).

Abstract reasoning: This is the ability to anticipate, understand, reason and initiate practicable and appropriate concepts and conclusions by applying imaginative ideas through logical thinking. It is the ability to think deeply and develop practicable ideas from the theoretical body of knowledge.

Also Daddow and Skitmore (2005) identified some ideal skills that required of those participating in a VM workshop. These skills include:

Lateral thinking ability and intuition;

- i. An inquiring mind;
- ii. Industry expertise;
- iii. Life experiences;
- iv. A positive, constructive approach;
- v. Knowledge of the client/owner requirements;
- vi. Motivated and enthusiastic;
- vii. Proactive;
- viii. Attentive;
- ix. Smart thinking;
- x. Having an open mind and an objective approach to communication;
- xi. Having personal skills;
- xii. No preconceived ideas;
- xiii. Able to bring expertise to the value management workshop;
- xiv. Ability to communicate ideas confidently and professionally;
- xv. Confidence;
- xvi. Understanding that what people may say, may not be quite what they mean, so they need to be able to interpret and ‘read between the lines’;

- xvii. Recognise reactions whether verbal or physical;
- xviii. Able to listen to other ideas and relate to others;
- xix. and be adaptable and flexible.

2.4 THE QUANTITY SURVEYOR AND VALUE MANAGEMENT

The Nigerian Institute of Quantity Surveyors (2004) defined a quantity surveyor as the expert professionally trained and experienced in dealing with construction cost, construction management and construction communication. The quantity surveyor is the expert who is concerned with financial integrity, contractual matters, procurement, and delivering value for the clients' money invested (Olanrewaju et al., 2014). The QS is above all a technocrat who measures outputs and inputs, undertakes cost engineering by using rates and prices, produces Bills of Quantities and schedules (Simpson and Dye, 2009). The QS also brings a level of construction technology knowledge (but not the design) that enables a functional analysis of the construction to take place. Since the inception of the profession, there has been a paradigm shift in the practices and services that quantity surveyors provide, from someone who was concerned with cost reduction and substitution of materials and components to someone who is concern with the achievement of value and enhancing productivity.

A research on VM practice by South African QS has found that 61% of the practitioners believe that VM assists in optimizing value, while 41% believe it facilitates in achievement of functionality (Bowen *et al.*, 2010).The findings indicate that the profession has started to move ahead of the cost realm and started to link along the “value” line for construction clients. VM has come to be considered as an effective methodology for achieving "best value for money" for clients since its initial application in the construction industry (Shen and Liu, 2003). VM was identified by Kelly and Poynter-Brown (1990) as cited in Ellis et al (2005) as a natural progression for the QS and as an opportunity for them to develop their leading-edge skills. The opportunity for quantity

surveying profession to benefit from the strength of VM in re-shaping their traditional images into more innovative services, are expected to place their position more marketable in the open market (Saifulnizam et al, 2011).

According to Kelly and Male (1993), an economic management of projects requires a combination use of value and cost, in which the integration between value management and cost management are seen to provide a potential benefits for QS profession. According to Coetzee (2009) both VM and cost management are important on a project and there are important links between them. When these two activities are combined, the total combined effect is bigger than the sum of the individual effects. Cost management enhances VM in several ways such as, for example it is the quantity surveyor who provides cost management that also produces the cost data that are necessary for VM studies. Data is required to make informed choices. If there is no on-going cost management, then VM proposals selected may not be incorporated into the design. VM on the other hand is beneficial to cost management because it lists ideas that could possibly save costs even if it is only at a later stage. The bottom line is that VM and cost management services should be integrated into a total project economics service to obtain optimal benefits from it. Oke and Ogunsemi (2013) observed that areas of competencies of the quantity surveyors are relevant to value management.

Olanrewaju and Khairuddin (2007) found that QS in the Nigerian construction industry are the most familiar with the discipline of VM as compared to other profession. This is due to their ability to provide cost advice to client which is one of the main concerns for construction projects. It is suggested that on the common run of construction projects the VM service has been largely championed by the QS/Cost Consultant. Quantity surveyors are regarded as being in a great position to influence Value Management implementation as compared to other design team member (Hogg, 1999). This is quite important as the implementation of VM has been found to be low in Nigeria (Oke and Ogunsemi, 2009). Also there has been an increasing

numbers of Government's regulation which requires construction project which exceeds certain amount to apply Value Management as part of cost management measure (Saifulnizam et al, 2011) and in particular the Federal Government of Nigeria (FGN) had only recently decreed the enforcement of 'Application of value-for-money standards and practices for the procurement of public assets and services' (Oke and Ogunsemi 2009). Simpson and Dye (2009) stated that the QS is often the guardian of value-for-money (VFM) on a construction project and should play a major part in directing the project towards value-based solution. They also identified VM as a tool which is used by the QS in providing VFM. Furthermore, there cannot be a successful VM exercise except there is an involvement and full participation of a cost expert or QS as the case may be (Kelly and Male, 2006). This creates a need for QS to be able to perform effectively and efficiently in a value management study or exercise. Oke and Ogunsemi (2013) identified and ranked basic competencies and personal skill attributes that are needed to be possessed by the members of the value management team for them to function effectively in a value management workshop. The extent to which the Nigerian quantity surveyors meet with this requirement (i.e. extent to which they possess these qualities) is yet to be established and this is the gap that this study will try to fill.

2.5 THEORETICAL FRAMEWORK

Within the organizational behaviour literature, an input-process-output framework of team performance has evolved. Classic works of Steiner (1972), McGrath (1964), and Hackman (1987) expressed the nature of team performance in classic systems model ways in which inputs lead to processes that in turn lead to outcomes (the input-processes-output, or I-P-O, model). This framework contends that a variety of input factors affect the interpersonal transactions that take place among team members which in turn influence team output. According to Rico et al (2011), there have been numerous reviews of research on the effectiveness of teams from 1999- 2009 (Sundstrom, McIntyre, Halfhill & Richards, 2000;

Kozlowski & Bell, 2003; Salas, Stagl & Burke, 2004; Gil, Alcover & Peiró, 2005; Ilgen, Hollenbeck, Johnson & Jundt, 2005; Nielsen, Sundstrom & Halfhill, 2005; Kozlowski & Ilgen, 2006; Mathieu, Maynard, Rapp & Gilson, 2008; Goodwin et al., 2009;); despite some differences between them, they can all be considered to have been based on the Input-Processes-Output (IPO) model (McGrath, 1964). This model identifies the composition, structure and processes of teams and the key antecedents to their effectiveness. Likewise, the model considers organizational and situational factors as influencing the structure of the team as a whole, affecting the rest of the variables (input, process, output).

Input factors are all factors that can be manipulated in order to change processes and outcomes (Cohen & Bailey, 2007). According to McGrath (1964), input factors can be at the level of the individual, the group or the environment. In contrast, Gladstein (1984) only distinguishes between factors on the group level and factors on the organizational level, whereas Cohen and Bailey (2007) propose environmental, organizational, group, and task factors. Individual factors are for example skills of the individual group members, as well as attitudes (e.g. preference towards teamwork) and personality characteristics (e.g. extraversion, conscientiousness) (McGrath, 1964). Group size, group structure, and the level of “cohesiveness” (McGrath, 1964) or group composition (Gladstein, 1984), and tenure (Cohen & Bailey, 2007) are considered as input factors on the group level. Also team leadership is mentioned by some authors as central input factor on team level. Input factors can also be found at higher levels, as the environment or the organization. These factors can be, for instance, reward structures, and the level of environmental stress (McGrath, 1964), industry characteristics (Cohen & Bailey, 2007) or resources offered by the organization as well as the whole organizational structure (Gladstein, 1984). Task design, like autonomy or interdependence is in the view of Cohen and Bailey (2007) also an important influencing factor,

whereas Gladstein (1984) considers the nature of the task as essential moderating variable between team processes and team outcomes, conflict communication (Cohen & Bailey, 1997).

Processes are group behaviours that can be observed, are influenced by different input factors and affect the outcome. Internal activities of the work group are behaviours that are relevant to reach the groups' goal, like effort, or strategies used by the group (Brodbeck, 1996). Other examples for interaction processes are time spent together, communication, encouragement among group members (McGrath, 1964), conflicts, strategy discussion, boundary management (Gladstein, 1984), team learning activities (Edmondson, 1999) or processes directed on external entities, like way.

Output or outcome is the result of the team processes and conceptualized in a multidimensional way. Output is usually defined by the degree to which a goal is reached (Brodbeck, 1996). Outputs can occur at different levels: the individual, group, unit, or organization (Cohen & Bailey, 2007). Although team outcome is often considered to be the main aim when supervisors influence team processes, it is hard to define the components of "team outcome". Often, this term is used synonymous with measures of performance or effectiveness. However, a closer look at several team models shows that performance or effectiveness is not necessarily the target or the main dependent variable. Measures of satisfaction, commitment or absenteeism (e.g. Cohen & Bailey, 1997) can be equally important. According to Cohen & Bailey (1997), group outcomes can occur at the individual, group, or organizational level and can be related to each other. They made the following distinction between three measures of team outcomes:

- i. Measures of performance effectiveness assessed in terms of quantity and quality of outputs, e.g. efficiency, productivity, response times, quality, customer satisfaction, and innovation,

- ii. Member attitudes, e.g. employee satisfaction, commitment, and trust in management
- iii. Behavioural outcomes, e.g. absenteeism, turnover, and safety.

Interactions have been documented between various inputs and processes (I x P), between various processes (P x P), and between inputs or processes and emergent states (ES).

VM involves the structured, facilitated, multidisciplinary team approach to make explicit the client's value system using function analysis to expose the relationship between time, cost and quality (Kelly and Male, 2004). VM has been identified as multidisciplinary team approach or team based approach (Leung and Kong, 2005; Kelly and Male, 2004; SAVE, 2001). The need for an appropriate study team as a pre-requisite for a VM study was identified by (DeLeeuw, 2001). This emphasises the need for the team to perform effectively. Studies carried out on team dynamics in VM showing respondents' views about team dynamics factors that influence the outcome of VM studies has a heavy emphasis on leadership and cohesion (sharing a common purpose), as well as ensuring effective team composition (skills mix) as being the most influential (Bowen et al., 2010). Membership composition of the VM team is a factor that affects team dynamics or processes (Kelly et al., 2004). From organizational behaviour point of view, appropriate team composition and interpersonal skills have been identified as part of the successful attributes needed for effective teamwork (Tarricone and Luca, 2002). Teams are most effective when they comprise members with the right skills for the tasks at hand. In terms of team composition, a key consideration when forming a team is to ensure that all the team members are qualified for the roles they will fill for the team. According to the team effectiveness model posited by Robbins and Judge (2013), amongst the factors required for team effectiveness is team composition.

Historically, research on team composition has tended to focus on manifest or descriptive characteristics—size and demographics (Moreland and Levine, 1992). More recently, team

researchers have started to examine team composition in terms of latent constructs—ability and personality. There are a variety of ways in which team composition can be possibly turned into a measurable team characteristic. The common element of the methodologies involves first measuring characteristics of individual team members. This study measured these characteristics amongst prospective team members of a VM study. Also this study investigated into the attributes required for effective team performance by VM participants, using a team effectiveness model posited by Robbins and Judge (2013) while focusing on the input-process relationship from the input-process-output framework. This study linked the interaction between input i.e. team composition (i.e. Personality and Ability) and processes i.e. VM processes of functional analysis and creativity.

The independent variables of the study include

- i. Personality of member with sub-variables which are openness to experience, conscientiousness, extraversion, agreeableness and neuroticism.
- ii. Ability of members with sub-variables decision making skills, problem solving skills, listening skills and conflict resolution skills while

The dependent variables are the processes involved in a VM study. In order to delimit the study only the Functional analysis and Creativity stage was observed as they were found to be very important to the VM workshop (Fong and Shen, 2000; Shen and Liu, 2003).

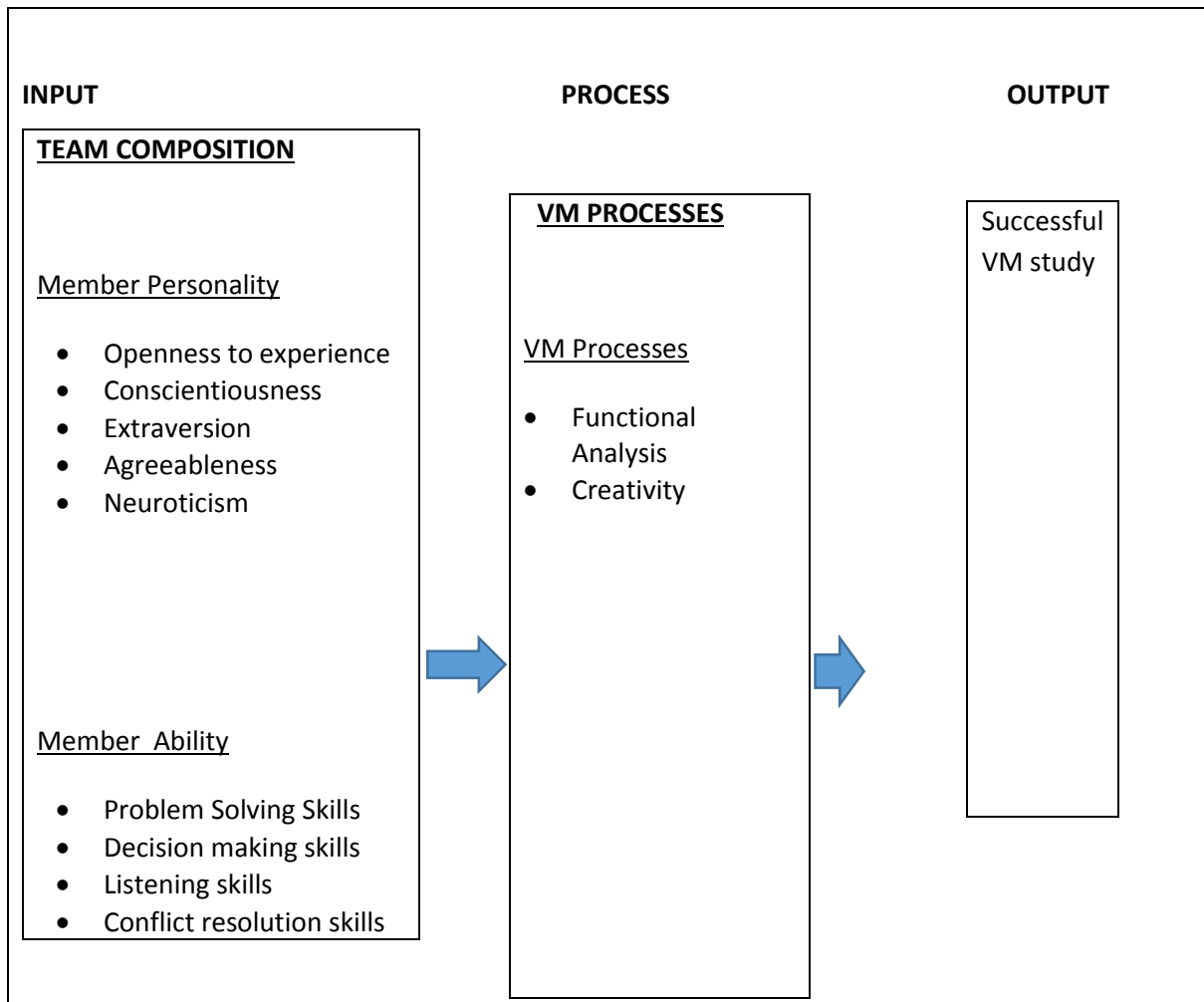


Fig 3. Theoretical Framework

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 RESEARCH APPROACH

There are two basic approaches to research, quantitative approach and the qualitative approach. Quantitative approach involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion. This approach can be further sub-classified into inferential, experimental and simulation approaches to research. Qualitative approach to research is concerned with subjective assessment of attitudes, opinions and behaviour. Research in such a situation is a function of researcher's insights and impressions. Such an approach to research generates results either in non-quantitative form or in the form which are not subjected to rigorous quantitative analysis.

This study used the quantitative approach especially the inferential approach to research whose purpose is to form a data base from which to infer characteristics or relationships of population. This usually means survey research where a sample of population is studied (questioned or observed) to determine its characteristics, and it is then inferred that the population has the same characteristics.

3.2 RESEARCH DESIGN

Research design is a conceptual structure within which the research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2004). Research design is the framework that has been created to seek answers to research questions. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in view the objective of the research and the availability of staff, time and money. The design of a study defines the study type

(descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type(e.g., descriptive-longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan.

There are many ways to classify research designs, but sometimes the distinction is artificial and other times different designs are combined. Nonetheless, the list below offers a number of useful distinctions between possible research designs.

- i. Descriptive (e.g., case-study, naturalistic observation, Survey)
- ii. Correlational (e.g., case-control study, observational study)
- iii. Semi-experimental (e.g., field experiment, quasi-experiment)
- iv. Experimental (Experiment with random assignment)
- v. Review (Literature review, Systematic review)
- vi. Meta-analytic (Meta-analysis)

Descriptive research design is a scientific method which involves observing and describing the behaviour of a subject without influencing it in any way. Many scientific disciplines, especially social science and psychology, use this method to obtain a general overview of the subject (Shuttleworth, 2008). A survey was used for this study. According to Abdulrahman et al (2013), the survey is good in measuring opinions and attitudes in large populations that can't be observed directly. It is used when dealing with very systematic collection of data or information from the population where samples are drawn for generalization.

3.3 RESEARCH METHODS

Research methods may be understood as all those methods/techniques that are used for conduction of research (Kothari, 2004). Research methods that can be used for a research, they

include experiments, interviews, questionnaires, case study, observation, analysis of historical records or documents etc. This study made use of the questionnaire. Questionnaires are an effective way of quantifying data from a sample group, and testing emotions or preferences (Shuttleworth, 2008). This method is very cheap and easy, where budget is a problem, and gives an element of scale to opinion and emotion. These figures are arbitrary, but at least give a directional method of measuring intensity. This method was chosen because it can help measure the intensity or extent at which the respondents possess the capabilities to be investigated.

3.4 STUDY POPULATION

Population in research is the totality of any group, person or objects which is defined by some unique attributes and is under study. This is to say that population is any group of being or subject the researcher has focused attention on. The research was designed to obtain information from a broad spectrum of construction professionals i.e. quantity surveyors, architects, builders, structural engineers and others; working in various career environments such as contracting, consultancy and client organizations in Nigeria. The sampling frame for the study was delimited to construction professionals in FCT Abuja, Lagos, Kano and Kaduna state because of the ease and convenience in obtaining data. The sample frame was gotten from the registered professionals' bodies e.g. QRSBN, NIA etc.

Table 3: Population of construction professionals

S/N	Construction Professionals	Population
1.	Quantity Surveyor	3915
2.	Architect	11460
3.	Builders	3205
4.	Structural Engineer	20,045
5.	Others	-

Source: Field survey (2017)

3.5 SAMPLE AND SAMPLING TECHNIQUE

The sample that represented the population was selected with the use of purposive sampling. This sampling method involves deliberate selection of particular units of the population for constituting a sample which represents the population. Purposive sampling was used for reasons of convenience and economy, also because of the unavailability of the list of the sampling population. Under purposive sampling, the organisers of the inquiry purposively choose the particular units of the universe for constituting a sample on the basis that the small mass that they so select out of a huge one will be typical or representative of the whole. The sample size was limited to the number of respondents that were obtained for each profession, which is given in the table below totalling to one hundred and fifty-two (152) respondent

Table 4: Sample size

S/N	Construction Professionals	Sample size
1.	Quantity Surveyor	73
2.	Architect	29
3.	Builders	22
4.	Structural Engineer	20
5.	Others	8
	Total	152

Source: Field survey (2017)

3.6 INSTRUMENT FOR DATA COLLECTION

The questionnaire was the instrument used for data collection. According to McLeod (2014), questionnaires provide a relatively cheap, quick and efficient way of obtaining large amounts of information from a large sample of people. This is useful for large populations when interviews would be impractical. Also this instrument was chosen because questionnaires can be an effective means of measuring the behaviour, attitudes, preferences, opinions and intentions of relatively large numbers of subjects more cheaply and quickly than other methods.

The questionnaire was be designed to elicit relevant data which will reflect the attributes of respondents and the variables on expectations and observations on capabilities required for participating effectively in processes involved in a VM study.

The questionnaire comprised of three sections namely:

1. General information
2. Team composition factors that affect team effectiveness
3. Skills required for stages in the Job plan.

Section 1 elicits the background information of respondents in terms of their profession, professional attainment, working experience and type of organization.

Section 2 consists of questions on the team composition factors that affect team effectiveness.

It has two sub-sections;

A. Where questions on Personality using Big Five Personality test about 20 questions were asked using a five (5) point likert scale of Strongly Agree, Agree, Neither Agree nor Disagree, Disagree and Strongly Disagree. Scale:

1 – Strongly Disagree; 2 – Disagree; 3- Neither agree/disagree; 4 – Agree; 5- Strongly Agree.

B. Where 23 questions were asked on Ability using a five (5) point likert scale of Hardly ever, Rarely, Sometimes, Often and Always/ Nearly Always.

Scale: 1- Never/Hardly ever; 2- Rarely; 3- Sometimes; 4- Often; 5- Always/Nearly always.

Section 3 consists of questions based on skills required for the stages in the job plan. The stages selected for investigation include the functional analysis stage and the creativity stage of the job plan due to their high relevance and a need for delimitation so as to reduce the scope of the study. It also consists of two sub-sections;

A. In this sub-section i.e. Functional Analysis stage, 12 questions were asked.

B. In this sub-section i.e. Creativity stage, 10 questions were asked.

For both sub-sections, a five (5) point likert scale of Very Low, Low, Moderate, High and Very High was used. Scale: 1- Very Low; 2- Low; 3- Moderate; 4- High; 5-Very High.

All questions contained in the questionnaire are all close-ended.

3.7 VALIDITY OF THE INSTRUMENT

The questionnaire was vetted by supervisors of this study.

3.8 PROCEDURES FOR DATA COLLECTION

The questionnaire was distributed by the researcher with the help of 3 research assistants to the sampled population. 152 questionnaires were returned filled out of 185 questionnaires that were distributed.

3.9 DATA ANALYSIS

Data collected was tabulated and both descriptive and inferential statistical methods were carried out. The analysis was carried out with the aid of IBM SPSS Statistics 21.0.

3.9.1 DESCRIPTIVE STATISTICS

Descriptive statistics concern the development of certain indices from the raw data. It is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way. Examples of descriptive statistics are frequency distributions, measures of central tendency (mean, median, and mode), and chart (pie charts and bar charts/histograms) that describe the data. The descriptive analysis used for this research include the mean, frequency distribution and percentages.

3.9.2 INFERENTIAL STATISTICS

Inferential statistics concern with the process of generalisation. Inferential statistics are also known as sampling statistics and are mainly concerned with two major type of problems: (i) the estimation of population parameters, and (ii) the testing of statistical hypotheses.

Karl Pearson's coefficient of correlation (or simple correlation) is the most widely used method of measuring the degree of relationship between two variables. Karl Pearson's coefficient of correlation is also known as the product moment correlation coefficient. This statistical method will be used in measuring the degree of relationship between sub-variables of the independent variables and dependent variables. It was used to test each of the hypotheses made at $p \leq 0.05$ (5%) level of significance. At this level, any hypothesis that is greater than 5% or $P > 0.05$ was rejected and hypothesis that is less than 5% that is $P \leq 0.05$ was retained.

Regression is the determination of a statistical relationship between two or more variables. The regression analysis is a statistical method to deal with the formulation of mathematical model depicting relationship amongst variables which can be used for the purpose of prediction of the values of dependent variable, given the values of the independent variable. When there are two or more than two independent variables, the analysis concerning relationship is known as multiple correlation and the equation describing such relationship as the multiple regression equation. The multiple regression equation was used because there are two independent variables i.e. Personality and Ability of construction professionals. In order to increase the accuracy of the model that was developed, while developing the model, only hypotheses that were significant at $p \leq 0.01$ (1%) were used in computing the values for the independent variables. Also standardized coefficients were used in the final regression equation i.e. in the equation $Y = a + b_1X_1 + b_2X_2$ where X_1 and X_2 are two independent variables and Y being the dependent variable, the constant a was taken as zero. This was done because without the VM team members i.e. the construction professionals (from which the independent variables are derived), the VM study (from which the dependent variable is gotten) cannot be carried out.

CHAPTER FOUR

4.0 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF RESULTS

4.1 ANALYSIS OF PERSONAL DATA OF RESPONDENTS

This section is mainly designed to provide general information about the respondents in terms of the respondents' profession, professional attainment of respondents, respondents' working experience, type of organization and participation in a VM study.

Table 4.1: Respondents profession

Profession	Frequency (No)	Percentage (%)
Quantity Surveyor	73	48.1
Architect	29	19.07
Builder	22	14.47
Structural Engineer	20	13.16
Others	8	5.3
Total	152	100

Source: Field survey (2017)

Table 4.1 shows the profession of the respondents. The respondents comprises of the construction professionals working within the Nigerian construction industry. The table shows that 73 (48.1%) of the respondents are Quantity Surveyors, 29 (19.07%) are Architects, 22 (14.47%) are Builders, 20 (13.16%) are Structural engineers and the Others, 8 (5.3%); totally one hundred and fifty-two respondents.

Table 4.2: Respondents Professional Attainment

Professional attainment	Frequency	Percentage
Probationer	16	10.5
Associate member	64	42.1
Fellow	23	15.1
Others	1	0.7
Missing	48	31.6
Total	152	100

Source: Field survey (2017)

Table 4.2 shows that 16 (10.5%) of the respondents are Probationers at their respective professional bodies. 64 (42.1%) were associate members, 23 (15.1%) were fellows, 1 (0.7%) to others and the remaining 48 (31.6) respondents don't belong to any professional body.

Table 4.3: Respondents professional working experience

Working experience	Frequency	Percentage
Less than 5years	16	10.5
6-10 years	58	38.2
]11-15 years	26	17.1
16-20 years	14	9.2
Exceeding 20 years	26	17.1
Missing	12	7.9
Total	152	100

Source: Field survey (2017)

From the Table 4.3 above; 16 (10.5%) of the respondents have working experience of less than 5years, 58 (38.2%) have experience ranging from 6-10years which is the highest, 11- 15years

of experience have 26 (17.1%) respondents, 16-20 years of experience have 14(9.2%) respondents, and respondents with experience exceeding 20years were 26 (17.1%). 12 respondents didn't fill in their years of experience in the construction industry.

Table 4.4: Type of organization

Organization	Frequency	Percentage
Consultancy	35	23.0
Client	22	14.5
Contracting	32	21.1
Others	63	41.4
Total	152	100

Source: Field survey (2017)

From the Table 4.4, 35 (23%) of the respondents work in consultancy firms, 22(14.5%) of the respondents work for client organization, 32(21.1%) work in contracting firms and others such as government, lecturing e.t.c. are 63(41.4%) in number.

Table 4.5: Respondents' participation in value management

Participation of value management	Frequency	Percentage
Yes	54	35.5
No	26	17.1
Missing	72	47.4
Total	152	100

Source: Field survey (2017)


The Table 4.5 shows the amount of respondents that have ever participated in a value management study. 54 (35.5%) of the respondents have participated in a VM study, 26 (17.1%) haven't while 72 (47.4%) didn't give an indication of having participated or not.

4.2 TEAM COMPOSITION FACTORS THAT AFFECT TEAM EFFECTIVENESS

This section relates to attributes required by construction professionals to participate effectively during VM processes in a VM study. It is made up of two parts; Personality and Ability.

Table 4.6: Descriptive statistics for team composition factors

Factors	Quantity Surveyor	Architect	Builder	Structural Engineer	Others	Average of Means	Remark
Mean							
COMPOSITION FACTORS							
PERSONALITY							
Openness to experience(4)	3.99	4.24	4.12	4.15	4.26	4.15	High
I have a rich vocabulary and a vivid imagination	3.83	4.28	4.23	4.25	4.50		
I am original i.e. come up with new ideas	4.15	4.21	4.05	4.10	4.13		
I don't have difficulty in understanding abstract ideas	3.99	4.21	4.18	4.15	4.13		
I am curious about many different things	3.97	4.24	4.00	4.10	4.10		
Conscientiousness(3)	4.07	4.14	4.18	4.05	3.96	4.08	High
I am always prepared follow predefined schedule.	3.79	4.38	4.45	4.20	4.13		
I am exacting in my work	4.03	4.00	3.95	3.75	4.13		
I pay attention to details and like order	4.40	4.03	4.14	4.20	4.20		
Extraversion(5)	3.57	2.93	2.33	3.05	2.50	2.88	Average

I feel comfortable around people	4.16	3.76	3.64	3.65	3.50		
I talk to a lot of different people at my workplace	3.61	3.10	2.36	2.90	3.00		
I am good at starting conversations	3.52	2.97	2.27	3.06	2.38		
I don't mind being of attention	3.06	2.50	1.82	3.05	1.75		
I am agreeable and sociable.	3.48	2.31	1.55	2.60	1.88		
Agreeableness(5)	4.09	3.81	3.84	3.89	3.55	3.84	High
I sympathize with other peoples' feelings	4.30	3.97	3.86	3.90	3.75		
I am interested in other peoples' problem	4.10	3.59	3.45	3.90	3.50		
I make people feel at ease	4.14	4.07	4.14	3.80	3.63		
I take time out for people	3.87	3.62	3.55	3.78	3.13		
I have a soft heart	4.01	3.79	4.18	4.05	3.75		
Neuroticism(3)	2.55	2.74	2.74	2.93	3.00	2.79	Average
I get irritated and upset easily	2.60	2.90	2.82	2.85	3.25		
I am more anxious than most people and have frequent mood swings	2.69	2.93	3.14	3.15	3.13		
I get stressed out easily	2.36	2.38	2.27	2.80	2.63		
  ABILITY							
Problem solving skills(5)	4.03	4.04	3.98	4.34	3.87	4.05	High
I usually have all the information I need when finding a solution to the problem	3.24	3.86	3.77	4.20	3.75		

I carefully define each problem before trying to solve it	4.15	4.18	4.14	4.45	4.13		
I generate solution to problems by looking from different point of views	4.39	4.21	4.09	4.35	4.00		
I take time to think about I choose between option when evaluating solutions	4.23	3.89	3.82	4.20	3.63		
Once I choose the solution, I develop an implemented plan with sequence of events needed for completion	4.13	4.04	4.09	4.50	3.85		
Decision making skills(6)	3.96	4.09	4.03	4.26	3.65	4.00	High
I try to determine to determine the real issue before stating the decision making process	4.32	4.18	4.00	4.35	4.00		
I consider a variety of potential solutions before I make my decisions	4.29	4.18	4.00	4.20	3.38		
I prefer to make decisions on my own then inform other people later	3.11	3.95	3.95	4.11	3.43		
If I have doubts about a decisions, I recheck my assumptions and process	4.06	4.15	4.00	4.25	3.71		
I carefully choose the best decision making tool for each specific decision	4.25	4.07	4.14	4.30	3.50		
I create an implementation plan before communicating my decision	3.75	4.00	4.00	4.35	3.88		
Listening skills(5)	2.86	2.82	2.94	2.82	1.88	2.66	Average
I make eye contact with others while listening	3.70	3.25	3.29	3.75	2.75		
I get bored with conversations easily- most people have nothing important to say	2.55	3.04	3.27	2.80	2.29		
I finish sentences for them, when they pause I know what they are going to say	2.35	2.57	2.82	2.60	1.63		
When I have something important to say, I will	2.05	2.25	2.41	1.90	1.25		

interrupt the speaker to make my point							
I nod my head and use other gestures and facial expressions to show that I am interested in what is being said	3.64	3.00	2.91	3.05	1.50		
Conflict resolution skills(5)	3.34	3.43	3.45	3.42	3.03	3.33	Average
When stressed, I am overly emotional and heated	2.70	2.93	3.14	2.30	2.50		
When communicating with others, I pay attention to non-verbal signals like facial expression, gestures, tone / intensity of voice e.t.c.	3.73	3.39	3.33	3.75	2.50		
I avoid difficult conversations and confrontations	3.41	3.18	3.05	3.35	2.63		
I understand and respect the view of others even if they differ from yours	4.26	4.32	4.27	4.40	4.13		
I always want to enforce your opinion	2.60	3.32	3.45	3.30	3.88		

Source: Field survey (2017)

The table 4.6 shows that the construction professionals include: quantity surveyors, architects, builders, structural engineers and others that work in the construction industry. The identified team composition factors i.e. attributes that are necessary to participate effectively during VM processes include member personality, member ability of the construction professionals. The analysis that follows gives a comparative view of respondents' score for each of the professions.

PERSONALITY

Five factors were investigated in accordance with the Big Five Personality model. These include openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. From the table above, under openness to experience, the mean score for quantity.

surveyors was 3.99, the architects had a mean score of 4.24, the builders had a mean score of 4.12, the structural engineer had a mean score of 4.15 and others had a mean score of 4.26. The average mean is 4.15 shows that all the categories of construction professionals have a high tendency to perform better in a team. This is because people that are open have increased learning, are more creative, more flexible and autonomous (Robbins and Judge, 2013). Also they are likely to be effective leaders because creativity is important to leadership and they tend to be more adaptable to change. This correlates with the competencies or skills i.e. creativity, adaptability and leadership given by (Oke and Ogunsemi, 2013; Ojelade, 2009) as important requirements for the composition of a VM team.

Under conscientiousness, the mean score for the quantity surveyors was 4.07, the architects had a mean score of 4.14, the builders had a mean score of 4.18, also the structural engineers had a mean score of 4.05 and others' mean was 3.96. The average means for this category was 4.08 which was high. According to Robbins and Judge (2013), this shows that the construction professionals tend to put greater effort at their work and are more persistent by nature. They have more drive and discipline and are better organized. This will increase their performance and also their leadership skills. This also corroborates the competency or skill i.e. self-motivation which was identified as required for a VM team member by Oke and Ogunsemi (2013).

Under extraversion, the quantity surveyors had a mean of 3.57 which was the highest indicating they have good interpersonal skills, are socially dominant and are more emotionally expressive. This tends to their performance in jobs requiring significant teamwork and interpersonal interactions such as VM. This might further explain the reason why quantity surveyors were found to be the most familiar with VM as opposed to other professions (Olanrewaju and Khairuddin, 2007). The architects had a mean score of 2.93, the builders had a mean score of 2.33 which is low, the structural engineers had 3.05 as their mean score and others had 2.50.

On the average, their means was 2.88 which is neither high nor low indicating that other than the QS, the other construction professionals were less assertive, less domineering and might not have good interpersonal skills. Also this corroborates the competency or skill i.e. social stlye (expressive) which was identified as required for a VM team member by Oke and Ogunsemi (2013).

Under agreeableness, the quantity surveyors had a mean of 4.09, the architects had a mean of 3.81, the builders; 3.84, the structural engineers; 3.89 and others had a mean of 3.55. On the average, their mean was 3.84 which is high. This indicates that they are agreeable, more compliant, conforming and are better liked. They will also tend to perform better at jobs that require frequent interpersonal interaction or significant teamwork e.g. VM.

Under neuroticism, the quantity surveyors had a mean of 2.55, both the architects and the builders had a mean of 2.74, the structural engineer was had a mean of 2.93 while lastly the mean of others was 3.00. Their average mean was 2.79 which is not high or low. They are likely to be averagely optimistic and positive and might experience quite a number of negative emotions. They are likely to be susceptible to the physical and psychological effects of stress.

From organizational behaviour perspective, according to Robbins and Judge (2013), many of the dimensions identified in the Big Five personality model are also relevant to team effectiveness. A review of the literature identified specifically that teams that rate higher on mean levels of conscientiousness and openness to experience tend to perform better, and the minimum level of team member agreeableness also matters: teams did worse when they had one or more highly disagreeable member. This was affirmed from the study, openness to experience, conscientiousness, agreeableness were identified as being relevant to obtaining effectiveness in VM team. It was also observed that extraversion is also relevant to VM study but the construction professionals were low in this factor.

ABILITY

Ability is an individual's current capacity to perform the various tasks in a job. Part of a team's performance depends on the knowledge, skills, and abilities of its individual members. The skills identified under ability include problem solving skills, decision making skills, listening skills and conflict resolution skills.

For this problem solving skills, the quantity surveyor had a mean of 4.03, the architect had a mean of 4.04, the builder, 3.98; the structural engineers had 4.34 while others had 3.87. On the average, their mean is 4.05 which shows that they have good problem solving skills i.e. they are good at problem identification, fact finding, problem definition, generation of ideas, selection and evaluation and acting. From OB point of view, being able to work as a problem solver was identified as a requirement of an effective team player (Broustein, 2015).

For decision making skills, the quantity surveyors had a mean of 3.96, the architects had a mean of 4.09, the builders had a mean of 4.03, the structural engineers had 4.46 and others had 3.65. Averagely, their mean is 4.00. This shows that the construction professionals were good at establishing a positive decision making environment, generating potential solutions, evaluating the solutions, deciding, checking the decision, communicating and implementing the decision. These elements are synonymous to the processes involved in a VM study i.e. information, functional analysis, creativity, evaluation and recommendation stages.

For listening skills, the quantity surveyors had a mean of 2.86, the architects had a mean of 2.82, the builders had a mean of 2.94, the structural engineers had 2.82 and other had the lowest mean of 1.88 indicating poor listening skills. On the average, their mean was 2.66 which is not low nor high. This means that the construction professionals had fair listening skills as opposed to what is required for a VM study. From an organizational behaviour point of view, listening attentively has been identified as an element needed for effective team work and in becoming

an effective team player (Broustein, 2015; Tarricone and Luca, 2002). Also in VM, high listening skills have been identified as a competency / skill also required by team members in order for them to perform effectively in a VM workshop (Oke and Ogunsemi, 2013; Daddow and Skitmore, 2005).

For conflict resolution skills, the quantity surveyors had a mean of 3.34, the architect had a mean of 3.43, the builders had a mean of 3.45, the structural engineers had a mean of 3.42 and others had a mean of 3.03. On the average their mean was 3.33 which indicates that the construction professionals had averagely good conflict resolution skills. It was stated that members of a VM team should possess conflict management and resolution skills (Oke and Ogunsemi, 2013).


From the study it was observed that the construction professionals had good problem-solving and decision making skills while their listening and conflict management skills were fair. These are skills that are required for effective performance of the VM team members. Also from OB point of view, teams are most effective when they comprise members with the right skills for the tasks at hand. Richards (2015) explained that there are two types of competencies required in a team; technical competence i.e. the technical skills of the members and personal competence i.e. qualities, skills and abilities of members that allow people to function in a team. From the study it can be said that in terms of ability, the construction professionals are still lacking in some of the skills required to participate effectively in VM study.

4.3 SKILLS REQUIRED FOR THE FUNCTIONAL ANALYSIS AND CREATIVITY PHASES OF THE JOB PLAN

The study also checked if the construction professionals possessed skills required for stages in the job plan i.e. abilities required to participate effectively within the VM processes. This was given in the table below. In order to delimit the study, two stages involved amongst the stages

identified were investigated. These stages include functional analysis and creativity stage. They were chosen because of their high importance to the VM workshop.

TABLE 4.7: Descriptive statistics for skills required for the job plan

	Quantity Surveyor	Architect	Builder	Structural Engineer	Others	Average of Means	Remark
Mean							
STAGES IN THE VM PROCESS							
 FUNCTIONAL ANALYSIS	3.80	4.10	3.87	4.04	3.74	3.91	High
I take care to define each problem carefully before trying to solve it	4.26	4.48	4.41	4.45	4.63		
I strive to look at problems from different perspective and generate multiple solutions	4.21	4.41	4.36	4.35	4.50		
I usually carry out an analysis of the solution to any problem I identify	4.17	4.34	4.36	4.35	4.38		
Once I choose a solution, I develop an implementation plan with the sequence of events necessary for completion	3.99	4.28	4.09	4.35	4.38		
I give justification for each course of action taken	3.90	4.31	4.09	4.15	4.50		
I have good understanding of logic diagrams	3.69	3.93	3.52	4.00	3.00		
My focus during the F.A. stage is to identify elements that have high cost but low functional utility	3.57	3.97	3.82	3.75	3.75		
Another consideration for me during this stage is the identification of items/elements of high importance that attracts low cost	4.04	4.17	3.82	4.15	3.63		
I can also contribute to the identification of factors that impact project success just as do the designers	4.17	3.79	3.27	3.65	2.38		

I don't think I have a contribution in the identification of the function of a building. That is the job of a designer.	2.10	3.14	2.86	3.35	1.75		
FAST diagramming is a function analysis tool that can aid me in understanding the cost/.value of design proposals	3.72	4.14	3.82	3.90	3.88		
I consider this stage as that whereby the cost objective of functions are arrived at based on issue analysis and information structuring	3.78	4.29	4.00	4.10	4.00		
✚ CREATIVITY	4.08	4.18	4.01	4.19	3.61	4.01	High
You look for new ways to create value in products, processes, services.	4.20	4.45	4.27	4.65	4.00		
You are good at identifying problems and potential problems	4.20	4.45	4.23	4.55	4.00		
You question assumption and recognize opportunities for change	3.97	4.17	4.05	4.10	3.63		
You like to seek different points of view	4.17	4.17	4.18	4.10	3.88		
You like to rethink the ways things are done	3.99	4.10	3.95	3.85	3.25		
You approach challenges creatively	4.04	4.29	4.05	4.25	4.00		
You look for surprising connections	3.62	3.76	3.48	3.70	3.13		
You put forward your own ideas with confidence	4.16	4.10	3.95	4.20	3.57		
You like to suggest alternative ways to achieve goal	4.13	4.24	4.00	4.30	3.13		
You evaluate solutions in order to make recommendation or decisions	4.33	4.10	3.95	4.20	3.50		

Source: Field survey (2017)

FUNCTIONAL ANALYSIS

This is an important part of the Workshop Phase, it is central to value management and cannot be rushed. The experience of the authors is that it should not be omitted (Male and Kelly, 2007). From the table above, the quantity surveyors' mean was 3.80, the architects had 4.10, the builders had a mean of 3.87, the structural engineers had 4.04 and others 3.74. on the average they all had a mean of 3.91 approximately 4 which is high indicating that the construction professionals could identify and classify functions, build function models, cost functions, establish function worth, select function for study and identify area for improvement. It also means that they would perform well in this stage.

CREATIVITY

From the table 4.7, for this stage, the quantity surveyors' mean was 4.08, the architects had 4.18, the builders had a mean of 4.01, the structural engineers had a mean of 4.19 and others 3.61 which is the lowest. On the average they all had a mean of 4.01 which is high. From this, it can be said that they have good creativity skills i.e. they can create solutions and generate innovation. Also they are good at gathering existing ideas and creating new ideas and options. Creative problem solving, ability to think creatively, indulging in an 'out-of-the-box' thinking are indispensable elements of a value management study (Ellis, et al., 2005).

Table 4.8: Difference of means amongst the general information categories

Categories	Mean			
	Personality	Ability	Functional analysis	Creativity
Profession				
<i>Quantity surveyor</i>	3.67	3.55	3.82	4.08
<i>Architect</i>	3.57	3.59	3.59	4.19
<i>Builder</i>	3.44	3.60	3.60	4.01
<i>Structural engineer</i>	3.61	3.71	3.71	4.19
<i>Others</i>	3.45	3.12	3.12	3.61
Years of Experience				
<i>Less Than 5 Years</i>	3.55	3.65	3.90	4.00
<i>6-10 Years</i>	3.60	3.56	3.91	4.07
<i>11-15 Years</i>	3.63	3.49	3.83	4.09
<i>16-20 Years</i>	3.47	3.39	3.99	4.05
<i>Exceeding 20 Years</i>	3.77	3.70	3.94	4.18
Type of organization				
<i>Consultancy</i>	3.77	3.55	3.88	4.14
<i>Client</i>	3.48	3.46	3.91	4.03
<i>Contracting</i>	3.71	3.79	4.01	4.20
Professional attainment				
<i>Probationer</i>	3.63	3.73	4.05	4.27
<i>Associate member</i>	3.67	3.67	3.85	4.08
<i>Fellow</i>	3.55	3.83	3.86	4.20

Source: Field survey (2017)

The table above 4.8 the difference in the respondents mean scores based on the different categories of profession, professional attainment, type of organization and years of experience. The scores give a comparative view of the respondents abilities based on these category. Generally though the ratings are mostly statistically significant, there is an even distribution across the categories.

4.4 THE RELATIONSHIP BETWEEN CONSTRUCTION PROFESSIONALS PARTICIPATORY ATTRIBUTES AND THOSE OF VM PROCESSES.

Hypothesis 1: The null hypothesis (H_{01}) *There is no significant relationship between the construction professionals' attributes and abilities required by the professionals within VM processes.*

Correlation and regression analysis were carried out data collected from the study. This was done in order to establish a relationship between the variables of the study. Correlation is significant at 0.01 level (2-tailed). From the study, the construction professionals' participatory attributes include, the team composition factors, personality and ability while the abilities required by these professionals within the VM processes was checked for functional analysis and creativity stages.

Table 4.9: Relationship between construction professionals’ attributes and their abilities required for VM processes

Team composition factor	Functional analysis	Creativity
Personality	.302**	.325**
Openness to experience (4)	.232**	.227**
Conscientiousness (3)	.348**	.240**
Extraversion (5)	.116	.263**
Agreeableness (5)	.375**	.412**
Neuroticism (3)	-.130	-.191*
Ability	.567**	.581**
Problem solving skills (5)	.463**	.388**
Decision making skills (6)	.625**	.579**
Listening skills (5)	.328**	.463**
Conflict resolution skills (5)	.370**	.308**

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Field survey (2017)

From the Table 4.9, it can be seen that that the Pearson’s co-efficient of correlation, r , for the relationship between professionals’ personalities and functional analysis was 0.302 which means there is a positive correlation between these two variables and this correlation is statistically significant. For the sub-variables; openness to experience, conscientiousness and agreeableness had their r values as 0.232, 0.348 and 0.375 which shows that there is a weak positive correlation between these sub-variables and functional analysis and these

relationships were statistically significant. For the other sub-variables; extraversion had a r value of 0.116 which shows a weak positive correlation with functional analysis and neuroticism had a r value of -0.130 which indicates a weak negative correlation with functional analysis. Both relationships were found to be statistically insignificant

The relationship between personality and creativity had an r value of 0.325 which was positive and statistically significant. The sub-variables; openness to experience, conscientiousness, extraversion and agreeableness had their r values as 0.227, 0.240, 0.263 and 0.412 respectively which shows that there is a weak positive correlation between these sub-variables and functional analysis. These correlations were statistically significant. Only neuroticism had a weak negative correlation with creativity with an r value of -0.191 which was statistically significant at 0.05% level.

Ability showed a rather strong positive correlation with both functional analysis and creativity with r values 0.567 and 0.581 respectively and these relationships were found to be statistically significant. For the sub-variables; problem solving skills had a weak positive correlation with both functional analysis and creativity with r values 0.463 and 0.388 respectively. Decision making skills had a strong positive correlation with both functional analysis and creativity with r values 0.625 and 0.579 respectively. Listening skills had a weak positive correlation with both functional analysis and creativity with r values 0.328 and 0.463 respectively. Conflict resolution skills had a weak positive correlation with both functional analysis and creativity with r values 0.370 and 0.308 respectively. All relationships between the sub-variables of ability and the VM processes; functional analysis and creativity were found to be statistically significant.

All positive relationships shows that an increase between the construction professionals attribute / sub-variable will lead to an increase in the professionals ability to perform

effectively in the correlating VM process while all negative relationships also indicate that an increase in the professionals attribute / sub-variable will lead to decrease in the professionals ability to perform effectively in the correlating VM process.

Table 4.10: Correlation matrix summary table of relationship between construction professionals' attributes and their abilities required for VM processes

	Functional			
	Personality	Ability	analysis	Creativity
Personality	1	.344**	.302**	.325**
Ability	.344**	1	.567**	.581**
Functional analysis	.302**	.567**	1	.634**
Creativity	.325**	.581**	.634**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field survey (2017)

The Table 4.10 presents the summary of the personality' correlation between the construction professionals' participatory attributes i.e. personality and ability their abilities to participate effectively in VM processes; functional analysis and creativity. The table shows that there is a weak positive relationship between personality and ability with an r value of 0.344, an increase in the mean value of the professional's personality will increase his abilities. Also the relationship between the construction professionals' abilities during functional analysis and creativity stages is a strong positive relationship with an r value of 0.634 indicating that an increase in the ability of a professional to perform effectively during functional analysis will also lead to an increase in his ability during creativity stage. All relationships were found to be statistically significant.

Regression analysis

A regression analysis was carried to formulate the mathematical model depicting relationship amongst variables which can be used for the purpose of prediction of the values of dependent variable, given the values of the independent variable. The unstandardized and standardized co-efficients were β and Beta respectively. The standardized co-efficients are to be used in formulating the model because in this case α , would not exist. Only relationships that were found to be significant from the correlation study that was carried out were used in the regression analysis.

Table 4.11: Regression analysis table

Variables	Functional analysis			Creativity		
	Coefficients		Sig.	Coefficients		Sig.
	B	Beta		B	Beta	
(Constant)	1.404		.000	1.423		.000
Personality	.213	.187	.015	.188	.139	.052
Ability	.460	.474	.000	.556	.532	.000
R Square		0.347			0.354	
F Statistic (sig)		0.000			0.000	

From the Table 4.11, there was a significant relationship between the construction professionals attribute and the abilities required for VM processes. From the model summary, $R^2 = 0.347$ and 0.354 respectively which means that team composition factors accounts for 34.7% and 35.4% of the variance in ability to participate effectively during functional analysis and creativity stages.

From the regression co-efficients table, the regression model for predicting the ability of the construction professionals to participate effectively in the VM processes.

For functional analysis,

$$VF.A. = 0.187 MP + 0.474MA$$

This means that personality and ability attributes of the construction professionals influences their abilities to participate effectively in the functional analysis stage by 0.187 i.e. 18.7% and 0.474 i.e. 47.4% respectively. Ability attributes seemed to have more influence on the construction professionals' ability to participate in functional analysis than personality.

For creativity,

$$Vcs = 0.132MP + 0.532MA$$

This means that personality and ability attributes of the construction professionals influences their abilities to participate effectively in the creativity stage by 0.132 i.e. 13.2% and 0.532 i.e. 53.2% respectively. Ability attributes seemed to have more influence on the construction professionals' ability to participate in the creativity stage than personality.

$V_{F.A.}$ = Mean value of construction professionals ability during functional analysis

$V_{C.S.}$ = Mean value of construction professionals ability during creativity

MP = Mean value of construction professionals' personality attribute

MA = Mean value of construction professionals' ability attributes

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

- i. The construction professionals (i.e. Q.S, Builder, Architect, Structural Engineer, e.t.c.) were seen to have rated highly under openness to experience, conscientiousness and agreeableness as it had been identified in literature as being relevant to team effectiveness. Though extraversion was found to be relevant to VM, the construction professionals rated averagely.
- ii. On member ability, the construction professionals had good problem solving and decision making skills but had were rather fair as regards listening and conflict resolution skills. This is indicated in table 4.3.1 with values 4.05 and 4.00 for problem solving skills and decision making skills, 2.66 and 3.33 for listening and conflict resolution skills respectively.
- iii. The construction professionals' abilities to participate effectively during functional analysis was also assessed and they were found to have good skills required during this stage of the job plan.
- iv. The construction professionals were also found to have good creative skills require to generate solutions and innovate during the creativity stage of the job plan.
- v. The construction professionals' personality were found to a have a weak positive relationship with their skills required during the functional analysis and creatively stage.
- vi. The construction professionals' abilities were found to have a strong positive relationship with their skills required during the functional analysis and creatively stage.

- vii. The construction professionals' abilities had more influence on the job plan stages than their personalities.

5.2 CONCLUSION

It has been established from theory that team composition is an important requirement for VM studies. Also under organizational behaviour, team composition is also a requirement for team effectiveness. This was confirmed from the findings as construction professionals' personalities and abilities were found to be mostly good with an exception to the listening and conflict resolution skills which they were found wanting which are important for VM studies to be successful. The relationship between team composition factors, personality and ability and the skills required for the job plan stages of functional analysis and creativity were found to be positive and statistically significant enabling the researcher to draft a model which can be used in screening construction professionals during the VM team members selection in order to promote/ increase the success of the VM studies.

5.3 RECOMMENDATIONS

Due to the need to promote the use of VM and also the need to have successful VM studies, construction professionals need to develop skills (both technical and social) required so that they can participate/ perform effectively during the VM study.

In order to do so, the Nigerian construction professionals should;

- i. Develop good listening skills that will help them in communicating better when they are in teams.
- ii. Develop good conflict resolution skills e.g. negotiation which will help in managing conflicts that will be encountered during team meetings.

- iii. Also the Nigerian construction professionals should learn more about value management so as to increase their understanding of the discipline.

5.4 CONTRIBUTION TO KNOWLEDGE

This study contributed the following to existing knowledge;

- i. The personality attribute of the construction professionals influences their abilities to effectively participate in the functional analysis stage by 18.7 % and creativity stage by 13.2%.
- ii. The ability attribute of the construction professionals influences their abilities to effectively participate in the functional analysis stage by 47.4% and creativity stage by 53.2%.
- iii. Development of a model which indicates the relationship between the attributes; personality and ability and skills of construction professionals during functional analysis stage and creativity stages.

REFERENCES

- Abdullateef, O. (2011). *Practice and prospects of value management in Nigeria: Value management in the Nigerian Construction Industry*. Retrieved from <http://www.amazon.com/Practice-Prospects-Value-Management-Nigeria/dp/3639338065>.
- Abdulrahman, D.A., Ogundiya, I.S. and Kura, S.B. (2013). *Research Methodology and Grantsmanship*. Ibadan: Foludex Press Limited.
- Afila, D. and Smith, N.J. (2007). Risk management and value management in project appraisal. *Proceedings of the Institute of Civil of Engineers: Management, Procurement and Law*. 160(2). 63-67.
- Anyanwu, C.I. (2013). Project cost control in the Nigerian Construction Industry. *International Journal of Engineering Science Innovation*, 2(12), 65-71.
- AS/NZS 4183 (1994) *Standards New Zealand*. Retrieved from <http://shop.standard.govt.nz/catalog/4183%3A1999%28AS%7CNZS%29/view>.
- Ashola, O.A. (2008). *Assessing the practice and prospects of value management in the Nigerian Construction Industry*. Masters thesis. Kulliyah of Architecture and Enviromental Design. International Islamic University Malaysia.
- Ashworth, A. and Hogg, K. (2000). *Added value in design and construction*. Harlow: Longman
- Barrick, M.R., Stewart, G.L., Neubert, M.J. and Mount, M.K. (1998). Relating member ability and personality to work processes and team effectiveness, *Journal of Applied Psychology*, 83, 377-91.
- Barry, B. and Stewart G.L. (1997). *Composition, process, and performance in self managed groups*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/9119798>.
- Bowen, P. A., Jay, C. I., Cattell, K. S., and Edwards, P. J. (2010) 'Value management awareness and practice by South African architects: exploratory survey findings'. *Construction Innovation*. 10, 2, pp.203-222
- Bowen, P.A., Edwards P. J. and Catell, K. (2009). Value management practice in South Africa: the built environment professional compared. *Journal of Construction Management and Economics*, 11, 1039-1057.
- Broadbeck, F.C. (1996). *Criteria for the study of work group functioning*. In West, M.A. (Ed.), *Handbook of work group psychology*, (pp 285-315). Chichester, UK. Wiley.
- Broustein, M. (2015). *Ten qualities of an effective team player*. Retrieved from <https://www.dummies.com/how-to/content/ten-qualities-of-an-effective-team-player.html>.
- Che'Mat M.M. (2007). *Value management: The way forward*. Retrieved from <http://vm-academy.com/lifeCycleValueMgmt.pdf>.
- Cheney, D.L, Seyfarth, R.M. (1990). Attending to behaviour versus attending to knowledge: examining monkeys' attribution of mental states. *Animal Behaviour*. 40:742-753.

- Coetzee, C.E. (2009). *Value management in the construction industry, what does it entail and is it a worthwhile practice?* Masters Thesis. Faculty of Built Environment and Information Technology, University Pretoria.
- Crainer, S. (1998). *Key management ideas: Thinkers that changed the management world.* Third edition. Financial times, Prentice Hall.
- Curral L.A., Forrester, R.H. and Dawson, J.F. (2011). Its what you do and the way that you do it: Team task, Team size and Innovation-related group processes. *European Journal of Work and Organizational Psychology*, 10(2). 181-204.
- Daddow, T. and Skitmore, M. (2005). Value management in practice: an interview survey. *Australian Journal of Construction Economics and Building*, 4(2), 10-18.
- Dallas, M.F. (2006). *Maximizing project value through risk and value management.* Retrieved from <http://www.value-eng.org/knowledge-bank/attachments/200606.pdf>.
- Dawson, B. (2002). Evolving Value management-Where to Next? *Journal of Value Management*, 8(1), 12-15.
- DeLeeuw, C.P. (2001), Value Management: An Optimum Solution. *International Conference on Spatial Information for Sustainable Development*, 2-5. Retrieved from <https://www.fignet/pub/proceedings/nairobi/deleeuw-CMTS2-2.pdf>
- Dell'Isola A.J. (1982). *A value management has an effective tool for making strategic decision.* www.vm-academy.com/ICC12000631PP19.pdf.
- DeMatteo, J.S., Eby, I.T. and Sundstrom, N. (1998). Team-based rewards: Current empirical evidence and directions for future research. *Research in Organizational behaviour*, 20, 141-183.
- Department of Housing and Works (DHW). (2005). *Value Management Guidelines.* Retrieved from www.treasury.wa.gov.au/cms/uploadedFiles/10_samf_vmg_082005.pdf
- Douglas, M. (2003). Why soft skills are essential part of the hard world of a business manager. *The British Journal of Administration Management*, 34, 34-40.
- Edmondson, A. (1999). Psychological safety and learning behaviour in work teams. *Administrative Science Quarterly*. Vol. 44, No 2. 350-383.
- Ellis, R., Wood, G. and Keel, D. (2005). Value management practices of leading UK cost consultants. *Journal of Construction Management and Economics*, 23,483-493.
- Eshofonre, F.P. (2008). *Factors affecting cost of construction in Nigeria.* Retrieved from covenantuniversity.edu.ng/content/download/51911/352229/file/PAT_MSc_1.pdf.
- Fong, P.S. and Shen, Q. (2000). Is the Hong Kong construction industry ready for value management? *International Journal of Project Management*, 18, 317-326.
- Fong, P.S., Shen, Q. and Cheng, W.L. (2001). A framework for benchmarking the value management process. *Benchmarking: An International Journal*, 8(4), 306-16.
- Fong, P.S.W. (2005). Knowledge acquisition, sharing and integration inside a value management team-reflection on an experience. *The Value Manager*. 11 (1), 9-14.

- Gil, F., Rico, R., Alaver, C.M. and Barrasa, A. (2005). Change –Oreinted Leadership Satisfaction and Performance in Work Group : Effects of Tam Climate and Group Potency , *Journal of Managerial Psychology*, vol. 20, No ¾, pp 312-328.
- Gladstein, D.L. (1984). Group in context: A model of task group effectiveness. *Administration Science Quaterly*, 29, 499-517.
- Godwin J.W., Pinto, A.R and Rosenthal N.A. (2009). Macrophages are required for adult salamander limb regeneration. Retrieved from www.pnas.org/cgi/doi/10.1073/pnas.300290110.
- Green, S.D. (1999). A participative research strategy for propagating soft methodologies in value management practice. *Journal of Construction Management and Economics*, 17, 329-340.
- Green, S.D. and Liu, A. (2007). Theory and practice of value management: a reply to Ellis et al. (2005). *Journal of 'Construction Management and Economics*. 25, 649-659.
- Guzzo, R.A. and Dickson, M.W. (1996). Teams in organization:Recent research on performance and effectiveness. *Annual review of psychology*, 47, 307-338.
- Hackman, J.R. and Wageman, R.W. (2005). *A theory of team coaching*. Retrieved from www.leadingchangenetwork.org/wp-content/uploads.../theory-of-team-coaching.pdf
- Hackman, R. (2002). *Five factor model*. Retrieved from www.free-managementEbooks.comfaqld/development-03
- Hellriegel, D., Slocum, J. W. and Woodman, R. W. (1998). *Organizational Behaviour*, Eighth edition. South-Western Publishing.
- Hertel, G., Konradt, U. and Voss, K. (2006). Competencies for virtual teamwork: Development and validation of a web—based selection and tool for members of distributed teams. *European Journal of Work and Organizational Psychology*, 15(4), 477-504.
- Hogg, K. (1999). Value management: A failing opportunity? *Construction, Building and Real Estate Research Conference (COBRA 1999): Royal Institution of Chartered Surveyors (RICS) Foundation*.
- Hughes, W. and Murdock, J. (2001). *Roles in construction projects: Analysis and a Terminology*. Birmingham: Construction industry publications
- Hunter, K and Kelly, J (2004) The case for value management in the UK public service sector. *20th Annual Association of Researchers in Construction Management (ARCOM) Conference*, Vol. 2, 1031-41.
- Hunter, K. and Kelly, J. (2003). The path to the application of Value Management in the UK public sector. *PRoBE*, 1,1-16.
- Ilgen, D.R., Hollenbeck, J.R., Johnson, M. and Jundt, D. (2005). Teams in organization: From input-process-output models to IMO model. *Annual Review of Psychology*, 56, 517- 543.

- Institute of Value Management. (2014). *What is value management*. Retrieved from <http://www.ivm.org.uk/whatisvaluemangement.php>
- Jaapar, A., Maznan, N.A. and Zawawi, M. (2012). Implementation of Value management in public projects. *Procedia: Social and Behavioural sciences*. 77-86.
- Jaapar, A., Zawawi, M., Ban, N.A. and Ahmad, N. (2011). Value management in the Malaysian construction industry. *Asia Pacific International Conference on Environment Behaviour Studies*, 35, 757-763.
- Jackson, C. (1996). *Early intervention in psychosis: Opportunities for secondary prevention*. Retrieved from www.onlinelibrary.wiley.com/doi/10.1111/j.2044-8260.1996+b01206.x/abstract.
- Katzenbach, J. and Smith, D. (1993). *The wisdom of teams: creating the high performance organization*. Retrieved from www.praxisframework.org/library/Katzenbach-and-Smith .
- Kaufman, J.J. (2006). The making of a VM facilitator, *Value World*, 29 (1), 8-14.
- Kelly, J. (2007). Making client values explicit in value management workshops. *Journal of Construction Management and Economics*, 25, 435-442.
- Kelly, J. and Male, S. (1988). *A Study of Value Management and Quantity Surveying Practice*. London: Surveyors Publications.
- Kelly, J. and Male, S. (1993). *Value management in design and construction: The economic management of projects*: Taylor and Francis.
- Kelly, J. and Male, S. (2006). Value management. In Kelly, J., Morledge, R. and Wilkinson, S. (Eds.). *Best value in construction*. Oxford: Blackwell Publishing.
- Kelly, J. and Poynter-Brown, R. (1990) Value management, in Brandon, P.S. (ed.) *Quantity Surveying Techniques: New Directions*. Oxford: BPS Professional.
- Kelly, J., Male, S and Graham, D. (2004). *Value management of construction projects*. Oxford: Blackwell Science.
- Kelly, J., Morledge, R. and Wilkinson, S. (2002). *Best value in construction*. Oxford: Blackwell Publishing.
- Kolo, B.A. and Ibrahim, AD, (2010). Value management: how adoptable is it in the Nigerian Construction Industry. *West Africa Built Environment Research (WABER) Conference*, 653-663.
- Kothari, C.R. (2004). *Research Methodology: (Methods and Techniques)*. New Delhi: New Age International ltd.
- Kozlowski, S.W.J and Ilgen D.R. (2006). Enhancing the difference of work group and teams. *Psychology science in the public interest*. 7(3).77-124.
- Lafasto, F. and Larson, C. (2001). *When teams work best*. Retrieved from <http://leadership.files.wordpress.com/2011/02/when-teams-work-best.pdf>.

- Lencioni.P.(2005) *The five dysfunctions of a team*. Retrieved from [www.mtdtraning.com/blog/lencionis-five-dysfunction and of a team.htm](http://www.mtdtraning.com/blog/lencionis-five-dysfunction-and-of-a-team.htm).
- LePine, J.A. (2003). Team adaptation and post change performance: Effects of team composition in terms of members cognitive ability and personality. *Journal of Applied Psychology*, 88(1), 27-39.
- Leung, M. (2003). *Participation in value management*. London: RICS Education Trust Royal Institute of Chartered Surveyors.
- Leung, M. (2009). *Reasons for applying VM*. SAVE , 1-6.
- Leung, M. and Kong, S. (2008). Identifying key competencies of VM facilitators based on international standards. *Hong Kong Institute of Value Management*, 1-7.
- Leung, M. and Liu, A.M. (2003). Analysis of value and project goal specificity in value management. *Journal of Construction Management and Economics*^ 21, 11-19
- Leung, M., Chu, H. and Xinlong, L. (2003). *Participation in value management*. Report, RICS Education Trust, The Royal Institution of Chartered Surveyors. London: Surveyor Publications.
- Leung, M., Ng, S.T. and Cheung, S. (2002). Improving satisfaction through value management, conflict stimulation and resolution in construction projects. *Journal of Management in Engineering*. 18 (2). 68-75.
- Lin, G. and Shen, Q. (2007). Measuring the performance of value management studies in construction: critical review. *Journal of Management in Engineering*, 23 (1).
- Lombardo, M. and Eichinger, W. (2005).T7 model of team effectiveness. Retrieved from <http://www.wrike.com/blog/6-different-team-effectiveness-models>.
- Male, S. and Kelly, J. (2007). *The re-appraisal of value methodologies*. Retrieved from www.value-eng.org/knowledge_bank/attachments/200428.pdf.
- Male, S. and Kelly, M. (1989). Organizational responses of public sector clients in Canada for the implementation of value management: Lessons for the UK construction industry. *International Journal of Construction Management and Economics*, 7, 203-216.
- Male, S., Kelly, J., Grongvist, M. and Graham, D. (2007). Managing value as a management style for projects. *International Journal of Project Management*, 25, 107-114.
- Male, S., Kelly, J., Gronqvist, M. and Graham, D. (2005). Reapprasing value methodologies in construction for achieving Best Value. *Value Solutions*, 1-4.
- Male,S., Kelly, J., Fernie, S., Gronqvist, M. and Bowles, G. (1998). *The value management benchmark: Research results of an international benchmarking study*. Edinburgh: Thomas Telford.
- Maramaldo, D. (2002). Wealth generation trough value. *Journal of Value Management*, 8(1), 2-11.
- McGrath, J.E. (1964). *Social Psychology: A Brief Introduction*. New York: Holt, Rinehart & Winston.

- McLeod, S. A. (2014). *Questionnaires*. Retrieved from www.simplypsychology.org/questionnaires.html
- Mickan, S. and Rodger, S. (2000). Characteristics of effective teams: a literature. *Australian Health Review*.23(3). 201 -208.
- Microsoft Encarta (2009). *Encarta dictionary*. Microsoft Corporation.
- Mohamad S.S. (2014). *Value Management in design planning: a system based framework for multidisciplinary team involvement*. Retrieved from http://eprints.qut.au/75950//saifulni_Mohamad_thesis_pdf.
- Moreland R.L. et.al. (1992). *Exposure effects in the classroom: the development of affinity amongst students*. Retrieved from www.researchgate.net/.../222608863_exposure_effects_in_the_classroom_the_development_of_affinity_among_students.
- Mullins, L. J. (2005). *Management and Organizational behaviour*. 7th ed. England: Pearson Education Limited.
- Neuman, G.A. and Wright, J. (1999). *Team effectiveness: beyond skills and cognitive ability*. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/10380418>.
- Neuman, G.A. et.al. (1999). *The relationship between work-team personality composition and the job performance of teams*. Retrieved from https://www.researchgate.net/application/clientvalidation.html?origPath=/publication/258138159_The_Relationship_between_Work-Team_Personality_Composition_and_the_Job_Performance_of_Teams.
- New South Wales Treasury (NSW) (2004). *Value Management Guideline*. Retrieved from www.treasury.nsw.gov.au/_data/assets/pdf_file/0009/5112/value_management.pdf
- Nielson, T.M., Sundstrom, E. and Halfhill, T. (2005). Group dynamics and effectiveness: Five years of applied research. In Wheelan, S.A. (Ed.), *Handbook of group research and practice* (pp 285-311). Thousand Oaks. C.A.: Sage.
- Nigerian Institute of Quantity Surveyors (NIQS). (2004). Who is a quantity surveyor? What can he do for you? *Programme of the 21st biennial conference/general meeting on Adding Value to a Reforming Economy – Challenge for the Quantity Surveying Profession in Nigeria*. Nigeria Institute of Quantity Surveyors.
- O'Neill, T. A. and Allen, N. J. (2011). Personality and the prediction of team performance. *European Journal of Personality*, 25(1), 31-42.
- O'Reilly, B(1998). *Those who trespass*. Retrieved from www.newyorker.com/books/page-turner/reading_bill_o'reilly_old_novel_about_a_tv_newsman_who_murders_severals_people
- Ojelade, R. B. (2009). *Incorporating value engineering as a component of construction procurement process in Nigeria*. Unpublished dissertation. School of Environmental Technology. Federal University of Technology, Akure.

- Oke, A. and Ogunsemi D. (2009) Competencies of quantity surveyors as value managers in developing economy. *The Construction and Building Research Conference of the Royal Institution of Chartered Surveyors (COBRA 2009)*. Cape Town.
- Oke, A.E and Ogunsemi, D.R, (2009). Value management in the Nigerian Construction Industry; Militating factors and the perceived benefits. *International Conference on Advances in Engineering and Technology*. Retrieved from <http://www.academia.edu>
- Oke, A.E. and Ogunsemi, D.R. (2013). Areas of competence of quantity surveyors and their relevance to value management discipline. *Nigerian Institute of Quantity Surveyors Annual Research Conference*, 1, 359-368.
- Oke, A.E. and Ogunsemi, D.R. (2013). Key competencies of value managers in Lagos state, Nigeria. *Procs 5th West Africa Built Environment Research (WABER) Conference*:773-782.
- Olanrewaju, A., Anavhe,P. and Abdul- Aziz, A. (2014). *The Nigerian quantity surveyors in an emerging market*. Retrieved from <https://www.cib2014.org/proceedings/files/papers/640.pdf>
- Olanrewaju, A.L. and Khairuddin, A.R. (2007). Value management: New direction for the Nigerian quantity surveyors. *Proceedings of a conference on Leading through innovation by Malaysian Institute of Quantity Surveyors*, 102-109.
- Pasquire,C.L. and Abidin, Z.N, (2007). Revolutionize value management: A mode towards sustainability. *International Journal of Project Management*, 25, 275-282.
- Perera, S., Karunasena, G. and Selvadurai, K. (2003). Application of value management in construction. *Built –Environment Sri Lanka*, 4 (1), 1-12.
- Richards, D.J. (2015). *Competent team members*. Retrieved from <https://www.odportal.com/team/effective/chapter7.html>.
- Rico, A.et.al. (2011). Retrieved from https://www.researchgate.net/publication/277934519_Rico_et_al_2011.
- RICS (2015). *RICS draft guidance – Value engineering and Value management*. Retrieved from https://www.consultation.rics.org/consult/value_engineering/view?objectid=865108.
- Robbins, S.P. and Judge, A.J. (2013). *Organizational Behaviour*.15th ed. U.S.A. Pearson Education, Inc.
- Rubin et. al. (1977). *A comparison of team effectiveness model*. Retrieved from <http://www.cioin.dex.com/article/articled/---/a-comparison-of-team-effectiveness-model>
- Saifulnizam, M., Coffey, V. and Preece C.N. (2011). Value Management: An extension of quantity surveying services in Malaysia. *International Construction, Business and Management Symposium*. Retrieved from https://www.academia.edu/1267712/Value_Management_An_Extension_of_Quantity_Surveying_Services_in_Malaysia.
- SAVE continental. (2007). *Value management*. Retrieved from www.value-eng.org.

- Saylor Academy (2015). *Organizational Behaviour*. Retrieved from www.saylor.org/site/textbooks/OrganizationalBehaviuor.pdf.
- Senior, B. and Swales, S. (2004). The dimensions of management team performance: a repertory grid study. *International productivity and performance management*, Vol.53, issue 4, pp 317-333.
- Shen, Q. and Liu, G. (2003). Critical success factors for value management studies in construction. *Journal of Construction Management and Economics*, 129(5),
- Shen, Q. and Yu, AT. (2012). *Value management: recent developments and way forward*. *Constructon Innovation*, 12(3), 264-271.
- Shuttleworth, M. (2008). *Descriptive Research Design*. Retrieved from Explorable.com: <https://explorable.com/descriptive-research-design>
- Sigle, H.M., Klopper, C.H. and Visser, R.N. (2000). The South African quantity surveyors and value management. *Project Forum: South Africa Project Pro*, 23-26.
- Simpson, V. and Dye, J. (2009). Value for money: a quantity surveyors perspective of the quantitative versus qualitative. *RICS COBRA Research conference*, 475-493.
- Singh, A and Jannadi, O. (2006). Comparisions of evaluation techniques in value engineering. *International conference in the Built environment*. ICOBE.
- Spaulding, M.W., Bridge, A. and Skitmore, M. (2005). The use of function analysis as the basis of value management in the Australian construction industry. *Journal of Construction Management and Economics*, 23(2005) 723-731.
- Standards Australian Committee. (1994). *Australian Standard AZ/NZS 4183*. Sydney: Standard Australia.
- Steiner I. (1972). *Group Process and Productivity*. Retrieved from <https://facultystaff.richmond.edu/dforsyth/ym/.../10%20Performance%202013.pptx>.
- Stevens R.D. (2014). *Value Analysis*. Retrieved from <http://ivm.org.uk/blog/post.php?s=2013-11-19-value-analysis-----25-----2013--canada>.
- Stuart, C. (1998). *Stuart Crainer: Books, biography, blog, audiobooks*. Retrieved from www.amazon.com/stuart-crainer/e/B000APU578.
- Tarricone, P. and Luca, J. (2002). Successful teamwork: A case study in quality conversations. *Proceedings of the 25th HERDSA Annual conference*, 640 - 646
- The Facilities Society. (2014). *Value management and engineering*. Retrieved from <http://www.facilities.ac.uk/j/free-cpd/157-value-management-and-engineering>
- Thiry, M. (2001). Sensemaking in value management. *International Journal of Project Management*, 19, 71-77.
- Thurnell, D. (2002). The personal style of the value management facilitator: How important is it. *5th International Conference of Hong Kong Institute of Value Management*. Retrieved from

https://www.academia.edu/4890860/The_personal_style_of_the_value_management_facilitator_how_important_is_it.

Total Asset Management (2000). Value Management Guidelines. Retrieved from [www.academia.edu/19744046/ Value_Management_Guidelines](http://www.academia.edu/19744046/Value_Management_Guidelines).

Whyte, A. and Cammarano, C. (2012). Value management in infrastructural projects in Western Australia: Techniques and Stages. *28th Annual ARCOM Conference*, 28, 797-806.

Wixson, J. and Heydt, H.J. (1991). The Human side of value engineering, *Society of American Value Engineers (SAVE)*, 30-38.

Wutchy, S., Jones, B.F., & Uzzi, B. (2007). The increasing dominance of teams in production of knowledge. *Science*, 316, 1036-1039.

Yu, A.T., Shen, Q., Kelly, J. and Hunter, K. (2005). Application of value management in project briefing. *Facilities*, 23(7/8), 330.

APPENDIX

LETTER OF INTRODUCTION

DEPARTMENT OF QUANTITY SURVEYING,
FACULTY OF ENVIRONMENTAL DESIGN,
AHMADU BELLO UNIVERSITY, ZARIA,
KADUNA STATE, NIGERIA.

Dear Respondent,

**REQUEST FOR RESPONSE TO QUESTIONNAIRE TO ASSESS THE ATTRIBUTES REQUIRED BY
CONSTRUCTION PROFESSIONALS TO EFFECTIVELY PARTICIPATE IN A VALUE MANAGEMENT STUDY
IN THE NIGERIAN CONSTRUCTION INDUSTRY.**

I am a student in the Department of Quantity surveying, at the Ahmadu Bello University, Zaria currently studying for a Master of Science degree in Quantity Surveying. As part of the requirement for my graduating, I am researching into the attributes required by the construction professionals to participate effectively in a value management study.

Consequently, I wish to solicit your kind assistance in providing data for this study through this questionnaire. This research is purely academic exercise and any opinion expressed by you in this questionnaire shall only be used for this purpose and no other.

You are therefore, kindly requested to fill and tick the appropriate spaces as provided in each of the items below as response that best represent your opinion on this issue raised.

Your sincerity and co-operation will be highly appreciated and the responses shall be treated in the highest confidence.

Thank You.

Yours faithfully

Yusuf, Aisha

Email: clicchic26@gmail.com

QUESTIONNAIRE

SECTION 1: GENERAL INFORMATION

1. Profession: Quantity surveyor Architect Builder Structural Engineer Others
2. Professional Attainment : Probationer Associate /member Fellow others (please specify) _____
3. Respondent's Working Experience: Less than 5 years 6 - 10 years
11 - 15 years 16 - 20 years Exceeding 20 years
4. Type of organization: Consultancy Client Contractor
5. Have you ever participated in a value management study? Yes No

SECTION 2: TEAM COMPOSITION FACTORS THAT AFFECT TEAM EFFECTIVENESS

Directions: The following statements concern your perception about yourself in a variety of situations. Please indicate the strength of your agreement with each statement, utilizing the corresponding scale by circling your choice.

A. PERSONALITY

Scale: 1 – Strongly Disagree; 2 – Disagree; 3- Neither agree/disagree; 4 – Agree; 5- Strongly Agree

Statements	Level of Agreement				
	1	2	3	4	5
I have a rich vocabulary and a vivid imagination	1	2	3	4	5
I am original i.e. come up with new ideas	1	2	3	4	5
I don't have difficulty in understanding abstract ideas	1	2	3	4	5
I am curious about many different things	1	2	3	4	5
I am always prepared follow a predefined schedule	1	2	3	4	5
I am exacting in my work	1	2	3	4	5
I pay attention to details and like order	1	2	3	4	5
I feel comfortable around people	1	2	3	4	5
I talk to a lot of different people at my workplace	1	2	3	4	5
I am good at starting conversations	1	2	3	4	5

I don't mind being the center of attention	1	2	3	4	5
I am outgoing, sociable	1	2	3	4	5
I sympathize with other peoples' feelings	1	2	3	4	5
I am interested in other peoples' problems	1	2	3	4	5
I make people feel at ease	1	2	3	4	5
I take time out for others	1	2	3	4	5
I have a soft heart	1	2	3	4	5
I get irritated and upset easily	1	2	3	4	5
I am more anxious than most people and have frequent mood swings	1	2	3	4	5
I get stressed out easily	1	2	3	4	5

B. ABILITY

Scale: 1- Never/Hardly ever; 2- Rarely; 3- Sometimes; 4- Often; 5- Always/Nearly always

Statements	Level of agreement				
I usually have all the information I need when finding a solution to a problem	1	2	3	4	5
I carefully define each problem before trying to solve it	1	2	3	4	5
I generate solutions to problems by looking from different points of view	1	2	3	4	5
I take time to think about how I choose between options when evaluating solutions	1	2	3	4	5
Once I choose a solution, I develop an implementation plan with sequence of events needed for completion	1	2	3	4	5
I try to determine the real issue before stating the decision making process	1	2	3	4	5

I consider a variety of potential solutions before I make my decisions	1	2	3	4	5
I prefer to make decisions on my own then inform other people later	1	2	3	4	5
If I have doubts about a decision, I recheck my assumptions and process	1	2	3	4	5
I carefully choose the best decision making tool for each specific decision	1	2	3	4	5
I create an implementation plan before communicating my decision	1	2	3	4	5
I make eye contact with others while listening	1	2	3	4	5
I get bored with conversations easily - most people have nothing interesting to say	1	2	3	4	5
I finish people's sentences for them, when they pause and I know what they are going to say	1	2	3	4	5
When I have something to contribute to a conversation, I'll interrupt the speaker to make my point.	1	2	3	4	5
I nod my head and use other gestures and facial expressions to show that I'm interested in what is being said	1	2	3	4	5
When stressed, I am overly emotional/heated	1	2	3	4	5
When communicating with others, I pay attention to non-verbal signals like facial expression, gestures, tone/intensity of voice etc.	1	2	3	4	5
I avoid difficult conversations/ confrontations	1	2	3	4	5
I understand and respect the view of others even if they differ from yours	1	2	3	4	5
I always want to enforce your opinion	1	2	3	4	5
I prefer working as part of the team rather than as an individual	1	2	3	4	5
I adapt to changing requirements	1	2	3	4	5

SECTION 3: SKILLS REQUIRED FOR STAGES IN THE JOB PLAN

A. FUNCTIONAL ANALYSIS STAGE

Below are some statements relative to functional analysis. Please indicate the extent to which each of these statements describes you as a quantity surveyor. Please circle your choice
 Scale: 1- Very Low; 2- Low; 3- Moderate; 4- High; 5-Very High

	Degree				
	1	2	3	4	5
I take care to define each problem carefully before trying to solve it.	1	2	3	4	5
I strive to look at problems from different perspectives and generate multiple solutions	1	2	3	4	5
I usually carry out an analysis of the solution to any problem I identify	1	2	3	4	5
Once I choose a solution, I develop an implementation plan with the sequence of events necessary for completion.	1	2	3	4	5
I give justification for each course of action taken	1	2	3	4	5
I have a good understanding of logic diagrams	1	2	3	4	5
My focus during the FA stage is to identify elements that have high cost but low functional utility	1	2	3	4	5
Another consideration for me during this stage is the identification of items / elements of high importance but attracts low cost	1	2	3	4	5
I can also contribute to the identification of factors that impacts project success just as do the designers	1	2	3	4	5
I don't think that I have any contribution in the identification of the main function of the building. That is the job of a designer.	1	2	3	4	5

FAST diagramming is a function analysis tool that can aid me in understanding the cost / value of design proposals	1	2	3	4	5
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I consider this stage as that whereby the cost objective of functions are arrived at based on issue analysis and information structuring	1	2	3	4	5
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B. CREATIVITY STAGE

Below are some statements relative to creativity. Please use the following scale to indicate the degree to which you demonstrate the skill, attitude or behaviour by circling as appropriate. Scale: 1- Very Low; 2- Low; 3- Moderate; 4- High; 5-Very High

Statements	Degree				
You look for new ways to create value in products, processes, services	1	2	3	4	5
You are good at identifying problems and potential solutions	1	2	3	4	5
You question assumptions and recognize opportunities for change	1	2	3	4	5
You like to seek different points of view	1	2	3	4	5
You like to rethink the way things are done	1	2	3	4	5
You approach challenges creatively	1	2	3	4	5
You look for surprising connections	1	2	3	4	5
You put forward your own ideas with confidence	1	2	3	4	5
You like to suggest alternative ways to achieve goals	1	2	3	4	5
You evaluate solutions in order to make recommendations or decisions	1	2	3	4	5
