

**AN ANALYSIS OF VALE-MANAGEMENT AS A PANACEA FOR HIGH PROJECT
EXECUTION FAILURE RATE IN SELECTED CAPE TOWN PROJECT FIRMS**

By

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DECLARATION

I, Sandisile Hendry Magwaza, affirm that the research work upon which the dissertation is based is my own (except where acknowledgements indicate otherwise), and that neither the entire research endeavour nor any part of it has been, is being, or will be submitted for another degree in this or any other education institution.

.....

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.....

Date

ABSTRACT

There is a need to draw a balance between satisfying needs, be they of the customer or the beneficiaries of the project, and that of maximising the utilisation of resources. Value management seeks to merge all aspects of the project process, and to find a balance between satisfaction of the project's needs and the stakeholder's interests. This technique is meant to improve the reconciliation and value of differing judgements and priorities to improve on the deliverables of the project. Consequently, the principles of defining and adding measurable value focuses on reaching the objectives, and finding solutions to problems before they appear. Therefore, the end results become an innovative way of integrating all operational activities, which enhance pre-emptive, risk averse management.

Value management is considered as a critical aspect in the effective management of project processes to reduce the high project failure rate in the construction industry. Part of the purpose of this study is to bring about awareness and knowledge of the effective use of the value management tool. This empirical research focused on project managers and other project practitioners who are tasked with the execution of project processes. A total of 125 respondents was drawn from the sampling frame. A structured questionnaire was used for the purpose, and collected data was captured and analysed, using the SPSS tool and an Excel spreadsheet. Relationships in the illustrations were interpreted and presented, forming the basis on which findings, conclusion and recommendations were made. A questionnaire has structured closed-ended questions (quantitative) and open-ended questions (qualitative) to complement each other. A mixed method approach (qualitative and quantitative) was applied to take advantage of the benefits of these two methods. The qualitative research applied a content analysis of the collected data.

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DEDICATION

I dedicate this study to my late mother, Mrs Nosandisile Magwaza, my aunt Phiwokazi Mlonyeni and brother Vuyo Magwaza who are my pillars of strength, especially during difficult times. I am also thankful to my dad, Momelezi Magwaza, for showing me that in life, nothing is impossible.

LIST OF ABBREVIATIONS AND ACRONYMS

APM	: Association for Project Management
BPR	: Business Process Re-engineering
BSRIA	: Building Service Research & Information Association
CIRIA	:Construction Industry Research and Information Association
CM	: Cost Management
EP	: Exploration Projects
EPSRC	: Engineering and Physical Science Research Council
FA	: Functional Analysis
LUSI	: The LCLS Ultra-Fast Science Instruments
SAVEI	: Society of American Value Engineers International
SA	: South Africa
TAM2000	: Total Asset Management Manual 2000
UK	: United Kingdom
USA	: United States of America
VA	: Value Analysis
VC	: Value Control
VE	: Value Engineering
VM	: Value Management/Methodology
VP	: Value Planning

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CHAPTER 1: Introduction

1.1 INTRODUCTION

The aim of the study is to explore the concept, Value Management (VM), as a tool, and to establish whether the tool has potential to solve the high failure rate in project execution. According to Abd-Karim, Rahmin, Danuri and Mohamed (2014: 1), Value Management is a well-received technique globally, and has expanded with a variety of industries that partake in project related work. This ranges from traditional project-orientated industries such as construction, aerospace, petroleum and healthcare to service industries as diverse as finance, utilities, telecommunications and government. Lock (2013: 1) postulates that technology, economic pressures of the industrialized world, competition between organisations and greater respect of value, are reasons for the demand of new projects, new project management ideas and techniques. Therefore, companies are challenged to establish new ideas, innovative techniques, knowledge and value creation to ensure successful project implementation.

In support, Peterson (2013: 9) posits that the need for projects is increasing extensively for companies, and expectations are higher in terms of performance (time, cost and specifications). Companies have realized the importance of implementing effective and efficient project processes to help achieve desired goals and to meet customer expectations. However, Dobson and Leemann (2010: 1) assert that research studies indicate that between 50% - 80% of all projects fail, including those that are led by experienced and capable project managers. It is difficult to complete projects within the triple constraints of time, cost and quality. Projects, products and processes continue to face the challenge of a high project execution failure rate, even if all the necessary resources have been allocated for the project (Shepherd and Cardon, 2009: 924). Projects refer to all new and existing product development, services, ventures, emerging markets and processes with a known start date and end date. To counter this high failure rate, the concept of value management has been growing steadily in the minds of both academics and practitioners.

1.2 BACKGROUND

SAVE International (2007: 7) reports that Value Analysis (VA) was developed at General Electric by Lawrence D. Miles, an electrical engineer in the 1940s. The developer realised that with systematic management of value and innovation improvement, General Electric would gain a competitive advantage in the marketplace. According to Cammarano (2012: 798), the VM process was developed in the manufacturing industry in the United States of America (USA) in 1947. Since then, VM spread through to the construction industry in the late 1960s in the USA. Later, the United Kingdom's (UK) construction industry developed an interest to adopt the Value Analysis method and renamed it Value Management (VM).

Oke, Omoregie, Aghimien, Olusola and Olatunji (2015:57) found that it was the USA's public sector bodies that implemented VM in construction projects. During World War II (1939-1945) many manufacturers were forced to substitute materials and designs owing to critical material shortages in the industry. Kelly, Male and Graham (2015: 6 - 9) stipulate that during the late 1980s VM evolved in the construction industry in the UK. It was during this time that the VM tool was adopted for use as a value-for-money measure within the construction industry in a number of countries. Over the years many value practitioners evolved from VA and Value Engineering (VE) to the process of VM, as it integrates throughout the entire project life-cycle.

Suhaimi (2014: 15) asserts that over the last few decades VM has matured over time, while there has been substantial research into its application within the construction industry. The evolution of VM has been developed from managing the project briefing, design process, methodologies and techniques to becoming a strategic development of performance measures. The findings of the study conducted by Rangelova and Traykova (2014: 433) reveal that VM sets processes that help to identify and remove all unnecessary costs, which are associated with the project, and still enhance customer value. Even so, Jaapar, Endut, Bari and Takim (2009: 211) maintain the fact that VM does not merely consider costs, but also the relationship between quality, function, value and costs in a broader perspective to reduce unnecessary costs that do not contribute to the project. However, Olanrewaju (2013: 4) argues that the VM process

does not only comprise a customer's value system for quality, reliability, conformance, durability, time and cost. It also encourages innovation, creativity and adaptability to change and enhances the effective use of resources, as well as analytical and good communication systems. According to Lop, Apandi, Kamar, Salleh, Mamter and Hamdan (2014: 2), the VM tool has been recognized internationally for improving client value in projects, products, processes and systems for almost forty years.

New Zealand Government Procurement (2015: 26) explains that VM is a method that assists with decision making at all levels of the organisation and project stages. The purpose of value relies on effective resource utilization with intentions to satisfy various project needs. Therefore, using fewer resources and still maintaining greater satisfaction of needs, means greater value achieved by a project. On the contrary, Al-Yami and Price (2006: 327 - 329) posit that VM is an excellent tool that ensures that employees use fresh approaches to problem solving, and setting tasks and objectives, whilst breaking through existing perceptions and still allowing for new ideas. The VM tool explains the entire philosophy and range of the method application processes at early strategic stages of the project. Therefore, value planning, value analysis and value engineering form part of VM.

Research studies have diverse and contradicting views of the concept of Value Management. Jansen (2010: 13) defines VM as a management approach that helps to increase project or product margins by applying effective systematic tools and approaches to find creative solutions. It strives to increase project value and reduces unnecessary costs to satisfy all stakeholders' needs and interests. This definition applies to all project-types, regardless of the industry or sector (for example, construction, manufacturing or retail), whereas, Mandelbaum, Hermes, Parker and Williams (2012: 1) explain that Value Management is a business improvement initiative for new projects or product development. Its phases entail orientation, information, functional analysis, creativity, evaluation, development, presentation and implementation. Successful business improvement initiatives, new projects and product development continuously aspire to improve customer satisfaction, sustainability and growth. Gould (2012: 14) acknowledges the fact that a critical factor that allows VM to

exist is the identification of a project need. As soon as a client clearly expresses a desire for a value system on a process, product or situation, a project will exist. A project may also begin with an identified and stated purpose or goal, which is established by the owner and is accomplished by the project team.

The Dublin Department of Finance (2009: 79) highlights that expert value managers use VM in a range of techniques such as Value Profiling (VP), Functional Analysis (FA), value metrics, optional selection, whole life costing and VE to maximise project value. The tool is a structured management of the total value equation, which is applied in all stages of the project, regardless of the industry or sector. In addition, Little (2010: 2) postulates that there are numerous operators that have already implemented VM techniques. However, a major challenge is to maintain the management and operational discipline, which is required to achieve effective and sustainable results in projects. The process requires VM knowledge and skills to ensure effective and efficient implementation of VM techniques. Hence, it is highly recommended that the project team, supervisors and senior management should receive formal VM training beforehand to ensure proper and successful implementation of the tool in the workplace.

The LCLS Ultra-Fast Science Instruments (LUSI) (2007: 3) states that VM is well organized and directed at analysing system operations, equipment, facilities and services to realize the lowest lifecycle cost that is consistent with the required performance, quality, reliability and safety. The VM tool also helps to determine the best value and relationship between worth and cost. However, Coetzee (2009: 1) argues that the VM process should be used as a service that aims to maximise the functional value of a project, and to manage its development from the concept phase to the audit of all decisions against a value system that is determined by clients or stakeholders.

Research studies continue to express different views on the use of VM. Nonetheless, a general feeling amongst researchers is that Value Management improves project value, project performance and team-dynamics. VM eliminates unnecessary project costs with the ultimate intention to satisfy stakeholders' needs. Maniak, Midler, Lenfle and Pellec-Dairon (2014: 5) affirm that the tool combats the challenge of having to coordinate

various organisational units to deliver new products and processes. The term VM is used to describe the total process of value enhancement for a client from project inception through to operation and use. Che-Mat and Shah (2006: 3) further state that the VM method is an accurate and systematic effort that aims to optimize project value, cost, facilities and systems. It also generates cost improvements without compromising project quality and performance. This is regarded as the most creative method of working together to effectively achieve client and stakeholder requirements. Al-Saleh and Taleb (2009: 52) profess that although there is no single agreed-upon definition and use, sustainability in terms of VM, involves three critical success factors, namely economic sustainability, social sustainability and environmental sustainability. Ultimately, the project's profitability will be enhanced by the efficient use and management of resources.

According to Whyte *et al.* (2012: 798), VM involves greater knowledge and skills that help to manage the value process by applying the correct tools and techniques at the appropriate time. A typical VM exercise involves seven phases, namely orientation, information, evaluation, development, presentation, feedback and creativity. Therefore, Value Management should not be perceived as a mere design review, conflict orientated and standardization exercise. In support, Olanrewaju (2013: 2) argues that VM reduces the risk of project failure, shortens project schedules, lowers unnecessary project costs, and improves quality, performance, reliability and safety. Therefore, effective VM implementation is conducive to successful achievement of project goals and objectives to meet customer expectations.

Venkataraman and Pinto (2008: 12) contend that research studies show that VM helps to reduce product, process or project failure, whilst adding value to organizational success. Value Management remains a critical contributing tool towards project success, but is often underestimated by organisations owing to a number of factors. Contrary to this assertion, Abd-Karim *et al.* (2014: 1) claim that many organizations are making progress to improve VM implementation while assessing the strengths and weaknesses to improve performance and gain a competitive advantage. Mixed signals

regarding the Value Management knowledge gap within organizations are concerning. Some organizations are becoming knowledgeable and are ready to use the tool, while other organizations are still less knowledgeable and are resisting the idea of Value Management implementation.

1.3 PROBLEM STATEMENT

As alluded to in the preceding literature review, there is a 50% – 80% failure rate in the execution of construction projects. There are compelling factors, which have led to this unprecedented project management failure rate even though the managers are experienced construction professionals. These professionals are also supported by state-of-the-art technology, which improves the rate at which tasks are performed, yet project execution still shows a high failure rate. Many solutions have been suggested without much success in the South African context, and there is a quest now to acquire new methods and techniques for the industry in the country. The research sought to evaluate the extent to which this tool is used in the Cape Town construction industry, whilst measuring the extent to which it can assist to reduce the project execution failure rate. The failure rate is characterised by cost overruns, which stem from rework, scope changes, and several other factors.

1.4 OBJECTIVES OF THE STUDY

The objectives of the study were stated or implied in the preceding literature review and partly in the problem statement, categorized as primary and secondary objectives.

1.4.1 Primary objective

- To identify the extent to which the Value Management tool is used in Cape Town's construction industry.

1.4.2 Secondary objective

- To establish the effectiveness of Value Management as a successful project execution tool in construction firms.

1.5 RESEACH QUESTIONS

1.5.1 Do project teams and managers use Value Management as a useful tool in the execution of construction projects?

1.5.2 Has the use of the Value Management tool (where it is used) made any significant improvements to reduce the high failure rate in construction projects?

1.6 RESEARCH PROCESS

According to Van Renen (2009: 3), a research process provides an overview of a method in which a process is conducted. The process begins from developing a research proposal up until the final submission of the dissertation or thesis. Panday and Panday (2015: 13) and Driscoll (2011: 156 - 158) profess that the research process consists of a series of steps, which are designed to effectively conduct research. It involves similar activities, regardless of the area of research or choice of methodology. Furthermore, Zonrabi (2013: 259) affirms that reliability of data and findings is one of the most critical requirements of any research process.

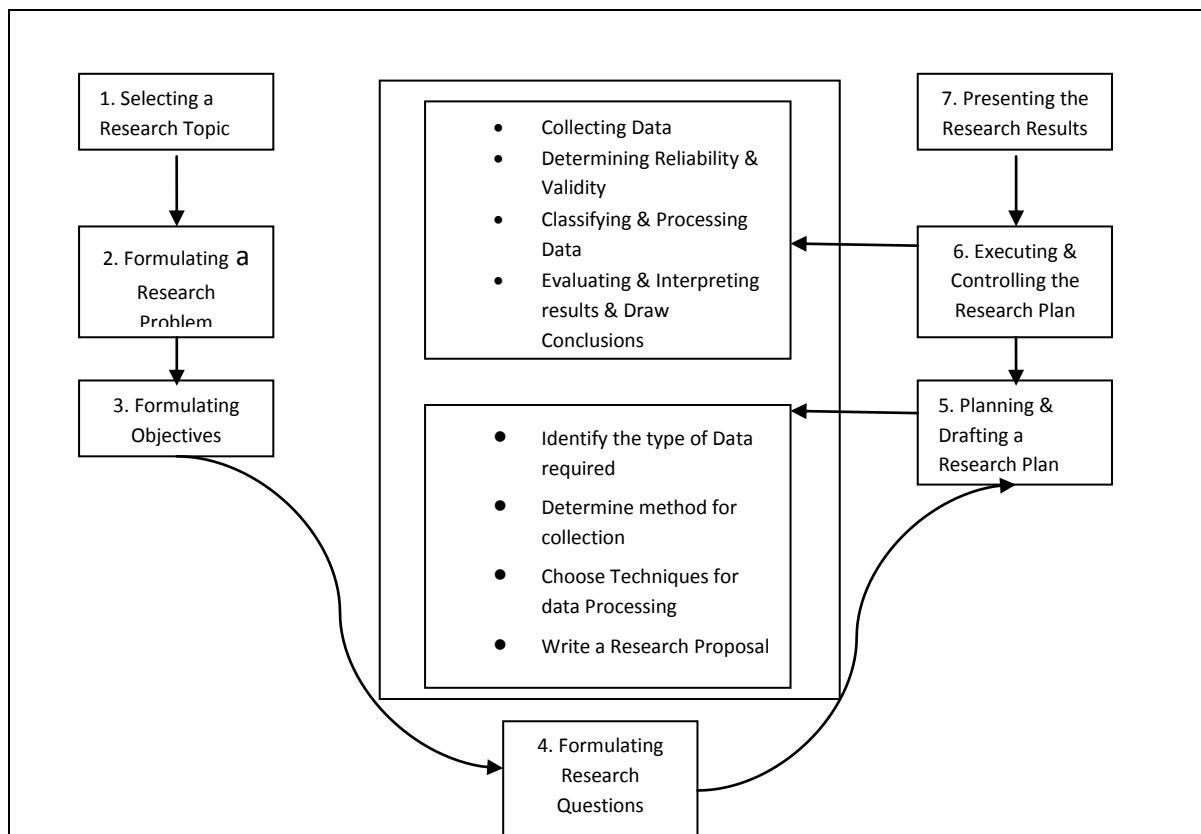
Gumede (2011: 4) posits that a research process has the following six fundamental stages, namely:

- Identification of the research topic;
- Definition of the research problem;
- Determining how the research will be conducted;
- Collection of the research data;
- Analysis and interpretation of the research data; and

- Writing a dissertation or thesis.

Tobedza (2011: 4) emphasizes the importance of understanding the research process before initiating a research project. The research process provides a structured framework that a researcher must follow and use as a guideline when conducting a study. It is a useful tool that guides and assists the researcher to produce a well organised and presentable study. Below (Figure 1.1) is a basic framework of a research process.

Figure 1.1: Research Process Framework



Source: Tobedza (2011: 4)

The research process, as indicated in Figure 1.1 above, begins with deciding on the topic of study. There are numerous considerations when deciding on a study topic (Jowah, 2015:92), as topics depend on whether there is an existing problem or a gap that should be developed after an extensive literature review. The extensive literature

review, therefore, needs to create a gap to justify the study. Some topics are merely solution-based because there are existing (sometimes identified and defined and sometimes not identified and not defined) problems. Depending on the circumstances, a research problem can be formulated and objectives can be established. This is followed by formulation of the research questions, which should be in agreement with the set objectives. Once completed, the research planning process (research design) can be constructed, and is followed by the research methodology that will be used.

1.7 RESEARCH DESIGN AND METHODOLOGY

Majija (2009: 11) explains that research methodology is a data collection research strategy that should comply with the demands of validity, objectivity and truth. Social sciences consist of two common research frameworks or methodologies, namely quantitative and qualitative research methodologies. Research design and research methodology are wrongly interchangeably used when they are not the same thing. Jowah (2015:62) contends that by virtue of their definitions, they are related, but not the same. The difference between these two is illustrated in Table 1.1 below.

Table 1.1 Differences between research design and research methodology

Research design	Research methodology
Strategic master plan	Operational or execution plan
Emphasises the road to be walked	Emphasises how the walking is done
Emphasis what results are expected	Emphasis on tools/techniques for results
Guided by research problem / question	Guided by the tasks and work packages
Focuses on rationality of research	Focuses on procedures and processes
Focuses on the “what should be done?”	Focuses on “how should it be done?”

Source: Jowah (2015:67)

Research design is a road map or path, which shows what the research requires (step-by-step) from beginning to end. Conversely, research methodology involves the “how”

process of the study. Rajasekar, Philominathan and Chinnathambi (2013: 6) state that research methodology is concerned with explaining the following:

- How did one formulate the research problem?
- Why is the particular study conducted?
- What types of data were collected?
- What particular method was used?
- Why was a particular technique of analysis of data used?

In support, Mnguni (2010: 46) posits that research methodology provides useful methods and techniques to acquire the necessary research knowledge for the survey. Whereas, Nxopo (2011: 5) asserts that research design should be perceived as a systematic sequence, which combines the researched data to answer the original research question. Both qualitative and quantitative methods (mixed-method approach) may be used to take advantage of the benefits of the two methods (Adebowale, 2014: 61). Questionnaires may comprise structured questions (quantitative) and open-ended questions (qualitative) to complement each other.

1.7.1 Quantitative research and qualitative research (mixed research method)

Garbarino and Holland (2009: 7) explain that quantitative research is a research approach that produces data in numbers by counting things, people and events. If there are no numeric labels attached to the variables, the researcher may not be able to quantify the data and identify patterns. Quantitative data focuses mainly on accurate measurements and statistics (Johnson and Christensen, 2008:34) by means of validated data collection tools. The aim is to predict behaviour and to measure statistics. This explains why quantitative research requires large samples and focuses on proportions (Given, 2008: 76) in order to predict behaviour. Whereas, Creswell (2013: 26 - 28) posits that qualitative research collects data by means of interviews, observations, open-ended responses and field notes. This helps to identify and understand social interactions, hence qualitative methods are generally flexible (Saladana, 2012: 111), and encourage spontaneity for effective interaction between

researcher and participant. It is therefore understood that qualitative methods offer a deeper understanding of a particular problem (Moballegghi and Moghaddam, 2008: 326), whereas quantitative research presents data across different respondent groups that help to make recommendations. Tewksbury (2009: 13) claims that the qualitative research approach offers additional benefits in understanding the study compared to the use of a quantitative research method only. Therefore, these two methods are combined as they complement each other.

1.7.2 Literature review

According to Cronin, Ryan and Coughlan (2009: 38), a literature review is defined as that, which summarises critically analysed research that is relevant to a specific topic. Randolph (2009: 1 - 2) emphasises the importance of writing a good literature review. A well written literature review often indicates that the author is knowledgeable and understands the literature of a specific field of study, and vice versa. A literature review also provides a framework to compare and discuss previous findings to new findings in the dissertation.

Additional evidence by Majija (2009: 12) states that a literature review provides the latest research findings in relation to a particular topic. It also assists with interpretation of the research findings for relevancy of the prospective research. For purposes of this study, an extensive literature review was sourced from existing textbooks, academic journals, dissertations, and other sources relevant to the topic. Chapter Two of the research presents an in-depth literature review to establish a theoretical background of the study.

1.7.3 Target population

As a tool, Value Management is part of the project execution process, which is the responsibility of the project manager and project team members. Because these project practitioners are directly involved with the execution processes of the project, they are the target population for this research. The focus was exclusively on project

practitioners in the construction industry within the Cape Peninsula area. The research was confined to this area specifically because of costs and convenience to the researcher.

1.7.4 Sample frame

Five (5) construction sites were identified for the research, each with an estimation of 25 project practitioners who are directly involved in decision making and project execution processes. This provided a sample frame of 125 project practitioners who were at the disposal of the researcher. These project practitioners sufficed to reduce sampling errors and the possibility of incomplete questionnaires. It was in the best interest of ethical consideration for the participating companies to remain anonymous, hence the names of these participating organisations were omitted. The sample frame was obtained in the Cape Town Metropole.

1.7.5 Sample size

The first factors that were taken into consideration were the limitations (economically and time-wise) to spread the research far and wide, and the number of construction companies that allowed the research to be conducted. Finch and Gordon (2013: 10) affirm that a correctly composed sample of 30 plus practitioners would suffice to allow for generalization of a survey. In this case 30 practitioners comprised almost a fifth ($\frac{1}{5}$) of the sample frame. This is considered to be large enough for generalisation.

1.7.6 Sampling method

Bloomberg (2008:185) concurs and points out the need to remove bias in the selection of a sample. Jowah (2013: 10) asserts that random sampling gives each prospective participant an equal opportunity to be selected for the survey. The sampling selection of the organisations for the research was based on project firms' availability. But simple random sampling was used within these construction companies to select respondents for the questionnaire survey. The technique was selected because it provides equal

opportunities for all individuals to participate in the survey, and allows for a fair, representative and unbiased sample.

1.7.7 Data collection method

A structured questionnaire was used to collect data from the respondents. The researcher personally distributed questionnaires to the respondents, who completed them in his presence. This approach was adopted deliberately to mitigate the rate of poorly completed “returns”, since the researcher was there to explain any ambiguities in the questions. Further to this, the researcher also made efforts to attenuate the number of questionnaires that are not returned as a result of practitioners’ inability. Thus, questionnaires were physically handed to the respondents, while the researcher waited for them to complete them, allowing him to collect the completed questionnaires immediately.

1.7.8 Research instrument – the questionnaire

A questionnaire is a logically constructed set of questions (Jowah, 2015:162), which is used to gather information from the respondents. According to Ngetich (2012: 7), a research tool is generally structured into two basic approaches, namely a positivistic approach (structured; closed-ended questions) and a phenomenological approach (unstructured; open-ended questions). Nxopo (2011: 7) and Nonxuba (2010: 5) assert that questionnaires fall within the broader definition of “survey research or descriptive survey”, and serves as a data collection method. Siwangaza (2013:4) posits that a questionnaire is a useful data collecting tool, which is given to respondents to complete, and in which the same set of questions are posed in an organised manner. After a pilot study (trial study with practitioners) the questionnaire was reconstructed following recommendations from the respondents, while the completed questionnaires were submitted to a statistician for final correction.

All respondents responded to the same set of questions that were posed in the questionnaire. The research instrument had four (4) sections, namely; Section A, which probed for biographical data and, which allowed for an opportunity to identify those who qualify to respond to the questions. Section B included 5-point Likert scale (closed-ended questions) that examined perceptions, practices and attitudes towards the use of VM. Section C (open-ended questions) (Creswell, 2013: 26 - 28), which related to the use and challenges of using VM as a project management tool. Section D provided respondents with an opportunity to discuss any other information that may have been omitted in the survey.

1.7.9 Data analysis

According to Mporu and Kendrick (2014: 35), data analysis is a process that promotes structure and order to the mass of collected data. For purposes of this study, data was gathered by using both quantitative and qualitative instruments. SPSS 24 (Software Program for Social Sciences) and Excel spreadsheets were used to capture and analyse data, since they have precise and user friendly qualities. Descriptive statistics were employed to analyse the collected data. Descriptive statistics quantitatively describe the main features of collected data. Parker (2014: 79) indicates that descriptive statistics are there to formulate unprocessed data into a logical and understandable format.

Qualitative data is analysed slightly differently, as it requires different analysis tools and techniques. For purposes of this study, data was obtained by means of open-ended and closed-ended questions in the administered questionnaires. Qualitative analysis results were carefully integrated with quantitative results, while the study's conclusions were drawn on the basis of the combined methods. Content analysis was used for the qualitative component of this research, particularly open-ended questions. The aim of the analysis was to find answers for the project management challenges, and to draw conclusions about real-world events. Collected data was analysed and presented in the form of bar charts, graphs, pie charts and tables to illustrate answers diagrammatically

in Excel. A qualified statistician assisted the researcher with the processing, analysis and interpretation of data. The report comprised of the last part of the dissertation.

1.7.10 Assumptions made

1.7.10.1 Respondents will not be biased and will be honest to the best of their understanding;

1.7.10.2 There will be no restrictions from any of the organisations where information and data will be collected;

1.7.10.3 The outcomes of the study will assist the author's workplace and project practitioners, in general;

1.7.10.4 All questions that will be asked will be understood, will not offend anyone and will be responded to by the respondents; and

1.7.10.5 Some project practitioners may refer to Value Management differently, since it is not a used or yet popular practice in South Africa (for example, VE/VA).

1.7.11 Scope and limitation of the study

1.7.11.1 The research was limited geographically to Cape Town owing to economic and time constraints in terms of when the report had to be submitted.

1.7.11.2 The research was only conducted at construction sites that agreed to participate in the survey.

1.8 ETHICAL CONSIDERATION

David and Resnik (2013: 10) define ethics as the difference between acceptable and unacceptable behaviour based on norms for conduct. Ethics consists of perspectives, methods and procedures that provide guidance on how to analyse and action complex issues. In complying with acceptable ethical standards, no names of individuals were recorded on research instruments. Hence, no individual or organization was linked to a particular, completed instrument, thus assuring anonymity. It is also important to

mention that all of the information that was received was treated with strict confidentiality and privacy.

A consent form or letter was obtained from all respondents before the survey was conducted. respondents participated voluntarily and no compensation was awarded to any of the respondents for their participation in the study. Protocol was observed in respect of general conduct and competence where interviews and surveys were conducted to promote quality assurance. Assurance was also given regarding the correctness and competence of responses, especially concerning open-ended questions.

1.9 CHAPTER CLASSIFICATION

- **Chapter 1:** The chapter introduced the concept of Value Management. It identified the problem statement, research questions, research objectives, research methodology, ethical consideration and significance of the study.
- **Chapter 2:** The chapter presented a literature review of Value Management definitions, phases, characteristics, benefits and techniques.
- **Chapter 3:** The chapter discussed Value Management standards, principles, models, tools and government regulations that influence the construction industry.
- **Chapter 4:** The chapter illustrated the research design and research methodology that was used to collect data and information for the study as means to achieve its objectives.
- **Chapter 5:** The chapter focused on presentation of the collected data, analysis of results and their interpretation. The results were presented in the form of charts, tables, graphs and histograms.

- **Chapter 6:** The chapter provided the study's findings and drew conclusions based on the analysis and interpretations that were presented in Chapter 5. Recommendations were provided as possible solutions to harness the high project management execution failure rate in the construction industry.

1.10 SUMMARY

Project execution failure rate is currently between 50% - 80%, as projects continuously fail owing to poor project execution. This has a negative impact on overall project costs (cost overruns and loss of future business by contractors). Stakeholders are not satisfied and there may be an increasing loss of trust in future contractors amongst customers. The aim of the study was to establish whether or not organizations make use of the Value Management tool as a panacea to improve the current situation. This will also help to understand the extent to which this (VM) tool can be used to help maximise the use of scarce resources in organisations by decreasing cost overruns, which stem from delayed completion of projects.

The tool has the advantage of measuring value incrementally during the execution process, thereby allowing for total quality management and stage by stage supervision of the process. It is considered to be a tool that measures and estimates project value with a continuous awareness of organizational performance. The tool is expected to maximise innovation, development and knowledge creation by allowing project challenges and opportunities to be defined and solved at the source. Project factors such as top level management support, motivated staff, competent project teams, project scope and strategy, resources, communication and stakeholders must be implemented effectively and efficiently. Therefore, the Value Management tool can be a potential solution to help to reduce the high project execution failure rate.

CHAPTER 2: Literature review on Value Management

2.1 Introduction

The purpose of this chapter is to provide a literature review, which probes Value Management definitions, functions and techniques. Various Value Management techniques are discussed in detail below, where each technique has its own phases and functions. Value Management workshops, characteristics, benefits and challenges to VM processes, are also discussed in this chapter. The aim was to provide an in-depth VM theoretical perspective and practices to help clarify some of the typical VM concepts and misconceptions. A further aim was to evaluate whether or not the VM tool is an effective method to help identify project management challenges, and to reduce the high failure rate in project execution.

Part of the problem is owing to the fact that sometimes project practitioners struggle to identify the difference between Value Management, Value Engineering, Value Analysis and Cost Management. Hence, the aforementioned tools are constantly implemented inappropriately, and result in failure to produce desirable results. The concepts are discussed briefly to provide a basic understanding of what they entail, and to provide means to differentiate them.

The chapter also covers aspects in relation to who can use the VM tool, when to use it, and those projects that are most suited to its use. Research studies have contradicting views regarding the best phase or time to implement VM in a project. However, Coetzee (2009: 11) is adamant that the optimal phase is an important phase to implement VM to enhance project value and improve success rates. This confusion often results in poor project management execution, thus increasing the already high failure rate in project execution.

2.2 The Concept of Value Management

Ezezue (2015: 8) argues that the VM concept is a significant platform that is used to gain a competitive advantage. It is a broad concept that requires comprehensive skills, knowledge and understanding. Malaysia Airport Holding Berhard (2011: 1) states that Value Management provides improved knowledge and understanding of critical project success factors. It constantly prioritises, validates and reviews project requirements. Whereas, according to Johnson *et al.* (2008: 15), VM is a unique management technique that creatively uses its methods and tools to enhance project value. It influences a positive management style, enhances positive human dynamics and takes its internal and external environment into consideration.

Whyte and Cammarano (2012: 798) profess that many research studies have a tendency to distinguish VM from value analysis and value engineering, while other studies treat these three terms interchangeably, as they consider them to be synonyms. According to Phillips (2008: 1), some jurisdictions use VE, VA and VM interchangeably, while other jurisdictions broaden the VM tool by including VE and VA as applications. Yet other jurisdictions use VA or VM in the early stages to define project scope and objectives, and then use VE at a later stage. Bewari *et al.* (2012: 1) postulate that VE/VA is an organized method that improves projects or products value by examining its functions. For the purpose of this study, the term VM was used throughout the study instead of using value analysis and value engineering interchangeably.

Lop, Apandi, Kamar, Salleh, Mamter and Hamdan (2014: 1) suggest that VM has functions that assist the tool to achieve value for money. The process ensures that the client's requirements and needs are not compromised in the process. Whereas, Fensel, Gagi, Kasper, Kett, Koleva, Leiter, Novalija, Stavrakantonakis, Stajner, Thaler, Thalhammer and Toma (2012: 22) posit that VM involves communication and information dissemination to enhance project value. Market and trend analysis, competitive intelligence, product and innovation management are some fundamental VM activities.

Nawawi, Muhammad, Mahbub and Abidin (2014: 90), as well as Isa, Kamaruzzaman and Jaapar (2015: 421) indicate that the Malaysian government's regulations want all projects that are worth R50 million and above to implement VM as a statutory requirement. The country's government believes that VM is a management tool that creates strong links between funding and outcomes. This is further supported by Jaapar, Maznan and Zawawi (2012: 77), who claim that Malaysia wants to monitor VM respondents' feedback and other challenges through VM workshop environment settings.

2.3 Value Management definitions

The term Value Management does not have a universally accepted definition (Venkataraman and Pinto, 2008: 4), hence a broader range of definitions is used to describe the same concept. Ahmed, Bushell and Chileshe (2012:2) assert that, depending on the context, situation and geographical location, VA, VE and VM terminologies are used interchangeably. Due to the broadness of the concept, it is crucial to thoroughly understand the VM tool and to use it appropriately. This will reduce the misinterpretation and improper application of the concept during project execution. According to Green and Liu (2007: 649), VM is developed by continuously contested performances and scripts across organizational arenas. It is globally enacted and conceptualized differently across different localized contexts, hence it resists universal definition.

There are numerous VM definitions from various authors who have diverse definitions and use of the term. Save International Value Standard (2007: 7) suggests that VM is there to improve value in the government sector, private sector, as well as construction and manufacturing industries worldwide. A lot of these definitions have a common purpose to improve products, processes and project value to satisfy stakeholders' needs. Below are some of the definitions that are commonly used to describe the term Value Management.

- Chavan (2013: 22) asserts that VM is a dynamic process that focuses on multi-disciplinary groups. It functionally prioritises what needs to be done, systematically defines common objectives, and creatively identifies targeted results. It is also structured to develop innovative and holistic solutions to complex problems.
- New Zealand Government Procurement (2015: 8) defines VM as a process of explicit functional benefits for a project. The tool strategically focuses on ensuring that the project is aligned with the core business of the client.
- Abd-Karim, Lowe, Abdul-Rahman, Wang, Yahya and Shen (2011: 2471) declare that VM is a proactive, systematic and rigorous method that enhances project value and life cycle costs without sacrificing the desired performance.
- Martinsuo (2014: 64) defines VM as a process that attempts to see beyond immediate results to meet stakeholder needs, in line with the project and programme scope.
- According to Kong (2013: 7), VM has numerous definitions that vary from one another, but have common core principles such as the following:
 - Multidisciplinary team method;
 - Systematic approach;
 - Value enhancing;
 - Analytical process; and
 - Functions.

Table 2.1: Summary of international VM definitions

Country	Category	VM Definition
European Standard, BS EN 12973:2000, Value Management,	Style of Management <ul style="list-style-type: none"> • Team approach • Value enhancing • - Organisational culture 	“Style of management, particularly dedicated to motivate people, develop skills and promote synergies and innovation, with the aim of maximizing the overall performance of an organization.”

		“Applied at corporate level, VM relies on a value-based organizational culture taking into account value for all stakeholders.”
Australian Standard, AS 4183:2007, Value Management	<ul style="list-style-type: none"> • Systematic approach • Analytical process • Prescribed Work Plan • - Value enhancing 	“Structured and analytical process, which follows a prescribed Work Plan to achieve best value or, where appropriate, best value for money.
SAVE International Value Standard, 2007. SAVE INTERNATIONAL is a global standard.	<p>Systematic approach</p> <ul style="list-style-type: none"> • Team approach • Analytical process • Value enhancing 	VM is a is the systematic application of recognized tools and techniques by a multidisciplinary team to identify and categorize the functions of a project and to create, select, and develop alternative approaches to cost-effectively deliver the functions and/or improve performance.”
Hong Kong (EWTC TC No. 35/2002)	<ul style="list-style-type: none"> • Systematic approach • Analytical process • - Value enhancing 	VM is an organized methodology applied to the analysis of functions, components, goods and services, from the point of view of the system as a whole, to satisfy the required functions of the project at the lowest total cost without compromising quality and the standard of performance.

Source: Kong (2013, 8)

2.4 Importance of Value Management

VM is a management service that analyses and develops the functions of a project or service Mesbah (2014: 1) by reviewing, evaluating and comparing all goals and objectives, which were identified for the project. The process is effective and efficient when performed on a daily growth basis of the industry, particularly in the construction sector. Saifulnizam, Coffey and Preece (2011: 1) posit that VM systematically seeks to achieve value for money by providing useful functions at the lowest costs, while maintaining high quality and performance levels. Therefore, the demand for VM practice increases gradually as clients seek high returns and improved project outcomes.

According to Saifulnizam and Coffey (2010: 1), VM provides a structured framework and multidisciplinary team members to enhance critical decision making discussions during the early project stages. Better optimization of construction costs is achieved through the contractor's early involvement, while maintaining effective decision making. VM application embraces other tools and techniques, for example the job plan and Functional Analysis System Technique (FAST). Borza (2010: 1) opines that the VM process has techniques that allow the project team to improve value projects, processes and products for the client. It systematically uses multidisciplinary teams to improve value through the analysis of project functions.

Ezezue (2015: 1 – 2) argues that VM is meant to reduce material costs through scientific approach and analysis. It is a role model for new business innovations. This is a powerful management tool, which requires managers to practice to attain leadership value among their peers and subordinates. On the contrary, Noor, Kamruzzaman and Gaffar (2015: 74) are adamant that VM can be utilized as a tool to develop knowledge and to build relationships to integrate climate adaptation into the construction space. Organizations are increasingly adopting VM for strategic planning, scenario planning, business process improvement/continuity, and change management.

Maznan, Jaapar, Bari and Zawawi (2012: 384) state that VM is a rigorous, multidisciplinary, structured, systematic and analytical process, which is designed to improve value, whilst optimizing project costs. It is there to creatively achieve the client's

requirements and generates cost improvements without compromising performance levels. Whereas, Osman, Anuar and Zulhumadi (2012: 290) opine that VM has an effective integration system that no other management tool can provide. It has a potential to reduce unnecessary costs that do not contribute to the project's value, facility and system.

In view of the Queensland Government's Department of Housing and Public Works (2010: 1), VM helps organisations with effective management decision making, planning and use of building assets. This is further supported by Rabbi (2016: 3) who mentions that every project is unique with its own project scope, schedule and cost that needs to be met to achieve stakeholder requirements. Therefore, an effective VM approach ensures that these factors are achieved successfully. The Malaysia Airport Holding Berhard (2011: 01) concludes that VM techniques assist organisations to define and refine business objectives, deliver project strategies and successfully achieve customer requirements. Ahmadpour (2011: 4) professes that defining project goals and objectives at commencement stage positively increases the effectiveness of the VM application in projects.

2.5 Concept of Value

SAVE International Value Standard (2007: 8) and Gillier, Hooge and Piat (2013: 4) define value as a fair return or equivalent in goods, services or money for something in return. It is generally represented by the relationship between a performance measured function, which is required by a customer against measured resources (namely time, labour and price). The value is generally expressed by the relationship:

$$\text{Value} = \text{Function}/\text{Resources}$$

Rangelova and Traykova (2014: 430) mention three major VM factors that are used to identify and improve value:

- Provision of all required project functions at a lower cost;
- Provision of additional functions at a lower cost; and

- Provision of additional functions without increasing costs.

Bewari and Susantono (2012: 13) state that value can be measured based on how well the project or process performs its intended functions and achieves its purpose. However, according to the New Zealand Government Procurement (2015: 26), the concept of value depends on the relationship between satisfying various stakeholders' needs and the resources that are used to do so. The fewer resources that are used, the greater the satisfaction of needs, the greater the value. Ezezue (2015:4) further posits that stakeholders may all have different perceptions of what represents value and VM strives to reconcile these differences. Value may be improved by increasing customer satisfaction, even if this means increasing the resources, provided that the satisfaction increases more than the increase in the resources that are used.

According to Gongbo (2009: 16), mathematically, value is written as a ratio of function over cost.

$$\text{Value} = \text{function}/\text{cost}$$

It is difficult to measure value with cost and function owing to the difference in function and cost units. A product or service can be theoretically increased by using the above-mentioned equation as follows:

- Decreasing the cost with the same function;
- Increasing the function with a reduction of the cost;
- Increasing the function with the same cost;
- Increasing the function significantly with slight addition of the cost; and
- Decreasing the cost significantly with a slight reduction of function.

In contrast, Phillips (2008: 2) asserts that value considers total cost of ownership, together with the user's compliance requirements, reliability of performance, quality and functionality. The value is determined by evaluating the project against the requested

project criteria and benchmarked project or system. VM makes use of group-based facilitated workshops to critically drive a systematic approach (Bowen, 2009: 286) to achieve better client value, particularly in construction projects. Functional value of the project or process is usually the main objective, taking into account the cost of delivering that function. Woodhead (2007: 1) argues that value is guaranteed to increase when functions are optimally aligned with the desired purposes, processes and outcomes.

2.6 Value Management characteristics

Chavan (2013: 22) confirms that VM key characteristics include, but are not limited to:

- A specific methodology;
- Key stakeholders in a managed team approach;
- Creative problem solving approach;
- Focus on achieving value-added solutions;
- Based upon integration;
- Focuses on function; and
- Focuses on project learning.

Value Management is a complex tool that has diverse processes and techniques. It would be expected for it to contain a whole range of globally diverse characteristics. Some of these characteristics are similar in nature, while others may be completely different from each other. Green and Liu (2007: 654) argue that there are no universally accepted VM characteristics, as even the functional analysis linked to VM has been challenged repeatedly. It is, therefore, possible that all published VM methodologies provide loose and indirect practices.

Nevertheless, Zavorotnity (2012: 4) lists characteristics of financial methods of corporate value management as follows:

- Financial improvements of business through restructuring;

- Management by financial balance and solvency;
- Management of financial resources formation;
- Introduction of systems to minimize unnecessary expenses; and
- Management of investment attractiveness of securities.

2.7.1 Value Engineering (VE)

Gaikwad (2012: 22) claims that VE is a systematic and organised approach, which is aimed at analysing the function of facilities, systems and services. The purpose is to achieve these essential functions at the lowest life-cycle cost, consistent with the required quality, reliability, performance and safety (Sharma and Belocar, 2012: 24). Conversely, Al-Yousefi (2008: 2) and Bewari *et al.* (2012: 12) assert that VE is well-known and impressively accepted for its value improvement through quality customization and LCC optimising. Hence, this confusion, the literature review and various other research studies have a lot of contradicting and diverse VE definitions. However, Othman (2008: 48) argues that VE seeks to investigate, compare, analyse and select the best option to achieve and exceed client expectations at the lowest costs.

2.7.2 Value Analysis (VA)

VA is a method that evaluates and eliminates factors of products or services that have no value for the customer or the product, but influences costs in the production process or service delivery. The process guarantees a better product or service for the customer at minimal costs, compared to replacing the existing product (Leber, Bastic, Mavric, Ivanisevica, 2014: 90 - 92). Therefore, its purpose is to increase value or reduce the costs of functions to improve the components of a project.

2.7.3 Cost Management (CM)

Coetzee (2009: 60 - 61) defines cost management as a service that uses a multi-disciplinary team to combine traditional quantity surveying skills with structured cost reduction techniques. According to Saifulnizam *et al.* (2011: 4 - 5), cost management is

a process where cost and price can be planned, analysed, controlled and forecasted. It is a management accounting process that entails planning and controlling of the project's budget to avoid overspending.

2.7.4 Value Management (VM)

VM is a strategically and organizationally focused process, which ensures that project objectives strategically fit with the client's core business. It clearly identifies the functional benefits of the projects to meet the client's requirements (New Zealand government Procurement, 2016: 8). VM holistically evaluates the entire project and scope changes (Rangelova *et al.*, 2014: 431), whereas cost management does not make any major changes on the project scope. The VM seeks value through balancing quality, life cycle, cost and time.

In addition to the above-mentioned terminologies, Potts (2008, 91) mentions that four are numerous other names that represent those in common use by VM organisations, namely:

- Value Methodology (VM);
- Value Review (VR);
- Value Management Review (VMR); and
- Value Planning.

Barton (2012: 2) concludes that there is no universally agreed difference and no legal protection between Value Management and Value Engineering. Any distinction between VA and VE is a matter of organizational choice/decision based on its desired goals or needs.

2.8 Benefits of Value Management

Osman *et al.* (2012: 290) state that the VM application enhances efficiency and delivers maximum benefits in the construction industry. However, VM has not yet become a widely practiced approach in Malaysia or in other developing countries. In support, Noor *et al.* (2015: 72) declares that VM has been gradually acknowledged as a strategic

planning tool by the Malaysian government. This is suited to deliver sustainable construction projects.

Christos (2007: 38) explains some of the important benefits of the VM. It saves energy and time costs. It encourages stakeholder commitment as it simplifies methods and procedures while reducing costs. The VM redirects savings to add value in a project. The VM minimizes time wastage and resources used, forecasts and communicates potential risks. It promotes innovation and acknowledges stakeholders' priorities. The tool maintains a strategic focus on organizational goals during project development and implementation. It monitors and evaluates the project life cycle, quality, constraints and objectives.

In addition to the above-mentioned benefits, Chavan (2013: 25), Burke (2007: 64) and Mesbah (2014: 15) list financial and unquantifiable benefits.

2.8.1 Financial benefits

- 2.8.1.1. Capital fund savings and maximum efficiency;
- 2.8.1.2. Proactively reduces conflicts and identifies possible problems;
- 2.8.1.3. Support information and provides management with authoritative evaluations;
- 2.8.1.4. Identifies alternative methods of construction and promotes communication;
- 2.8.1.5. Defines quality and performance standards; and
- 2.8.1.6. Maximizes returns on investments.

2.8.2 Unquantifiable benefits

- 2.8.2.1. Provides clear briefs, definitions of roles and responsibilities;
- 2.8.2.2. Improves respondents' skills, team and clients' relationships;

- 2.8.2.3. Provides joint ownership of problems and solutions;
- 2.8.2.4. Saves project development time through multitask teamwork;
- 2.8.2.5. Improved operational efficiency; and
- 2.8.2.6. Challenges assumptions.

2.8.3 Non-financial VM benefits

Al-Saleh *et al.* (2009: 52) suggest that there are three non-financial VM sustainability principles:

1. Environmental sustainability: Practise a rational use of natural resources and effective waste management to reduce environmental footprint and pollution;
2. Economic sustainability: Effective management of resources and VM application to enhance project performance, profitability and meet customer requirements; and
3. Social sustainability: VM responds to societal needs (stakeholders, users, clients and wider community) to enhance social prosperity and quality of life.

Furthermore, Rabbi (2016: 2) indicates that non-financial benefits are achieved in every VM study or project implementation. This includes, but is not limited to the vast reduction regarding project implementation timeline, reduced project execution risks, enhanced functional performance, project team alignment and strengthened project programmes.

2.9 Value Management study

Huyuta (2015: 15) defines the VM study as a logical sequential process towards the study of value. The value manager/facilitator selects various professionals that will be involved in the VM process. Li (2008: 13) further says that the VM process has a systematic and organized VM job plan. The job plan has to be understood, analysed and followed accordingly in order to achieve value improvement and successful VM implementation. According to Waterhouse (2007: 50), the VM process is important

during the planning and preliminary design stages. Thereafter, beneficial changes without causing significant disruptions lessen. Nawawi *et al.* (2014: 91) assert that Malaysia adopted the Save International's VM Job Plan, as it focuses on cost optimization.

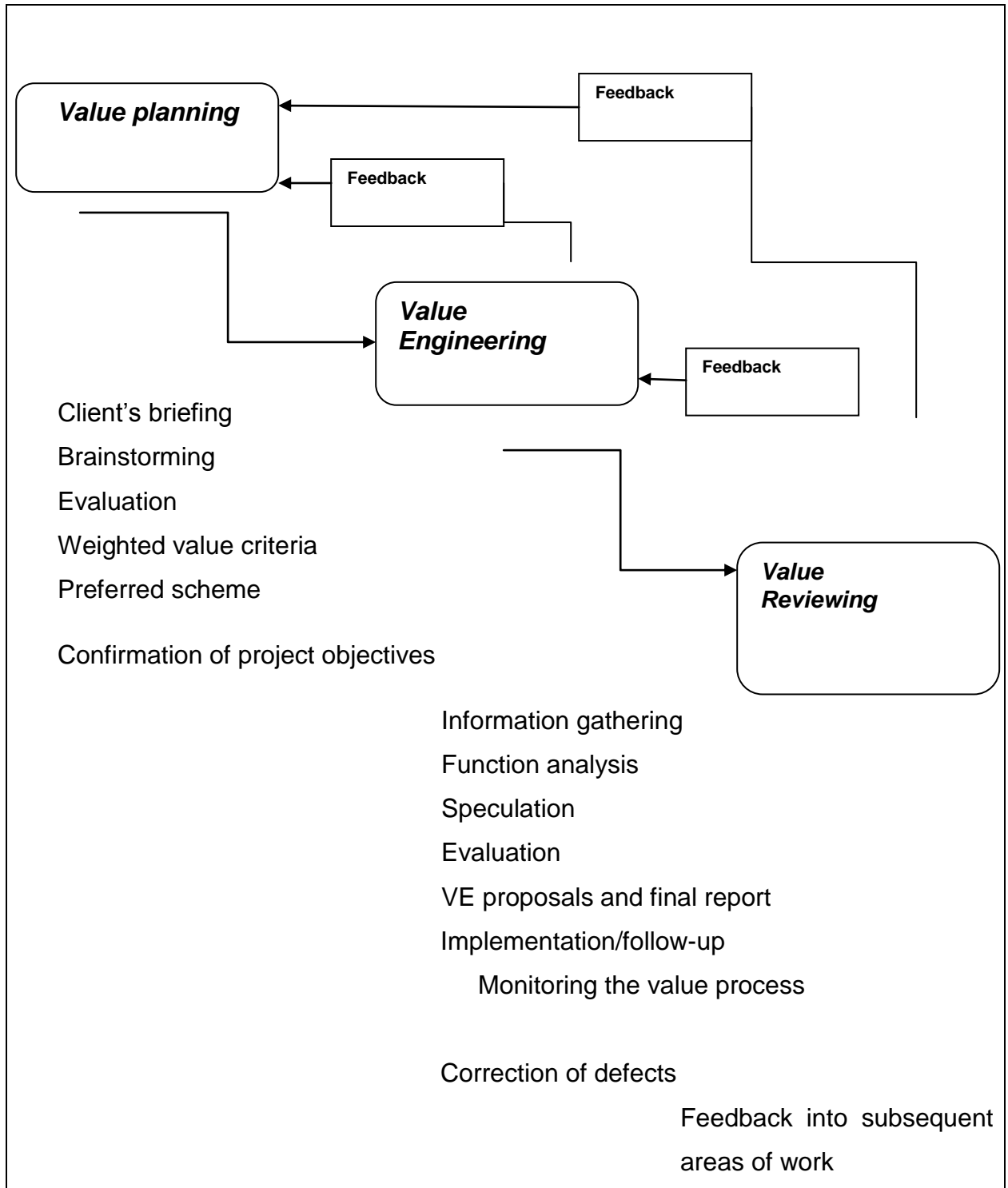
Christos (2007: 25) asserts that a VM study is an organized and systematic approach that clearly indicates the client's project goals and objectives. Both internal and external organizational environments are taken into account for a functional team based workshop. According to the Australian Standard AS4183 (2007: 16), VM study can become successful when project team members:

- Are engaged in the entire study's workshop stages;
- Completely accept and part-take in the study's goals, objectives and outcomes; and
- Understand and acknowledge the fact that team, client or project interests are more important than that of an individual or personal concerns.

According to Jaapar *et al.* (2012: 80), the VM guide is divided into three study types, namely:

- Value Assessment or Value Planning: Strategic planning conducted before a project's approval. The tool identifies performing and cost optimizing projects;
- Value Engineering: Conducted after project approval to achieve project objectives. The purpose is to identify the best approach that is conducive to project implementation processes and to maximize value for money;
- Value Analysis or Value Review: Conducted after project completion to review if required goals and objectives are met. Challenges and weaknesses are identified and minimised to ensure continuous project improvement.

Figure 2.1: Value Management study

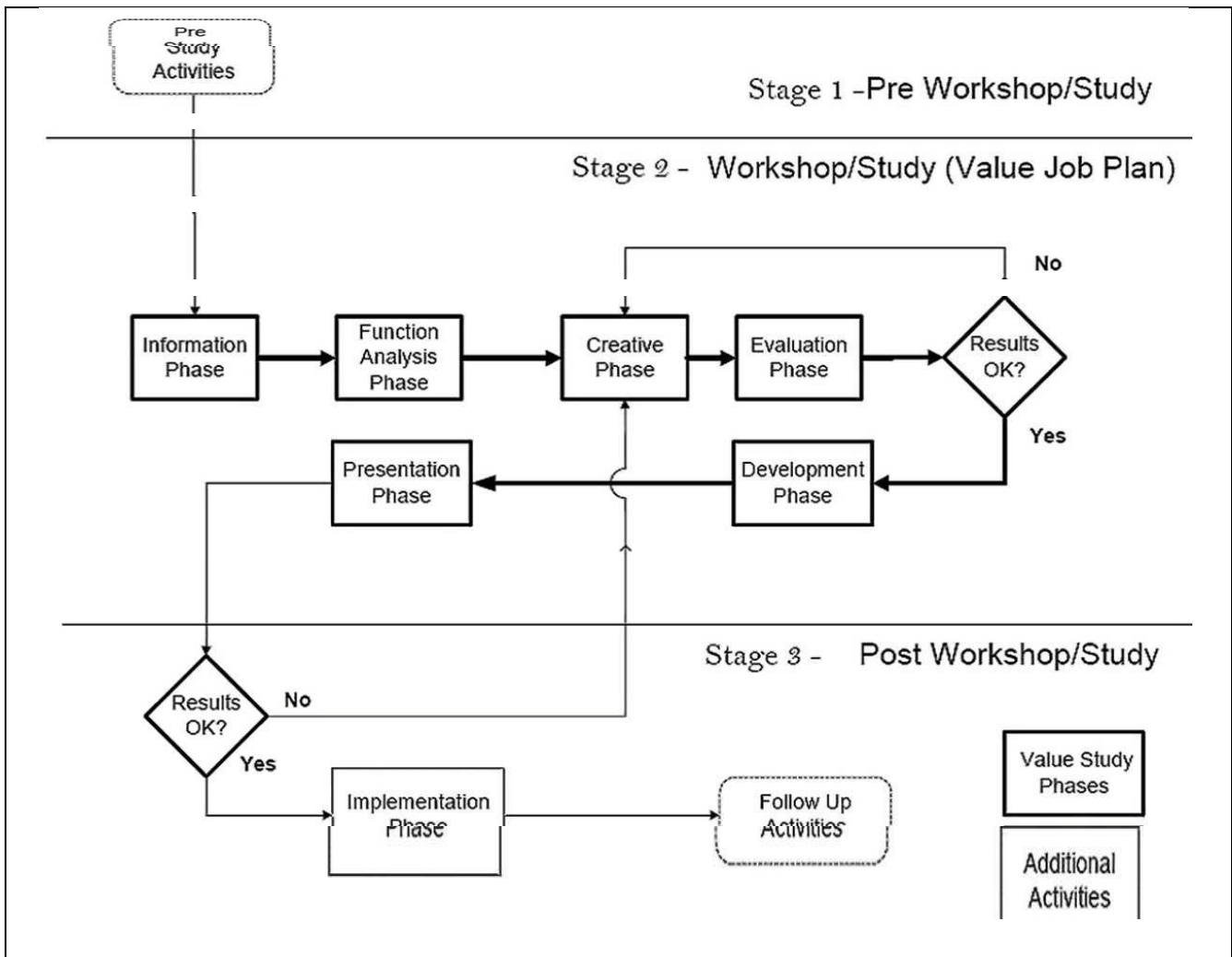


Source: Potts (2008: 92)

2.10 Value Management Job plan

There are various VM job plans around the world and each job plan has its own sequence of VM steps. Some may have similar steps, while others have completely different sets of steps. According to Gongbo (2009: 20), the VM job plan consists of core elements that are sequentially structured within a Value Management study. There are sequential phases that guide and support team synergy and decision making within a structured process. Therefore, applying the VM at the early stage of a project allows greater benefits (Saifulnizam *et al.*, 2011: 2), and consistently improves on cost reduction. Opportunities of making necessary changes are more, and lessen as the project progresses. Suhaimi (2014: 27) mentions that the VM job plan format is flexible and may be amended to suite particular projects.

Figure 2.2: Value Study Process Flow Diagram



Source: Save International and Value Standard (2007: 12)

2.10.1 Job plan phases

Save International and Value Standard (2007: 12) states that all job plan phases stimulate the project team to bring creative ideas for the project design. Chege *et al.* (2008: 4) and Sievert (2014: 3) suggest that VM job plan phases comprise of the Information Gathering phase; the Function Analysis phase; the Creativity or Innovation phase; the Evaluation phase; the Development phase; and the Presentation phase.

Table 2.2 Job plan comparison

VM Job Plan (Miles, 1972)	VM Methodology (Kelly <i>et al.</i> 2004)	VM Prototype Guideline (Jaapar, 2006)	VM Manual (EPU, 2011)
Orientation	Pre-study stage	Pre-workshop stage	Pre workshop
Information	Workshop stage	Workshop stage	Workshop
Speculation	Information	Information	Information
Analysis	Creativity	Analysis	Function Analysis
Programme planning	Evaluation	Creativity	Creativity
Programme execution	Development	Judgement	Evaluation
Status summary	Presentation	Development	Development
conclusion		Presentation	Presentation
	Post-study stage	Post-workshop stage	Post workshop

Source: Jaapar (2012: 81)

2.10.2 Pre-workshop stage

The pre-workshop phase encourages and ensures that all stakeholders participate in a properly coordinated workshop. Activities of this phase include finalising team structure,

meeting orientation, study duration, location and conditions, site visits, cost estimation and verification, and models preparation (Othman, 2008: 48). Abidin and Pasquire (2007: 276) postulate that a VM workshop identifies and provides effective and sustainable project drivers.

2.10.3 Workshop stage

The Australian Standard AS4183 (2007: 13) posits that workshops have a variety of styles and may be conducted in a manner that suits that particular organization. According to the Queensland Government's Department of Housing and Public Works (2010: 1), key elements of the VM study in a workshop bring stakeholders together in a forum, which:

- Allows effective and maximum stakeholders contribution;
- Promotes combined technical expertise, knowledge and people experience from diverse principles;
- Enhances group dynamics instead of relying on individual inputs;
- Encourages a cohesive project perspective rather than collecting individual independent elements; and
- Focuses on cost effective use by participating in short duration workshops.

Facilitators guide workshop respondents by focusing on VM processes through the following activities:

- Confirm VM study objectives and scope;
- Build rigorous VM knowledge and understanding;
- Generate alternatives to achieve value for money;
- Evaluates alternatives;
- Develop proposals and options that have the most potential;
- Provide recommendations;
- VM proposal approval and a written report accepted by client; and
- Construct a plan of action.

Plan of action:

- Consolidate workshop outcomes;
- Present workshop respondents' views; and
- Highlight potential VM ideas.

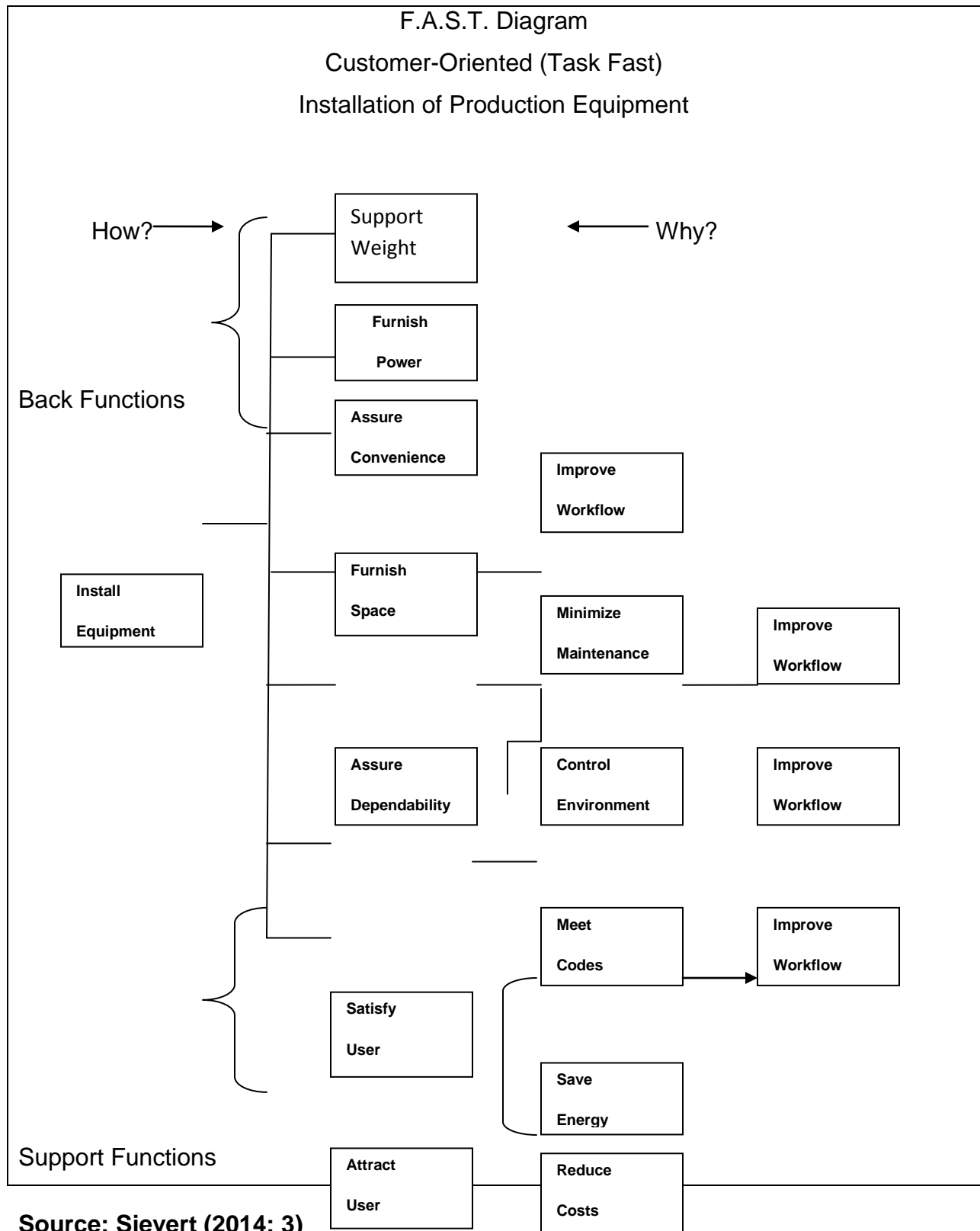
2.10.4 Information phase

The information phase is about gathering all the necessary information, which is required to ensure successful project implementation. It entails acquiring the VM team members' views, goals and objectives. Questions such as “what is this”, “what does it do”, and “what needs to be done” must be answered during this phase (Mesbah, 2014: 17). Basically, the phase collects important information and documents that are required for the project to succeed. According to Suhaimi (2014: 27), the client chooses an experienced facilitator that will lead the workshop. This is a critical phase of the workshop, and all project stakeholders are encouraged to participate.

2.10.5 Functional Analysis phase

O'Farrell (2010: 13) asserts that Functional Analysis specifically identifies where cost reduction can be achieved. It is the key primary function that separates VM from any other value improvement approach. The function uses a Functional Analyst System Technique (FAST) diagram to critically analyse these functions with a scope study (LCLS Ultrafast Science Instrument, 2007: 4). According to Wao, Ries, Flood and Kibert (2016:2), FAST identifies basic and secondary functions that support and enhance project performance.

Figure 2.3: Functional Analyst System Technique (FAST)



2.10.6 Creativity phase

Project team members share knowledge, and innovative and creative ideas that may contribute to the project's success. Project leadership and team members gather in a workshop for discussions and brainstorm ideas for the project. During this phase judgment of ideas is prohibited, and separate team members generally have separate creative phase sections (Al-Yousefi, 2008: 6).

2.10.7 Evaluation phase

According to Li (2008: 15), the evaluation phase identifies and shortlists the best ideas that have potential to improve the project. Techniques such as Life Cycle Cost, Value Metrics, Pugh Analysis and Kepner-Tregoe are prioritized and selected during this phase for further project development. Other VM approaches include the 40-hour job plan methodology, "the contractors change proposal", the VM audit, and the Japanese 3-hour Compact Value Engineering Program. The 40-hour plan reviews the sketch design of a project and is the most adopted VM approach (Lai, 2006: 29). Li (2008: 7) mentions that VM approaches, systems and functions have to be rigorously understood based on the customer/stakeholders' value system. However, Ramly, Shen, Yu, Yuan and Chung (2012: 3) argue that the 40-hour workshop is expensive to facilitate, while it is difficult to gather key stakeholders to participate in the workshop. Stakeholders in Hong Kong request more narrow and straightforward VM studies.

Suhaimi (2014: 22) postulates that the Value Management Audit, the 40-hour Workshop, the Value Management Change Proposal and Charette are the four most critical and common VM study approaches. Each and every approach has its unique methods, timeframes and objectives of conducting the study as means to achieve the desired project performance.

Table 2.3: Comparison of Value Management approaches

VM approach	Duration of study	Time of study
Value Management Job Plan- 40-hour workshop	5 days, 40 hours	After sketch design
The Value Management Audit	1-2days	Briefing stage
Contractor's Change Proposal	Not regular	Site operation
The Japanese Compact Study	3 hours	Site operation

Source: Lai (2006: 43)

Mesbah (2014: 25) lists the most effective and commonly used VM tools and techniques, which are presented below.

Table 2.4: Common Methods of VM Process - (Directorate-General XIII, 1995), (AS/NZS 4183, 1994), (BS EN 12973, 2009) and (SAVE, 2007)

Methods	Prominent feature
Function Analysis	Determining the function and objectives of project, each idea or alternative and then discussing it.
FAST chart	
Life Cycle Cost Analysis	
Brainstorming	Relies on creative thinking, group activities, group discussions, and decision making based on group's idea.
Synaptic technique	
Hierarchy diagram	Breaking down a project into sub-parts and elements to focus on them in detail.
Value index	Calculating value index based on cost and value of the project.
Advantages/ disadvantages method	Using advantages and disadvantages method to evaluate each idea, as well as the project.
Risk Analysis	Determining the risks, threats and hazards

	of each alternative to evaluate them.
Simple multi-attributes Rating technique (SMART)	Determining some simple explanation of the project to discuss it and to evaluate the project or each alternative.
Time, cost and quality triangle	Evaluating a project's time, cost and quality.
Stakeholder analysis	Determining the needs of the stakeholder to evaluate project.
SWOT analysis	Review alternative materials' 'strengths, weaknesses, opportunities and threats' (SWOT). These specify the objectives of the project and identify all internal and external factors that will either be favourable or unfavourable in a project.
Assessment metrics	Using a special matrix such as a weighted matrix and environment assessment matrix scores.
Lever of value	Evaluating the project, based on dividing the project into several value levels.
Cost estimation	Estimating the total investment cost of each alternative.
Spatial Adjacency Programming	Evaluating the project through especial programs and computer algorithms, based on knowledge systems.
Logical framework	
Cost-Benefit analysis (B/C)	A systematic approach that compares the quantifiable benefits and costs of a project.

2.10.8 Development phase

According to Alazemi (2011: 62), all ideas that were identified in the proposal are developed into constructive alternatives. Following this, a document is developed to determine potential alternatives that should be used. The ideas are analysed and developed into potential value alternatives. These basic questions are imposed in this process:

- What is an informed description of each selected idea?
- What is the basis for this change?
- Which of these are mutually exclusive and independent?

The purpose of this phase is to ensure that key stakeholders understand the logic of the proposed alternatives. A comprehensive report (namely a value proposal) is produced and circulated across all stakeholders involved, including the client or sponsor (Suhaimi, 2014: 44).

2.10.9 Presentation phase

A presentation to the respondents (client, stakeholders, project sponsor and designer) takes place before recommendations are implemented. The final proposal is summarized and presented so that objections, dissatisfactions and recommendations are discussed before the final approval (Arowosafe, Ceranic and Dean, 2015: 3). The idea is to ensure that potential risks and challenges are resolved before final approval of the proposal.

2.10.10 Post workshop phase

Lai (2006: 42) avows that upon approval of the VM proposal, drafts should be prepared (specifications, change orders, handbooks and contract requirements) to ensure effective transformation of plans into action. The project team will perform the following steps in the post study:

- Clear misconceptions, provide assistance and resolve problems;
- Minimise implementation delays experienced in the proposal stage;
- Compare the actual audit results with desired results;
- Provide a cost savings report to clients;
- Submit technical solutions to clients to consider for other projects;
- Identify problems encountered and recommend solutions; and
- Obtain information for future projects and VM studies achieved from completed implementation actions.

2.10.11 Value Management facilitator

According to Bowen *et al.* (2011: 8), the VM workshop/approach promotes team-based synergistic benefits in the organization and within projects. Effective communication is encouraged by gathering all relevant project stakeholders. Gongbo (2009: 31) states that the VM framework has fundamental factors that guide VM implementation. A facilitator has to ensure availability of essential factors such as facilitators, respondents, clients, team and team dynamics, time and venue of VM studies. Also, VM processes, types of VM studies and VM techniques are identified and implemented in the workshop. Saifulnizam *et al.* (2011: 6) posit that a good and competent facilitator needs more than mere quantity surveyor analytical skills. She/he needs a combination of organizational management skills, technical and human relations, communication skills and in-depth VM knowledge.

2.11. Summary

The chapter discussed the concept of Value Management, definitions and benefits of using the tool in construction projects. Important characteristics of the tool were discussed here to provide a better understanding and knowledge for project practitioners concerning Value Management. It highlights the potential risks of not implementing Value Management techniques in project execution.

One of the challenges that the chapter highlighted is the difficulty among project practitioners to identify the difference between concepts and functions of the VM, VE, VA and CM. These concepts were briefly discussed to provide a better understanding of the purpose and use of each concept, and how they vary from each other. The chapter further discussed a VM study's phases and effective approaches that organisations can utilise to achieve better results during project execution.

CHAPTER 3: Value Management standards, principles, models, tools and government regulations

3.1 Introduction

The chapter discusses project practitioners' knowledge and awareness of Value Management within South Africa and globally (developing & developed countries). It focuses on the significance of using VM techniques, the risks of not using VM, types of projects that are suitable for the use VM, as well as VM challenges and constraints. International Value Management statutory requirements, principles, and tools and techniques are included in the chapter, as they provide essential guidelines, and rules and regulations that countries need to conform to.

Often countries and organizations are resistant to adopt VM owing to a lack of knowledge and popular misconceptions about the tool. The chapter addresses some of these typical misconceptions and suggest possible solutions in this regard. Possible solutions and means to improve VM challenges for the betterment of the VM application in project organization, are crucial. Therefore, this chapter addresses some of the significant factors/tools that should be considered to ensure successful implementation of Value Management. It also includes a VM model that may potentially improve and harness the current high project execution failure rate in the construction space.

3.2. Value Management in South Africa

Bowen (2009: 1039) opines that VM is widely accepted and practiced only in developed countries. Developing countries such as South Africa (SA) are nowhere near, as most professionals (architects, engineers, quantity surveyors and project managers) still lack an understanding of the concept of Value Management. Coetzee (2009: 7) further supports this by stating that VM in South Africa is not popular and well-practiced in the building industry. Therefore, it is significant that South African built professionals familiarize themselves with, and use, VM. Part of the problem is owing to the general perception that developing countries are currently at an infancy stage in terms of VM

awareness. Developing countries need rigorous training and development workshops to increase knowledge and better understanding about the VM tool.

3.3 Value Management awareness and implementation in other countries

Kim, San-Lee, Nguyen and Luu (2016: 2) assert that many developing countries do not embrace VM. Countries like SA, China, Malaysia, Vietnam, Nepal and Nigeria are still new to using VM in the construction industry. Bowen (2009: 287) explains that countries like Hong Kong, China and SA have been slow to adopt VM owing to misperceptions, a lack of awareness and strict distinctions between the design and construction phases. Lop *et al.* (2014: 2) support the argument that South Africa is not yet aware of VM and does not recognize it as a management technique. Rather, it would seem that the old value engineering is understood better than the modern developments of VM.

However, Kevin and Fadason (2012: 4) acknowledge the fact that VM is a widely used technology, particularly in developed countries. The use of VM in Hong Kong's local construction is critical to assist projects to achieve stakeholder goals and objectives. Bewari, Susantono, Rahman, Sari Sesmiwati and Rahaman (2013: 46) assert that countries like the UK, USA, Japan and Australia use VM application to gain a competitive advantage and to solve numerous challenges in the construction industry.

According to Safulnizam (2010: 4), the Southeast Asian construction industry does not embrace VM. This is caused by a knowledge gap between current VM development applications compared to those in already developed countries. However, Kong (2013: 6) is adamant that VM is becoming common in Hong Kong, especially in the public sector's infrastructural development programs. Through VM development standards and training, Hong Kong will gradually enhance its VM development practices. Jaapar (2009: 214) is also positive that continuous research and monitored development is necessary to ensure effective and efficient VM future development in Malaysia. Developing countries will benefit from making use of VM, especially in the construction industry.

Kelly (2007: 436) mentions some of the developing and developed countries that have successfully adopted VM, namely:

- Australia;
- United Kingdom;
- United States;
- Japan;
- India;
- Saudi Arabia; and other
- Middle East countries.

Most of these countries above have been practicing the application of Value Management for decades. Adoption and application of VM is a long term process. Countries (developing/developed) and organisations should understand and accept that VM takes time to perfect. Organisations have a potential to utilise VM tools, approaches and techniques, as long as they are well understood and applied accordingly.

With all that has been said, O'Farrell (2010: 12) argues that VM is a developing technique that has insufficient theoretical foundation to claim international success status. Currently, universities and institutes are developing applications to analyse and model VM performance in the project design phase.

3.4 Use of the VM Approach

Christos (2007: 32) explains that VM helps to identify poorly defined projects at early stages. It rescues projects from generating unnecessary costs, time overruns, long-term user dissatisfaction, claims and excessive operating costs. The tool is a solution to many things, such as:

- Poor or lack of communication;
- Poor relationship between the construction and design methods;
- Lack of coordination between the operator and the designer;

- Negative influences and attitudes amongst stakeholders;
- Outdated specifications or standards;
- Temporary decisions that end up being permanent;
- Lack of vital information; and
- Honest misconceptions.

Suhaimi (2014: 16) posits that VM can be utilised at any phase of project implementation. The project's outcomes or benefits will differ, depending on the time that VM was implemented on the project. In support, Abidin and Pasquire (2007: 275) assert that sustainability and performance enhancement is massively absorbed in the design and conceptual stage of the project process. VM encourages team cohesion to achieve sustainability needs, whilst maintaining the successful use of limited resources.

Al-Yami (2012: 14) states that VM plays a critical role in value enhancement by reducing time, and improving quality, performance, reliability and maintainability. In addition, VM modifies human behaviour by stimulating employees' creativity, attitudes and teamwork. Chavan (2012: 24) mentions that a three dimension value aspect must be achieved. Achievement occurs is when project value requirements are met to a client's satisfaction, meeting organizational goals and employee growth. VM, therefore, enhances cost effective decision making, team cohesion and reduces project delays. In contrast, Jaapar, Endut, Bari and Takim (2009: 214) argue that the VM process leads to poor teamwork and poor facilitation skills in the VM workshop. Stakeholders resist adoption of the tool owing to a lack of knowledge and understanding of VM practices.

Hence, Bowen (2010: 53) states that VM has become an organisation's internal requirement to reduce costs, optimize value, clarify project brief and improve functionality. Other organizations adopt VM owing to clients' increasing demand for value enhancement and keep abreast with local competition. Therefore, some organizations are bound to utilise the tool owing to external circumstances and customers' demand to meet desired value standards.

Noor *et al.* (2015: 75) claim that VM has many effective qualities to enhance sustainability issues regarding project plans, designs and decision-making. Both public and private sector companies can benefit immensely to achieve positive project execution outcomes, provided that VM is utilised appropriately. The high project execution failure rate can be reduced through the effective and efficient application of the VM approach.

3.5 Potential risks of not using Value Management in construction projects

The Queensland Government's Department of Housing and Public Works (2010: 2) indicates the following possible risk factors that are associated with not utilising VM, namely:

1. Insufficient definition of service requirements;
2. Improper strategy implementation for meeting needs;
3. Outcomes that indicate poor value for money;
4. Imbalance between operating, capital and maintenance expenditure;
5. Inappropriate project brief;
6. Ineffective stakeholder communication; and
7. Lack of project ownership by end user.

3.6 Types of projects suitable for VM

Coffey *et al.* (2010: 2) assert that the generic nature of VM is so diverse and flexible, allowing for use by various types of projects, which range from buildings to water treatment works. Coetzee 2010 (24) further states that VM is suitable for any project or product type, ranging from buildings to project subdivisions. According to Gongbo (2009: 76), each project is unique and each VM study is linked to the project's uniqueness to achieve the required goals and objectives. Therefore, according to Saifulnizam *et al.* (2010: 15), there is no fixed project application that is suitable for the use of VM. Any part of the project construction activity (systems, programs and work processes) is allowed to reap the VM benefits in any project.

Gillier *et al.* (2013: 7-8) postulate that the VM approach may be deployed the moment the objective (what to deliver) and beneficiaries (who to deliver to) are known. In the planning activity there are two distinct phases, namely the problem definition phase and the problem solving phase. Waterhouse (2007: 50) also states that VM may be applied to all types of projects. Major projects in New Zealand use VM in industrial complexes, retail centres, tourism, hospitals and commercial office developments.

3.7 VM challenges and constraints

- Lack of technical and management expertise among VM workshop respondents. In the building design stage contractors are excluded, which may lead to poor project implementation (Bowen, 2010: 47 - 49).
- Professionals often misinterpret VM as a cost cutting tool rather than value-add. This confusion usually leads to project management failure, while the designing teams become reluctant to use the tool (Maznan *et al.*, 2012: 383 - 384).
- Project managers struggle to remain focused on VM basic principles to enhance performance. There is a need to provide adequate training and development to project managers, frontline employees and technical staff (Ezezue, 2015: 5).
- Project teams receive little advice and guidance about VM. Instead, they are given a structured approach, which is offered by an independent facilitator. Employees may easily become confused and de-motivated by this act (Green *et al.*, 2007: 652 - 653).
- VM is structured in a deceiving manner. Some management processes are repackaged in a seemingly short and quick process, whereas this is not the case. In practice, project teams end up compromising processes in an effort to catch up with limited or lost time (Phillips, 2008:3).

- South-East Asian countries encounter growing environmental factors that become natural consequences of economic development. This becomes a challenge as VM is fairly new and unfamiliar to developing countries (Noor *et al.*, 2015: 78).
- Whyte *et al.* (2012: 802 - 803) argue that time constraints, as well as a lack of understanding and commitment, are critical factors that hinder the success of VM implementation. Design procedures and company policy do not provide enough time, especially in design bid build contracts. Contrarily, Rabbi (2016: 1) affirms that adopting VM practices has streamlined project schedules and budgets and have improved stakeholder satisfaction. It also provides a consistent, structured and effective business approach. Undertaking VM practices has a potential save of about C\$700 million or more on high value investments.
- Lai (2006: 47) states that it is too expensive to implement VM. In North America the standard fee to implement a VM workshop ranges between \$20 000 - \$40 000. Many clients are not willing to pay this extra fee. This could be another reason why developing countries resist committing fully to adopting this tool. In contrast, Isa *et al.* (2015: 421) postulate that stakeholders are demanding that VM should be used frequently, particularly in key construction projects.
- According to Bowen *et al.* (2011: 11), China established that VM practices were different from international mainstream practices. The country identified barriers such as inappropriate use of VM mathematical techniques, inappropriate measures to encourage the use of VM, and insufficient scope of VM applications.

3.8 International VM standards and regulations as a statutory requirement in other countries

O'Farrell (2010: 18) contends that several federal agencies, government bodies and construction bureaus insist that VM should be carried out for all major projects. According to Abd-Karim *et al.*(2014: 1),US government regulations mandated that a VM

study must be adopted by all projects that cost USD2 million and above. The same government ordered that the Department of Transport (DFT) should ensure that all projects that cost USD100 million and above should use VM. Ramly *et al.* (2012: 3) posit that Hong Kong mandated the country to apply VM to all government projects that exceed \$200 million.

Government of South Australia (2015: 29) regulated the country to conduct a VM study for all construction projects that are equal to or greater than \$11mil. The aim was to assist the project sponsor, project team and the Lead Agency to select the most suitable concept design. According to Hayatu (2008: 67-68), the Nigerian government has not yet fully committed itself to regulating VM. The country has to adopt VM and include it in its procurement process, which was designed by the Bureau of Public Procurement.

Rabbi (2016: 1) argues that the City of Calgary regulates all capital infrastructure projects, amounting to C\$25 million and beyond, to undergo one VM study before implementation. Then, projects beyond C\$75 million have to undertake at least two VM studies before implementation. Management may consider reducing these thresholds to C\$25million in the next six years, provided that VM implementation demonstrates continuous success. The city also makes it compulsory for companies to undertake VM programmes, and short-listed five qualified companies and six certified value specialists to facilitate these programmes.

Ramly and Shen (2012: 106) suggest that government should develop strategies and adopt VM as a compulsory tool. Below are countries that adopted VM as an obligatory policy. See Table 3.1

Table 3.1: Government policy/standards in relation to the VM applications

Country	Year first Introduced	Government Policy/Instruction	Guideline/ Standard
USA	1947	US Congress Bills	Value Standard

		(1993)	& Body of Knowledge (2007)
UK	1960	HM Treasury Guidance Publication No.54 (1996); and Cabinet Office - Management of Value Initiative (2010)	European Standard – BS EN 12973 : 2000
AUSTRALIA	1960	Australian Capital Territory Associations Incorporation Act (1991); and Total Asset Management System Manual : NSW Government (1993)	Australian Standard – AS 4183 (2007)
HONG KONG	1988	Work Bureau Technical Circular (1998 and 2002); and The Construction Industry Review Committee (2001)	Nil
MALAYSIA	1986	Economic Planning Unit Circular No.3 (2009) of Prime Minister's Department	VM Implementation Guidelines for Public Projects and Programs (2011)

Source: Ramly (2012: 106)

Nawawi *et al.* (2014: 90) and Isa *et al.* (2015: 421) indicate that the Malaysian government wants all construction projects that are worth R50 million and above to implement VM. The country's government believes that VM is a management tool that creates strong links between funding and outcomes. This is further supported by Jaapar *et al.* (2012: 77) who professes that Malaysia wants to monitor the VM respondents'

feedback and other challenges through VM workshop environment settings. Malaysia Airport Holding Berhard (2011: 1) states that the Malaysian government introduced proactive measures to enhance the VM tool to achieve these desired objectives. Malaysia also has a National Government Manual that mandates the use of VM as a standard application and reference source for VM.

In contrast, Alazemi (2011: 71) posits that, recently, projects that applied VM have not delivered satisfactory results, particularly in the government sector. Management encountered obstacles such as employee resistance to change, lack of clear vision and cohesive understanding. Lack of proper training and skills development resulted in poor performance standards. However, Johnson *et al.* (2008: 38) assert that organisations should rigorously implement VM policies and practices to achieve positive results. Policies and practices should be strictly aligned with general management goals at the highest level, as they affect all other activities. In support, the IT Governance Institute (2008: 26) states that VM must form part of corporate culture and management practices. It has to be aligned with the entire organisational governance framework to achieve positive outcomes.

3.9 Value Management as a panacea for project execution failure

A KPMG (2013: 11) survey that was conducted in 2012 indicated great concerns over a general increase in project failure, globally. Since the year 2010, the overall project failure rate has increased drastically in the financial services and government sector. Hayatu (2008: 11) postulates that many construction companies fail to complete projects within the prescribed budget, time and required quality. Sometimes this is owing to a lack of stakeholder involvement and trust among themselves.

O’Farrell (2010: 13) lists the root causes of project failure or performance decline in the Table below.

Table 3.2: Root causes of construction industry project failure/decline

Reasons for failure	Root causes for failure
Lack of integration	Inexperienced client project coordinators

Inadequate project briefs	Poor appreciation of optimized design
Lowest bid selection strategy	Lack of skilled & experienced people
Poor management process	Lack of open communication
Devalued professional ethics & standards	Poor use of technology

Source: O’Farrell (2010: 13), Developed from Engineers Australia, 2004

Christos (2007: 17) states that VM is the only management approach that simultaneously combines various attributes into a single framework. They include effective management style, positive human dynamics, internal and external environment awareness, effective methods and tools. These attributes are conducive to preventing or reducing project failure and enhancing customer satisfaction. This is further supported by Patterson and Pun (2015: 79) who claim that VM is a style of management that promotes staff growth, skills development, synergies, innovation and performance. The absence of VM techniques and principles often leads to discontinuation of social development projects, especially towards the end of the funding period.

Li (2008: 7) further argues that VM programmes successfully assisted organizations such as British Airways, BAA, BP, Pfizer, and Stanhope, as well as retail, water and rail companies to improve value. These companies gained major success factors such as capital cost reductions, reorganization, risk mitigation, improved production processes and capital cost reduction. Saifulnizam *et al.* (2010: 5) mention that VM offers the construction industry improved management strategies and flexible professionals. The tool also grants all professions an opportunity to embrace their skills and improve client services. Ramly *et al.* (2012: 3) posit that VM is a significant tool that assists construction projects to achieve value for money. It also strives to equip construction professionals with VM knowledge and skills in the construction industry.

Potts (2008: 98) states that poor planning and time management often leads to poor project definition and scope. Customer requirements are not met while budget costs are

exceeded. VM can be a solution to these challenges. Below are the 9 VM management principles that ensure successful application of the tool.

Table 3.3: Value Management principles

Principles	Descriptions
1	Value Management should be incorporated into the development process, commencing at the earliest practicable time(preferably before a decision to proceed has been taken).
2	A 'Gateway' or similar system should be put in place as one of the first organisational steps in the development journey. This 'peer-reviewed' system will help to ensure that the project is aligned with desired outcomes right from the beginning.
3	Risk assessment should be undertaken before a decision to proceed with the project is taken, and a risk management plan should be produced, monitored and regularly updated if and when the project proceeds.
4	Mechanisms to ensure the project's financial viability after funding from an Official Development Assistance(ODA) body ceases. During the VM workshop stakeholders have an opportunity to see and learn about the various facets of the project.
5	Networking and collaboration in order to promote inter/intra ministerial agency/community /sectoral relations to achieve the best possible project outcomes. Principle 1, the undertaking of a VM study would have some bearing here as the bringing together of multi stakeholders for defining the scope of the value factors would lead to this collaboration.
6	The choice of which Social Development Project should be undertaken. Those initiatives not rated on the government's priority list as contributing to national development, appeared to be at high risk of becoming unsustainable at the end of funding.
7	Introduction of an element of training or mentorship for those who would play integral roles in the entity and would be tasked with sustaining benefit flows. Particularly in cases where specialist/ technical support is required to provide institutional support, mechanisms must be put in place to ensure that the requisite capacity is strengthened on the project management team.
8	Implementation of a monitoring framework. Reference has been made to the application of the gateway approach as a useful tool in this strategic framework and critical questions that must be asked at each "gate". Additionally, seven (7) success criteria (service delivery, affordability - value for money, sustainability, governance, risk management, stakeholder management and change management) are used to assess the progress of projects, undertaken by a reviewer.
9	The use of participatory methodologies as an approach in the initiation, as well as the

	management, of projects. In this regard people are organised, skills are harnessed, singularly and collectively, synergies and creativity promoted, and overall performance of the organisation is advocated. This advocacy has a positive impact on enhancing (organisational) performance.
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Source: Patterson and Pun (2015: 83)

3.10 Other supportive tools and techniques to consider for a successful project execution

It is important to acknowledge the fact that VM alone cannot achieve the desired project outcomes or requirements. Maes and De Bruyn (2014: 4407) state that VM practices cannot function successfully in isolation. Other supporting tools and techniques must be integrated. KPMG (2013: 14) emphasizes the significance of the continuous application of risk management methodology throughout the project's lifecycle. Risk management processes are there to identify, access and control unforeseen project risks.

Supportive processes and systems need to be integrated to achieve positive and successful project requirements. According to the Australian Standard AS4183 (2007: 5), these tool or methodologies include, but are not limited to:

- Project management planning;
- Time management;
- Quality management;
- Risk management;
- Contract administration;
- Procurement and purchasing;
- Gateway review processes;
- Incentive schemes;
- Change management;
- Business excellence; and
- Cost management.

In addition, Ahmadpour (2011: 4) concludes that there are various other key business performance factors such as knowledge management, conflict management, culture, communication, and so on. These factors focus on supporting VM in becoming an effective management tool to enhance project performance and to satisfy client needs.

3.11 General misconceptions about Value Management

Lai (2006: 15) mentions the following typical misconceptions that hinder the effective implementation of the VM practices:

- VM is an instinctive implementation of a quantity surveyor;
- VM is considered to be an unprofessional effort, which leads to its doubted integrity and capability;
- VM does not consider quality as it is only a cost cutting approach; and
- VM implementation is the project manager's responsibility.

Ezezue (2015: 5) claims that VM analysis is not meant for cost reduction but rather for project value enhancement. Enforcing cost reduction efforts may potentially reduce specific essential elements and result in reduced performance or quality. This may be a reason to discuss and clarify all these misconceptions before or during the workshop stage.

3.12 Ways to improve Value Management approach and general perceptions

Like any other tool or technique, the Value Management approach/strategy needs continuous evaluation and improvement for it to keep up with real world challenges in the built environment. Constant improvement in technology also enforces Value Management tools to improve to keep up with time and to meet the needs of the industry. The Australian Standard AS4183 (2007: 21) states that VM should be adopted and applied as part of an organisation's culture at all decision making levels. It states three possible ways that may be used to enhance VM culture:

- Encourage senior management to support the use of VM in the organization;
- Individuals should participate in VM growth and development workshops to improve their knowledge about value management; and
- Organisations should provide more VM application opportunities through VM studies.

It is important to understand the difference between VA, VE, VM tools and various techniques. This will prevent the misconception and misuse of these techniques. Waterhouse (2007: 50) opines that VM awareness, knowledge and expertise are lacking. Therefore, countries should introduce VM in universities as a course, and companies should facilitate more knowledge awareness workshops.

Ramly (2012: 108 - 109) mentions other possible solutions that could contribute to VM improvement, namely:

- Training and Continuous Professional Development (CPD) to assist project teams to acquire and enhance individual knowledge and understanding;
- A procurement and incentive clause that will force government to adopt and include VM as a regulatory procurement process requirement;
- Research and Development (R&D) to allow and influence further growth and development opportunities to close the current VM knowledge imbalance;
- Professional institutions that will apply statutory regulations and guidelines to continuously promote the use of VM;
- Guidelines and standards that will create common VM principles, cohesion and unambiguous VM implementation in projects;
- Marketing, promotion and publication that will spread information and knowledge to the public; and
- Conferences and seminars to encourage knowledge sharing and to discuss or track VM application successes and failures.

Shen and Liu (2007: 11) suggest that VM should include benchmarking to achieve and maintain the industry's superior performance. Benchmarking is a structured continuous measurement process that compares the organization's business against the best leaders in that particular category. Lange *et al.* (2010: 25) opines that benchmarking compares the actual process, product or service performance with competitive market or standards. The aim is to analyse the market, improve performance and gain a competitive advantage. This is further supported by Gahtani (2015: 54) who avows that VM urgently needs such performance indicators to enhance decision making processes and returns on investments. VM performance must be properly measured and evaluated to ensure effective and efficient VM implementation and successful outcomes.

Saifulnizam *et al.* (2011: 5) state that benchmarking also assists clients to identify potential value managers that are suitable for certain types of projects. Kong (2013: 27) argues that VM workshop study styles and processes were already reviewed and developed in 2008. The pre-brief workshop, brief workshop, Charette, and concept design workshop are some of the benchmark intervention points that are developed in a project's life cycle via VM workshops. Bowen, Jay, Castell and Edwards (2010: 205) also mention that international benchmarking studies provide effective structural guidelines for the VM framework.

Rabbi (2016: 4) argues that project teams and sponsors do not apply VM effectively and consistently. Public sector organisations should ensure effective VM application through selecting the right team members, facilitators, processes and an organized approach. Maes *et al.* (2014: 4406) further state that successful VM application is achieved by introducing sound VM practices. These practices are there to capture business value, evaluate organisational value, facilitate value creation and gain competitive value. Johnson *et al.* (2008: 39) emphasize the importance of feedback to all stakeholders that are directly or indirectly involved in the project. Feedback is a suitable platform to review progress, unforeseen shortfalls and a learning experience for future projects. Bowen *et al.* (2011: 10) conclude that VM must form part of the management process to achieve

organisational goals and objectives. It should also be integrated in the continuous project development and improvement processes. However, this statement was alluded to earlier by Patterson *et al.* (2015: 83) when they said that this is one of the existing fundamental principles of VM that was implemented to ensure project success.

3.13 Recommended Value Management Maturity Model (VMMM)

The IT Governance Institute (2008: 26) suggests that a VM Maturity Model that consists of iterative-steps can be a solution to improve VM implementation. The model has three domains, namely Portfolio Management, Investment Management and Value Governance. Each domain contains five VM identification levels that a company can use to set target levels for achievement. The model gives the company a better understanding and reflection of where it stands regarding VM management knowledge. It also provides a thorough awareness of the company’s strengths, weaknesses and areas of improvement, which are required before committing to using VM. Below is the VM Maturity Model’s characteristics and an accompanying five-point scale (0 - being lowest and 5 - being highest).

Example

Domains	VG Maturity Domain					PF Maturity Domain					IM Maturity Domain				
	COMMUNICATION					OPERATIONS					FINANCE				
Level	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5

Table 3.4: Value Management Maturity Model (VMMM)

Value Management Maturity Model			
Domains	VG Maturity Domain	PF Maturity Domain	IM Maturity Domain
Levels	-----	-----	-----
Level 0: Non-Existent	There is no communication between the organization and its departments/units,	There is no project process/progress awareness between the	The organization mainly focuses on the project’s end results. There is no

	for example, Finance, Marketing, Project Team, etc.	organization and project functions. There are no project portfolios in place.	strategic link between the project and the organization's expected benefits.
Level 1: Initial	<p>Organisation slightly recognizes its departments. Communication between departments and functions is at its infancy stage. Business cases are defined on project by project bases though less accountability is defined. Skills and tools exist on an individual basis.</p>	<p>Portfolio management practices are applied in some functions and in isolation. No defined responsibilities and accountabilities for portfolio management. Each function/department is accountable for its own resources. Programme review adoption is limited. Business cases, evaluation and selection programmes/projects are utilized on ad hoc or needs basis. Skills, tools and financial metrics are applied on an individual basis.</p>	<p>The focus is usually on project cost, and recognition to improve the governance of the project is minimal. The project is allocated its own budget. Investment management processes and organizational involvement is vague. Business cases are seldom and investment processes are ad hoc. Financial metrics are average, and may only exist specifically for project delivery costs. Tools and skills are individually dependent.</p>
Level 2: Recognition	<p>Awareness between management and other departments/functions is increasing. Collaboration and formalized VM framework is a need. Individual accountability, formal commitment and job training is a priority. Tools are used on an ad hoc basis.</p>	<p>Awareness for cohesion and management of project portfolios increase. Business cases are evaluated based on financial and other measures. Organisational management is involved in the programme/project selection process. Accountability and responsibilities are not yet clear, and depend on individuals. Knowledge and</p>	<p>Senior management is aware of project related investments. Organizational involvement in major projects increases, but roles and responsibilities are not yet defined. Business cases are not yet clearly defined or formalized and are still applied to certain projects. The budget is still allocated to the project, since the focus is only on costs.</p>

		skills are limited to support project portfolio management. Training is inconsistent.	Inconsistent benefits, risks and financial metrics for project costs. Various tools and techniques are used with limited skills.
Level 3: Defined	All parties across all departments understand the VM governance requirements. A need for efficiency to ensure optimal resource allocation arises. All formal business/project documentations are required. Accountability is shared, but roles and responsibilities are still unclear. Formal training plans exist, but are not implemented consistently. Tools are used increasingly, but not yet standardised across the organisation.	Knowledge about project portfolio management and practices, is average. Business cases are required for all programmes. Accountability and responsibility exist for project programmes. Financial measures, strategic alignment and risk assessment are reported for most projects. Processes and policies exist, but are not applied consistently. Resources and portfolio management skills are monitored in relation to the project and organizational needs. Consistent training is planned and executed accordingly. A suitable project management system/approach is used to gather information, and supports decision making.	Organisational change management needs are acknowledged and management realizes a need to manage project investments. All business functions have clearly defined business cases, accountability, responsibilities and budgets. Financial and high level financial benefits, risks, costs and benefits are recognized, evaluated and reported. The focus is on the project's results and overall business outcomes. Business case development is supported by expertise, skills and standard tools from both the project and business.
Level 4: Managed	Commitment is shared across the organization and necessary functions are engaged with to optimize performance and project value. Accountability and	Senior management consistently review performance and are fully committed. Project management duties, roles, accountability,	Senior management is fully committed to the investment of the project. Stakeholders are provided with all the project's responsibilities and

	<p>business functions are clearly assigned. Business case reviewed, updated and re-evaluated throughout the project lifecycle. Skills, processes, communication and resource allocation are optimized through the effective use of VM. Standard tools are integrated with organizational systems. Formal training plans are executed as required.</p>	<p>responsibilities and support practices are applied with the overall governance model. Resource management is integrated to support project selection based on a formal review and formal approval process. Business projects are developed and maintained based on categorized project portfolios. Experts provide continuous training and development as planned. A suitable project management system/approach is used widely.</p>	<p>accountabilities. Project programmes and benefits' realization plans are constantly updated in a comprehensive and complete business case. Dashboard and benefits register techniques are utilized to robustly establish financial metrics. Programme management skills are made available across the organization and project tools are used to support the project.</p>
<p>Level 5: Optimised</p>	<p>VM forms part of the corporate culture. The organization and project teams work cohesively to consistently report on and optimize resources, processes and projects. Accountability is clear and processes are continuously improved through effective use of VM tools and techniques. External experts are assigned.</p>	<p>Project portfolio management and practices form part of the corporate culture. Projects are monitored and evaluated continuously to optimize value. Accountability and responsibility are clearly defined and accepted. Senior management engages in project performance and organizational reporting to support decision-making by executives. Project/portfolio management measurements are in place to monitor both internal and</p>	<p>A proactive and regular performance review programme is established by the board and executive management. Full economic life-cycle cost, risks, and financial and non-financial benefits are assigned accordingly. They are continuously monitored and adjusted to ensure accountability and optimized value. Tools and techniques are aligned and integrate to project and business objectives. Business cases are updated to reflect and</p>

		external environments.	determine performance. Skilled experts and training is a priority.
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Source: IT Governance Institute (2008: 26 - 29)

3.14 Summary

The chapter discussed the use of Value Management in South Africa and in other across the globe. Based on the research findings, many countries, including South Africa, are not yet aware and knowledgeable about the use of Value Management. It has been suggested that Value Management workshops and experienced facilitators are needed to introduce the tool and to bring awareness about it to project practitioners. This will help to equip project managers with knowledge about the potential risks of not using Value Management, particularly for those projects that are suitable for VM. It is also important to understand VM challenges and constraints that can be expected during VM implementation, especially in the infancy stage.

International VM standards and regulations that countries use as statutory requirements were also discussed in this chapter. The purpose of this is to ensure that project practitioners gain awareness and understanding about various VM rules and regulations as they differ from one country to another. Another challenging factor that hinders the successful implementation of value management is misconception. Due to a lack of knowledge and owing to misconceptions about the tool, project practitioners have become reluctant and untrusting of using the tool. Some of the misconceptions have been discussed in this chapter to enlighten project managers. Lastly, common root causes of project execution failure were also discussed in this chapter, together with potential solutions to this crisis. Value Management models are recommended as a panacea for the high project execution failure rate in the construction industry.

CHAPTER 4: Research Methodology

4.1 Introduction

The chapter describes the research design and methodology that was utilised to collect data, collate results and compile conclusions for the study. The purpose of a study is to discover solutions, unknown information, general law relationships, and behaviours, and encourage informed decision making processes (Willis, Jost and Nilakanta, 2007: 288). The main research objectives of the study are to identify the extent to which the Value Management tool is used in Cape Town's construction industry. Also to establish the effectiveness of Value Management as a successful project execution tool in construction firms. The focus is also on the studied target population, methods used to collect and analyse data, systems used to interpret data, sample, sample bias, sample size, data analysis and ethical considerations. Gwija (2014: 33) posits that a research methodology is a systematic and scientific approach of collecting and analysing data to realise a satisfactory solution for a particular problem or situation. It is a methodical process that gathers relevant information for the intended study (Laphi, 2013: 49) and investigates with an intension to gain knowledge and find solutions for a problem. Mhlauli (2015: 55) describes research methodology as an effective process, which is used to collect information and data that is conducive to making informed business decisions.

4.2 Research design

Sousa, Driesnack and Mendes (2007: 503) state that research designs are commonly classified as qualitative and quantitative in nature. However, various studies combine these two designs into one mixed method or combined method within the same study. According to Pandey and Pandey (2015: 18), a research design is a structured framework that is used as a guideline to collect and analyse data for a study. It is considered as a collection measurement and data analysis design to guide the research. Viljoen (2010: 62) asserts that a research design is a logical sequence that links collected data to the study's original research question. Therefore, the design

assists in selecting research sites and data collection procedures for the research question/s of the study. Whereas, Huff (2009: 85) postulates that research design balances activities that are significant components to contribute towards the acquiring of knowledge. Hancock, Ockleford and Windridge (2009: 4) highlight the importance of conducting a literature review before deciding on a research design that will suitably address the intended research question. The decision involves considerations regarding the kind of data that is collected, the way that it is collected, analysed and interpreted.

A combination of both qualitative and quantitative research design (mixed-method approach) was followed in this research endeavour. Denscombe (2007: 107) explains that a mixed method approach uses both qualitative and quantitative methods as alternative strategies within a single research project. Tobedza (2011: 49) defines qualitative research as a method that consists of studied use and a collection of various empirical materials, namely case studies/observations. Conversely, Akwunwa (2013: 58) mentions that quantitative research answers questions of how and why, while focusing on relationships among measured variables. This study used the mixed method approach to identify whether or not the VM tool is used by construction firms to combat the high project execution failure rate in Cape Town.

4.3 Theoretical aspects of research methodology

Research is often misinterpreted as a process of searching for information, gathering information and facts documentation. Whereas, a research is a systematic process of collecting data, analysing data and interpreting it to gain an in-depth understanding of the situation or condition (Williams, 2007: 65). Rugg and Petre (2007: 31) opine that research is about discovering something new (facts and findings) in pursuit of knowledge. If the knowledge is new to that particular individual, then it is secondary research, but if the knowledge is new to everyone, then it is primary research. Driscoll (2011: 154) postulates that primary research is commonly conducted by means of observation, interviews and surveys. Rajasekar, Philominathan and Chinnathambi (2013: 2) refer to research as a systematic analysis that investigates solutions for social

and scientific problems. Research types are broadly categorised into two main methodology classes, namely; basic research and applied research.

Majija (2009: 11) argues that research methodology is a research strategy or methods of collecting data. It entails rigorous planning, structuring and execution to comply with objectivity and validity. According to Peffers, Tuunanen, Rothenberger and Chatterjee (2007: 5), a methodology is a system of practices, principles and procedures which are applied to a specific division of knowledge. Choy (2014: 104) argues that regardless of the type of research methodology that is selected quantitative and qualitative approaches are used to purposefully debate, criticise and comment on the findings of a survey study. Conversely, Vargas-Hernandez, De Leon, and Valdez (2011: 46 - 47) claim that research methodology is regarded as an intellectual activity that assists in the collection, analysis and interpretation of data. However, research methodology has not been a well-developed field by both academics and scientific literature, particularly within a strategic management perspective.

Morton-Achmad (2008: 193) explains that research methodology involves both quantitative and qualitative methods. Therefore, comprehensive data collection is achieved where neither approach would have achieved in isolation. In this study data was collected in two forms during the research process, namely secondary data and primary data. Secondary data was collected by means of journals, publications, textbooks and various internet sources. This included all the literature that was reviewed and reported on in Chapters Two and Three of this study. Primary data was collected by means of administering questionnaires to various respondents/employees within construction firms in the Cape Town Metropole. Primary research was conducted to reveal and answer several unanswered questions in the literature review.

4.4 Research strategy

According to Greener (2008: 35), research strategies are different from actual research methods, although they are related. Understanding the difference between research

strategies and research methods is crucial for any study. William (2011: 70) refers to research methods as techniques that are used to execute the actual research. They provide means to collect, gather, analyse information and make conclusions. Adams, Khan, Raeside and White (2007: 25) further state that research methods are ways of conducting and implementing a study, and a research methodology is a philosophy and science of the entire study.

Babbie, Halley and Zaino (2007: 9) explain that, generally, there are two types of research strategies, namely inductive research and deductive research. These two approaches guide and assist the researcher to gain in-depth knowledge. Bhattacharjee (2012: 14 - 15) further asserts that induction strategy draws its conclusions on facts and observed evidence. Whereas, deduction strategy draws its conclusions on behaviour or phenomenon based on logical reasoning. Saunders, Lewis and Thornhill (2009: 106) declare that selecting a suitable research strategy and research methods is important, as it has a significant impact on understanding the root cause of that, which is investigated.

4.5 Target population

Horn (2010: 110) defines population as a set of items, data or individuals where a sample is taken. It centres on members of particular groups such as product users, organizational staff or those with a particular condition. According to Puhan (2013:1), target population constitutes a selected area or specific group. The study can specify weights in any suitable proportion to represent new or existing forms of samples. Hart, Dykema, Elver, Schaeffer and Stevenson (2010: 5) suggest that a smaller target population is always easier to contact, as it is not feasible to study the entire population. A larger and complex target population often focuses on the subgroup of the overall total population of interest.

The study only considered project managers, supervisors and team members that are frequently and directly involved in organisational projects. Therefore, contract

employees, outsourced employees and part-time employees may have been included in the study, depending on their level of involvement. The more involved the employee the high the chances of him or her to be included in the study. Employees that were recently appointed were not considered for the study as they may have lacked exposure and sufficient experience on projects. In addition, employees that were recently on long term leave or suspension did not participate. The study was conducted at Cape Town Metropole construction firms. A sample was drawn for the study while the entire population was not studied owing to limited time and the costs of collecting data.

4.6 Population validity

Burns and Burns (2008: 427) mention that population validity determines the accuracy of the participant's responses within a sample of the particular target population. Venter (2008: 143) further states that even when there is a low response rate, population and research validity may not be significantly compromised, especially when there is a *high quality of respondents*. According to Dijkers (2011: 6), results of population validity can be generalized from a sample or a specific population group from which the sample was drawn. Therefore, population validity is affected by the level of sampling and the inclusion of personal variables when interacting with treatment effects (anxiety, student ability, gender, and so on). For this study, population validity was determined by the high level of experienced respondents who took part in the study. This helped to enhance value and accuracy with regards to content validity of the survey results. In addition, the researcher ensured that popular and reputable construction companies are targeted to ensure good quality and reliable results.

4.7 Sampling selection and sampling method

As soon as the specific population, site and setting are approved, subsequent sampling decisions are made (Marshall and Rossman, 2006: 64). Maya (2010: 61) defines sampling as a systematic process of selecting behaviours, a group of people, geographic areas or any other division for studying a subset of a population. Tobedza

(2011: 50) and Mateus (2012: 72) refer to sampling as a process of choosing a certain percentage or portion of the population to represent the whole population. Ekandu (2011: 67) suggests that there has to be a reasonable or fair number of the sample to provide for less sampling errors.

Boeije (2010:35) opines that there is a vast difference between sampling in qualitative research and sampling in quantitative research. Quantitative research implements statistical and probability representation, whereas qualitative research consists of selected and examined units from a defined research population. Cohen, Manion and Morrison (2007: 100) assert that the standard and quality of research does not only rely on the appropriateness of the instruments and methodology, but also on the sampling strategy suitability. The International Atomic Energy Agency (IAEA) (2007: 59) mentions that sampling strategy entails a sampling program that considers future necessity to accomplish complementary analytical determinations. There has to be sufficient quantities of representative sub-samples.

The study drew a random sample among construction companies that are in the Cape Town vicinity. Participating companies were selected and valued equally, regardless of the size, calibre or years of existence. Horn (2010: 111) asserts that random sampling provides reasonable representation of a population and is easy to understand. Moriarty (2011:7) suggests that sampling captures the core different logics between qualitative and quantitative methods. According to Weisner, Kalil and Way (2008:349), in most cases qualitative samples are smaller than quantitative samples owing to time constraints in data collection and analysis. In support, Sebastiao (2013: 64) argues that time, costs and other resources constraints make it impossible to study every individual of the targeted population.

4.8 Sample size

Mhlauli (2015: 61) mentions that a sample size is determined or influenced by the dimension of the targeted population. The bigger the population, the more precise will

be the generalisation or results of the study. According to Akwunwa (2013: 59), the sampling units are drawn from a sample size list or record of a population. Iacobucci and Churchill (2010: 312) state that a sample size has to be big enough to satisfy sufficient, sound and convincing results. It is a complex concept that is influenced by the sample type, time, money, available personnel and statistics in question. Hart *et al.* (2010: 05) posit that a sample survey is better than studying the entire population, since smaller sample sizes encourage positive responses and follow ups.

Due to time constraints and a limited budget, the entire population was not studied for this study. Rather, a total of 125 respondents was drawn from the sampling frame. It is important to understand that the more questionnaires that were administered, the higher the accuracy of the responses and answers to the research questions. A sample size of 30 responses among the targeted population would generalize reasonable enough feedback for the study. The sample size was large enough to represent the rest of the population. Adams *et al.* (2007: 91 – 92) maintain that a sample size is important for survey research as it determines the adequacy in relation to the goals and objectives of the study.

4.9 Sampling bias

Simundic (2013: 12) defines bias as any intentional or unintentional deviation of facts in data collection, data analysis, interpretation and publication. An act of introducing bias is immoral and unethical, as it may negatively influence the outcomes of the study. Bias is a systematic error that can jeopardise evaluation of the findings. Laphi (2013: 58) explains that sampling bias is a sample that does not represent or generalise the sample results to the entire population study.

According to Rebar, Gersch, Mcneean and McCabe (2008: 123), sampling bias may be triggered by a researcher that selects a sample that reflects the researcher's characteristics and beliefs. Therefore, random sampling can successfully have a positive impact in minimizing selectivity and researcher bias. The random sampling

technique has potential to reduce sampling bias, as the subjects have equal opportunities of being selected (Glidewell, Entwistle, Eccles and Grimshaw, 2010:1229-1245).

4.10 Method of data collection

According to Marshall *et al.* (2006: 61), identifying the site, setting and population should be at the forefront of the design study. The aims are to clear, shape and justify all of the subsequent activities of the research. Phelps, Fisher and Ellis (2007: 179 – 180) stipulate that data collection is the most critical process for a study. Conducting rigorous and well-organised data collection provides easy, accurate and reliable data analysis. Hancock *et al.* (2009: 16) posit that interviews, focus groups, observations, questionnaires, open-ended questions and a collection of narratives are qualitative research methods for data collection. Boeije (2010: 58) further states that data may be collected by means of verbal material from daily life, namely advertisements or chat sessions. A researcher may also request correspondences such as e-mails, letters, minutes and records available for the study from individuals or organisations.

Primary data collection that was used for this study comprised a mixed method approach with the use of a literature review and self-administered questionnaires. All questionnaires were hand delivered to respondents and explained in detail to ensure clarity. Questionnaires completion and collection dates were discussed and confirmed between the researcher and respondents. These efforts were strategically implemented to minimize low or non-response rate. Williams (2007: 70) explains that the aim of adopting the mixed method approach is to gather both qualitative and quantitative research strengths, and to reduce possible weaknesses from either approach. In support, Cresswell (2012: 534) argues that the mixed method approach provides far better understanding of the research problem and question than using either qualitative or quantitative approach in isolation. Mixed method application is able to transform data for comparison and validate one form of data from another form of data. It also allows a fair intuition for respondents (Driscoll, Yeboah, Salib and Rupert, 2007: 20 – 21).

The following Table depicts a typical example of data collection types and methods, particularly for qualitative research.

Table 4.1: Types of data collection and methods in qualitative research

Data Collection Methods and Types of Data: Qualitative Research		
Data collection methods	Illustrative types of data	Specific examples of data
Interviewing and conversing	Language (verbal and body)	Another person's explanation of some behaviours or actions, a recollection
Observing	People's gestures, social interaction, scenes, actions and physical environment	Amount and nature of coordination between two people, spatial arrangements
Collecting	Contents of: personal documents, other printed materials, graphics, archival records and physical artefacts	Titles, texts, dates, and chronologies, other written words, entries in an archival record
Feeling	Sensation	Coldness or warmth of a place, perceived time, interpretation of other people's comfort or discomfort

Source: Yin (2011: 131)

4.11 Data analysis

Pandey and Pandey (2015: 40) mention that data analysis acknowledges various activities for both quantitative and qualitative research studies. According to Viljoen (2010: 65), data should be thoroughly analysed to ensure that the search questions and hypotheses are addressed to achieve the intended research objectives. Personal interviews, telephone interviews and self-administered questionnaires/surveys are the three primary types of data collection, which research uses. The analysis involves

information gathering (Tsobze, 2010: 42) and thorough interpretation of the collected data.

The SPSS (Software Program for Social Sciences) was used for data analysis as it is effective and has user-friendly qualities. The aim of the analysis was to find answers to particular problems and to draw conclusions about real-world events based on the problems. Collected data was hence analysed and presented in the form of charts, graphs, and tables to illustrate answers diagrammatically. The report comprised of the last part of the dissertation.

4.12 Ethical consideration

In complying with internationally accepted ethical standards, no names of individuals or organisations were recorded on the research instruments. Hence, no individual or organization was linked to a particular completed instrument, thus assuring anonymity. It is also important to mention that all of the received information was treated with strict confidentiality and privacy. A consent form or letter was obtained from all respondents before the survey was conducted. respondents participated voluntarily and no compensation was awarded to any of the respondents for their participation in the study. Protocol was observed in relation to general conduct and competence of interviews, where interviews and surveys are conducted to promote quality assurance. The researcher also assured of the correctness and competence of responses, especially where open-ended questions are concerned.

4.13 Assumptions made

4.13.1 Respondents would not be biased, and would be honest to the best of their understanding.

4.13.1 There would be no restrictions from any of the organisations where information and data will be collected.

4.13.2 The outcomes of the study should assist in the author's workplace and project practitioners, in general.

4.13.3 All questions that were asked were understood, did not offend anyone and would be responded to by the respondents

4.13.4 Some project practitioners may refer to Value Management differently, since it is not a used or popular practice in South Africa as yet (for example, VE/VA).

4.14 Scope and limitation of the study

4.14.1 The research was geographically limited to Cape Town owing to economic and time constraints within which the report has to be submitted.

4.14.2 The research was only conducted at construction sites that agreed to participate in the survey.

4.15 Summary

The chapter described research methodology and research design that were used to conduct this study. A background on how research studies were conducted, and the tools and techniques to collect and analyse data, were also discussed in this chapter. The focus was on critical factors such as target population of the study, sample, sample size, data analysis, population validity, ethical consideration and scope limitations.

CHAPTER 5: Presentation and discussion of results

5.1 Introduction

Chapter Five of the study focuses on analysis of the data that was collected by means of using a structured questionnaire. The chapter discusses the structure of the questionnaire, respondents' profiles, respondents' response rate and Value Management as an effective measuring tool in project execution. The results of the study are summarized and presented in frequency distribution graphs, tables and charts. The aim was to explain the concept of the Value Management tool and to establish whether the tool has potential to reduce the high failure rate in project execution. This chapter also discusses the extent to which project teams and managers are familiar with the use of VM as an effective harnessing tool in the execution of construction projects.

5.1.1 Structured questionnaire

All respondents responded to the same set of questions. The instrument that was used comprised four (4) sections, namely: Section A (Biographical details) respondents were given an opportunity here to qualify to participate in the survey. Section B (Characteristics of the organisation) a Likert scale (closed-ended questions) was used to examine the perceptions, practices and attitudes of the organisation. Section C: In relation to Value Management, closed-ended questions were posed regarding the use, understanding and difficulties of using VM as a project management tool. A Likert scale was also used in this section of the questionnaire to collect data from the respondents; Section D comprised open-ended questions, which discussed the use of Value Management in projects. According to Croasnum and Ostrom (2011: 19), a Likert scale is a systematic framework that provides a range of responses to a statement or series of statements ranging from a scale of 1 to 5. Respondents were granted an opportunity to express their views and opinions about Value Management and its applications on projects; and lastly, Section E allowed respondents to discuss any

additional information that may be useful for the survey. It was a platform for respondents to share their views and opinions about the questions that were asked in the survey concerning the concept of Value Management.

5.1.2 Data collection

The study was conducted exclusively to project practitioners in the construction industry within the Cape Peninsula area. A total of 76 (of the 125 target population) project practitioners at different levels of employment in the construction industry responded to the questionnaires that the researcher administered. The total number of respondents in terms of percentage amounted to 60.8 percent of the total targeted population for this study. The rest of the administered questionnaires were returned incomplete, and were mostly irrelevant to be able to draw any constructive criticism and conclusions.

5.1.3 Data analysis

SPSS 24 (Software Program for Social Sciences) was used to capture and analyse data since it has precise and user-friendly qualities. Data analysis results were then presented in the form of excel graphs, charts and tables owing to its neat and well presentable appearance. In the analyses of the descriptive data, some of the variables were cross-tabulated via SPSS 24 to determine whether there were any significant correlations between certain variables.

5.2 Section A: Biography

Questions that were asked in the biography section included the following:

- Indicate your gender;
- Indicate your age group;
- Indicate your position in the organisation;
- Indicate your highest formal qualification level;

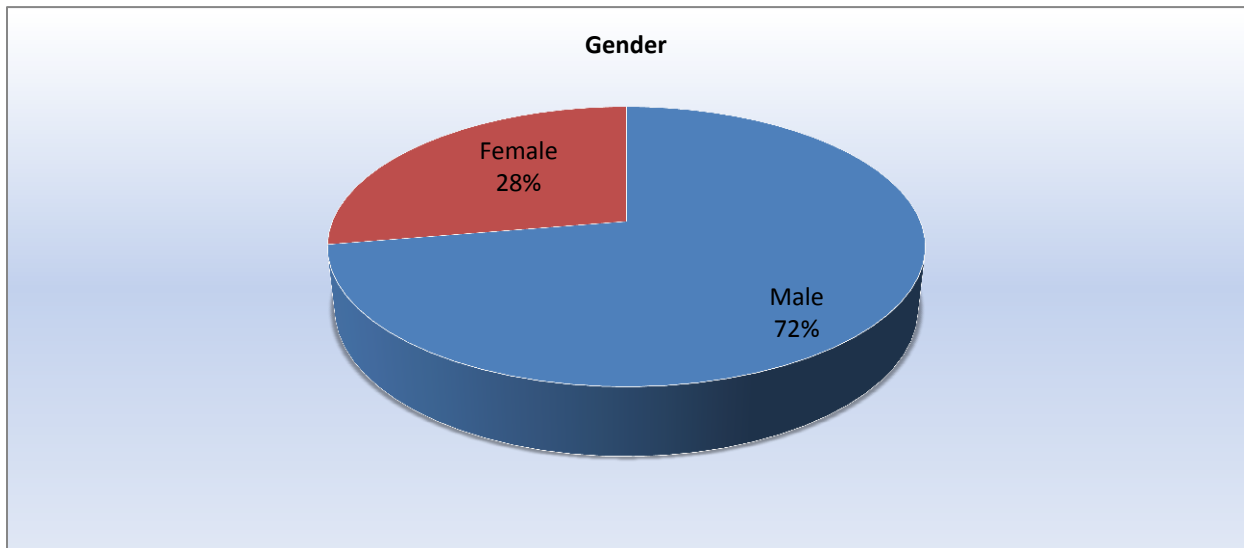
- Indicate your years of working experience in projects;
- How often are you involved in project team meetings?
- How often are you involved in day-to-day operations of the project?

As alluded to earlier, the researcher sought the respondents' biographical details to identify the relevance and suitability of respondents to participate in the research. It also helped the researcher to conduct a proper and constructive analyses of the respondents' data.

5.2.1 Statement 1: Indicate your gender.

Indicate your gender.

Figure 5.1



	Female	Male	Total
Percentage	28%	72%	100%
Frequency	21	55	76

Source: Author's fieldwork

In terms of gender, there is a huge gap between male and female employees in the construction industry (see Figure 5.1). The significant majority of male respondents

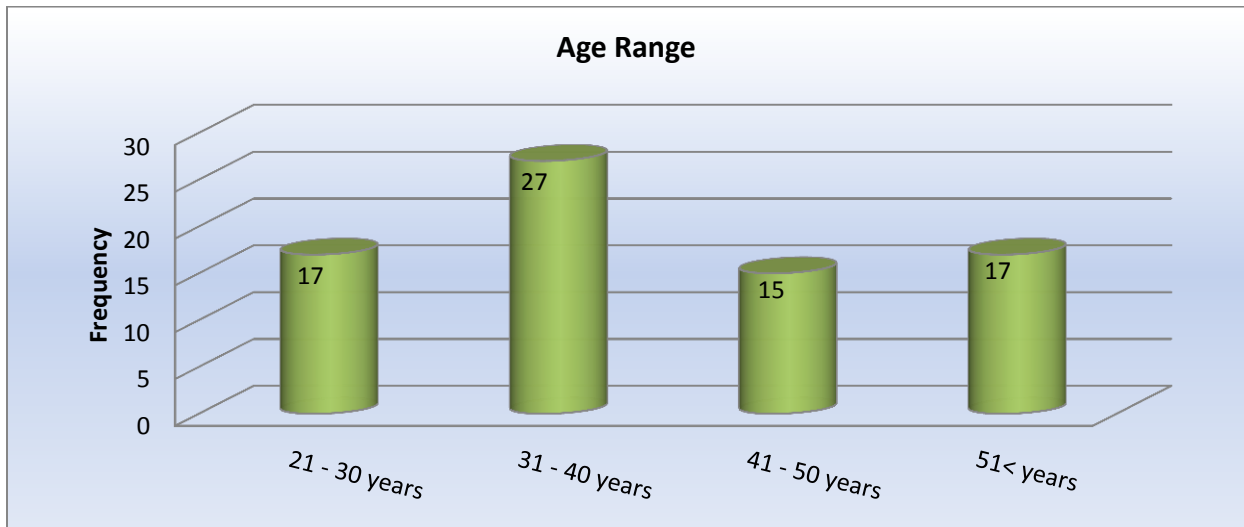
comprised 72 percent of the total target population, whereas the female respondents represented 28 percent. This difference may be caused by the fact that the construction industry is, traditionally, predominantly occupied by males based on the general perception that males are more suited to the built environment industry as opposed to their female counterparts.

In support, Yokwana (2015: 1-2) states that women face the unfortunate situation of unequal job opportunities in the construction industry. It is always difficult and almost impossible for women to grow and develop their skills successfully here, since it is a male dominated industry. For the longest time, position of power has been owned by men. A lack of willingness by mentors and role models to assist female employees, is one of the contributing factors for the current imbalance in the industry.

5.2.2 Statement 2: Indicate your age group.

Indicate your age group.

Figure 5.2



	21 – 30 years	31 – 40 years	41 – 50 years	51 < years	Total
Percentage	22.4%	35.5%	19.7%	22.4%	100%
Frequency	17	27	15	17	76

Source: Author’s fieldwork

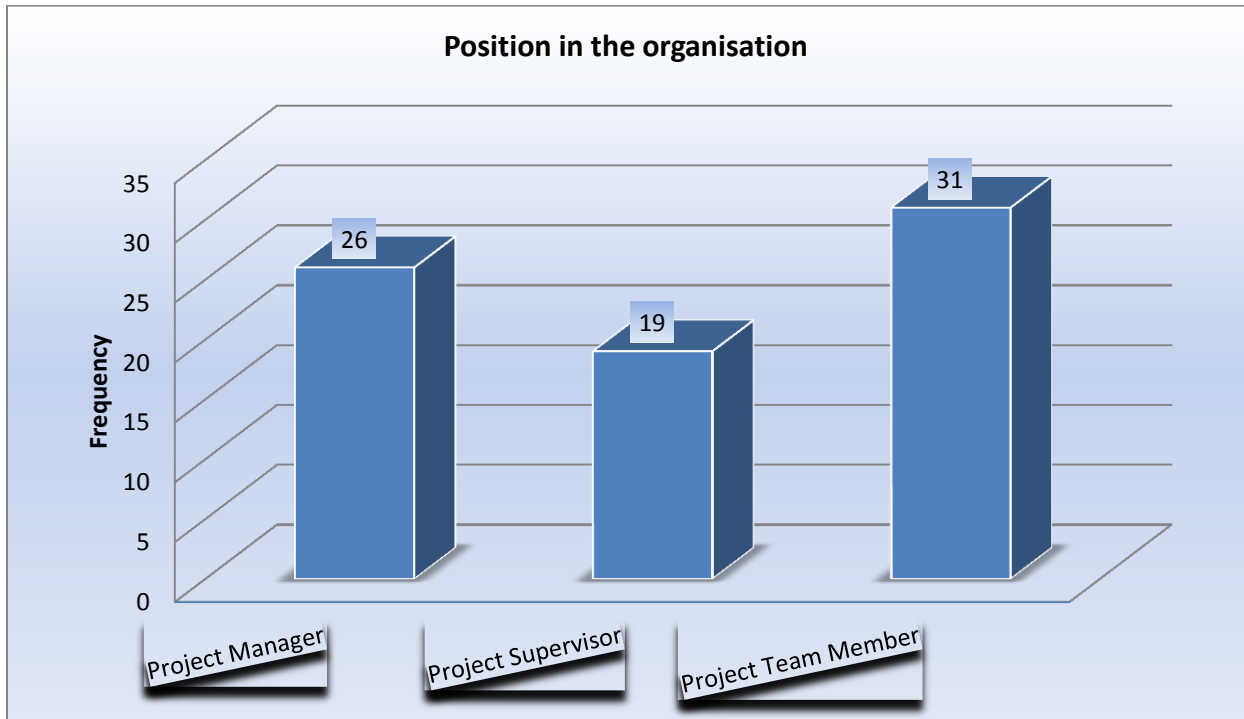
The above Figure indicates that a great part of the construction industry is currently dominated by young to middle-aged adult employees. Figure 5.2 shows that 35.5 percent of the respondents were between the ages of 31 and 40 years old, followed by a tie of 22.4 percent who were between the ages of 21 and 30 years, and 51+, respectively. Respondents who were aged between 41 – 50 years comprised the least percentage (19.7 percent) of the total target population.

The diverse integration of young adults, middle-aged and elderly employees creates a favourable working environment where knowledge sharing is concerned. Experienced employees tend to share knowledge and skills with inexperienced employees, while the younger ones bring creative ideas and innovations to the organization. No respondents aged 20 years and below participated in the survey, as they were likely to be in the process of completing their studies at tertiary level. This may also reflect the fact that organizations employ staff who have relevant skills, competence, experience and qualifications.

5.2.3 Statement 3: Indicate your position in the organization.

Indicate your position in the organization.

Figure 5.3



	Project Manager	Project Supervisor	Project Team Member	Total
Percentage	34.2%	25%	40.8%	100%
Frequency	26	19	31	76

Source: Author's fieldwork

According to Figure 5.3, project team members have the highest percentage (40.8 percent), followed by project managers (34.2 percent) and, lastly, project supervisors (25 percent). The survey results indicate a fair representation of construction professionals within organizations, as this allow broader and diverse points of view, since they come from different levels of the organizational hierarchy.

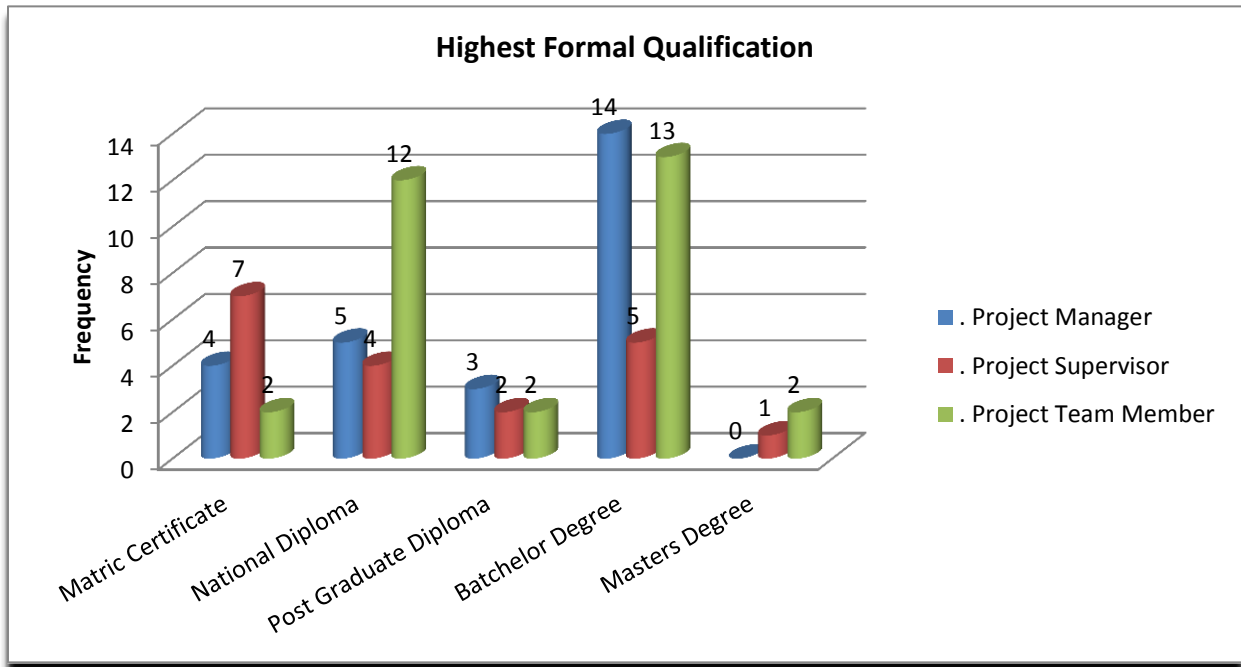
The data presentation was confident to collect sound knowledge of the construction industry because respondents, particularly project managers and project supervisors,

responded in adequate numbers to fulfill the objectives of the study. respondents were also considered to be matured and sufficiently experienced to provide constructive information, considering the number of years that they have worked in the mentioned industry (see Figure 5.4).

5.2.4 Statement 4: Indicate your highest formal qualification.

Indicate your highest formal qualification.

Figure 5.4



	Project Manager	Project Supervisor	Project Team Member	Total
Percentage	34.2%	25%	40.8%	100%
Frequency	26	19	31	76

Source: Author’s fieldwork

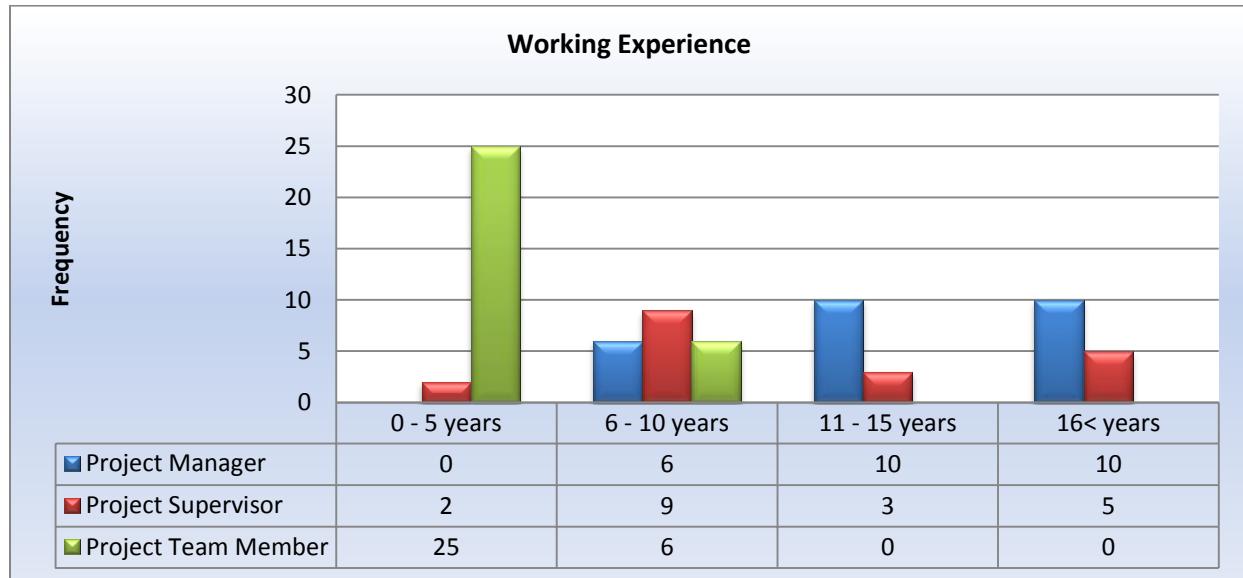
Figure 5.4 above indicates respondents’ highest formal qualification and shows that each participant obtained either a high school or a tertiary qualification. A majority of project managers have Bachelor’s degrees 18.4 percent (14). Followed by 6.6 percent (5) project managers who have diplomas and 5.3 percent (4) have a matric certificate. There is a low 3.9 percent (3) who have post graduate diplomas. The second highest

percentage of qualifications was for project team members' 17.1 percent (13) have Bachelor's degrees and 15.8 percent (12) have national diplomas. Amongst project team members 2.6% (2) of them have Master's degrees, post graduate diploma and matric certificate, respectively. Supervisors followed with 9.2 percent (7) who have matric certificates, while 6.6 percent (5) have Bachelor's degrees and 5.3 percent (4) have national diplomas. For this study, only 1 supervisor held a Master's degree in the entire target population.

Based on the above data presentation there is a high demand for project practitioners who have formal qualifications. As the construction industry continues to grow, there is an increasing demand for qualified project managers to join the construction space. Gradually, there will be an increase in the number of project managers that have the required skills, knowledge and expertise to perform. It will also ensure that project performance is delivered according to the client's expectations, through recruiting skilled project managers, supervisors and team members. Ultimately, the current high project execution failure rate will be something of the past.

5.2.5 Statement 5: Indicate your number of working years' experience in projects. Indicate your number of working years' experience in projects.

Figure 5.5



	0 - 5 years	6 - 10 years	11 - 15 years	16 < years	Total
Percentage	35.5%	27.6%	17.1%	19.8%	100%
Frequency	27	21	13	15	76

Source: Author's fieldwork

Figure 5.5 above shows that 35.5 percent of the respondents have below 5 years of working experience, while a majority of them are project team members (25 members). Approximately, 27.6 percent of the respondents have between 6 to 10 years of working experience, followed by 17.1 percent of the sample (n=13) that have between 11 to 15 years of working experience. Lastly, a total of 15 respondents (19.7 percent of the sample) reported having at least 16 years of working experience in the project management arena.

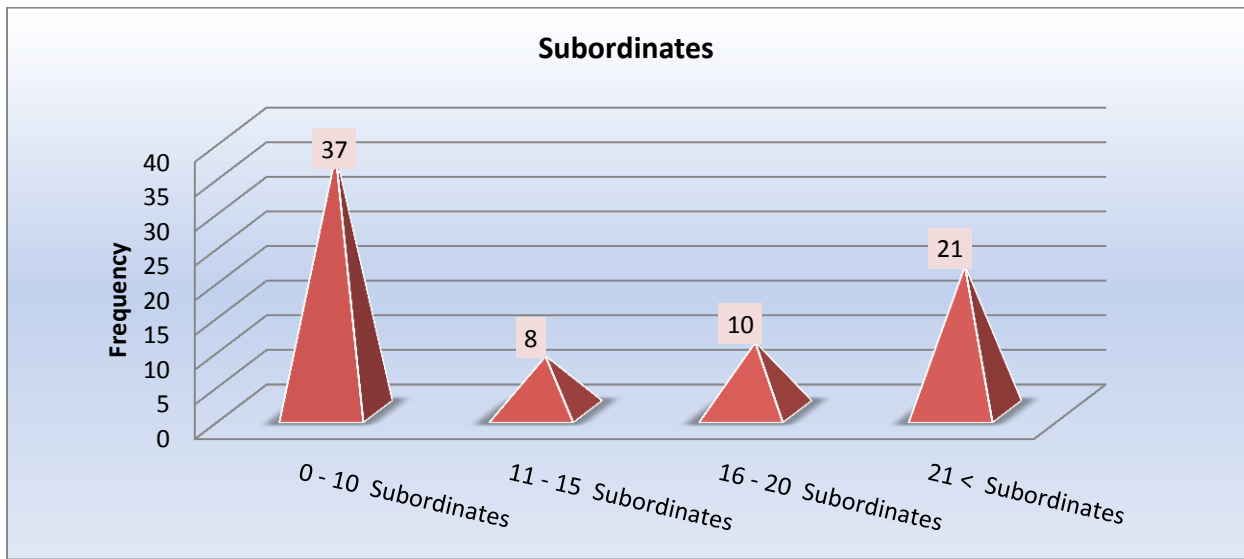
Both Figure 5.3 and Figure 5.5 indicate that project team members (40.8 percent) are predominantly represented, more so than project managers and supervisors. However, in terms of work experience, there are more project managers and project supervisors who will ensure accuracy and effective use of collected data. Experienced project

managers and supervisors are there to guide and lead teams to achieve their desired project goals and objectives. In support, Laphi (2013: 64) asserts that experienced project professionals have a responsibility to teach the basic skills of project management to young professionals to enable them to deliver better projects.

5.2.6 Statement 6: How many subordinates report to you?

How many subordinates report to you?

Figure 5.6



	0 - 10 subordinates	11 - 15 subordinates	16 - 20 subordinates	21 < subordinates	Total
Percentage	48.7%	10.5%	13.2%	27.6%	100%
Frequency	37	8	10	21	76

Source: Author's fieldwork

Figure 5.6 above indicates that a high percentage of 48.7 percent of the respondents have less than 10 subordinates, followed by 27.6 percent that have 21 or more subordinates. Followed by 10.5 percent and project managers who have 11 to 15 subordinates. Approximately, 13.2 percent project managers have 16 to 20 subordinates. This may indicate that team leaders have small and manageable project teams. Should this be the case, then effective communication, high performance and

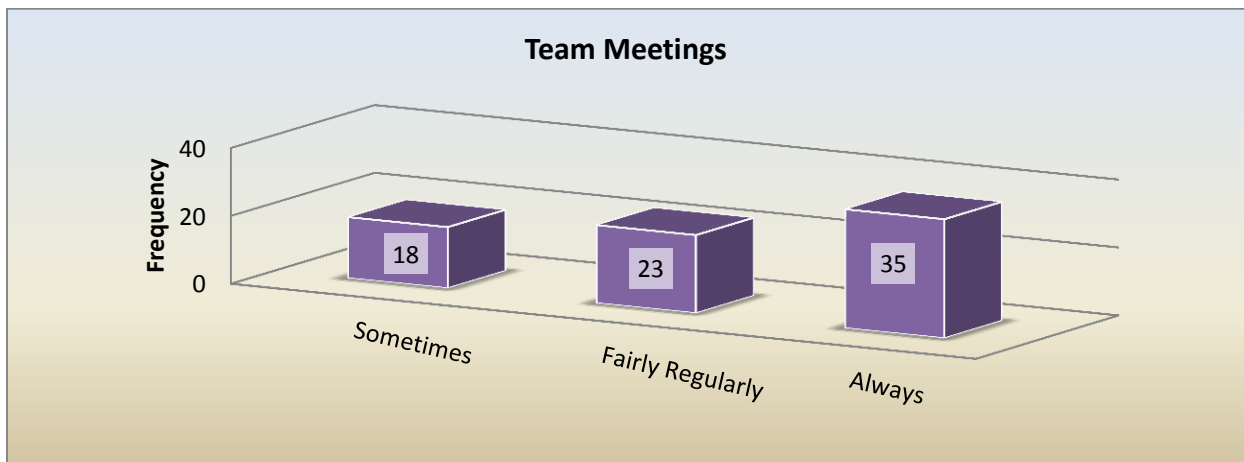
team cohesion may be expected, particularly when teams are led by experienced team leaders that have with effective leadership qualities.

Respondents that have 21 subordinates and more could be regarded as those who are well experienced, skilled and matured project managers who fall within the 34.2 percent pool that was highlighted in Figure 5.3 earlier. With suitable knowledge, skills and competence, 11 to 15 subordinates and 16 to 20 subordinates are fairly reasonable numbers for project teams that are led by one project manager/supervisor. Therefore, according to Figure 5.6, a majority of these organizations may be considered to present well-balanced management of project teams as far as team sizes are concerned.

5.2.7 Statement 7: How often are you involved in project team meetings?

How often are you involved in project team meetings?

Figure 5.7



	Sometimes	Fairly Regularly	Always	Total
Percentage	23.6%	30.3%	46.1%	100%
Frequency	18	23	35	76

Source: Author's fieldwork

According to the above Figure, respondents indicated that organizations do engage in team meetings, since a total of 46.1 percent said that they always did, while 30.3

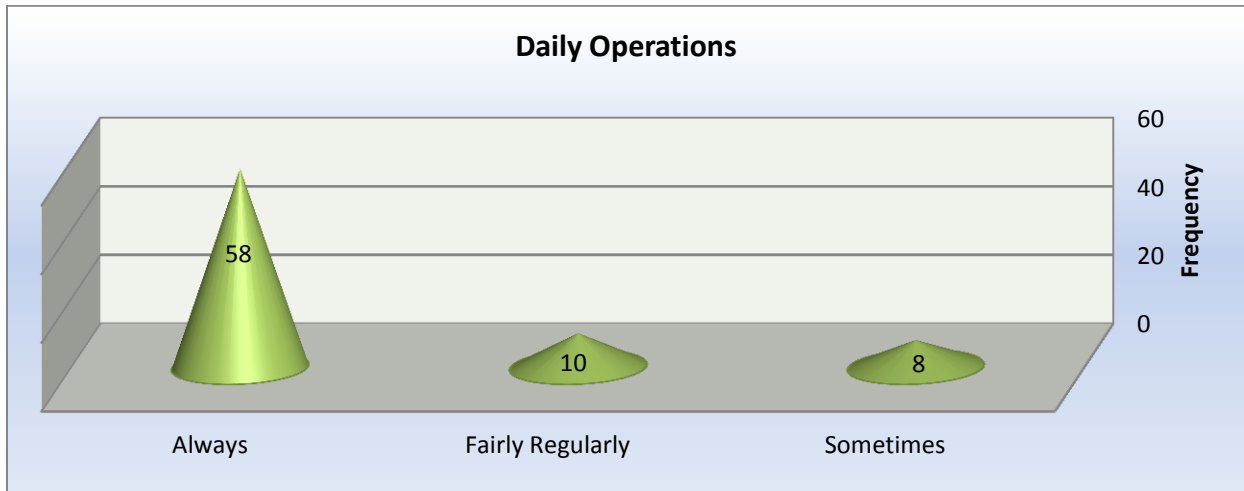
percent said that they participated fairly regularly. Combining the two percentages totals 76.4 percent, which is a positive indication that organizations do actually participate in project team meetings. Only a smaller percentage of 23.6 percent indicated that meetings are not common in the organization. As much as it is a small percentage compared to the other two responses, it is yet a serious and concerning factor, as it might be a common cause of poor project communication practices within an organization. Hence, the sharing of information between colleagues and dissemination of knowledge from experienced project professionals to young professionals, may not be viable or realised.

However, the general understanding, based on Figure 5.6, is that organizations do recognize and acknowledge the significance of constantly engaging in project team meetings. Therefore, effective communication and regular feedback may be regarded as a cornerstone for team cohesion and employee motivation. Clear communication of project goals and objectives ensures that everyone involved in the project understands exactly what to expect and what is expected of them. This makes it even better when the organization has smaller and more manageable project teams to avoid unnecessary misunderstanding and conflicts.

5.2.8 Statement 8: How often are you involved in day-to-day operations of the projects?

How often are you involved in day-to-day operations of the projects?

Figure 5.8



	Always	Fairly Regularly	Sometimes	Total
Percentage	76.3%	13.2%	10.5%	100%
Frequency	58	10	8	76

Source: Author's fieldwork

The frequent and daily involvement of project practitioners in day-to-day operations of the project has a lot to do with understanding exactly what happens in the entire project. It also provides an opportunity to foresee possible risk factors that may arise so that the necessary precautionary measures can be implemented to combat risks, and hence enhance project success. Figure 5.8 illustrates that a majority of the respondents (76.3 percent) mentioned that they are constantly involved in the day-to-day operations of their projects.

A smaller percentage of 13.2 percent stated that they are fairly regularly involved in the daily operations of their projects, while low 10.5 percent of respondents said that they are sometimes involved in day-to-day operations. None of the respondents indicated

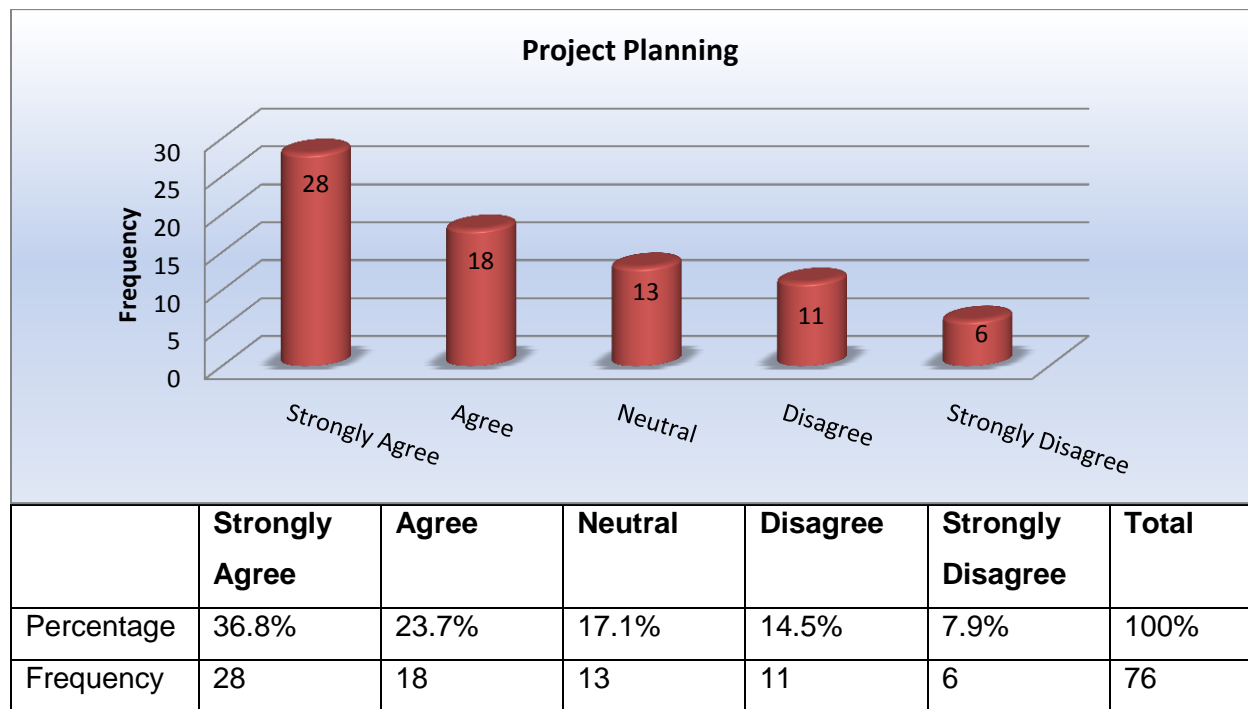
that they are never involved in daily project operations. These results are deemed to be satisfactory in acknowledging the fact that project practitioners are directly and consistently involved in daily project execution activities. Nonetheless, it is of extreme important to highlight the fact that these meetings need to be productive and constructive to add value to the project. Meetings may be held on daily basis, but if they do not add value or benefit the project's success, then they are of no use. Hopefully, this is not the case in organisations out there.

5.3 Section B: Characteristics of the organisation

5.3.1 Statement 9: Planning is the project manager's responsibility.

Planning is the project manager's responsibility.

Figure 5.9



Source: Author's fieldwork

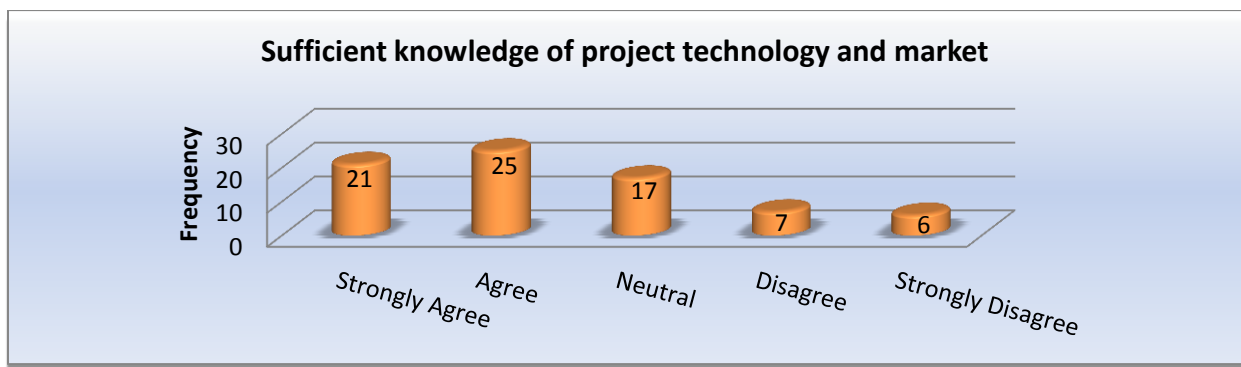
Figure 5.9 illustrates that a total of 62.3 percent of the respondents agreed (38.6 percent strongly agreed and 23.7 percent agreed) with the above statement that project planning is a responsibility of a project manager, while 22.4 percent disagreed with the

statement (14.5 percent disagreed and 7.9 percent strongly disagreed), and 17.1 percent were indecisive on the matter.

In most cases, project planning is understood to be the project manager’s responsibility. However, this perception may not always be true and may jeopardize project success, both financially and otherwise. Project planning is important as it is the initial phase of the project. Part of project planning is to ensure that all stakeholders that are affected (directly and indirectly) are involved from the beginning of the project. Among other things, project details, sharing of ideas and conflict of interests are identified, discussed and resolved at the initial stage. Therefore, the idea of expecting that the project manager will take care of everything, can be a recipe for disaster. Stakeholder participation helps to improve decision making and problem solving because everyone is involved, as goals, objectives and project expectations are discussed beforehand.

5.3.2 Statement 10: Our organization has sufficient knowledge of project technology and market forces such as suppliers, distributors, competition. Our organization has sufficient knowledge of project technology and market forces such as suppliers, distributors and competition.

Figure 5.10



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	27.6%	32.9%	22.4%	9.2%	7.9%	100%
Frequency	21	25	17	7	6	76

Source: Author’s fieldwork

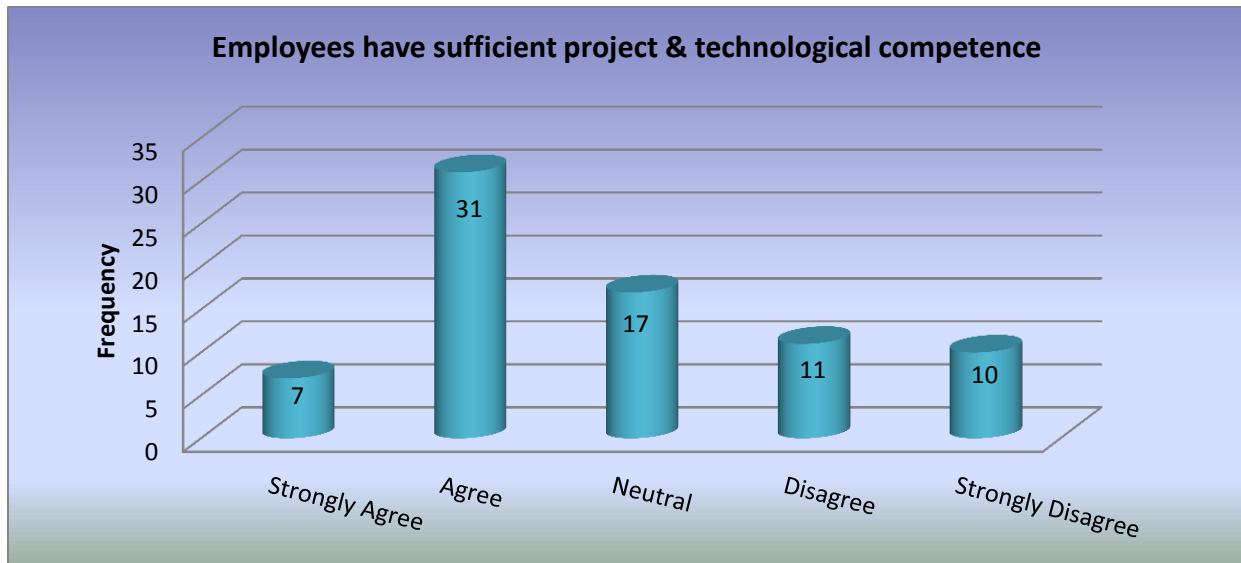
As shown in Figure 5.10, a total of 59.6 percent of the respondents strongly agreed (32 percent agreed and 27.6 percent strongly agreed) that organizations have enough knowledge regarding project technology and other market forces. It is significant to have effective project technology, as it automatically gives organisations a competitive advantage, improves their performance and ensures customer satisfaction. However, it is concerning that there was a noticeably large percentage of neutral respondents, namely 22.4 percent. This could possibly mean that organisations have a considerable number of areas where knowledge of project technology and other market forces is lacking.

According to the presented data, a lot of internal employees do not have confidence in the availability of project technology and other market forces. A lack of proper technology and poor market forces may lead to an organisational incompetence and result in a struggle to survive the highly competitive and ever-changing built environment industry. Risks of project failure are highly possible in this regard. Less respondents, namely 9.2 percent and 7.9 percent disagreed and strongly disagreed, respectively, with the above assertion that their organization has sufficient knowledge of project technology and market forces such as suppliers, distributors, and competition.

5.3.3 Statement 11: Employees have sufficient project and technological competence (skills, knowledge, competence and work experience).

Employees have sufficient project and technological competence (skills, knowledge, competence and work experience).

Figure 5.11



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	9.2%	40.8%	22.4%	14.5%	13.1%	100%
Frequency	7	31	17	11	10	76

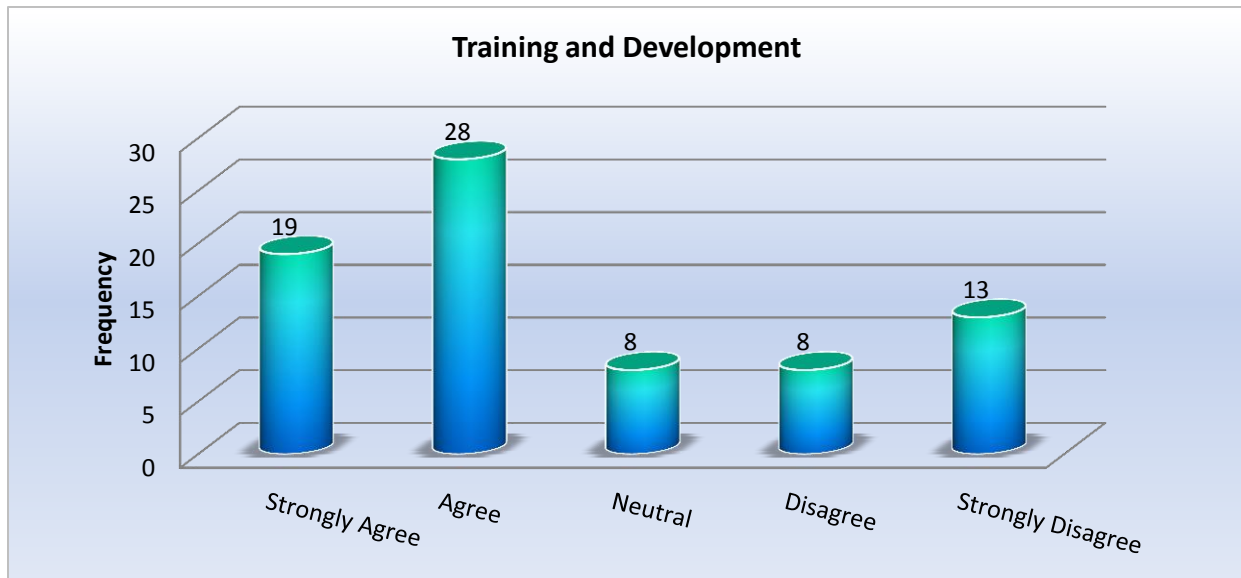
Source: Author’s fieldwork

Figure 5.11 above depicts a data representation, which shows on one hand that 50 percent of the respondents agreed (40.8 percent agreed and 9.2 percent strongly agreed) that employees have sufficient project and technological competence. Conversely, a total of 27.6 percent of the respondents disagreed with the above assertion (14.5 percent disagreed and 13.1 percent strongly disagreed), while a noticeable 22.4 percent of the respondents chose to remain neutral in this regard. With an identical significant percentage of 22.4 percent of the responses, as shown in Figure 5.10 and Figure 5.11, the issue of sufficient project technology, employee skills, competency and other factors, remain questionable.

5.3.4 Statement 12: Management provides necessary training and development programmes to all project staff.

Management provides necessary training and development programmes to all project staff.

Figure 5.12



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	25%	36.8%	10.5%	10.5%	17.1%	100%
Frequency	19	28	8	8	13	76

Source: Author's fieldwork

A majority of respondents concurred with the statement that organisations provide necessary training and development programmes to employees. Respondents agreed with a majority Figure of 61.8 percent, while 36.8 percent agreed and 25 percent strongly agreed. A total of 17 percent of the respondents strongly disagreed, and 10.5 percent disagreed and remained neutral, respectively.

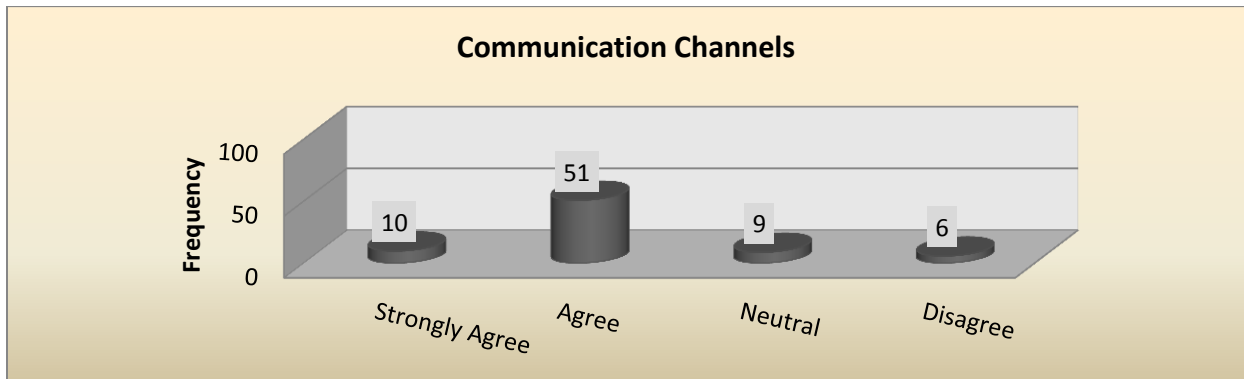
Employee training and development is crucial as it improves employee performance, knowledge and skills to execute the job. It also encourages an individual's personal growth, especially for those young professionals that are fairly new in the construction

industry (see Figures 5.2 and 5.5). As discussed in Figures 5.10 and 5.11, the built environment industry highlighted significant attention to the need for organisations to train and develop employees. Tertiary qualifications and natural intelligence alone are insufficient for employees to perform the job to the best of their ability and to meet highly competitive external standards. Figure 5.12 indicates that employees are trained and developed as and when needed. Positive results in this respect will gradually show by improvements in the project’s success rate, especially if employees are exposed to effective training and relevant programmes.

5.3.5 Statement 13: Management promotes effective communication channels and continuous feedback to its employees.

Management promotes effective communication channels and continuous feedback to its employees.

Figure 5.13



	Strongly Agree	Agree	Neutral	Disagree	Total
Percentage	13.2%	67.1%	11.8%	7.9%	100%
Frequency	10	51	9	6	76

Source: Author’s fieldwork

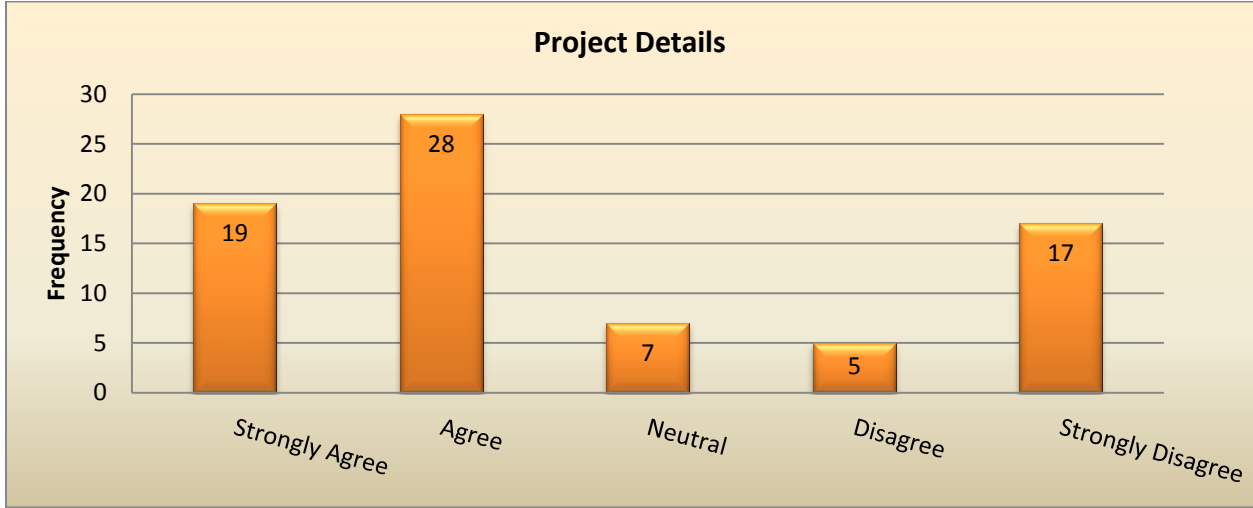
Figure 5.13 depicts that management promotes effective communication channels and continuous feedback for employees. Respondents agreed with a total percentage of 80.3% (Agree: 67.1 percent and Strongly Agree: 13.2 percent). A small percentage of the respondents, namely 11.8 percent remained neutral and an even smaller

percentage of respondents, namely 7.8 percent, disagreed. There were no respondents who strongly disagreed with the above statement. It would appear that management is doing a great job to ensure that effective communication channels have been established and continuous feedback is maintained. Employees will have a sense of direction as they clearly understand the bigger picture of the organization, including project goals and objectives. Figure 5.7 also emphasizes the fact that effective communication is a perfect platform to share information between colleagues and to disseminate knowledge from experienced project professionals to young and inexperienced professionals. It is also evident that results that are presented in Figure 5.8 are a true reflection of effective and productive team meetings that are held by organizations on a daily basis.

5.4 SECTION C: Value Management

**5.4.1 Statement 14: The project is provided in detail to all practitioners involved.
The project is provided in detail to all practitioners involved.**

Figure 5.14



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	25%	36.8%	9.2%	6.6%	22.4%	100%
Frequency	19	28	7	5	17	76

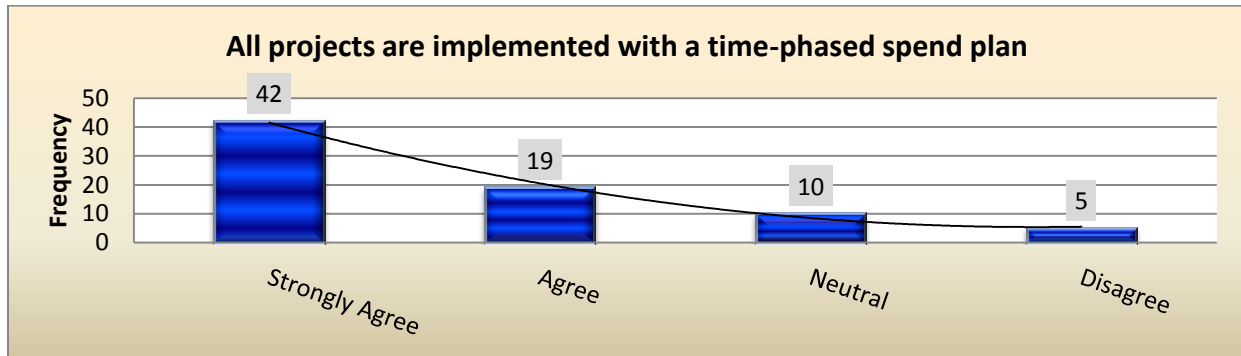
Source: Author’s fieldwork

The results shown in Figure 5.14 above confirms that a lot of respondents agreed that sufficient project details are provided to all project practitioners that are involved in project spaces. A total of 36.8of percent the respondents agreed with this statement, followed by 25 percent that strongly agreed. About 29 percent of the respondents disagreed with the statement in question, while 22.4 percent strongly disagreed and 6.6% disagreed. A total of 9.2 percent of the respondents chose to remain neutral in this respect.

It is of outmost importance to acknowledge the fact that thorough project details are provided to all stakeholders that are involved in the project. Stakeholders gain a sense of inclusion and uniformity, knowing that their presence and contribution is acknowledged and appreciated by the project manager. Once again, the statement speaks directly to the effective use of available communication channels in the organization. Providing comprehensive project details to project team members, clients, sponsors and suppliers, provides an opportunity to fully understand the project goals and objectives. It is also a perfect platform to ask relevant questions in relation to anything that may be unclear. Therefore, this reiterates the fact that project planning is not only the project manager's responsibility, but also that of all stakeholders that are directly and indirectly influenced by the outcomes of the project at hand.

**5.4.2 Statement 15: All projects are implemented with a time-phased-spend plan.
All projects are implemented with a time-phased-spend plan.**

Figure 5.15



	Strongly Agree	Agree	Neutral	Disagree	Total
Percentage	55.2%	25%	13.2%	6.6%	100%
Frequency	42	19	10	5	76

Source: Author’s fieldwork

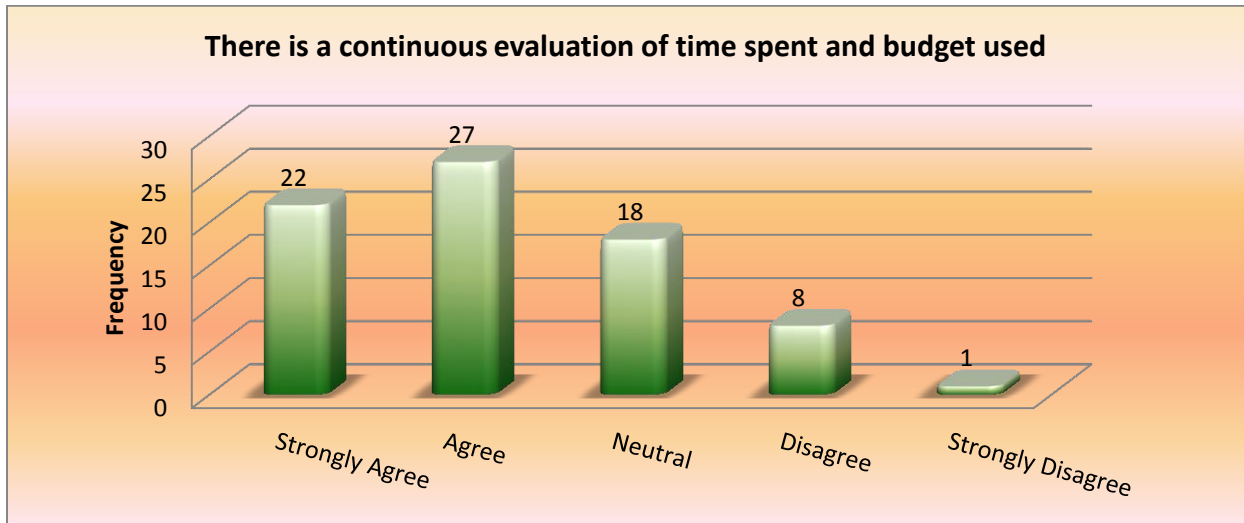
According to Figure 5.15, about 55.3 percent of the respondents strongly agreed that organisations encourage projects to be implemented with a time-phased spend plan, while 25 percent agreed with the statement, hence a high total of 80.2 percent concurred in this regard. A total of 13.2 percent of the respondents remained neutral and 6.6 percent disagreed, while none of the respondents strongly disagreed.

A time phased plan is important for any project execution as it provides useful information such as targeted milestones that should be achieved, timeframes in which to complete activities and available budget to be used. Management of value and keeping track of time has to be monitored frequently so that the project manager can track immediately whether or not the project is executed according to the prescribed time period, or if it is behind schedule. In this regard, Value Management techniques are essential to identify timeframes and actual payments versus committed spending, cost categories, spending limits and approvals for the specific project.

5.4.3 Statement 16: There is a continuous evaluation of time spent and budget used.

There is a continuous evaluation of time spent and budget used.

Figure 5.16



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	29%	35.5%	23.7%	10.5%	1.3%	100%
Frequency	22	27	18	8	1	76

Source: Author's fieldwork

Respondents agreed that organisations and managers implement continuous evaluation of time spent and budgets used for every project. This is shown in Figure 5.16, where 35.5 percent of the respondents agreed and 28.9 percent strongly agreed with the mentioned statement. A total of 23.7 percent of the respondents remained neutral, while 10.5 percent disagreed, and 1.3 percent strongly disagreed in this respect.

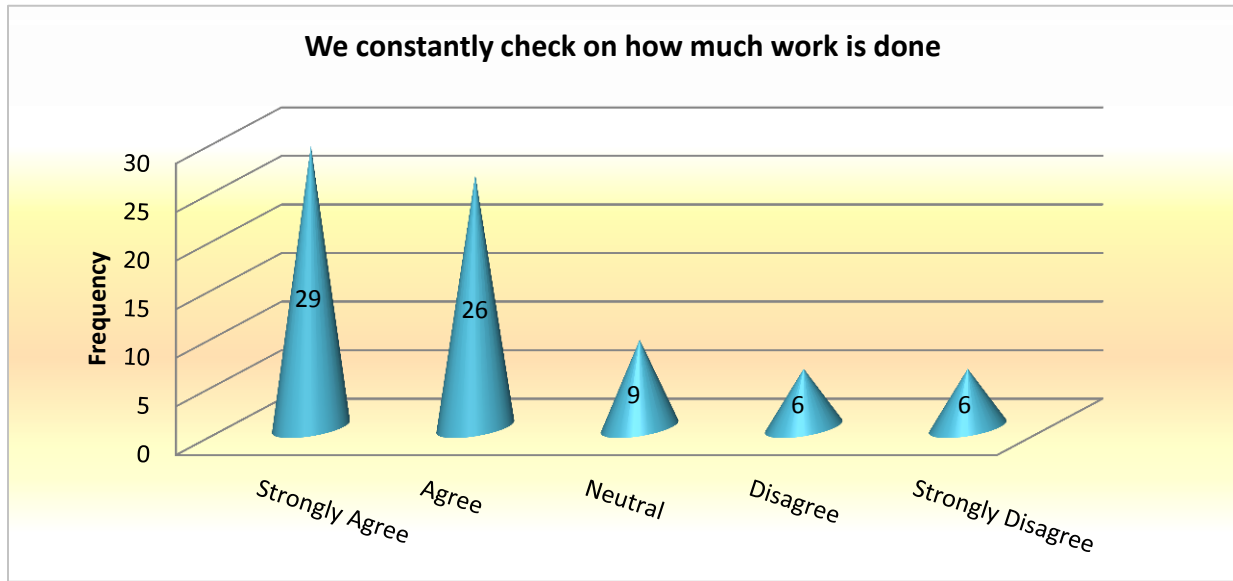
Project budget is generally regarded as the most essential component of any project planning. Project managers should ensure that sufficient project budget is presented for the successful implementation of the project. An insufficient budget may pose a high risk for the success of project implementation. Hence, a Work Breakdown Structure (WBS) is always required for the cost estimation process to generate as much accurate

information as possible. Acquired information will then be used to create a more accurate and systematic time phased budget plan for that particular project.

5.4.4 Statement 17: We constantly check on how much work is done, given time spent.

We constantly check on how much work is done, given time spent.

Figure 5.17



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	38.2%	34.2%	11.8%	7.9%	7.9%	100%
Frequency	29	26	9	6	6	76

Source: Author’s fieldwork

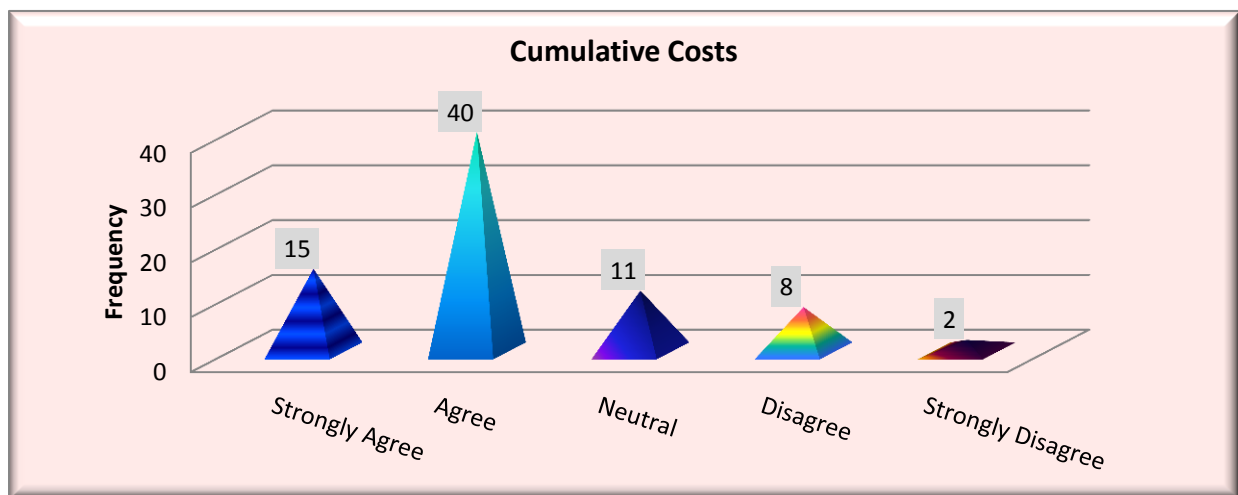
Respondents were requested to indicate whether project teams and managers constantly check and keep track of how much work or tasks have been completed. The aim is to compare the work that has been completed to see whether it matches with the initial planned or estimated schedule for that particular activity or task (as seen in Figures 5.15 and 5.16).

A total of 72.4 percent of the respondents agreed that constant checks are conducted to see how much work has been completed. It is clear that project practitioners do constant follow ups on projects to monitor actual progress. This is evident based on a much smaller percentage of 15.8 percent of the respondents who disagreed, and the 11.8 percent that remained neutral in respect of this statement.

5.4.5 Statement 18: Cumulative costs are regularly reviewed against the prescribed project plan.

Cumulative costs are regularly reviewed against the prescribed project plan.

Figure 5.18



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	19.7%	52.6%	14.5%	10.5%	2.7%	100%
Frequency	15	40	11	8	2	76

Source: Author’s fieldwork

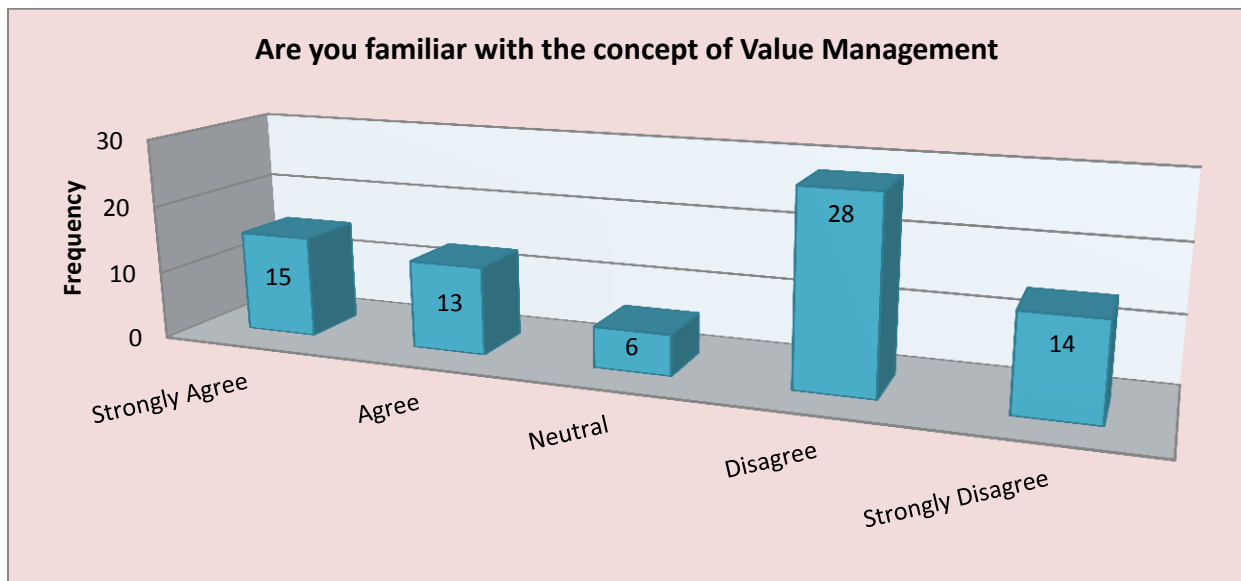
As illustrated in Figure 5.18 above, respondents agreed that cumulative costs are reviewed against the prescribed project plan. A majority of 52.6 percent of the respondents strongly agreed with the statement, followed by 19.7 percent that agreed. A total of 13.1 percent of the respondents disagreed with the statement that the organisation does not implement cumulative costs, checks and reviews.

As shown in Figure 5.16, project professionals within the organizations agreed with the fact that project teams and managers continuously evaluate time spent against the used budget. Hence, project managers and teams will have an opportunity to evaluate and review cumulative costs of the project against the prescribed project plan. In support of this, there was positive feedback from respondents who indicated that 72.3 percent of the respondents do acknowledge continuous checks and reviews as common practice within organizations (see Figure 5.18).

5.4.6 Statement 19: How familiar are you with the concept of Value Management?

How familiar are you with the concept of Value Management?

Figure 5.19



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	19.7%	17.1%	7.9%	36.8%	18.5%	100%
Frequency	15	13	6	28	14	76

Source: Author’s fieldwork

In Figure 5.19 above respondents indicated with a high percentage rate of 36.8 percent that they disagreed that they are familiar with the concept of Value Management, while

18.4 percent stated that they strongly disagreed with the mentioned statement, and 7.9 percent remained neutral in this regard. A total of 36.8 percent of the respondents agreed that they are familiar with the concept of Value Management, while 19.7 percent strongly agreed and 17.1 percent agreed.

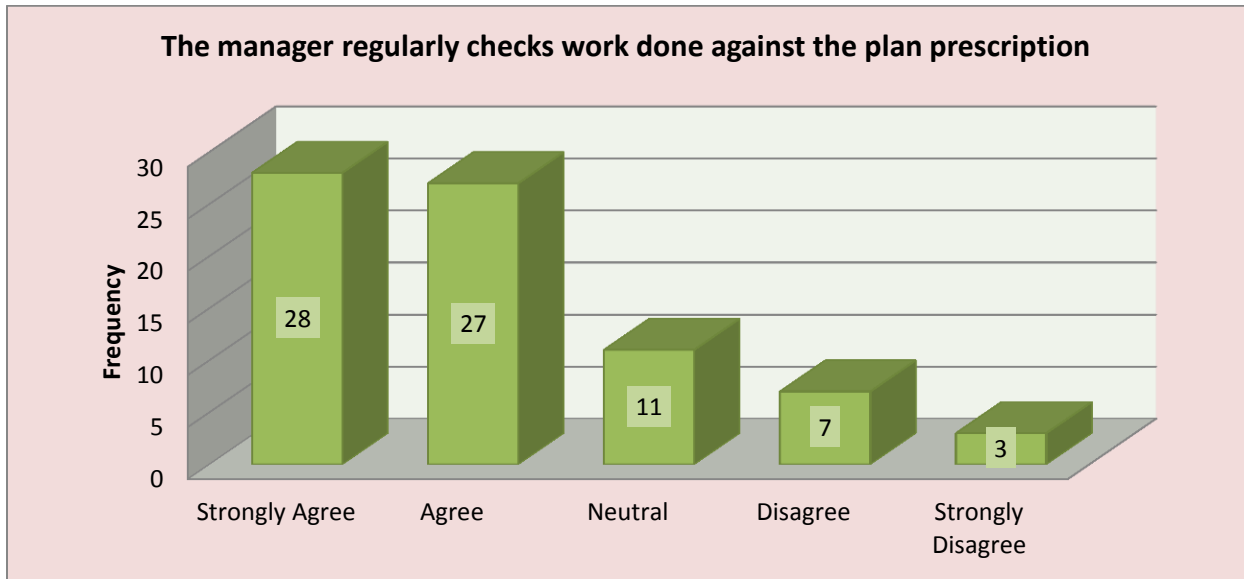
As stated earlier in Figure 5.2 that there is a diverse integration of young adults, middle-aged and elderly employees. The researcher is of the view that project professionals' knowledge or understanding of the concept of Value Management was obtained differently from one practitioner to another owing to various learning backgrounds. Young adult professionals may have obtained the knowledge from tertiary institutions (educational background), while middle-aged and elderly project managers may have acquired their knowledge from the actual working environment. Some employees may have been exposed to some of the VM techniques that are implemented at work, or benefited from training opportunities or programmes that were provided by the organisation.

Inadequate knowledge and understanding of the VM tool could be one of the reasons why employees become reluctant or resistant to the idea of implementing the tool in organizations. Amongst other factors, fear of the unknown and resistance to change are fundamental reasons why employees are not willing to commit to the use of Value Management.

5.4.7 Statement 20: The manager regularly checks work done against the plan prescription.

The manager regularly checks work done against the plan prescription.

Figure 5.20



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	36.9%	35.5%	14.5%	9.2%	3.9%	100%
Frequency	28	27	11	7	3	76

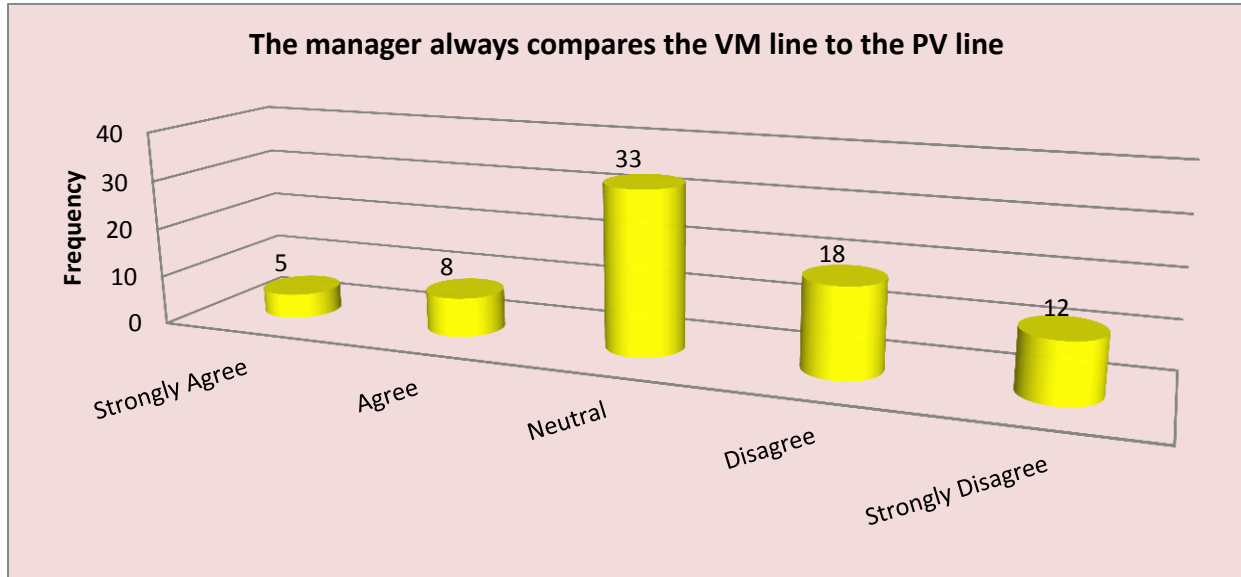
Source: Author's fieldwork

Figure 5.20 shows that respondents strongly agreed (36.8 percent) and agreed (35.5 percent) that managers regularly check work done against the plan prescription. Smaller percentages of 14.5 percent and 13.1 percent of the respondents indicated that they were neutral and disagreed, respectively. The data presentation in Figure 5.20 concur with most of the above-mentioned Figures and analyses, which indicate that there are regular checks of activities against the prescribed project plan. This means that organizations do monitor and keep track of project progress until the completion stage.

5.4.8 Statement 21: The manager always compares the Value Management (VM) to the Present Value (PV) line.

The manager always compares the Value Management (VM) to the Present Value (PV) line.

Figure 5.21



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	6.6%	10.5%	43.4%	23.7%	15.8%	100%
Frequency	5	8	33	18	12	76

Source: Author’s fieldwork

Figure 5.21 above indicates that a total of 43.4 percent of the respondents in the construction industry were neutral regarding the above statement, followed by 23.7 percent that disagreed and 15.8 percent that strongly disagreed. A total of 17.1 percent of the respondents agreed that project managers compared the VM line to the PV line.

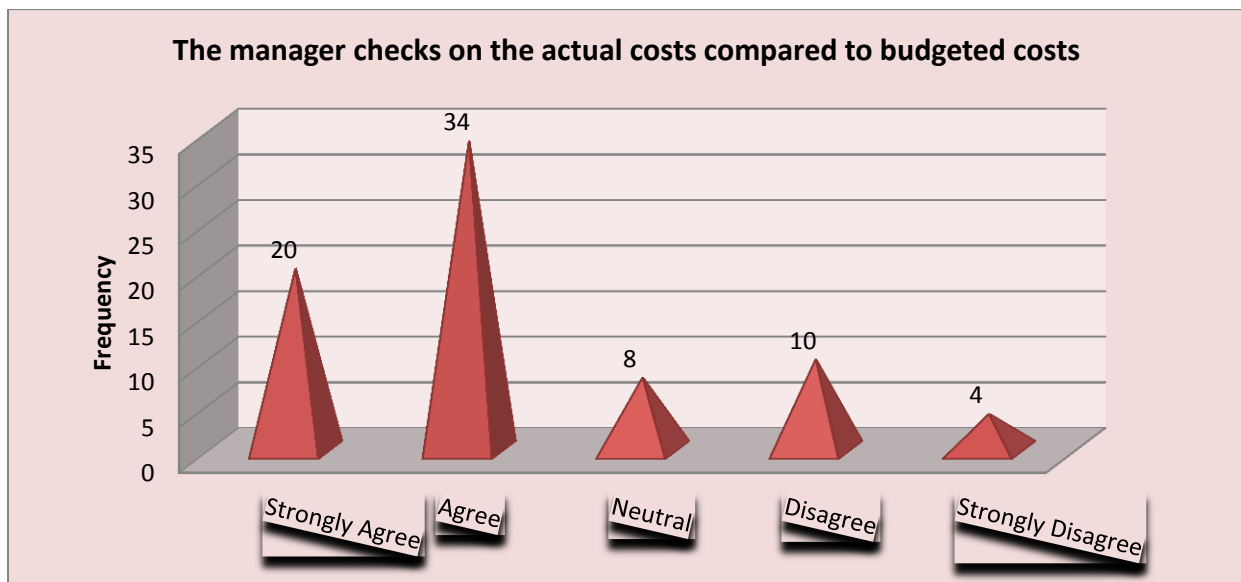
The researcher is under the assumption that a lot of respondents that were neutral, disagreed and strongly disagreed did so because of their limited knowledge and understanding of VM practices (see Figure 5.19). As alluded to in Figures 5.2, 5.3 and 5.5, a majority of the respondents that participated in this study are young adult

professionals that have little working experience. In addition, even among some of the adults and experienced project managers there is still limited knowledge about the concept of Value Management. This explains why most respondents opted to remain neutral in respect of this specific statement.

5.4.9 Statement 22: The manager checks on the actual costs compared to budgeted costs.

The manager checks on the actual costs compared to budgeted costs.

Figure 5.22.



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	26.3%	44.7%	10.5%	13.2%	5.3%	100%
Frequency	20	34	8	10	4	76

Source: Author’s fieldwork

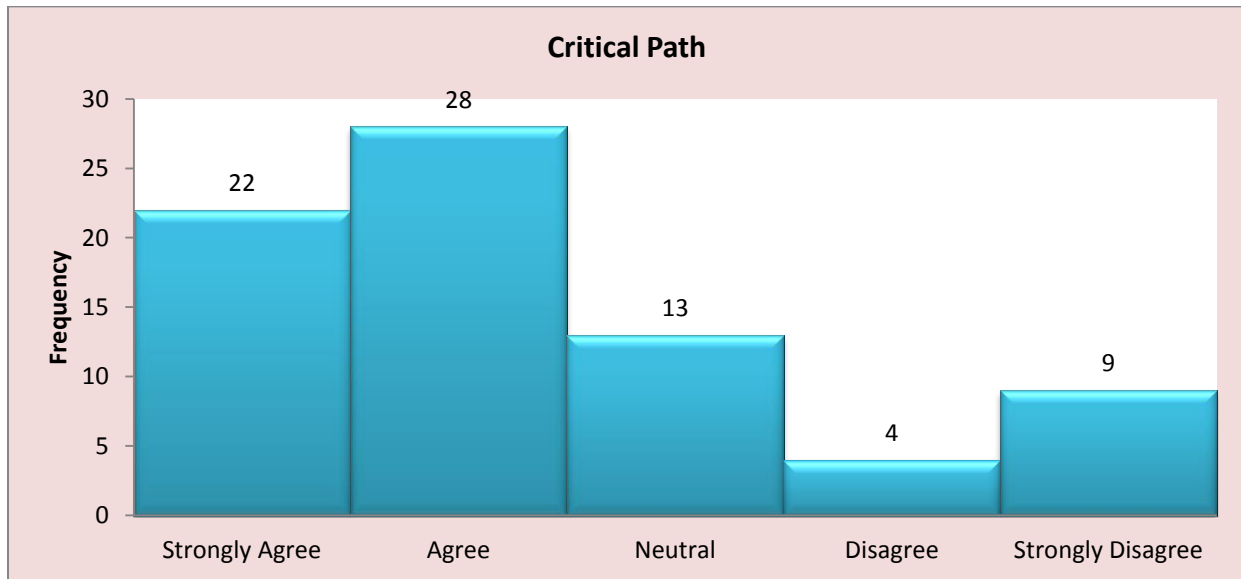
According to Figure 5.22, 71 percent of the respondents agreed that the manager checks on the actual costs compared to the budgeted costs of the project, while 18.5 percent disagreed and 10.5 percent remained neutral in this regard. Project managers and project team leaders take the responsibility and accountability to ensure that actual costs are always compared to the project’s budgeted costs. Notably so, this is one of

the most important responsibilities for a project manager, as failure to do so may be a potential risk for project failure.

5.4.10 Statement 23: The manager keeps checking the critical path during project execution.

The manager keeps checking the critical path during project execution.

Figure 5.23



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	29%	36.8%	17.1%	5.3%	11.8%	100%
Frequency	22	28	13	4	9	76

Source: Author’s fieldwork

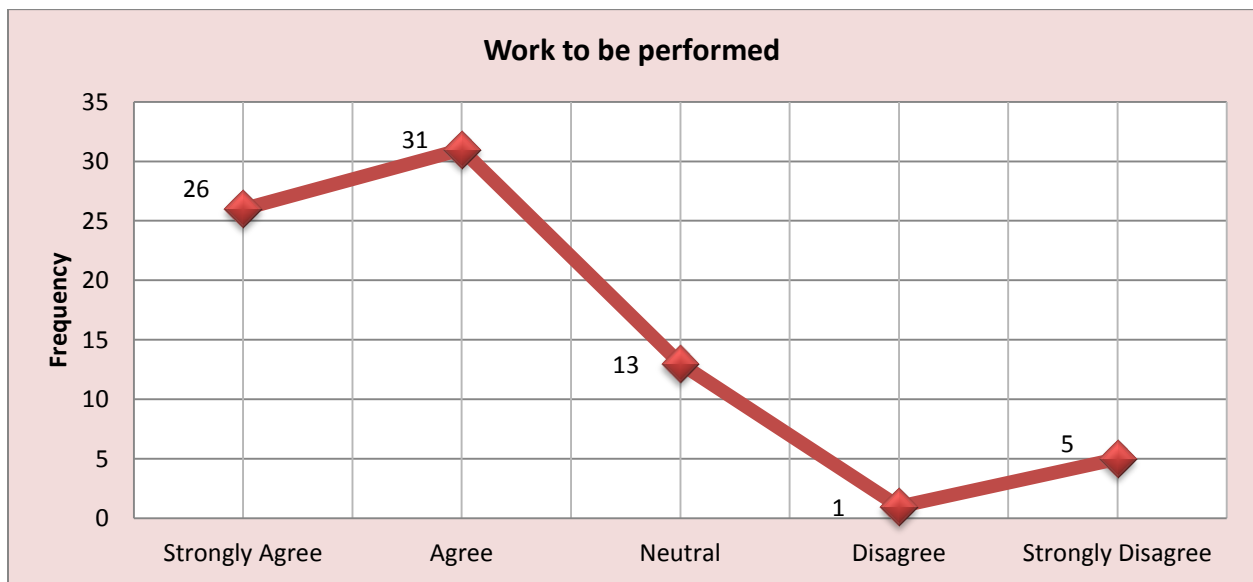
Figure 5.23 presents results that confirm whether project managers keep checking the critical path during project execution. The results indicate that only 5.3 percent of the respondents disagreed and 11.8 percent strongly disagreed. A total of 36.8 percent of the respondents agreed, while 28.9 percent strongly agreed. The Figure indicates that only a minority of 17.1 percent remained neutral in this regard. This implied that a majority of the respondents agreed that project managers do check the critical path during project execution.

In simple terms, a critical path is an analysis method that clearly indicates activities and the direction that the project will follow to achieve its intended milestones successfully. It is important for the manager to do this, as it helps to plan tasks that need to be completed (for example, project schedules and resources planning).

5.4.11 Statement 24: Work that should be performed is always defined first before commencement.

Work that should be performed is always defined first before commencement.

Figure 5.24



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	34.2%	40.8%	17.1%	1.3%	6.6%	100%
Frequency	26	31	13	1	5	76

Source: Author’s fieldwork

Respondents were asked in Figure 5.24 if work that is performed is always defined before commencement. A noticeable high percentage of 40.8 percent of the respondents agreed that work is defined before commencement. Just above 34 percent of the respondents strongly agreed with the statement and a small percentage of 17.1 percent were undecided. A total of 6.6 percent strongly disagreed and 1.3 percent

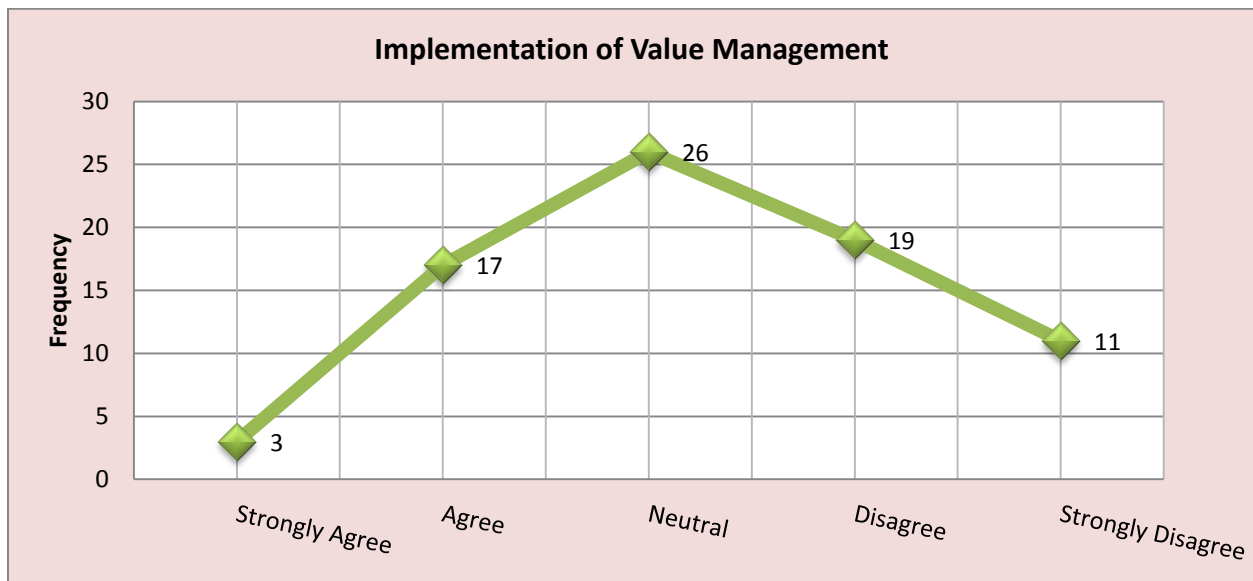
disagreed with the statement that work that is performed is always defined before commencement.

Once again this speaks to effective communication between project managers and project teams. The statistics revealed in the above Figure highlights an important fact that project managers are doing their best to ensure that effective communication practices are adhered to in the organization. Proper communication practices help to improve employee morale, performance and team spirit in the organization.

5.4.12 Statement 25: Implementation of Value Management can vary significantly depending on the circumstances.

Implementation of Value Management can vary significantly depending on the circumstances.

Figure 5.25



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	3.9%	22.4%	34.2%	25%	14.5%	100%
Frequency	3	17	26	19	11	76

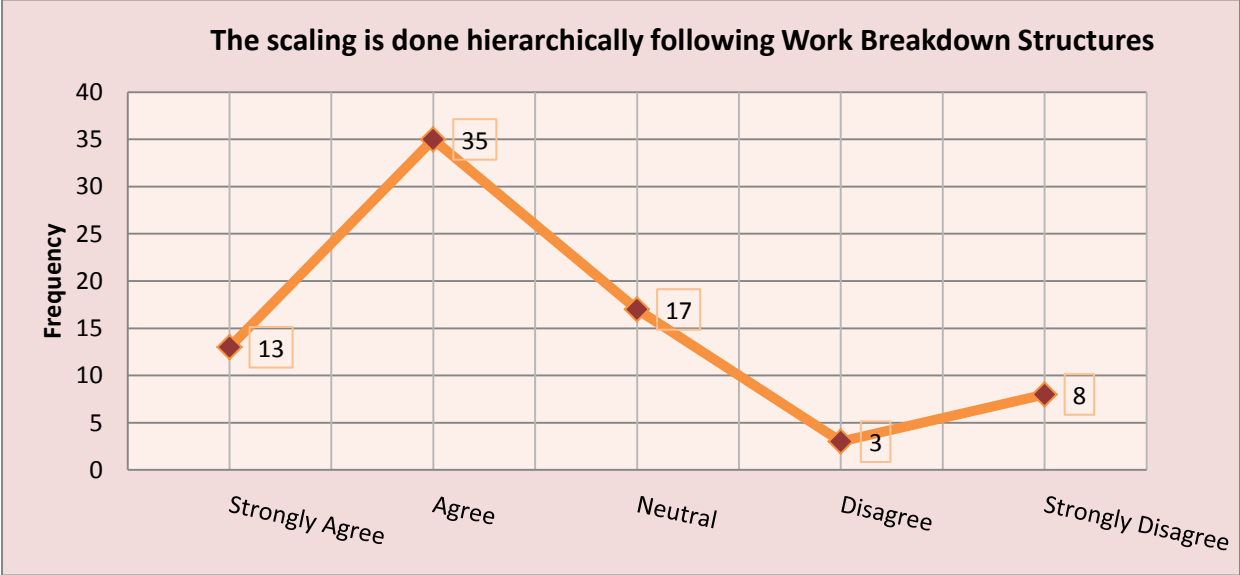
Source: Author's fieldwork

The statement serves to confirm whether Value Management implementation in the construction industry varies significantly, depending of the circumstances (for example, project size or project value). Figure 5.25 illustrates similar results to Figures 5.19 and 5.21. A high percentage of respondents (34.2 percent) remained indecisive, as some of them disagreed (25 percent) and strongly disagreed (14.5 percent). A total of 22.4 percent agreed and 3.9 percent strongly agreed, which may be owing to the fact that they are older, experienced project professionals that have been in the built environment for many years.

5.4.13 Statement 26: Scaling is done hierarchically following Work Breakdown Structures.

Scaling is done hierarchically following Work Breakdown Structures.

Figure 5.26



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	17.1%	46.1%	22.4%	3.9%	10.5%	100%
Frequency	13	35	17	3	8	76

Source: Author’s fieldwork

The process of scaling occurs when the project manager measures and assigns activities according to a systematic manner for a project. Scaling of projects, according

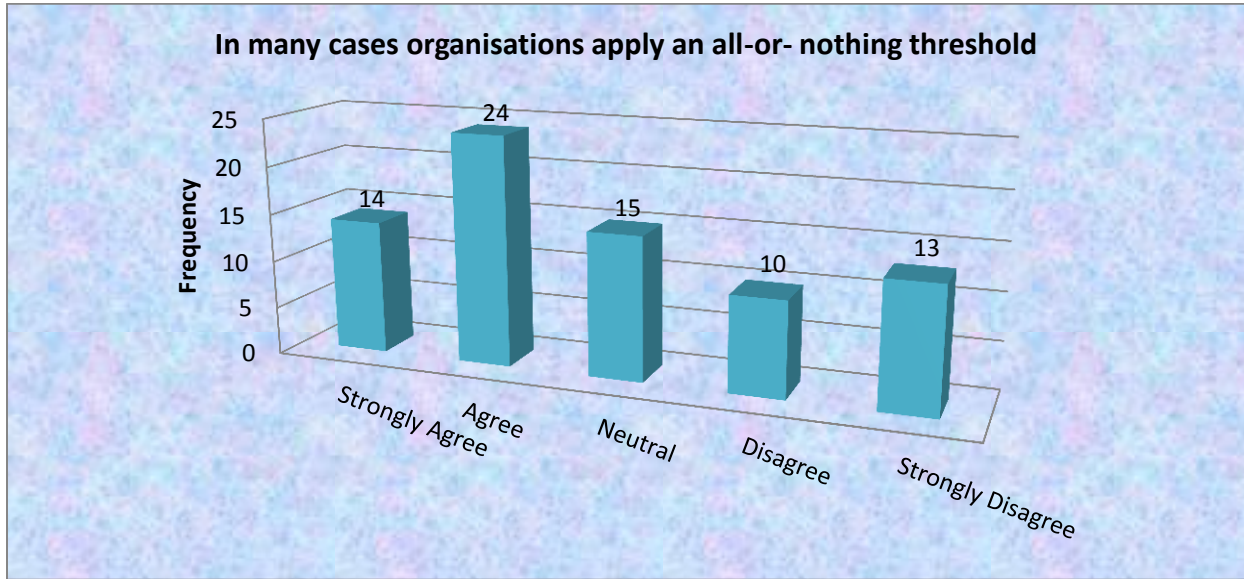
to a work breakdown structure, was evaluated as being a fairly popular practice by organizations. A total of 46.1 percent of the respondents agreed that the organisation uses scaling, while 17.1 percent strongly agreed, and 22.4 percent remained neutral. It is possible that these respondents are not sufficiently knowledgeable about the idea of scaling, according to work breakdown structures in the organization. Therefore, the researcher assumes that some organizations use other alternative tools, techniques or terms when scaling projects.

Representation of smaller percentages between respondents that disagreed (3.9 percent) and (10.5 percent) strongly disagreed did not go unnoticed. This goes to show that there are still organizations that do not realise the importance of project planning, particularly with the use of the work breakdown structures. With that said, project managers and organizations need to make use of scaling methods, even if it is not via the exact use of actual work breakdown structures. It is important as it creates a sense of direction and control to achieve intended project milestones.

5.4.14 Statement 27: In many cases, organizations apply an all-or-nothing threshold.

In many cases, organizations apply an all-or-nothing threshold.

Figure 5.27



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	18.4%	31.6%	19.7%	13.2%	17.1%	100%
Frequency	14	24	15	10	13	76

Source: Author’s fieldwork

The bar graph above illustrates that 31.6 percent of the respondents agreed that organisations apply an all or nothing threshold. A total of 19.7 percent of the respondents remained neutral, while 18.4 percent strongly agreed with the use of the all or nothing threshold. A total of 20.3 percent of the respondents disagreed, as 13.2 percent disagreed and 17.1 percent strongly disagreed.

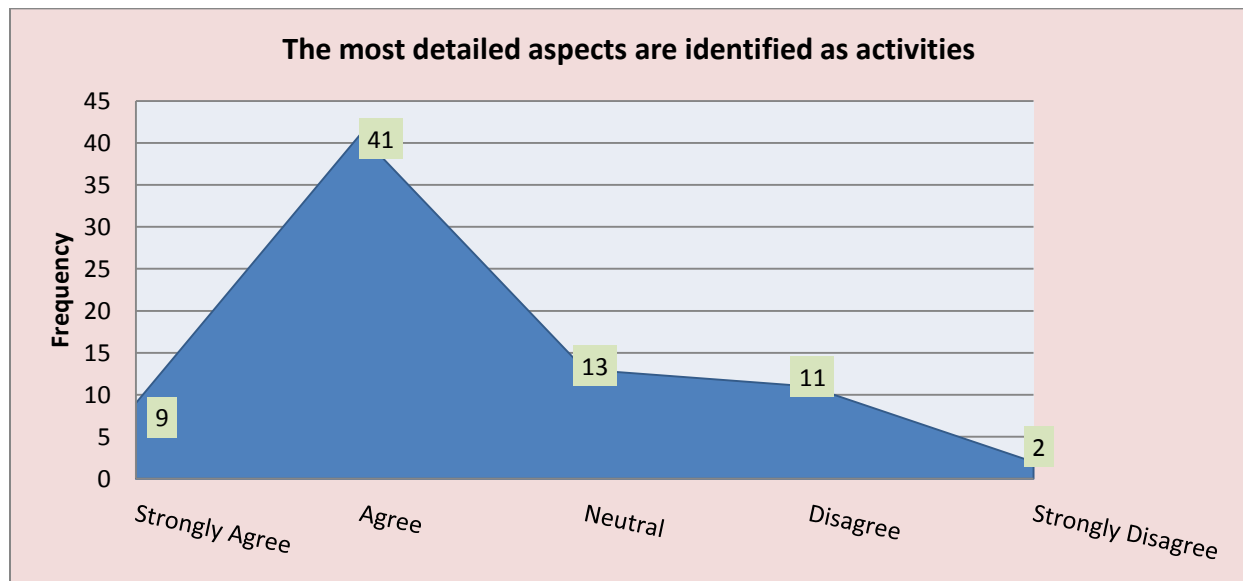
Normally, organisations apply an all or nothing threshold system to categorise projects according to value-add in the organization, price costs, risks factors, project size, and so on. Some organisations also consider factors such as external regulatory limitations (statutory requirements or limitations) before deciding whether or not the organization

will bid for the particular tender. It is important that an organization takes time to decide on which project threshold to use to avoid future possible obstacles or challenges that may arise during project execution.

5.4.15 Statement 28: The most detailed aspects are identified as activities.

The most detailed aspects are identified as activities.

Figure 5.28



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	11.8%	54%	17.1%	14.5%	2.6%	100%
Frequency	9	41	13	11	2	76

Source: Author’s fieldwork

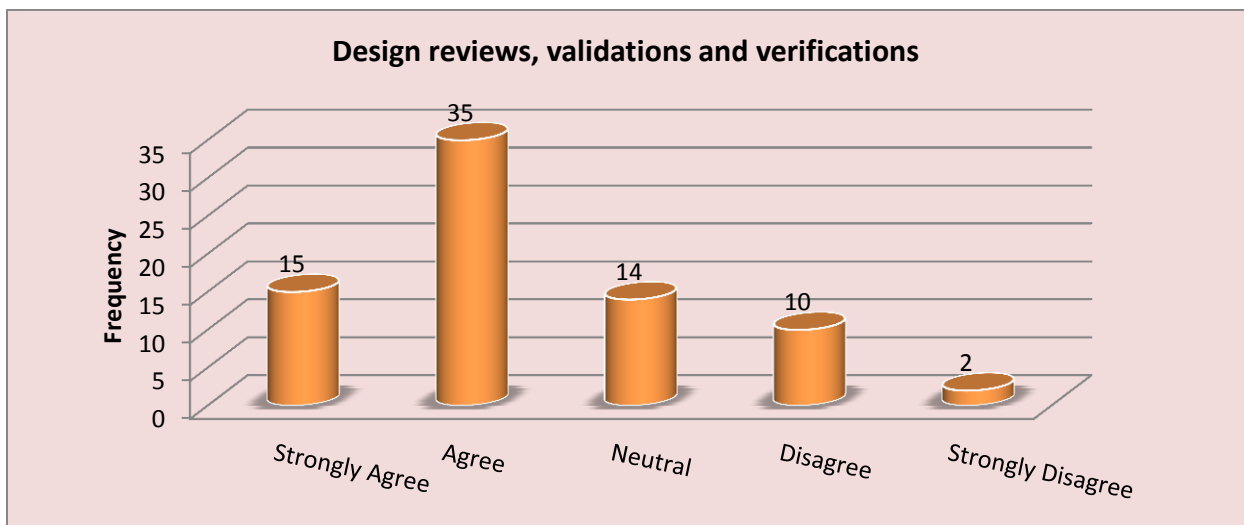
Figure 5.28 indicates that almost 65 percent (53.9 percent agreed and 11.8 percent strongly agreed) of the respondents agreed that the most detailed aspects of the project are identified as activities. A few respondents of 17.1 percent (14.5 percent disagreed and 2.6 percent strongly disagreed), opined that organisations do not really identify the most detailed aspects of the project as activities. Only 17.1 percent of the respondents remained neutral in this regard.

Identifying the most detailed aspects of a project as activities helps to simplify the job by creating simplified, manageable and understandable tasks. Therefore, project teams can have sets of targeted milestones to achieve within specified pre-planned time periods. Hence, effective communication practices, regular meetings and team cohesion are crucial, because everyone involved should have a clear understanding of the project’s goals and objectives. It also encourages an employee to completely understand the impact, contribution and how his/her role fits into the bigger picture in order for the project to succeed. This also provides opportunities to notice and keep track of the tiniest details and activities that could be overlooked in the process.

5.4.16 Statement 29: Design reviews, validations and verifications are performed in all project stages to ensure quality project delivery.

Design reviews, validations and verifications are performed in all project stages to ensure quality project delivery.

Figure 5.29



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	19.7%	46.1%	18.4%	13.2%	2.6%	100%
Frequency	15	35	14	10	2	76

Source: Author’s fieldwork

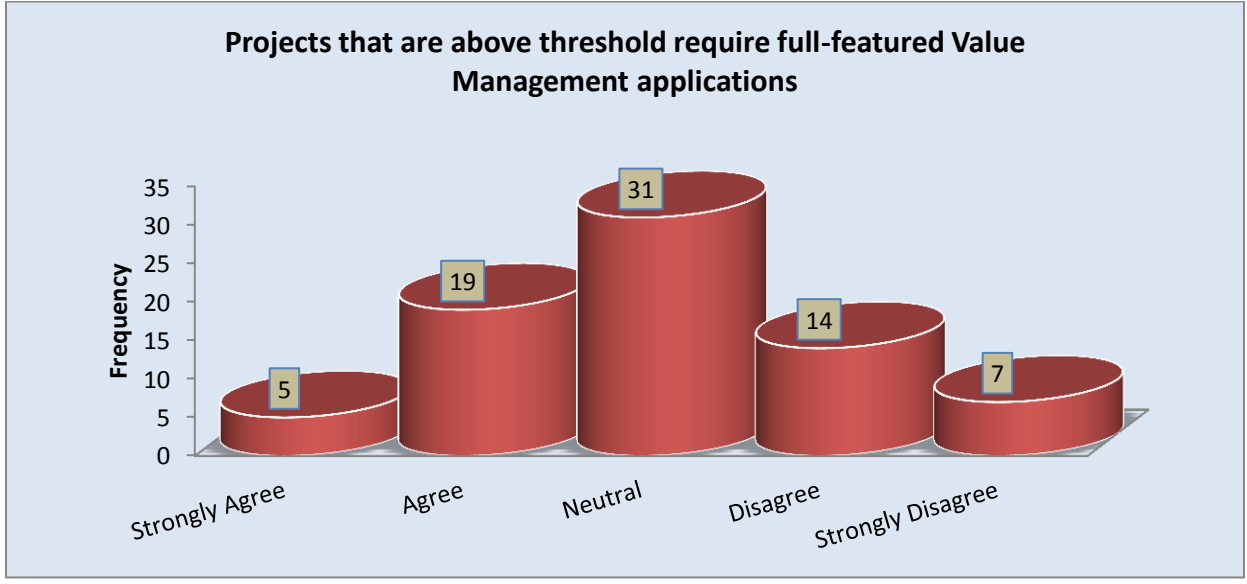
Figure 5.29 indicates that among respondents, a bulk of 65.8 percent (46.1 percent agreed and 19.7 percent strongly agreed) agreed that design reviews, validations and verifications are performed in all project stages to ensure quality project delivery. A total of 18.4 percent of the respondents remained neutral regarding the statement, while a minority of 15.8 percent (13.2 percent disagreed and 2.6 percent strongly disagreed) disagreed with the statement.

Design reviews, validations and verification processes ensure that the entire design addresses all the necessary requirements of the project. All project requirements that have been set out are validated and verified to ensure that desired project standards and expectations are met. The above Figure illustrates that these processes are adhered to by the majority of organizations in the targeted population.

5.4.17 Statement 30: Projects that are above threshold require full-featured Value Management applications.

Projects that are above threshold require full-featured Value Management applications.

Figure 5.30



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	6.6%	25%	40.8%	18.4%	9.2%	100%

Frequency	5	19	31	14	7	76
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Source: Author's fieldwork

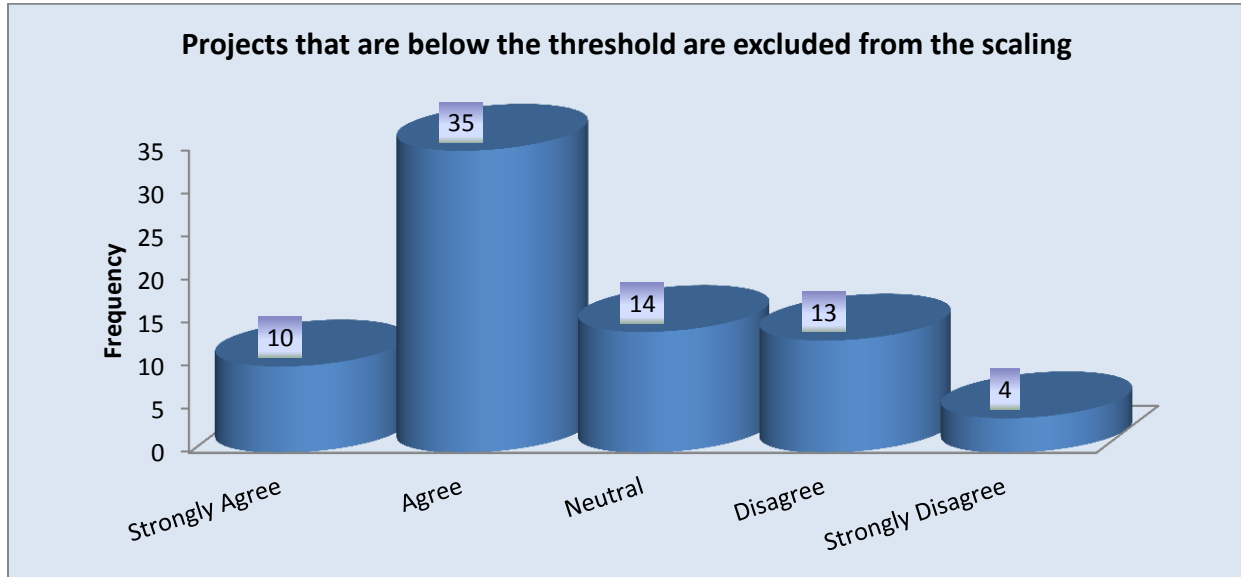
Close to 41 percent of the respondents were indecisive regarding the statement that projects above threshold require a fully-featured VM application. Considering the fact that a lot of respondents that participated in this study do not have a thorough background and understanding of Value Management techniques, it is understandable why respondents would remain neutral.

It is probably those who are much older and more experienced that agreed that projects above threshold require a full-featured VM application, since 25 percent agreed and 6.6 percent strongly agreed with the above statement. Some of them might be young professionals that have theoretical backgrounds, which they acquired from tertiary institutions. A total of 31.6 percent of the respondents agreed with the statement, which could also indicate that a lot of project professionals have little confidence in the effective use of the VM tool. Even though there may be more respondents that understand the concept of Value Management, confidence is still significantly low in this respect. Only about 28 percent (18.4 percent disagreed and 9.2 percent strongly disagreed) of the respondents disagreed.

5.4.18 Statement 31: Projects that are below threshold are excluded from the scaling.

Projects that are below threshold are excluded from the scaling.

Figure 5.31



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	13.2%	46.1%	18.3%	17.1%	5.3%	100%
Frequency	10	35	14	13	4	76

Source: Author’s fieldwork

The results shown in Figure 5.31 indicate that projects that are below the threshold are excluded from the scaling. A majority of respondents (46.1 percent) agreed that projects below the threshold are excluded and 13.2 percent strongly agreed. A total of 18.4 percent of the respondents remained neutral, while 22.4 percent agreed with the statement (17.1 percent agreed and 5.3 percent strongly agreed).

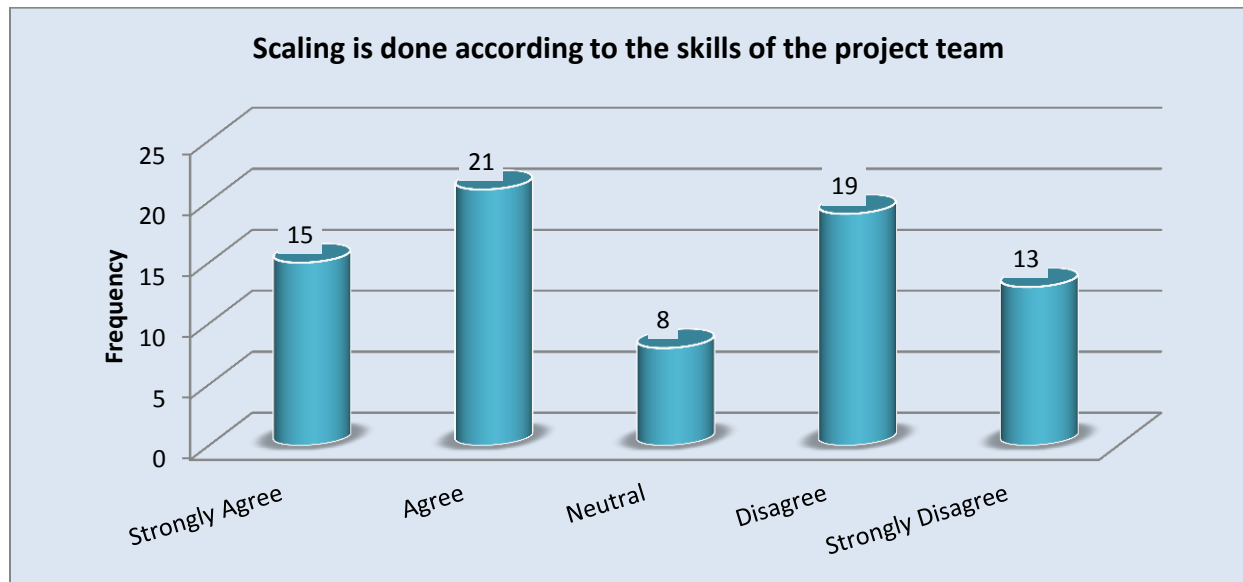
The responses to this statement is an indication that organisations are less likely to include or accept execution of projects that are below the threshold. The results presented in this Figure are in line with the results shown in Figure 5.27, where organizations apply an all-or-nothing threshold. This may be regarded as another precautionary measure to avoid the acceptance of projects that may fail owing to

unrealistic commitments by project managers (for example, low budget or insufficient resources).

5.4.19 Statement 32: Scaling is done according to the skills of the project team.

Scaling is done according to the skills of the project team.

Figure 5.32



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	19.8%	27.6%	10.5%	25%	17.1%	100%
Frequency	15	21	8	19	13	76

Source: Author’s fieldwork

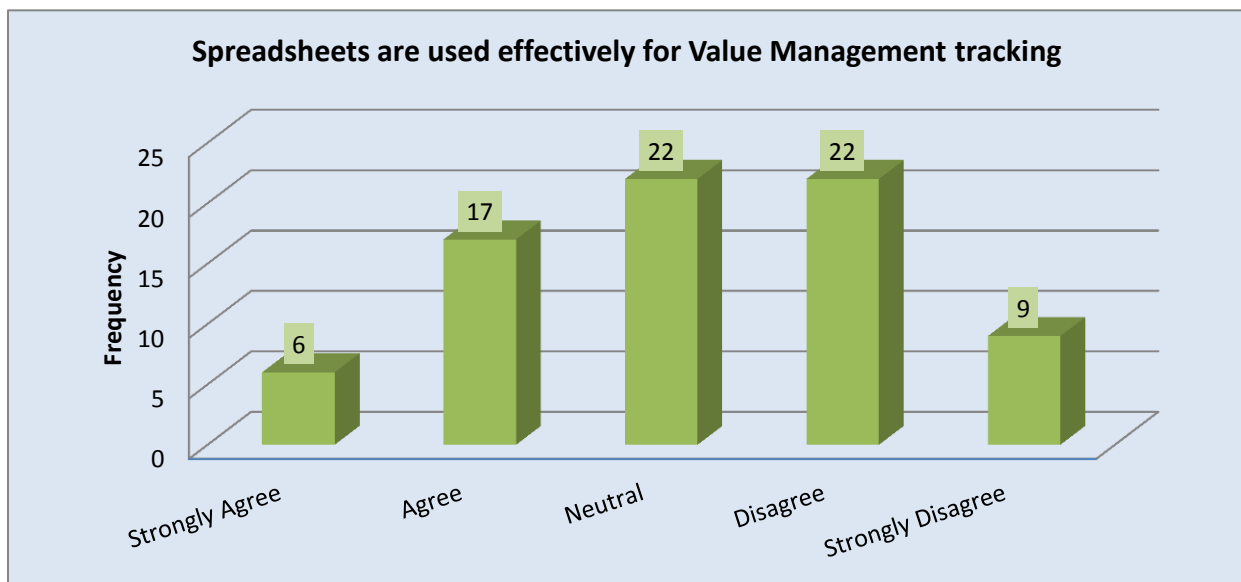
Figure 5.32 presents results that have an almost 50/50 percentage standpoint between respondents that agreed (47.3 percent) and those that disagreed (42.1 percent). A minority percentage of 10.5 percent of the respondents were indecisive regarding the statement in question. Selecting a project team that has employees that have suitable skills, knowledge and competence is one of the most significant factors that any project manager should consider. It is a serious concern to witness that a huge percentage of respondents believe that scaling is not done according to the required skills of a project team.

In support, according to the percentage displayed in Figure 5.35, half of the respondents (50 percent) disagreed that sufficient resources are allocated to all projects. Evidently, respondents have contradicting points of view regarding levels of satisfaction in relation to resources allocation in organizations (for example, competent employees that are suitable for a particular project, team or project). The results displayed in Figure 5.32 raise possible questions around the level, suitability and type of training and development programmes that organizations provide for employees.

5.4.20 Statement 33: Spreadsheets are used effectively for Value Management tracking.

Spreadsheets are used effectively for Value Management tracking

Figure 5.33



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	7.9%	22.4%	28.9%	28.9%	11.9%	100%
Frequency	6	17	22	22	9	76

Source: Author’s fieldwork

According to Figure 5.33, respondents indicated whether or not spreadsheets are used effectively for VM tracking. The majority of respondents (57.8 percent) were split evenly between neutral respondents (28.9 percent) and those who disagreed (28.9 percent).

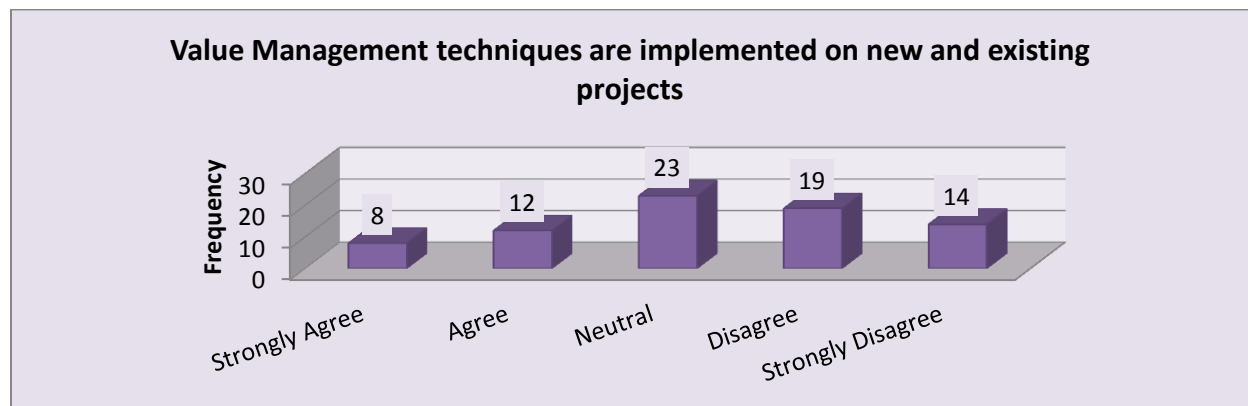
Not far behind, 22.4 percent of the respondents agreed that spreadsheets are used effectively for Value Management tracking. A total of 11.8 percent of the respondents disagreed, while 7.9 percent strongly agreed.

Understandably so, many respondents chose to remain neutral and others disagreed because of their lack of broader understanding of the concept of Value Management. It is important to also acknowledge the fact that VM is still at an infancy stage and is not a popular tool that is used in the country. However, some of the same VM techniques are found to be used by some of the country’s construction organizations, though practitioners may not be aware that these are the exact VM tools (for example, Value Profiling, Value Driver and FAST). Maybe this would be an eye-opener if organisations can begin to introduce and facilitate Value Management workshops to gain in-depth understanding about the tool.

5.4.21 Statement 34: Value Management techniques are implemented on new and existing projects.

Value Management techniques are implemented on new and existing projects.

Figure 5.34



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	10.5%	15.8%	30.3%	25%	18.4%	100%
Frequency	8	12	23	19	14	76

Source: Author’s fieldwork

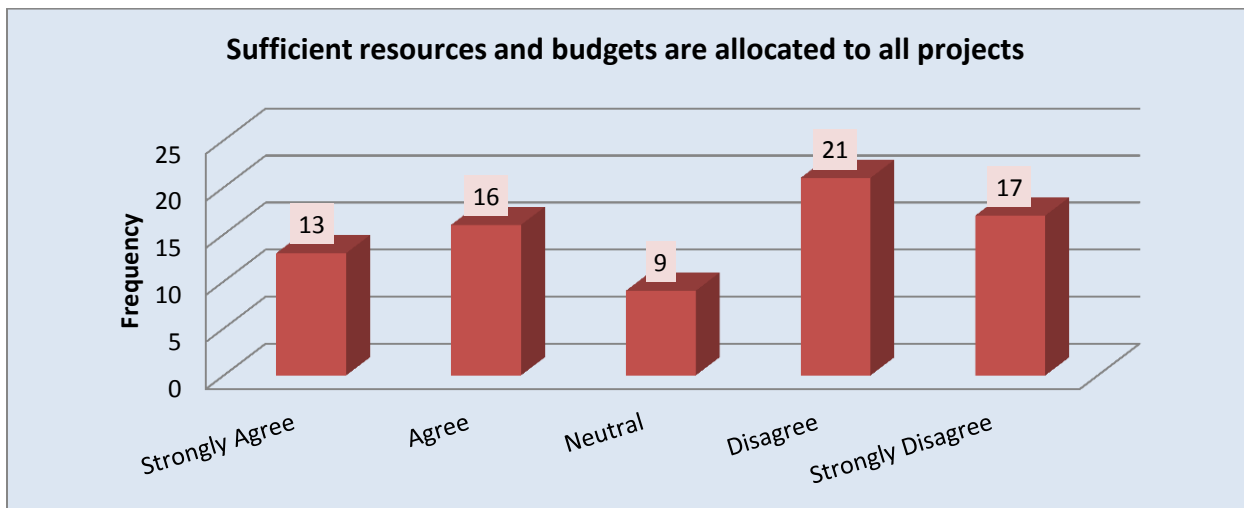
Figure 5.34 illustrates a descending respondent percentage, since 30 percent remained neutral, 25 percent disagreed, 18.4 percent strongly disagreed, 15.8 percent agreed and 10.5 percent strongly agreed. These results are evident and similar to the results and discussions represented in Figure 5.33, where respondents show little understanding about the concept of Value Management.

Many project managers have a perception that Value Management can only be implemented in existing projects. There is a general thinking that the tool can only be used to measure value once the project is in existence. Whereas, in actual fact the opposite is true. Value Management can be used on both new and existing projects. However, it produces even better results when it is implemented in the initial phase of the project.

5.4.22 Statement 35: Sufficient resources and budgets are allocated to all projects.

Sufficient resources and budgets are allocated to all projects.

Figure 5.35



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	17.1%	21.1%	11.8%	27.6%	22.4%	100%
Frequency	13	16	9	21	17	76

Source: Author's fieldwork

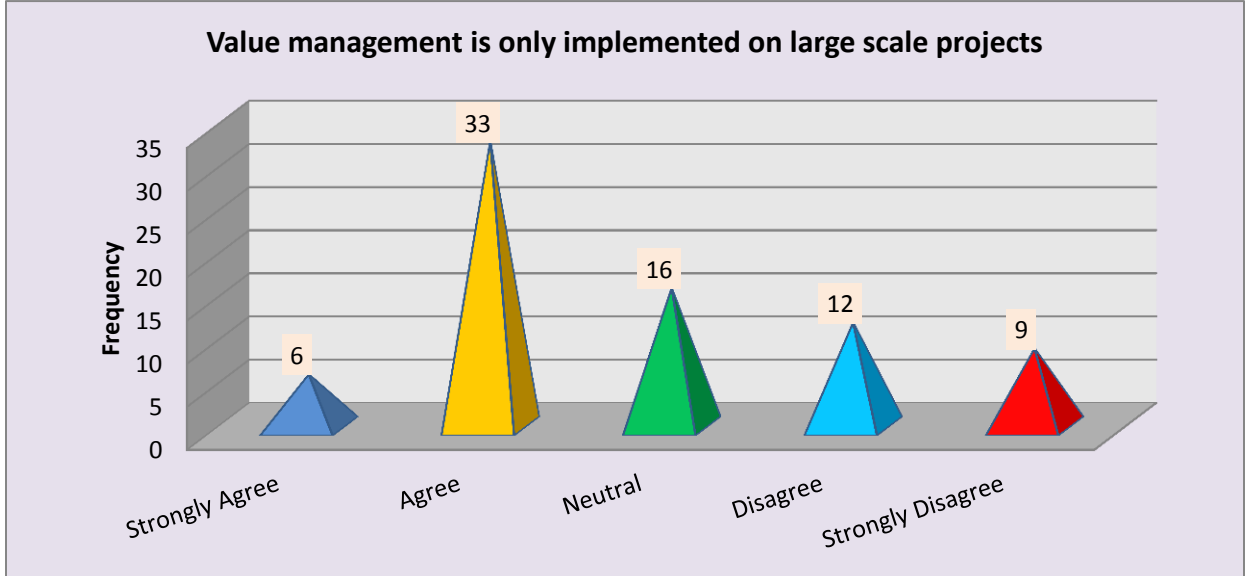
Figure 5.35 illustrates data presentation that indicates whether sufficient resources and budgets are allocated to all projects. About 50 percent of the respondents disagreed (27.6 percent disagreed and 22.4 percent strongly disagreed). A total of 21.1 percent of the respondents agreed and 17.1 percent strongly agreed. The remaining 11.8 percent of the respondents were indecisive regarding this statement.

Figure 5.33 showed contradicting opinions as to whether or not scaling is done according to the skills of the project team. According to the presentation displayed above (including the respondents' results in Figure 5.35), it is evident that a lack of sufficient resources and budget allocation may be a potential risk factor for the highly experienced project execution failure rate in the construction industry.

5.4.23 Statement 36: Value Management is implemented only on large scale projects.

Value Management is implemented only on large scale projects.

Figure 5.36



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	7.9%	43.4%	21.1%	15.8%	11.8%	100%
Frequency	6	33	16	12	9	76

Source: Author's fieldwork

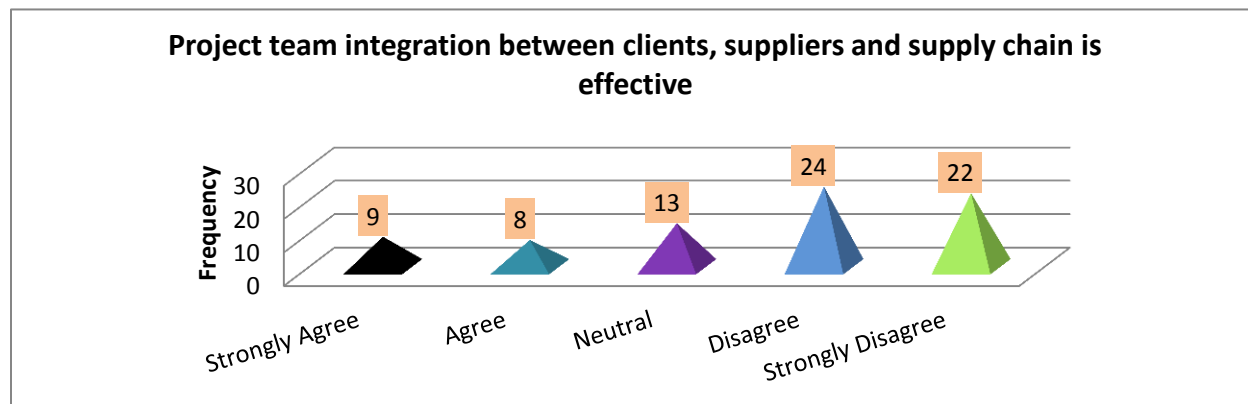
Figure 5.36 illustrates that 43.4 percent of the respondents agreed, 21.1 percent remained neutral, 15.8 disagreed, 11.8 percent strongly disagreed and 7.9 percent strongly agreed. The response results are evident and similar to the results and discussion represented in Figure 5.33.

As discussed before in previous Figures of this analyses, respondents are not fully exposed to the concept of the Value Management tool. Therefore, responding to some of the VM implementation related questions may have been a challenge for some of the project professionals. However, 60.3 percent of the respondents agreed to the use of VM, while it is highly possible that respondents referred to some other VM related techniques that are used by organizations. Some of the respondents may be project practitioners that learned about the concept from tertiary institutions, particularly young and middle age employees (see Figures 5.2 and 5.5).

5.4.24 Statement 37: Project team integration between clients, suppliers and supply chain is effective.

Project team integration between clients, suppliers and supply chain is effective.

Figure 5.37



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	11.8%	10.5%	17.1%	31.7%	28.9%	100%
Frequency	9	8	13	24	22	76

Source: Author's fieldwork

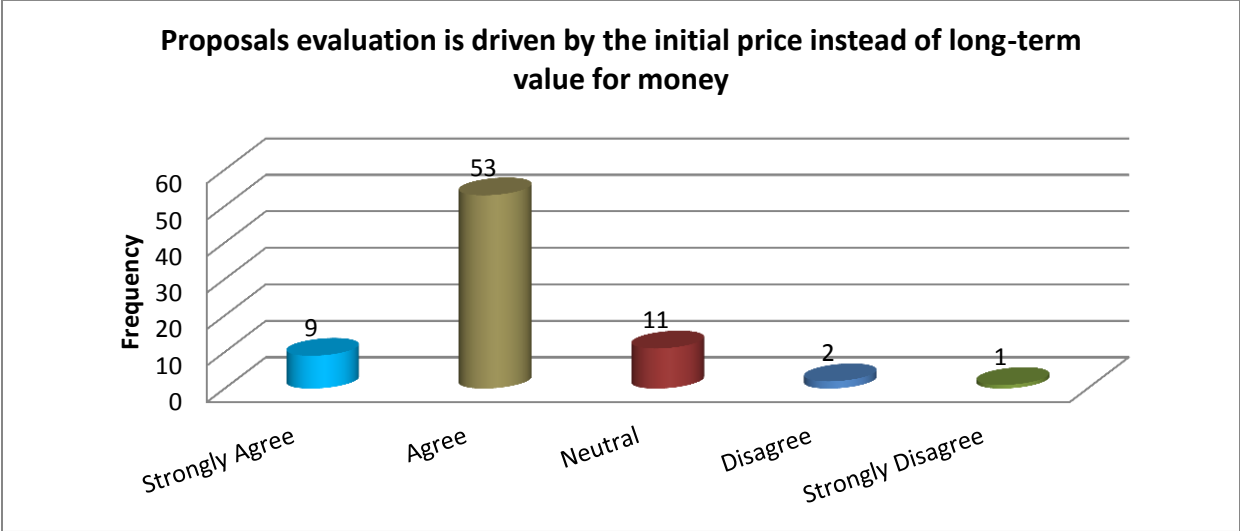
According to Figure 5.37, respondents disagreed with the statement that project team integration between clients, suppliers and supply chain is effective. Approximately, 60.06 percent of the sample disagreed with the statement (31.7 percent disagreed and 28.9 percent strongly disagreed). A smaller percentage of 17.1 percent remained neutral while an even smaller percentage strongly agreed and agreed (11.8 percent) and (10.5 percent), respectively. Integrated departments help to avoid duplication of resources and increase the smooth flow of information across relevant departments and stakeholders.

Figure 5.13 indicates that organisations have effective communication channels and continuous feedback for employees. In contrast, by virtue of respondents, the data presentation on Figure 5.37 indicates little integration between clients, suppliers and supply chain department. This could mean that effective communication channels are only applied internally amongst project teams and not externally (for example, clients, suppliers and other departments). This highlights the need for improvement of external communication channels to gain a competitive advantage, solid communication with all stakeholders involved and improved customer satisfaction. Good relationships with external forces generally improve the smooth running of operations as it avoids unnecessary misunderstandings or delays.

5.4.25 Statement 38: Proposal evaluation is driven by the initial price instead of long-term value for money (e.g. Whole-life Value for Money).

Proposal evaluation is driven by the initial price instead of long-term value for money (e.g. Whole-life Value for Money).

Figure 5.38



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	11.8%	69.7%	14.5%	2.7%	1.3%	100%
Frequency	9	53	11	2	1	76

Source: Author’s fieldwork

According to Figure 5.38 above, proposal evaluation is driven by the initial price instead of long-term value for money. A total of 69.7 percent of the respondents agreed that proposal evaluation is driven by the initial price. In addition, 11.8 percent of the respondents strongly agreed and 14.5 percent remained neutral in this regard. Lastly, 2.6 percent of the respondents disagreed and 1.3 percent strongly disagreed.

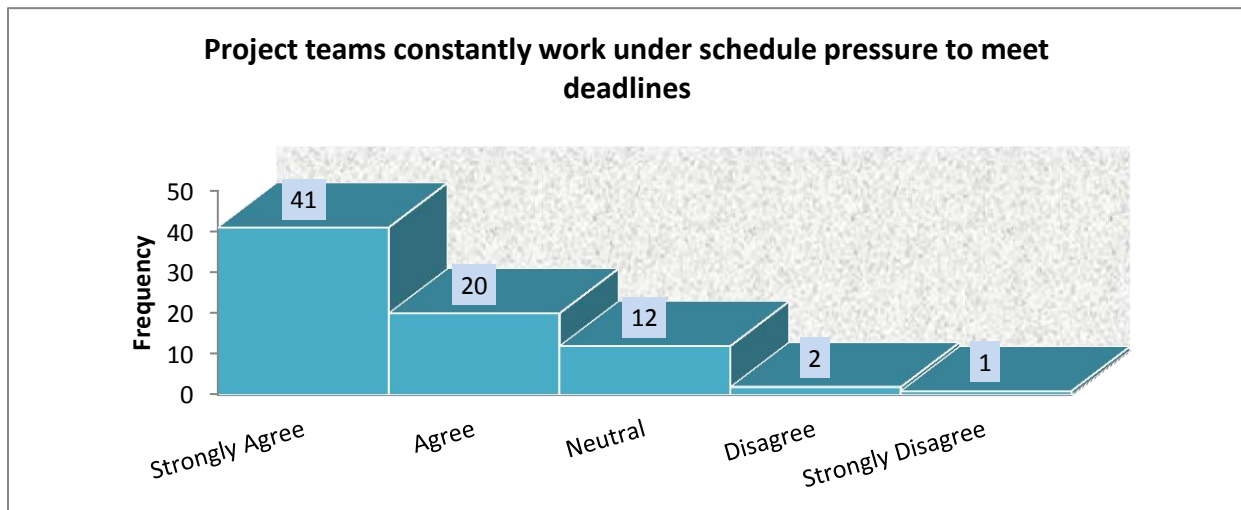
Based on the respondents’ results, a majority of 81.5 percent of the respondents agreed that construction projects are driven by the initial price instead of long-term value for money. As much as the initial project price is important when evaluating project proposals, there are other factors that are equally important that a project manager or

organization should consider. In some cases project execution can be disastrous as the long term value for money principle is overlooked. The project may result in it being under-budgeted, as the long-term monetary returns could potentially be far less than the actual cost price of executing the entire project. The results presented in Figure 5.38 prove to be in contrast with the important use of project scaling and, therefore, negatively impacts on sufficient resources and budget allocation.

5.4.26 Statement 39: Project teams constantly work under schedule pressure to meet deadlines.

Project teams constantly work under schedule pressure to meet deadlines.

Figure 5.39



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	54%	26.3%	15.8%	2.6%	1.3%	100%
Frequency	41	20	12	2	1	76

Source: Author's fieldwork

Figure 5.39 is an analysis of the results, indicating that project teams constantly work under schedule pressures to meet project deadlines. A high total of 80.2 percent agreed (53.9 percent strongly agreed and 26.3 percent agreed) that organizations and project teams are expected to complete tasks or activities within a specific timeframe. A total of

a little more than 15 percent of the total target population of respondents remained neutral regarding the statement in question.

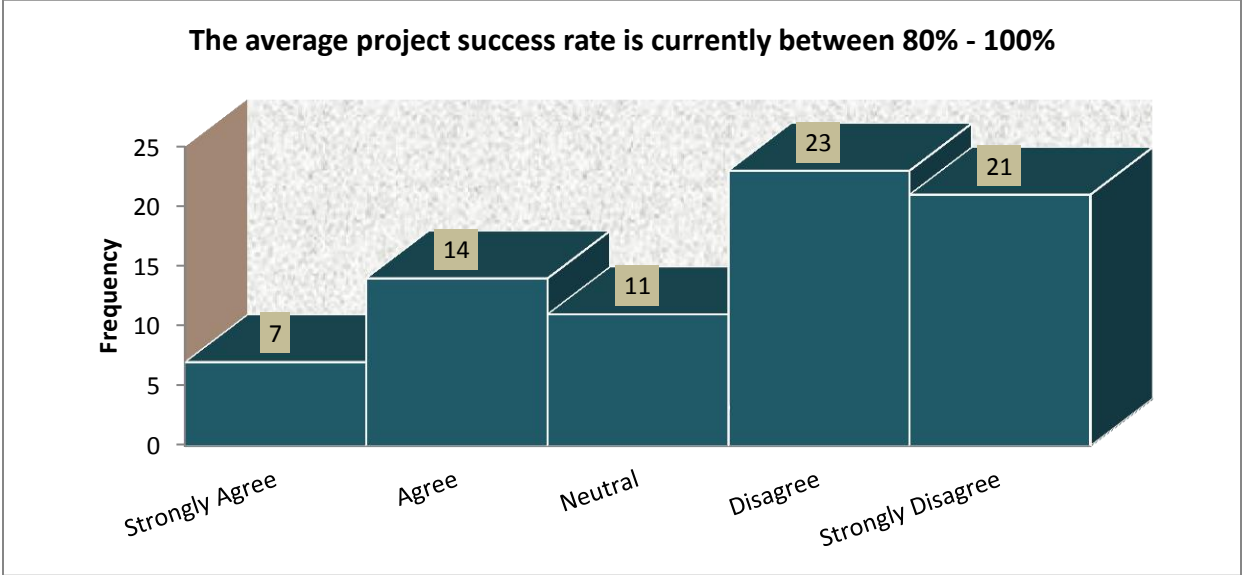
This is a typical reality of the real world situation, particularly in the construction industry. Project practitioners are always faced with a challenge of having to meet tight project schedules and are automatically expected to deliver quality projects and services for clients. Possibilities of making errors are always high when faced with a challenge to meet tight schedules. Project planning, scaling, design reviews, verifications, validation and communication channels may be executed improperly, as project teams are work against time. In most cases project execution failure becomes the end result owing to poor quality of the project, since proper processes and procedures were not followed accordingly.

One would argue that project practitioners and teams are qualified professionals. It is expected of them to deliver good results even if it means working under pressure, simply because work needs to be done. Be that as it may, experience and skills alone are not enough. Necessary supporting tools and technology are essential for project practitioners to be able to deliver qualitative results within a prescribed time schedule.

5.4.28 Statement 40: The average project success rate is currently between 80% - 100%.

5.4.29 The average project success rate is currently between 80% - 100%.

Figure 5.40



	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Percentage	9.2%	18.4%	14.5%	30.3%	27.6%	100%
Frequency	7	14	11	23	21	76

Source: Author’s fieldwork

As indicated in Figure 5.40 that project professionals agreed that the average project success rate is currently far below the desired 80% -100% percentage rate. A total percentage of about 50.6 percent (30.0 percent disagreed and 27.6 percent strongly disagreed) disagreed that the project success rate is achieved in the construction industry. A response percentage of 14.5 percent remained neutral regarding the above-mentioned statement. Only a small number of respondents, namely 27.6 percent, are of the view that project success statistics do actually get to the 80 percent plus mark.

Undoubtedly, these statistics are a concern, as project execution success rate is very low. Projects continue to fail in the industry where project requirements are not delivered according to the client’s desired expectations. Based on the entire analysis of

the respondents' results, there is still a lot of work that needs to be done to curb the existing project execution failure rate. Figure 5.39 highlighted one of the major challenges where project teams constantly work under schedule pressure and struggle to meet deadlines. This could be one of the reasons that the current average project success rate is so low.

5.5 Section D: Open-ended questions

Section D (open-ended questions) is regarded as a good platform that allows respondents to openly express their views or opinions about a particular question that the questionnaire poses. There is no particular sequence in the manner in which respondents answered the questions. Content analysis was used for the qualitative component to analyse open-ended questions in this section.

5.5.1 What influenced or encouraged the organization to make use of Value Management?

The purpose of this question was to understand what encouraged or influenced various organizations to adopt the VM concept in the construction industry. A majority of 78 percent of the respondents answered the question, while 12 percent chose not to answer it. Of the 78 percent responses, about 45 percent of the respondents indicated that they are neither knowledgeable nor familiar with the concept of Value Management. A total of 33 percent of the respondents indicated that they are familiar with Value Management, while the majority indicated that use of the tool was influenced by a need to reduce project costs. Of the 33 percent of the respondents, only 16 percent indicated that the reason to adopt the tool was influenced by the need to improve project performance, while a small percentage, namely 7.6 percent indicated that the organization wanted to improve team cohesion and stakeholder involvement. Amongst the entire target population there were few respondents (9.4 percent) that indicated that organizations wanted to become competitive, improve or enhance project value, and keep track of project progress and the budget.

5.5.2 What are the benefits of using the VM tool (financial or non-financial)?

The purpose of this question was to highlight the benefits that project practitioners have identified for projects and organizations since adoption of the VM tool. A majority of 58% of the respondents indicated that they have no idea about the benefits of Value Management, while 19% of the respondents did not respond. The remaining 23 percent indicated that respondents regard the following as benefits of the VM tool: it improves organizational culture; creates a balance amongst stakeholders' needs; improves the quality of project delivery; improves profit margins; improves customer satisfaction ratings; controls project costs; clarifies the business case for the project; compares actual costs to budgeted costs; keeps track of time scheduled for project completion; improves project value at a reduced cost; and helps with continuous value appraisal.

5.5.3 What challenges did organizations or project teams experienced when VM was introduced?

The purpose of this question was to understand the different challenges that organizations and project teams experienced when the organization introduced Value Management. A majority of 62 percent of the respondents did not respond to the question, while 38 percent indicated various challenges that they experienced upon introduction of VM. The following is a summary of challenges that the project practitioners mentioned: Value Management implementation is time consuming; employees are resistant to change; fear of the unknown owing to uncertainty and misconceptions; employees struggle to understand the benefits of the VM; government policy restrictions; unrealistic expectations; lack of stakeholders' participation; conflict of interests amongst stakeholders; employees expect short-term financial rewards; administrative issues owing to a lot of paperwork; needs to be monitored and tracked regularly; stakeholders' goals; and objectives differ from those of the actual project.

5.5.4 What was your response to the idea of using VM?

The purpose of this question was to understand the views and opinions that project practitioners hold concerning the establishment of Value Management in the

construction space. A total of 76 percent of the respondents answered the question and 24 percent did not. About 34 percent of the respondents stated that they are against the use of Value Management, based on some of the abovementioned challenges indicated in question 5.5.3. They mention that Value Management progress measurements are sometimes difficult to be communicated at all levels of the project and the organisation as a whole. Respondents are also of the view that implementing Value Management techniques and workshops is expensive for local construction organizations, particularly for small and medium sized organisations.

A total of 24 percent of the total target population indicated that they are positive about the use of Value Management. They believe that Value Management is still at its infancy stage and unpopular in the country. Value Management implementation may be time consuming, but the benefits of using the tool are effective as means to enhance project success rates. Project practitioners have to be introduced to the use of the tool to avoid any misconceptions and uncertainties. Some of the project managers and team members have welcomed the use of the tool as it improves project budget, time and quality. In support, other project practitioners indicate that VM will improve project value, profits and reduce costs. There were also respondents that were of the view that the effectiveness of the VM tool depends on the size of the project, since the bigger the project, the more effective the tool. A small total of 18 percent indicated that they are neither for nor against VM based on the fact that they have little or no knowledge about the implementation of the tool.

5.5.5 Do staff members receive any formal training on VM?

The purpose of the question was to identify whether or not organizations provide VM training programmes for employees. If training programmes and workshops are provided by organizations, then project managers and project teams will gradually gain knowledge, understanding and confidence concerning VM. A majority of 62 respondents (82 percent) indicated that organizations do not provide formal training on Value Management. The other 14 (18 percent) respondents indicated that the organisations do provide formal training on Value Management.

5.5.6 If yes, how long does the training take to complete? If no, please ignore.

The purpose of this question was to establish the level and quality of Value Management training that the organizations provide. Value Management training and workshops should be a continuous exercise so that organizations keep up with the ever-changing environmental challenges and remain competitive. Also, the longer the training or workshops, the higher the chances are that in-depth and detailed information will be transferred to employees. This will also reduce the current level of misunderstanding and misconceptions about the tool, as more knowledge is acquired from training programmes. Based on the survey's results, only 8 (10.5 percent) respondents indicated that Value Management workshops last between 2 – 3 weeks. The rest of the respondents 6 (7.9 percent) indicated that Value Management training takes between 1 – 2 weeks. None of the respondents indicated that Value Management takes between 3 - 4 weeks or a month and longer in the organizations.

5.5.7 Does the organization use Value Management techniques to improve project value, innovation, performance or reduce costs? If other, please specify

The purpose of the question was to identify the main reasons for organizations to implement Value Management tools and techniques in projects. Organisations implement Value Management techniques for various reasons from project to project or organization to organization. Some organisations categorize projects that require VM techniques based on the size or cost of the project, while others categorise them based on other factors such as enhancing creativity, value or performance. A majority of 84 percent of the respondents responded to the question, while 16 percent did not. A high figure of 48 percent of the respondents indicated that Value Management techniques are implemented by organizations to reduce project costs, followed by 21 percent who stated that VM implementation helps to improve project value. About 8 percent of the respondents mentioned that VM helps to improve performance, and the rest of the respondents, namely 4 percent, indicated that VM is innovative. Only 3 percent of the

respondents specified other reasons, namely: it improves communication channels; gains a competitive advantage; and achieves the project's goals and objectives.

5.5.8 What are the 5 most common reasons for project execution failure?

The purpose of this question was to highlight some of the most common causes for project execution failure. It was also, to assist in establishing whether the Value Management tool has the potential to curb some or all of the common causes of project execution failure. Respondents mentioned various causes for the high project execution failure rate, namely: time and budget constraints; lack of adequate skills and knowledge; poor project planning; project managers' inability to delegate; delayed or insufficient information; late payments by employer or client; failure to implement projects as per prescribed plan; frequent changes in building design; poor workmanship; poor project management skills; poor communication between stakeholders and teams; unskilled and incompetent labour force; employee resistance to adapt to change; lack of employee commitment; unrealistic or unclear project goals and objectives; inappropriate use of programmes or techniques; poor decision making; lack of stakeholder participation; conflict of interests amongst stakeholders and clients; use of inexperienced sub-contractors; poor use of technology; poor control of project progress and quality; pressure to meet tight deadlines; poor documentation of business cases; and improper evaluation of the SWOT analysis.

5.5.9 Do you think that the VM tool has potential to improve or harness the high failure rate in projects? If yes, why, if no, why not?

The purpose of this question was to understand whether or not project practitioners have trust and confidence that the VM tool can potentially improve or harness the high project execution failure rate in the construction industry. A majority of 43 percent of the respondents were positive that implementation of the VM tool can bring about change and improve project execution success rates. One of the most significant benefits of the VM tool is that it strengthens communication and tracks project progress regularly.

Respondents were of the view that the construction industry would deliver quality projects with the useful tools and techniques of Value Management.

However, a total percentage of 31 percent of the respondents clearly indicated that they are not familiar with the VM tool. Therefore, it was difficult for them to decide whether or not the tool was effective. About 16 percent of the respondents did not respond to the question. Only 10 percent believed that Value Management is not the way to go. They believe that this is one of the new strategies that will end up failing, much like any other tool that has been used in the book.

Respondents believe that project practitioners should be provided with proper training and development programmes to understand the purpose and benefits of Value Management. With proper VM workshops, employees will become familiar and comfortable with the idea of using Value Management. The tool improves project control, especially if there are sufficient resources and expertise to deliver the project. However, large and complex projects should be managed by well experienced and knowledgeable project managers. There should be continuous value evaluation and controls to ensure that Value Management reaps the benefits and meets performance measures that are required for the project to succeed.

5.5.10 What other measures or models (other than VM) does the organization use to ensure successful project execution?

The purpose of this question was to get to know and understand some of the value measuring tools and models that organisations use to execute projects. As mentioned earlier, some of the techniques used by organisations happen to be VM techniques. There was no particular sequence of importance in the manner in which respondents answered the question. A majority of 53 percent of the respondents indicated that the following are some of the models or applications that organizations use in the real world: Work Breakdown Structure (WBS); Blue Beam; Value Evaluation; Value Profiling; Value Drivers; SMART; Mind-Maps; Weighting techniques; Process Mapping; Creative Techniques; Functional Analysis System Technique; Cost Worth; Target Costing;

PS/MS Projects; FAST; Five-Point Scale; Option Selection; Value Benchmarking; and Candy.

About 42 percent of the respondents indicated that there are no specific formal models or techniques that are employed by the organisation. Project execution is carried out by following informal or unstructured models in the organisation. These statistics are an indication that there is quite a lot of construction organisations that do not have specific and formal project execution models and techniques. It could be that some of the informal models do work, but it may be difficult to implement the same techniques in huge and complex projects. Strategic models and techniques are important tools that organisational projects need in order to be able to improve performance and meet customer expectations. A lack thereof could be a reason for the current high project execution failure rate experienced in the construction industry. Only a small percentage of about 5% of the target population did not respond to this question.

5.6 Section E: Additional comments

5.6.1 If there is anything that has been omitted, please feel free to add your comments.

This section was at the end of the questionnaire where respondents were given an opportunity to add anything that they feel may have been omitted in the survey. It was important to have this section to allow respondents to provide vital information that would be beneficial to the study's conclusions and recommendations. The information also gives the researcher a broader knowledge and understanding that comes directly from project practitioners who have real world experience.

A high percentage of 81 percent of the total respondents did not add anything in this section, while only 19 percent of the respondents commented. Respondents highlighted that many organisations and project practitioners are not aware of Value Management techniques, particularly in the construction industry. Only certain value techniques are used to measure value in projects. Even these techniques are not implemented in detail (step-by-step), as indicated in the book when projects are executed. They believe that it

would be better if qualified experts would facilitate training workshops to equip project managers and practitioners. Whereas, other respondents opined that VM implementation is time consuming and expensive to implement. Introducing the tool comes with a lot of challenges, which range from employee resistance to change, too much paperwork, numerous inspections, change of organisational culture, time invested in training workshops and learning new ways of doing things within the organisation.

The concern is that VM will lead to projects not being completed within the prescribed deadlines. Therefore, project teams will experience constant pressure, since Value Management techniques have sequential step-by-step processes to follow in order to acknowledge positive results or benefits on the project. In the construction industry time is money, and customers want to see the project or service completed in the quickest time possible. Some project practitioners believe that, theoretically speaking, Value Management is a perfect value measuring tool to implement, but in practical terms, the tool is not conducive in the real world experience, particularly in the built environment.

5.7 Summary

The data analysis that this chapter presented and discussed was collected by the researcher in the form of structured questionnaires. The aim of this chapter was to collect data from respondents, analyse the data and present the results of the survey in the form of charts, graphs and tables. Results indicate that the majority of respondents were not that familiar with the concept of Value Management. There are a few project practitioners that have a basic understanding about the VM tool and most of them are the older and more experienced project managers. Some of the project practitioners may have gained a little bit of knowledge from formal education (for example, at tertiary institutions).

It is of outmost importance to highlight the fact that some of the tools/techniques that organizations use are actually VM tools, but some organisations or project practitioners are not aware of this. This may be owing to the fact that VM workshops are not facilitated by organizations, internally nor externally. If VM workshops were facilitated by organisations then many project managers and project teams would be familiar with the

tool. In this way they will realize how VM applications/techniques can be utilized holistically to enhance project performance and reduce the high project execution failure rate. The next chapter concludes the study with results, remarks of the study and recommendations that are based on the survey's findings.

CHAPTER 6: Findings, conclusions and recommendations

6.1 Introduction

The objective of the study was to provide an understanding of the concept of the Value Management (VM), and to establish whether or not the tool has the potential to solve the high failure rate in project execution. In recent years the construction industry has shown an increasing demand of project management skills and techniques. This is owing to the fact that the industry has grown rapidly and project types are becoming more complex, particularly in developing countries. Therefore, project management practitioners are faced with a challenge to successfully achieve project goals and objectives, and thus meet customer expectations. Among other things, project managers have to ensure that projects are delivered within the triple constraints of quality, time and budget. Effective project teams, techniques and technology are required to ensure that project execution becomes a success. Hence, there is a need to evaluate and establish whether VM has potential to help control, reduce or curb the high project execution failure rate in the built environment industry (namely, the construction industry).

One of the biggest challenges that project managers face in South Africa and in other developing countries is project control, particularly in the construction industry. Project schedules are constantly pushed back with rising costs, which ultimately affect the quality of the project. Project performance in terms of work schedule, cost and quality is communicated poorly, and this may result in project delays owing to miscommunication (Kiwane, Meyer and Steyn, 2016: 192). This once again speaks to the increasing demand for effective project management skills to control and keep track of project value from the initial phase up until completion. Project and organizational value improves significantly when project performance is communicated well, and value management can be a helping tool for many projects.

Value Management methodology is an effective tool that measures project performance and also mitigates project risks. It encourages employee cohesion, teamwork, communication and knowledge creation in the deliverance of small sized, medium sized

and complex projects. The methodology follows processes, applications and techniques to evaluate and scrutinize projects to define and maximise the best value for money. These applications focus mainly on value rather than on the actual cost. Unnecessary costs are automatically reduced through the effective use and implementation of the VM application during project execution. It is important that Value Management applications, processes and techniques are followed accordingly and precisely in order for the projects to achieve maximum benefits. Some of the VM benefits include, but are not limited to, building the morale of project teams, encouraging stakeholder participation, reducing unnecessary project costs, clearing project briefs; and improving decision making.

Previous chapters in this study discussed in detail project management issues, causes for project execution failure and value management perspectives. This chapter presents and discusses findings in respect of the study's collected data. The purpose of discussing these findings is to establish whether there is a correlation between the literature review and the new data from the findings. Recommendations will help to establish common and critical factors that negatively affect project execution and establish VM tools and techniques that will help to reduce the current high failure rate in the construction industry.

6.2 Summary of objectives of previous chapters

The first chapter introduced the concept of Value Management and established whether it has capabilities to curb the high project execution failure rate in the construction industry. A brief literature review was discussed with an intension to highlight the significance of the study and identify a gap, which will assist in structuring the problem statement. The problem statement was systematically structured and aligned with the research objectives, research design and research methodology. The chapter also outlined and presented the study's target population, sample frame, sample size, sampling selection, method of sampling, data analysis and limitations. Last, but not least, ethical considerations were discussed in this chapter, together with the scope and limitations of the study.

Chapter Two discussed the concept of the Value Management tool in detail. The importance of VM methodology, techniques and characteristics were explained, together with the benefits of effective VM implementation. VM workshop stages, VM study, VM job plan phases and various techniques were also included in the chapter. The chapter also highlighted a distinction between Value Management, value engineering, value analysis and cost management, since some organizations use the term interchangeably, while others still struggle to understand the difference between these terminologies.

Chapter Three of the study further discussed VM and its practical applications in the industry, in general, particularly in the built environment. Value Management methodology was discussed in the South African context, as well as other developing countries that embarked on utilizing the tool for its projects. An in-depth analysis of the risks of using or not using VM techniques were highlighted, taking into account the pros and cons that project managers should acknowledge. In addition, VM challenges and international statutory requirements were discussed, as well as project types that are suitable for the effective use of the tool. Another critical aspect that was discussed in the chapter related to potential VM models that can be implemented in projects to bring about solutions for the high global project execution failure rate.

Value Management misconceptions and Value Management improvement strategies form part of the chapter to bring to light better understanding of the use of the tool. Like any other tool or methodology, Value Management should be improved continuously to ensure that it delivers improved project performance and maintains the existing competitive advantage in projects. The chapter also discussed possible solutions that can be implemented to improve the VM tool, and to keep it relevant to date.

The next chapter explained in detail the research design and methodology that was used to collect data to achieve the study's objectives. The study's target population, together with the sample frame, sample size, sampling method, data collection methods and data analysis were also discussed. The scope, limitations of the study and ethical considerations also formed part of the chapter in question.

The next chapter introduced the presentation and discussion of results that were collected in the survey. The results were presented in the form of pie charts, bar graphs and tables, as each presented set of data had its own explanation and interpretation of results. A detailed discussion of the results and findings followed, with an intension to respond to or provide a solution and answers to the problem statement and research objectives of the study. The chapter concluded that VM methodology has potential to improve the high failure rate in project execution that the construction industry faces.

Chapter Six of the study further discusses the findings or results of the collected data from respondents. Recommendations and conclusions are discussed in this chapter, based on the findings and interpretations drawn in the previous chapter (Chapter 5) and literature review. Therefore, recommendations were made based on the fact that project practitioners are not that familiar with VM. Respondents suggested that more VM experts need to facilitate VM workshops in organizations. The high demand for VM workshops and training programs facilitation will help to increase awareness and also clear some of these popular misconceptions.

6.3 Discussion of findings, conclusions and recommendations.

As mentioned in Chapter Five, important highlights and key points of the results and findings are discussed here briefly and recommendations are provided thereafter. The researcher used personal understanding and interpretation of the meaning of the data that was collected to draw recommendations and conclusions for the study. It is imperative to highlight the fact that one of the limiting factors, when questionnaires were administered to respondents, was the lack of VM knowledge amongst project practitioners. Lack of VM knowledge and misconceptions of the tool remain challenging factors for a lot of project professionals, particularly in South Africa.

6.3.1 What are the general causes for project execution failure.

The following reasons were mentioned as some of the most common reasons why projects fail: time and budget constraints; lack of adequate skills and knowledge; poor project planning; project managers' inability to delegate; delayed or insufficient

information; late payments by employer or client; failure to implement projects as per prescribed plan; frequent changes in building design; poor workmanship; poor project management skills; poor communication between stakeholders and teams; unskilled and incompetent labour force; employee resistance to adapt to change; lack of employee commitment; unrealistic or unclear project goals and objectives; inappropriate use of programmes or techniques; poor decision making; lack of stakeholder participation; conflict of interest amongst stakeholders and clients; use of inexperienced sub-contractors; poor use of technology; poor control of project progress and quality; pressure to meet tight deadlines; poor documentation of business cases; and improper evaluation of the SWOT analysis.

Recommendation: The process of identifying the causes of project execution failure is important, as it helps project managers and teams to be well aware of the critical factors that may be detrimental to the success of the project. This also helps project practitioners to establish necessary measures to curb or combat these issues beforehand. Value Management techniques can be a solution and a methodology that assists with its diverse applications. The VM tool has potential to address most of the aforementioned factors, either directly or indirectly, whilst satisfying all stakeholders. Benefits of using VM techniques can either be financial or non-financial, or both. Either way, they will be to the betterment of the project's success by ensuring that project goals and objectives are achieved successfully. However, it is important to ensure the following key factors when implementing the VM techniques in a project: VM must always be introduced at the project's development phase (initial phase); encourage all key stakeholders to participate; VM study should be tested for authenticity; and minimize project schedule and costs by ensuring that VM is properly coordinated with the construction program by experienced VM experts.

As alluded to before in the literature review, the VM approach has the ability to identify most of the aforementioned causes of project failure beforehand. This gives the project manager, project team and stakeholders ample time to acknowledge such challenges, discuss them and seek solutions. Value Management may also be utilised as a

forecasting tool that is able to foresee future challenges that can be detrimental to the project's success. This gives the project manager and team an opportunity to introduce preventative measures to avoid any harm and possible delays to the project. The project manager can then have enough time to focus on other issues of the project rather than waste time on trial and error, or fixing problems that could have been avoided in the first place.

6.3.2 Benefits of using the VM tool (financial or non-financial).

As alluded to earlier, the VM tool has both financial and non-financial benefits. Benefits of using the tool include, but are not limited to, the following: improves organizational culture; creates a balance amongst stakeholders' needs; improves quality of project delivery; improves profit margins; improves customer satisfaction ratings; controls project costs; clarifies the business case for the project; compares actual costs to budgeted costs; keeps track of time scheduled for project completion; improves project value at a reduced cost; and helps with continuous value appraisal.

Recommendation: It is important to make sure that Value Management is facilitated properly and for the intended results for the project to achieve desired results. Many instances have recorded the misconception that the VM can be used to primarily cut project costs. The VM tool is there to improve project value and to keep track of project progress, while cutting costs is a by-product that is achieved indirectly, subject to effective implementation of the VM techniques. Therefore, it is extremely important for the project manager to use the tool correctly, and with a team of experienced and competent team players. Hence, management can maintain a risk averse project, low project execution costs, and a high benefit exercise, particularly when it is integrated effectively with other project management methodologies.

6.3.3 Challenges that organizations or project teams experienced when VM was introduced

In most cases it is natural for project practitioners to become resistant and reluctant to be introduced to a new concept or implementation, and the VM tool was no exception.

Whenever VM was introduced many project practitioners portrayed a sense of passive participation in VM workshops. Many stakeholders and project practitioners have become resistant and have developed negative perceptions towards the concept of VM owing to a concern that the learning process might make it harder for them to grasp new concepts or techniques. Sometimes they complain about a lack of time to complete all tasks in the workshop owing to information overload with limited time. Another major impediment that the construction industry faces is the inability to fund VM implementation. Because of this project, professionals chose to ignore the use of VM, as the additional costs of setting up the project team would ultimately be too costly for the organization and the client/s.

Whereas in some instances, project professionals raised a concern that VM requires a lot of paperwork and follow-ups, especially when there is a change in building design. In this industry time is money, especially with the constant pressures to meet deadlines and achieve required milestones of the project.

Recommendation: There must be an increased level of input from VM specialists with improved facilitation skills in VM workshops. It is believed that the more VM workshops are facilitated and addressed in the construction industry, the more project practitioners will learn and become informed about Value Management, and develop trust in it. Implementing VM techniques incorrectly may be the cause for high costs in project execution; otherwise, employing a team of experts may be less costly to implement the tool and achieve the desired results. In support, Olawumi, Akinrata and Arijeloye (2016: 47) explain that the advantages and benefits of implementing the VM tool still outweighs VM implementation costs. The tool should be made an official practice in projects, particularly for those large and complex projects so that stakeholders and client expectations can be met while increasing value for money.

Recommendation: A suitable solution that would ensure effective and efficient VM implementation would be the introduction of Value Management electronically. Everything else will remain the same but will be done electronically compared to the physical paperwork. This will enable a cost effective, flexible, quick and easy

implementation of the VM tool/techniques. Inevitably so, it is important to realise that it will be costly to introduce and implement Value Management, since it will be a completely new approach for the organisation. Yet again, project practitioners should bear in mind the fact that most of the costs will be once-off payments to gain access to resources that they do not have (for example, software). Once they have the resources the rest will be history, as they will now experience long term benefits that will eventually outweigh the costs of introducing the tool (for example, competitive advantage or improved project success rate).

Fear of the unknown and resistance to adapt to change is a major challenge, since VM is new to many. Project practitioners need to familiarise themselves with VM applications and become comfortable using the tool. Therefore, less time will be spent to complete tasks/activities, as they become familiar with the applications. Productivity and achievement of project milestones improve as project managers and teams become more effective and efficient. Time delays will be prevented, possible future obstacles will be solved in advance, and projects will be completed within prescribed time schedules. It is important to highlight the fact that this is not an easy task to achieve, but through passion, hard work, commitment and dedication, it will be.

6.3.4 Formal training for staff on Value Management.

Based on the survey results that was discussed in Chapter Five of the study, some of the staff members do receive formal training. However, it is an extremely low percentage 14 (19 percent) of the respondents that received formal training, while the majority 62 (81 percent) did not receive training. This is quite a huge percentage, which clearly shows that a lot has to be done to increase the percentage or number of trained VM practitioners. Of the 14 (19 percent) respondents, only 8 (10.5 percent) of the respondents indicated that Value Management training/workshops take between 2 – 3 weeks within the organization. The rest of the respondents 6 (7.9 percent) indicated that Value Management training takes between 1 – 2 weeks. None of the respondents indicated that Value Management takes between 3 - 4 weeks or a month and more in the organizations.

Recommendation: It is important to acknowledge the fact that the VM tools and techniques continuously improve with time to keep up with the ever changing environment and competitive industry. Hence, the VM workshop and training programs should be facilitated continuously for employees and technological resources to remain relevant. Also, it is important for projects to achieve maximum benefits so that the client and key stakeholders can be satisfied. These training programs will take out of the already limited time that project teams have, but this must be considered as a long term investment for the organization and for the development of employees' skills. Over time, the organisation's reputation will improve, the project success rate will improve, employee morale will improve, team cohesion and stakeholder participation will improve and communication will also improve.

6.3.5 Planning is the project manager's responsibility.

Project planning is generally understood to be the project manager's responsibility. However, this perception may not always be true and may jeopardize project success, both financially and otherwise. Project planning is important as it is in the initial phase of the project. Part of project planning is to ensure that all key stakeholders that are affected (both directly and indirectly) are involved at the beginning of the project. Among other things, project details, sharing of ideas and conflict of interests are identified, discussed and resolved at the initial stage. Therefore, the idea of expecting that the project manager will take care of everything can be a recipe for disaster. Stakeholder participation helps to improve decision making and problem solving because everyone is involved, as the goals, objectives and expectations of the project are discussed beforehand. A planned project is almost guaranteed to produce positive outcomes, especially when all parties are involved.

Recommendations: It should be understood that project planning is not only a project manager's responsibility, but also that of all the stakeholders that are involved. A lack of senior management and stakeholder participation can lead to a complete failure of the entire project execution process. Project planning should be seen as the foundation for the project's initial phase. Therefore, all stakeholders involved in the project, project

practitioners, as well as the client should be involved from the outset to ensure that everyone is on the same page before commencement of the project. Stakeholders and a project team includes, but is not limited to, a project manager, project planner, quantity surveyor, architect, engineering design manager, contractors, builder, procurement officer, client and sponsor. If the abovementioned role players form part of the project at planning phase, potential challenges are foreseen, discussed and resolved on the spot.

Effective communication practices among stakeholders should be adhered to early to avoid misunderstanding and unnecessary conflicts. Therefore, all parties would be clear and understand the project goals, objectives and milestones. This motivates and encourages all participating individuals, since they know that they form part of the collective team, as their views and opinions are considered by the project manager. Team spirit is high, a sense of responsibility and accountability exists and everyone works towards common goals and objectives, which contribute to the success of the project and hence meets the customer's expectations. Effective, collective planning contributes immensely towards the successful implementation of the project, and meets customer expectations. The project manager should ensure that all parties involved participate in the project start-up meeting to discuss factors such as project scope, budget, timelines, goals and objectives, and so on. Thereafter, project team progress meetings should be held regularly so that all stakeholders remain up to date with the project's progress, and also use this as a platform to share ideas for the betterment of the project.

6.3.6 Time and resource allocation in projects

The construction industry is generally known for being a busy industry, where project practitioners have a responsibility to complete projects successfully and within a prescribed time period. Project teams constantly work under schedule pressures to meet deadlines. Therefore, inadequate time allocation on projects can result in sub-optimal outcomes, or even complete project failure. In addition to the situation, poor

allocation of resources is another critical factor that often results in project delays and difficulties to meet these tight schedules. Insufficient resources allocation (for example, budget, project team, materials, and so on) means that resources will fall short even before the project is completed and additional funding will be needed to complete the job.

Recommendation: Often, issues of insufficient resources allocation speak to poor project planning and poor project management skills. Project details such as project scope or project brief should be addressed early and thoroughly to all project practitioners and affected stakeholders. The process will help to identify possible constraints and shortfalls that may arise in the execution process of the project. It is important that this process is done right from the beginning of the project so that precautionary measures are taken to prevent project execution failure and potential delays. Most significantly, key stakeholders, effective communication channels, experienced leadership, skilled project practitioners and risk management issues should be prioritised so that the project reaps maximum benefits. With the effective use of available VM techniques and applications, the current project execution failure rate can become a thing of the past. VM techniques enhance communication, value for money, team and stakeholder cohesion, and help to keep track of the project's performance. However, it is important to acknowledge the fact that a tool or methodology cannot deliver the desired results as a stand-alone, and Value Management is no exception. There has to be a competent and skilled project team, sufficient allocation of resources, modernized technology, and so on for the implementation process to be successful.

6.3.7 Project team integration between clients, suppliers and supply chain

The results that were discussed in Chapter Five of the survey indicate that there is little integration between clients, suppliers and other internal departments. This highlights the need for the improvement of internal and external communication channels to gain a competitive advantage and to maintain solid communication with all stakeholders. Effective communication is affected negatively when there is little integration among

stakeholders, clients and internal departments. Supply chain in terms of payment arrangements, ordering and delivering material (procurement), and other useful resources may also be affected negatively. Unnecessary delays will arise and project goals may not be achieved, as required. Project performance may be affected, which can impact negatively on the project and organisation's reputation.

Recommendation: Project stakeholders, teams and clients are regarded as key role players that are important value drivers of the project. Integrated departments help to avoid the duplication of resources, and increase the smooth flow of information across relevant teams, departments and various stakeholders. It also allows for the smooth operation of activities, as important information is received on time and by relevant individuals. The project manager and other senior management across departments have an obligation to encourage teamwork between project teams, departments and external stakeholders. Building proper relationships with stakeholders ensures that suppliers will have a healthy relationship with the organization. Supplier turnaround time may be quicker in terms of delivering materials, while bulk items may be purchased at discounted prices. Therefore, acquiring good value for money and project completion will be achieved, as per desired project goals.

6.3.8 Proposals evaluation is driven by the initial price instead of long-term value for money.

A majority of respondents in the survey agreed that construction projects are driven by the initial price instead of long-term value for money. As much as the initial project price is important when evaluating project proposals, there are other factors that are equally important for a project manager or organization to take into account. In some cases project execution can be disastrous because the long term value for money principle is overlooked. The project may result in it being under-budgeted as the long-term monetary returns could potentially be far less than the actual cost price of executing the entire project.

Recommendation: Proper value analyses techniques should be utilized so that the project manager, project team and stakeholders can make informed decisions. As much as the initial project execution price is important, too is long term value for money and investment benefits for the organization. Future prospects of the organization depend on current decisions that the organization makes. Therefore, the effective use of value analyses techniques (for example, Whole-life/Value for Money) will help the organization to identify whether or not bidding for a particular project will be a long term or short term benefit.

6.3.9 Skilled and experienced project practitioners with formal qualifications.

There is a high demand for skilled and experienced project professionals. The construction industry is in need of more project professionals that have formal project management qualifications, particularly those with Master's and doctorate qualifications. The level of formally qualified project managers within the built environment is low. Skills shortages in the construction industry is a challenging factor. Few qualified and experienced project practitioners force the industry to employ incompetent and under-qualified employees. This can be costly to the success of the organisation and its projects, particularly large and complex projects. The same applies to the need for skilled and experienced VM practitioners who are qualified to implement and facilitate the VM techniques in projects.

Recommendation: Organizations should introduce formal recruitment programs that will focus on employing young, qualified professionals from various tertiary institutions. These professionals will learn the practical execution of projects from experienced adult project experts within organizations. Gradually, the skills transfer process will grow over time, and qualified individuals will grow and gain experience in the construction industry. Simultaneously, organizations should introduce VM training programs, seminars, in-house mentoring, and professionals' forum programs for employees to be exposed to the methodology.

A combination of experienced individuals, together with young graduates, will be beneficial to the organization. Young graduates will bring creative ideas and innovation,

whereas experienced professionals will share knowledge and experience in the organisation. This will improve employee knowledge on project management skills, project technology abilities, market forces, employee skills and, ultimately, improve project performance.

6.3.10 Value Management workshops

Value Management training workshops are required for organizations and employees in the construction industry. The study's survey results indicate that organisations that offer VM training workshops only provide one or two day workshops. A two-day workshop may be effective for employees, but VM takes longer timeframes for it to be implemented effectively and understood by employees. This is caused by the fact that VM is complex and has many techniques, applications and implementation strategies. Time constraints is a major challenge for project practitioners owing to tight project schedules, while it is difficult to attend the 40-hour VM workshop.

Recommendation: There should be qualitative implementation and facilitation of VM workshops. When VM is understood well, project professionals will begin to understand that the tool can be implemented in any type of project, regardless of the project size or scale. Also, VM should be implemented as soon as possible for it to enhance effective benefits in a project. VM workshops will clear increased misconceptions of the use and benefits of Value Management. Therefore, organizations will be able to implement VM accordingly, and with better knowledge and understanding of its techniques and benefits. Sacrificing the time to attend training programs will have long term benefits for projects and organizations, as this will improve project efficiency and minimize the rate of failure projects. In this regard, it is important to allow more time spent in workshops, even it lasts for a week instead of two days. However, the organisation will have to schedule these workshops carefully so that they do not interfere with current projects that are underway. Project managers and training facilitators have a responsibility to communicate to create a balance between time spent in workshop programmes, and the successful execution of existing projects.

6.3.11 Summary

The chapter discussed the findings relating to whether or not Value Management has potential to reduce the high project execution failure rate in the construction industry. Recommendations were made, based on the survey results that were discussed in Chapter Five and the literature review of the study. The aim is to help to establish common and critical factors that negatively affect project execution, and to establish suitable VM tools and techniques that will help to reduce the current high execution failure rate in Cape Town's construction projects. This will be achieved through the use of a literature review and conducting a survey. However, there are concerns that VM implementation is costly, time consuming and less popular in many areas of the world. It is for these reasons that project practitioners are reluctant and lack trust in the use and benefits of the VM methodology.

There have been suggestions that VM workshops and training programs should be facilitated frequently to increase awareness. Workshop facilitation and training should be managed by expert and competent VM professionals to ensure effective implementation. Proper implementation and facilitation of VM will ensure successful achievement and noticeable benefits for all stakeholders involved in the project. Gradually, organizations and project practitioners will gain confidence and trust in the effective use of the VM tool to help reduce the high project execution crisis that the construction industry faces. In terms of costs, VM methodology can be facilitated and implemented electronically to reduce paperwork, travelling costs, workshops facilitation, conference costs, flight booking costs, and so on.

Lastly, it was learned that there is a high demand for skilled and competent project practitioners in the industry. Value Management has the potential to identify such challenges and shortfalls in the earliest stages of the project. Therefore, effective VM implementation can help project managers and stakeholders to make necessary changes early, as well as decision making that will benefit successful project execution. The purpose of the study was to assist project practitioners in the author's workplace,

and the entire construction industry, in general, by adding value and establishing solutions to end the high failure rate in project execution.

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QUESTIONNAIRE

An analysis of Value Management as a panacea for high project execution failure rate in selected Cape Town project firms

Dear Respondent

This is an academic exercise aimed at investigating whether organizations make use of the Value Management (VM) tool to harness current high projects failure rate within the industry. The questionnaire targets all **project managers, supervisors and team members** that are involved in projects within organisations. **Please do not write your name or that of your organisation**, as this is a confidential document and no information will be given to the public.

RESEARCHER NAME: SANDISILE MAGWAZA

PROJECT UNDER REVIEW PERIOD: 01 JUNE 2017 – 31 AUGUST 2017

RESEARCHER CONTACT DETAILS: 076 748 1874

SECTION A: BIOGRAPHY

Please cross the applicable boxes below.

1. Indicate your gender below

Male		Female	
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2. Indicate your age

Under 20 years	21-30 years	31-40 years	41-50 years	51+ years
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3. Indicate your position in the organisation

Project manager	Project supervisor	Project team member	Operations staff	Other
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4. Indicate your highest formal qualification

Matric Certificate	National Diploma	Post Graduate Diploma	Bachelor's Degree	Master's Degree
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5. Indicate your years of working experience in projects

0-5 years	6-10 years	11-15 years	16+ years
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6. How many subordinates report to you? If none, please ignore

1-10employees	10– 15employees	15-20employees	20+employees
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7. How often are you involved in project team meetings?

Seldom	Sometimes	Fairly Regularly	Always
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8. How often are you involved in day-to-day operations of the project?

Seldom	Sometimes	Fairly Regularly	Always
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SECTION B: CHARACTERISTICS OF THE ORGANISATION

CLOSED-ENDED QUESTIONS

Decisions Options	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Code	1	2	3	4	5
					Decision options

CHARACTERISTICS OF THE ORGANISATION		1	2	3	4	5
1	Planning is the project manager's responsibility.	1	2	3	4	5
2	Our organization has sufficient knowledge of project technology and market forces such as suppliers, distributors, and competition.	1	2	3	4	5
3	Employees have sufficient project and technological competence (skills, knowledge, competence and work experience).	1	2	3	4	5
4	Management provides necessary training and development programmes to all project staff.	1	2	3	4	5
5	Management promotes effective communication channels and continuous feedback to its employees.	1	2	3	4	5

SECTION C: VALUE MANAGEMENT

Decision Options	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
	1	2	3	4	5
VALUE MANAGEMENT					Decision options
					1 2 3 4 5
1	The project is provided in detail to all practitioners involved.				1 2 3 4 5
2	All projects are implemented with a time-phased-spend plan.				1 2 3 4 5
3	There is a continuous evaluation of time spent and budgets used.				1 2 3 4 5
4	We constantly check on how much work is done, given time spent.				1 2 3 4 5

5	Cumulative costs are regularly reviewed against the prescribed project plan.	1	2	3	4	5
6	How familiar are you with the concept of Value Management?	1	2	3	4	5
7	The manager regularly checks work done against the plan prescription.	1	2	3	4	5
8	The manager always compares the Value Management (VM) to the Present Value (PV) line.	1	2	3	4	5
9	The manager checks on the actual costs compared to budgeted costs.	1	2	3	4	5
10	The manager keeps checking the critical path during project execution.	1	2	3	4	5
11	Work that should be performed is always defined first before commencement.	1	2	3	4	5
12	Implementation of Value Management can vary significantly, depending on the circumstances,	1	2	3	4	5
13	Scaling is done hierarchically following the Work Breakdown Structures.	1	2	3	4	5
14	In many cases organizations apply an all-or-nothing threshold.	1	2	3	4	5
15	The most detailed aspects are identified as activities.	1	2	3	4	5
16	Design reviews, validations and verifications are performed in all project stages to ensure quality project delivery.	1	2	3	4	5
17	Projects that are above threshold require full-featured Value Management applications.	1	2	3	4	5
18	Projects that are below the threshold are excluded from the scaling.	1	2	3	4	5

19	Scaling is done according to the skills of the project team.	1	2	3	4	5
20	Spreadsheets are used effectively for Value Management tracking.	1	2	3	4	5
21	Value Management techniques are implemented on new and existing projects.	1	2	3	4	5
22	Sufficient resources and budgets are allocated to all projects.	1	2	3	4	5
23	Value Management is implemented only on large scale projects.	1	2	3	4	5
24	Project team integration between clients, suppliers and supply chain is effective.	1	2	3	4	5
25	Proposal evaluation is driven by the initial price instead of long-term value for money (e.g. Whole-life value for money).	1	2	3	4	5
26	Project teams constantly work under schedule pressures to meet deadlines.	1	2	3	4	5
27	The average project success rate is currently between 80% - 100%.	1	2	3	4	5

SECTION D: OPEN-ENDED QUESTIONS

1. **What influenced or encouraged the organization to make use of Value Management?**.....
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2. **What are the benefits of using the VM tool (financial or non-financial)?**
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3. What challenges did the organization or project teams experience when VM was introduced?

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4. What was your response to the idea of using VM?

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.....

5. Do staff members receive any formal of training on VM?

Yes No

6. If yes, how long does the training take to complete? If no, please ignore.

1 – 2 weeks	2 - 3 weeks	3 - 4 weeks	1+ month
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7. Does the organization use Value Management techniques to improve project value, innovation, performance or reduce costs? If other, please specify.....

Value	Innovation	Performance	Reduce costs
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8. What are the general causes for project execution failure?

8.1.....

8.2.....

8.3.....

8.4.....

8.5.....

9. Do you think that the VM tool has potential to improve or harness the high failure rate in projects? If yes, why, if no, why not?

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10. What other measures or models (other than VM) does the organization use to ensure successful project execution?

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SECTION E: ADDITIONAL COMMENTS

If there is anything that has been omitted, please feel free to add your comments below.

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Thank you for taking time to complete this survey.

Your effort is highly appreciated.

GRAMMARIAN CERTIFICATE

SHAMILA SULAYMAN PROOF READING AND EDITING SERVICES

31 August 2018

Dear Sir / Madam

This confirms that I have proof read and edited the study entitled: “***AN ANALYSIS OF VALUE-MANAGEMENT AS A PANACEA FOR HIGH PROJECT EXECUTION FAILURE RATE IN SELECTED CAPE TOWN PROJECT FIRMS***”, and that I have advised the candidate to make the required changes.

Thank you.

Yours faithfully



(Mrs) SHAMILA SULAYMAN

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