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MASTER OF SCIENCE IN QUANTITY SURVEYING

INCORPORATING VALUE MANAGEMENT IN PUBLIC SECTOR
PROJECT DELIVERY PROCESSES: THE CASE OF THE
INFRASTRUCTURE DELIVERY MANAGEMENT SYSTEM

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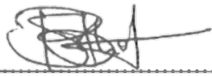
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DECLARATION OF ORIGINALITY

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I, Sithela Bridget Sithole, declare that this research report is my own original and unaided work. Any work that has been used that is not my own (printed, internet, or any other source) has been properly acknowledged and referenced in accordance with the department's requirements. I have not used work that has been previously produced by any other individual to hand in as my own work. I have not allowed, nor will I allow any other person to copy my work with the intention of passing the work as his or her own work. This work is submitted in partial fulfilment of the requirements of MSc in the domain of Quantity Surveying at the University of the Witwatersrand, Johannesburg.



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07 day of June 2024

ABSTRACT

The construction sector is mostly a contentious issue especially when economic growth depends on the delivery of infrastructure. Within the sector, the infrastructure delivery system is a vital component in the delivery of physical infrastructure to support the economic and social outcomes of government.

Having an effective public sector delivery system requires regulations, policies and standards that reflect the values of government and wider society. However, the inability to manage the delivery of infrastructure within the estimated budget while ensuring the clients receive value for money is a pervasive problem of the South African public sector with public sector projects often exceeding budgets and failing to deliver value for money.

In response, the South African government has introduced an Infrastructure Delivery Management System (IDMS) seeking to standardise the infrastructure delivery management process to try and deal with some of the challenges experienced in the delivery of infrastructure. However, Value Management (VM) has long been established as a systematic way to enhance value for money and international practice frequently has VM practice embedded within the country's infrastructure delivery systems. This study seeks to explore whether or how VM has been incorporated within the IDMS process and whether the incorporation of VM into the IDMS is something that was considered by the designers of the IDMS process.

The study adopts a mixed methods research methodological approach. The primary data was collected through questionnaires which were distributed to the targeted population involved in the development of the IDMS policy and strategy within government. The questionnaire requested respondents to rank the factors hindering the incorporation of VM within the Infrastructure Delivery Management System (IDMS). This was then followed up by in-depth interviews with selected respondents to understand the thinking behind the extent to which IDMS incorporates VM IDMS.

Overall, the findings demonstrated that there is limited knowledge and understanding of VM as an application that delivers quality and sustainable products and outputs with a cost-benefit and within the required timeframes within the IDMS. The conclusion that can be drawn from this is that the introduction of the IDMS missed an opportunity to embed VM practice and thus its likely effectiveness in ensuring value for money for the taxpayer is limited.

KEYWORDS: Value Management application, Infrastructure Delivery Management System, Public sector projects, South African construction industry.

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LIST OF ABBREVIATIONS

ASGISA	Accelerated and Shared Growth Initiative for South Africa
CIDB	Construction Industry Development Board
CIOB	Chartered Institute of Building
CMP	Construction Management Profession
CPD	Continuous Professional Development
DBSA	Development Bank of Southern Africa
DTIC	Department of Trade, Industry and Competition
EVM	Earned Value Management
FIDMP	Framework for Infrastructure Delivery and Procurement Management
GEAR	Growth, Employment and Redistribution
IDIP	Infrastructure Delivery Improvement Programme
IDMS	Infrastructure Delivery Management System
NDP	National Development Plan
PFMA	Public Finance Management Act
PPP	Public Private Partnership
PPPFA	Preferential Procurement Policy Framework Act
RDP	Innovations includes Reconstruction and Development Program
SA	South Africa
StatsSA	Statistics South Africa
SCM	Supply Chain Management
SOE	State Owned Enterprise
USA	United States of America
VA	Value Analysis
VBM	Value Based Management
VE	Value Engineering
VEMSSA	Value Engineering Management Society of South Africa
VM	Value Management

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1 INTRODUCTION

1.1 Background and Context of the Problem

The construction industry is a key industry that contributes significantly to the economy of both developing and developed countries (Gornig, Michelsen, & Pagenhardt, 2020). That the industry is investment-led is why governments show great interest in its effectiveness in their roles as both regulators and major clients (Department of Trade, 2023). For example, at the City of Johannesburg's Construction Permit ceremony held on the 20th of January 2023 in Pretoria, South Africa, Dr Anthony Costa, the Investment Lead in the Private Office of the President, emphasised that the construction industry plays an important role in South Africa by creating an environment that is enabling for business (Department of Trade, 2023).

By definition, the construction industry refers to construction activities in the heart of the construction of physical structures, for example, buildings and infrastructure in the economy, whether on land or marine (Kale & Arditi, 2001). According to Ofori (2007), the construction industries are essential in many economies as they deliver the infrastructure that in most cases, is the backbone of economic activity. The industry due to its labour-intensive nature, also tends to be one of the largest employers in many countries (ibid). In South Africa, the construction sector provides jobs to about 1.3 million individuals (Zingoni, 2020). The construction industry determines the amount of "investment efforts in a resource-rich country are translated into investment outcome" (ibid).

South Africa as a developing economy, is prioritizing infrastructure investment in its efforts to tackle the triple challenges of poverty, inequality, and unemployment (Ncube & Tullock, 2015). In 2011 the government published the National Development Plan (NDP) with infrastructure development as the focus area and further stated that, in many instances, the government is predominantly responsible for the delivery of capital of infrastructure (ibid). The government delivery of this capital infrastructure is mainly the focus and has consistently been challenged by external factors i.e. politics, social issues, etc., further influencing the delivery process. Numerous innovations and processes have been introduced to address and thus mitigate some of the delivery concerns including risk mitigation. Government innovations include the Reconstruction and Development Program (RDP), Growth, Employment and Redistribution (GEAR), Accelerated and Shared Growth Initiative for South Africa (ASGISA) and other government policies meant to address the system to reduce poverty and balance the inequalities that were caused (Durokifa, 2023).

One of the innovations or processes available to the industry is Value Management (VM) which is defined as a “technique that is function-oriented and proven as an effective tool to manage the achievement of better design, construction, and cost-effective construction and transportation project elements” (Luvara & Mwemezi, 2017).

Value Management was initially utilised in cases where there was a shortage of essential resources to produce products for human consumption in the manufacturing industry (Oke & Aigbavdoa, 2017). The shortage of products for manufacturing was so severe that the industry could not meet societal demands. It was because of this that Lawrence Miles formulated a way for sourcing alternative products, parts, or resources at low cost to replace unavailable ones (Oke & Aigbavdoa, 2017).

1.2 Substantiation of the Problem

The challenge, as highlighted above for the construction industry, is an inability to manage the delivery of infrastructure while ensuring the client receives value for money. Infrastructure delivery within the estimated budget is always a challenge and particularly, it is notable that in the public sector, projects often tend to exceed the estimated budget, burdening the taxpayers and reducing the resources available for other government activities.

Whilst Value Management can act as a counteraction to ensure better for money, government initiatives, including in South Africa have focused primarily on the operative and effective functions of infrastructure procurement and “delivery management systems”. This is particularly the case in South Africa where public sector procurement is seen as a means to ‘transform’ the economy through policies and legislation such as Broad-Based Black Economic Empowerment, and Preferential Procurement (Nzimakwe, 2023). However, these interventions have resulted in mixed results, and in the case of fixed investment, multiple instances of poor project delivery. To try and achieve consistency in project delivery, the South African government has implemented a universal project delivery methodology for public sector projects called the Infrastructure Delivery Management System (IDMS) intended as a system and procedures of good practices in the delivery management of infrastructure. The primary focus of IDMS is the delivery and life cycle management of public sector infrastructure according to the Construction Industry Development Board (CIDB) and National Treasury (CIDB, 2010).

Alongside the IDMS, the 2020 National Treasury's Framework for Infrastructure Delivery and Procurement Management (FIDPM) seeks to encourage the concept of public sector 'value-for-money' through the process of Infrastructure Delivery Management and Infrastructure Procurement Management and the activities promote the use of resources to achieve optimal intended results. The above implies that 'value for money' should be the focus of the public sector project delivery, and this opens the possibility for the wider application of VM. The FIDPM further prescribes the minimum requirements for implementation of IDMS in project delivery, which are:-

- a) Infrastructure Delivery Management processes consisting of portfolio, programme, projects, operations and maintenance of infrastructure; and
- b) Infrastructure Procurement Gates (a process perspective on project delivery)

The question that arises is the extent to which IDMS incorporates VM into the design of its process. Several South African legislations and CIDB documentation indicate *Best Value* as a target or inspiration but are silent about the formal inclusion of VM.

Whilst it would be logical to expect VM to be integrated within the public sectors projects delivery processes such as IDMS and examples of this exist in international practice (Netshiswinzhe, Aigbavboa, & Thwala, 2024), however, it is not clear how or whether it is done, whether this was part of the intention of the developers of IDMS and awareness of VM by professionals is correlated to the under-implementation of VM. Ultimately this may result in sub-optimal value achieved by public sector projects.

1.3 Problem Statement

With the construction industry contributing to the South African GDP, government infrastructure delivery becomes at the forefront of capital project delivery. However, the delivery is hindered by challenges of late project delivery, delays, project cost overrun etc. and requires regulations for an efficient and effective system for capital project delivery. These delays in the completion of projects hamper economic growth and development. Addressing these challenges requires implementing the infrastructure delivery system, adopted and included within the policies, regulations and standards becomes a priority to standardize and address infrastructure delivery.

Hence, the study seeks to explore whether or how VM has been incorporated within the IDMS process and whether the incorporation of VM into the IDMS is something that was considered

by the designers of the IDMS process, to assist in enhancing the delivery process of capital infrastructure in the aspiration of delivering value for money.

1.4 Research question

From the above problem, the primary research question is:

To what extent has the IDMS incorporated VM into the design of its process?

Sub-question 1

How is the concept of VM understood by the policy formulators of the IDMS process?

Sub-question 2

How is VM practice incorporated into the public sector project delivery processes under the IDMS?

1.5 Research Aim and Objective

This research is aimed at *exploring the use of VM in public sector project delivery and how VM is embodied within the public sector project processes, for instance, the mandate in policies and legislations.*

The objectives that are necessary to achieve this are:

- Explore the context and role of infrastructure post-1994;
- Understand the intent behind developing a standardised infrastructure delivery management system;
- Review examples of similar standardised processes internationally;
- Explore the evolution and contribution of VM to enhance project outcomes;
- Explore the role of VM within standardised project delivery processes internationally;
- Investigate the relationship between standardised project delivery processes and value management processes;
- To establish the awareness and understanding of VM by policy and legislation makers;
- Explore the relationship between IDMS and Value Management, and;
- To establish if the design of the IDMS accommodates and supports VM applications.

1.6 Assumptions

The study was impacted by the following assumptions:

- It was assumed that VM knowledge as a process is limited within the South African construction industry
- There exists limited knowledge surrounding the VM theme, thus hindering adoption and inclusion in South African legislation (Bowen, Edwards, Cattell, & Jay, 2010).
- The lack of benchmarking of Value Management (VM) activities against international standards and the absence of adherence to standard methodologies in its application are common observations in many contexts (Bowen *et al.*, 2010).
- VM and value for money are recognised in the SA private sector

1.7 Limitations

The study was impacted by the following limitations:

- Only IDMS decision and policymakers involved in the incorporation of the project delivery system approached for study
- The nature of the study targeted policy makers resulting in small response numbers

1.8 Outline of the Study

The research report comprises five chapters which are outlined below:

Chapter 1: Introduction- This section introduces the reader to the theme and topic and contextualises these into the research question which emerged from the contextual background and problem statement.

Chapter 2: Literature review- This section will take on a three-pronged approach. The purpose of the literature review is to discover the global and local literature that exists concerning the theme of the paper and the research question posed. This section will take on a three-pronged approach. Firstly, the section will investigate and unpack, generally, the extent to which VM and IDMS have been written about and discussed to unpack the debates and gaps that exist that need to be bridged. Secondly, literature regarding specific international case studies will be debunked. Discussing and understanding international case studies will reveal to the reader how forward or backward the theme is in the chosen case studies which will allow to bring forth recommendations of lessons that can be learnt from these international examples. Lastly, the section will go on to contextualise the first two parts of this section within the context of South Africa.

Chapter 3: Research methodology- The research methodology section aims to help the reader understand the thought process behind why and how the data was collected. This will allow the reader to determine whether these methods are credible.

Chapter 4: Findings, discussion, and analysis of the results- This section is at the heart of this thesis as it determines whether the research question has been accurately answered or not. This section will assist in contributing to the body of knowledge that exists within the world of academia and will lead into the recommendations section that will follow.

Chapter 5: Conclusion and recommendation- In this chapter, the entire paper will be summarised, and synthesised, and key findings will be highlighted.

2 LITERATURE REVIEW

2.1 Introduction

This chapter aims to gather existing global and local literature that speaks to the topic of this research. The chapter sets the scene and informs the extent to which this theme has been researched and written about by fellow scholars, academics, and institutions.

The chapter seeks to provide an in-depth review of Value Management (VM), theory and practice both internationally and locally; how VM is defined; the similarities and/ or differences between application and implementation based on the regions they are located globally, if any; the critiques and discussions in the literature regarding the response to the application of Value Management in South African built environment context. Furthermore, demonstrates the relationship between VM and infrastructure delivery system through the application of policies, standards and regulations in the public sector.

By the end of this chapter, the reader would have gained a clear and holistic understanding of the extent of literature that exists regarding this theme and this research paper, where the gaps are, and therefore be provided with a more informed understanding of the relevance of this study.

2.2 Theoretical framework

A theoretical framework serves as the blueprint for the study because it helps to guide the theory-thinking and actions taken throughout the research process. A theoretical framework helps in the selection of the study's philosophical foundation as well as a suitable methodological data collection and analysis (Ravitch & Carl, 2016). Therefore, a theoretical framework guides the entire study's research process including defining the problem, literature survey, methodology, and the discussion of the findings plus the conclusions (Adom, Hussein, & Agyem, 2018). The theories constituting this theoretical framework are the goal-setting theory and the Value-Based Management Theory, and they are discussed below as they relate to the context of this study.

2.2.1 Goal-setting theory

The goal-setting theory was formulated as guided by the theory of motivation, specifically the intrinsic motivation dimension that assumes that people have internal drivers that inspire them to behave in certain ways, which include their core values, interests, and personal sense of morality (Deci & Ryan, 2008). Locke and Latham (2002) formulated the theory based on the

proposition that goals affect action, with the main aim being to predict, explain, and influence performance on organisational or work-related tasks. The goal-setting theory consists of principles that support the creation of effective and motivating goals: clarity, challenge, acceptance, feedback, and complexity (*ibid*). Added to the above, commitment is acknowledged as a moderator, especially when faced with challenges during the process of achieving the goal. Moreover, self-efficacy (the belief that one is capable of achieving the goal), enhances goal commitment (*ibid*).

Self-efficacy is enhanced by leaders in an organisation by making way for effective training; being inspirational guiding employees towards finding inspirational leaders who can be role models; and through the use of effective communication meant for motivating the employees (Bandura, 1997; Locke & Latham, 2002). The setting of goals in public sector institutions starts with the leaders developing strategies on how value management can be applied optimally. This will require that there be plans on how employees will be trained so they can be cognizant of the importance of the need for change as well as the importance of the effective implementation of Value Management. A holistic approach must be applied so all officials within public organisations understand that there is a need to add value to the delivery of the services provided. This means that, because employees are drivers of change within an organisation, there must be strategies in place to get to a state where the employees have a value-creation mindset. Overall, goals must be set at all levels within public organisations, which will be guided by the current state and having a vision of what the desired state is.

2.2.2 Values-Based Management Theory

Values-Based Management is not a new management technique or a method, or a new system of control, it is a mental attitude toward the conscious, systematic, and prevalent application of various traditional methods that are directed to maximising shareholder value (Mella & Pellicelli, 2008). As a theory, Value-Based Management argues that human values form the core of managing organisations. Leaders and managers of organisations are responsible for identifying and supporting shared values within and outside the organisation (Beutell, 2018). This means human values are the drivers of the mission, goals, and objectives of organisations while informing leadership, strategy, decision-making, ethics, plus social responsibility (*ibid*). However, leaders find it challenging to implement value management because it demands a particular mindset while it requires that there be a division of the organisation into divisions, necessitating a cross-functional team for effective facilitation (Beck, 2014).

In the public sector, Value Management serves as an alternative to New Public Management theory, which focuses on ensuring that the government is transitioned into a more effective and resourceful institution, while public value management emphasises that public leaders and managers must create value for citizens through their work (Naidoo & Holtzhausen, 2020). This means the focus is on the needs of citizens, to ensure that there is value in the goods and services they receive from the government as individuals and as communities (ibid). Some values are more prevalent in different organisations and an understanding of those values helps in the understanding of “how” and “why” some tasks and processes take place (MacCarthaighn cited in Raleting, 2022). This means that Value Management is addressed and optimised differently for the different government organisations, which highly depends on the values of the leaders and dominating values in general. However, the findings of Raleting and Nzimakwe (2022) indicate that Value Management fails in the public sector because of a lack of knowledge about public service value, value conflicts, and the rewards associated with non-value behaviour.

2.2.3 Value-Based Management

Value-Based Management (VBM) and Value Management (VM) are two complementary concepts that, when implemented together, can significantly enhance an organization's performance and value-creation capabilities. If VBM is implemented separately, it would implicitly align/facilitate the introduction of Value Management.

Ittner & Larcker (2001) concur that VBM with many consistent results in prior research, identifies gaps and inconsistencies, discusses common methodological and econometric problems, and suggests fruitful avenues. The primary goal for VBM is maximizing the value contribution, financial health and success of the company.

On the other hand, VM is regarded as an approach that focuses on maximizing the value derived from resources by optimizing processes, projects, and decision-making frameworks. It is not limited to shareholder value but considers all stakeholders, including customers, employees, and suppliers (Kelly, Male & Graham, 2004). Both concepts complement and enhance each other and focus on value creation.

2.2.4 Merging the theories

The goal-setting theory explains that organisations must set goals when it comes to providing value and the Value-Management theory states that people’s values influence the values of

organisations. Public institutions are concerned with providing services of optimal quality, however, the leaders plus employees are significant contributors. This is why it is important to set goals concerning adopting a value-based mindset in the public sector and ensuring every official is cognizant of the importance of prioritising adding value to service delivery and meeting the needs of citizens.

2.3 Defining Value Management

It is imperative, as a point of departure, to explore the different definitions that exist for Value Management (VM). This exercise will reveal the extent of global and local consensus and discrepancies that currently exist in academic literature.

Various definitions of VM and Value engineering exist in the world, and each country has a different understanding, some of which are shared in Table 2.1. Before exploring these definitions, it is important to note that different regions use different terms for VM, however, the descriptions and definitions of these terms often coincide.

Table 2.1: Definitions of Value Management

DEFINITIONS VALUE OF MANAGEMENT		
1	VM is an effective method for design management and can reduce unnecessary life cycle costs and capital before the commencement of the project.	Kelly, Male & Graham (2004),
2	Is a cost-cutting exercise and can enhance the value of the project and while this process has the capability of removing unnecessary costs which is often a by-product of the VM process, this should not compromise the quality	Al-Saleh & Taleb (2015)
3	VM intends to improve the ratio between benefits and costs and also concentrate on eliminating unnecessary costs from the project or asset, or systems, components or processes associated with it	Royal Institution of Chartered Surveyors (RICS) (2017)
4	VM intends to improve its value by providing solutions/alternatives to optimize project functions and costs without compromising quality and performance through multidisciplinary team exercises	Gunarathne, Zainudeen, Parera, & Parera (2020)
5	VM as a technique/process whose main focus is to describe, maximise, and achieve 'value for money (CIOB, 2021)	The Designing Building

All the above-mentioned authors concur that VM is a useful tool that enhances value and assists in the costs or budget and schedule challenges. Overall, VM encompasses various performance measures which are implemented by an organisation's strategic management, as informed by reliable information (Beck, 2014). This means that it encompasses implementing a comprehensive VM system comprising strategic planning, where there will be an establishment of value drivers, and financial measures while analysing internal and external factors (ibid).

Furthermore, in embracing VM as a revolving approach it applies to all types of projects irrespective of which sector they come from. Similarly, VM is not about omitting items on the scope or reducing the specification below the level of performance but is about removing unnecessary costs from a project, to give the client the best value.

Therefore, from the above-stated definitions, and for this study, the adopted definition of VM, is a way to elevate the value of products and services and might be argued as vital in any objectives. Also, adopt the fit-for-use approach to materials and specification options in construction. Furthermore, this study will adopt VM as a tool to assist capital infrastructure projects in reducing unnecessary costs without compromising the quality of the product. When VBM is already in place, VM becomes a natural extension, as both frameworks aim to optimize outcomes based on value considerations. The metrics and analytical tools used in VBM can be seamlessly integrated into VM processes to ensure that decisions are aligned with the overarching goal of maximizing value.

2.4 Value Management: An International Perspective

Specialists in the industry tend to use Value Management (VM), Value Engineering (VE) and Value Analysis (VA) interchangeably, even though there is a clear distinction between all three terms (RICS, 2017).

The VM concept is increasingly used by the construction industry as a category to delineate the entire process of enhancing a project's value from concept to service" (Male, Kelly, Fernie, Gronqvist, & Bowles, 1998). In addition, VM has been described as a systematic approach that involves the identification of the required functions and the selection of alternatives that maximize the achievement of the functions and performance at reduced costs (Olanrewaju, 2013). Adoption of VM requires alignment with the broader goals and values of the organisation and its stakeholders.

With that said, the numerous definitions mentioned above of VM, there is a commonality that the existence and adoption, enhances and maximises the achievement of the required functions and performance at the lowest costs. VM as a systematic approach provides a structured and consistent approach to do this and can adapt to any environment when applied correctly.

Hunter & Kelly (2003) concur with Fong & Shen (1999) that, “VM can be viewed differently depending on whether it is project-based or can be used to review as a continuous operation.” Concerning continuous operation, VM depends on continuous performance assessment to ensure that projects and processes deliver maximum value. This includes the use of Key Performance Indicators (KPIs) that measure value-related outcomes.

Bone & Law (2000) cited by Hunter, *et al.* (2003) that, “VM is a formal method for evaluating any product, process, project, or service, and it can be used on an ongoing basis”. This, thus, indicates that VM is a tool that can be applied from the inception of the project, used as a measuring stick for processes and services offered to offer *Best Value*.

Since VM as a tool can be implemented in any industry can elevate the value of products and services and is vital in any objectives. It adopts the fit-for-use approach, so internationally, the construction industry has followed suit in terms of adopting the cost-effective, risk management and non-quality compromise process. Ranesh, Bushell, and Chileshe (2012) state that, VM has been successful in facilitating the delivery of projects as best practices. Then, it is fitting that VM in the US was used widely from the 1950s, but it took more than three decades for Europe to start applying it, and it was only, in 1983 that the UK had its first application (Akram *et al.*, 2018). As the years proceeded, many more countries adopted VM in various industrial sectors of their economies. A couple of decades later, VM was adopted within the construction industry. Scholars and VM practitioners alike advocated for the usage of VM as an application for value delivery and ‘*Best Value*’ in many countries' construction industries.

Presently, VM application is a recognised, well-known practice that is utilised in the United States of America (USA), the United Kingdom (UK), China, Canada, as well as Australia. Within the African continent though Nigeria is recognised as applying it consistently (Oke & Ogunsemi, 2009) with the country incorporating the VM application since the 1990s through workshops and other methods (*ibid*). The adoption of VM in South Africa (SA) on the other hand, seems to be moving at a rather sluggish pace (*ibid*).

International studies indicate that for VM to be successful, it should be paired with the country's infrastructure delivery system to produce successful results. Furthermore, recent VM studies in developed countries mentioned above, indicate that best practice for an infrastructure delivery system involves understanding and managing the inherent complexities of the system about adoption and standardising. Malete and Khatleli, (2019) also concur that an effective infrastructure delivery system paired with policies for infrastructure planning, procurement and delivery, to standardize requirements across the public sector is an attempt to address the infrastructure delivery challenges.

The above can be effective if the professionals in South Africa are more accepting of the VM concept. Othman, Kineber, Oke, Zayed, and Buniya (2020) concur that VM is seldom used and less common in South Africa. It was no surprise that during the investigation of this research, it became apparent that many construction professionals in South Africa are uncertain about the VM concept, whereas increasingly there is enquiring and demand by private clients that VM be used during the key stages of their construction projects. From the research perspective, even though it seems like previous studies were conducted in South Africa about VM in construction.

In other countries, there is a buy-in from different stakeholders regarding the use of VM, especially between the government and the private sector through Private Public Partnerships (PPP) which has proven to yield success in the initiative (Hai, Toan, & Van Tam, 2021). Unfortunately, that is not the case in SA because the benefits of the application of VM have not been completely realised regarding the value it adds to services rendered to clients (Othman, Kineber, Oke, Zayed, & Buniya, 2020).

VM has been demonstrated as a systematic approach application to assist infrastructure projects in reducing unnecessary costs and enhancing the value of projects. The incorporation of VM in the South African construction industry or public sector projects has the potential to boost the value of a construction project and to produce the “Best Value”; not necessarily by cutting costs but by conducting a pre-feasibility and viability of the project. But for that to happen, international practice suggests that it needs to be introduced systematically and that the best results are achieved through integration with a country's delivery management system. The introduction of IDMS within South Africa is intended to address the infrastructure delivery challenges. IDMS equipped with standards and policies for infrastructure delivery. Introducing the infrastructure delivery system in the public sector should ensure effective management of

project complexity directly impacting project performance, in a context where failure in infrastructure projects often stems from a lack of understanding of the delivery process as a complex venture (Malete & Khatleli, 2019).

Although often treated and used synonymously, VE and VA are a subset of the generic approach of VM. In this study, VM is used as an umbrella term that encompasses all value methodologies, including VE and VA. Male *et. al.* (1998) state that, a VM is described as a constructive, innovative, problem-solving, or problem-seeking service that manages a project's creation from concept to use to maximize its functional value. This method employs formal, team-oriented exercises to create and evaluate existing or created solutions to a problem in relation to the client's value requirements (Ayodeji & Aigbavboa, 2017).

With these worldwide and rapid advancements, the application of VM in construction has matured internationally and a variety of planning applications have been introduced within the application unlike in SA, public sectors in many parts of the globe have since managed to catch onto this wave where Western countries like the USA, UK, France, and Germany seem to be leading the pack.

Within those countries where VM has been adopted, the private and public sectors seem to be driving the application, which is indicative of the benefits of the VM process. Within the African diaspora, however, according to Oke, Ogunsemi, & Adeeko (2013), “VM was introduced in Nigeria in the 1990s through workshops, seminars, and conferences organised by stakeholders in manufacturing, production, and the construction industry”.

This indicates that partnerships, stakeholders, professionals, and public office seem to have a common goal of introducing and implementing VM. Furthermore, the Accelerated Change Accelerate change report (2014) published by the UK Strategic Forum Construction mentions that “the partnership between government and the private sector involvement is key in making VM a success. The report also mentioned that VM is embedded within the standards and legislation of the construction industry.

Involvement and adoption of VM by the public sector, coupled with buy-in in terms of mandating and legislating by different stakeholders, especially the government, yields success of the initiative. Research indicates that the incorporation of VM within the procurement process or planning phase especially for mega projects yields beneficial results; for example, Lian *et al.* (2010) observe that “in Australia, a recent benchmarking study into alliancing in the

public sector, recommends that state treasuries collaborate to develop a comprehensive procurement selection guide”.

Research also indicates that utilising VM will assist in benchmarking as a process of measuring the output of the companies or consultants on the service or product output. Kelly, Steven, and Graham (2004) cite that this benchmarking will enable the consultants and designers to accept and understand the output and requirements of the client. Furthermore, Olanrewaju (2013) mentions that “if clients value system is not made explicit, consultants and designers merely focus on requirements that were not intended by a client”.

Mandating and implementing VM allows benchmarking within the planning phase and eliminates the gap of scope creep, which is the culprit of cost overruns, but VM addresses more factors, and according to Saifulnizam & Coffey (2010) who cited Kelly *et al.* (2004) that “VM aims at improving the client value system in projects, products processes and systems”. This also includes focusing on design issues that relate to cost improvement. In addition to this, VM is a sustainability application that maximises the functions and lifespan of development and should be mandated and legislated within existing policies.

It has also been recognised that “there has been the minimal application of VM to public-sector initiatives, which provides an opportunity for further investigation at a later stage, in conjunction with the introduction of Scottish *Best Value* legislation” (Hunter & Kelly, 2004). Furthermore, they mention that a “review application was constructed and named the *Three wheels of Best Value*. The tool is used by a task team involved within the VM process and application for evaluating all possible service procurement choices and selecting the *Best Value* choice” (Hunter & Kelly, 2004).

Their research went on to argue that “VM has attained a certain degree where the style and content of the various workshops are predictable within manufacturing and construction, their advanced research investigates and makes an argument for the introduction of VM to the UK public service sector” (Hunter & Kelly, 2002). Further cited Ancaroni & Capaldo (2001), and Navaratnam & Harris (1995); that “there is enough interest on public service sector to demonstrate the VM worth to society and the research has encouraged the research question: Can VM techniques deliver ‘*Best Value*’ in a public sector project delivery environment?” (Hunter & Kelly, 2004)

The *Best Value* concept was first introduced in 1997 where the goal and objective were to improve service quality. Higgins *et al.* (2004) through their research “identified key principles of *Best Value* which include accountability, transparency, continuous improvement, and ownership”. They go on to further elaborate that *Best Value* promotes responsibility and accountability and thus ensures that simple and robust information is used to demonstrate performance. Also, transparency requires decisions taken by the public office to be open and transparent, with evidence of clear interpretation (Paul, Rob, Keith, Hunter, & Kelly, 2007).

Overall, VM is an application used for providing the basis for decision-making and its implementation requires commitments for the desired outcome to be achieved. Importantly, for global organisations, the implementation of VM requires that the final component be linked to multi-period individual and company performance commitments (van Wyk & Smith, 2008). The success of the implementation of VM depends on the training of top management of organisations in system principles as well as the logic of critical metrics (*ibid*).

2.5 Value Management in South Africa

In the 2019 National Budget speech, the former Minister of Finance, Tito Mboweni, stated “the challenges faced in the delivery and implementation of public infrastructure projects” and highlighted that a need exists for a shift in policy and direction in the delivery of infrastructure. The focus should be directed toward strengthening public project preparation to which he allocated R625 million (National Treasury, 2019).

With that said, preliminary research indicates that South African professionals are not actively using VM as a cost overrun, coordination application. According to Sigle *et al.* (1999), SA first saw its introduction to VM in the late 1960s by Union Carbide. An engineer named Van Heerden was part of the Union Carbide Group after studying further in the USA, he realised the potential of the process and, established his own VM enterprise in SA: the Value Engineering Management Society of South Africa (VEMSSA) which was founded in 1997. Even with this introduction 25 years prior, there seems to still be a reluctance to fully incorporate the VM initiative in SA and where it has been, the adoption of this application is rather slow. Only certain components of VM applications are being applied but not the total prescribed application. Saifulnizam & Coffey (2010) cited Jaaper *et al.* (2009), that “in Malaysia, some clients’ organisations have been applying certain aspects of the VM methodology and concepts in their project planning and had unsuccessful outcomes.” Desktop research also indicates that the adoption of VM should be embraced holistically and not the

selection of the components, unsuccessful outcomes are expected, and this should be a learning lesson in the South African context.

Van Staden (1998) identified that “in South Africa, the established organisation introduced several accredited VM courses and programmes, which included passing of an examination, facilitation of workshops, etc. these training included forty-hour programme”. Since its introduction in 1968, there seems to be a gap where there was inactivity and VM was not practiced in SA until the 1980’s. The above initiative seemed like a step in the right direction, for the introduction of a compact national standard/training/certification manual will no doubt promote the implementation of value management in the construction industry” (Van Staden, 1998)

Following that VM Services (Pty) Ltd was established for South African professionals and uses VM as a progressive method aims to simplify decision making” (Van Staden, 1998). This is a company that facilitates training and offers consulting of Value Engineering or VM methodologies in collaboration with clients who have engineered new thought processes and business practices companies of all sizes in the following countries: Emirates, Japan, France, Australia, Botswana, Kenya, Zambia, Zimbabwe, Mozambique, Mauritius, and South Africa (VMServices, 2024). The outcome has been a major shift in strategy which resulted in “significant impacts on profits, new development strategies, the planning and implementation of large projects, technological breakthroughs and significant organisational changes” (*ibid*).

Coetzee (2009) is also of the view that “VM has been practised for many decades already, yet in SA mostly built environment professionals are only vaguely familiar with VM” and that there is limited evidence and research that VM is appropriately utilised. He further goes on to describe the types of projects that VM can be implemented:

- Project budget
- Complexity of projects
- Similar projects
- Newly adopted technology elements and few precedents,
- Restricted budgets within projects
- Projects with tight design timelines with high visibility projects

Within the South African context, the CIDB has adopted the Infrastructure Gateway System. This initiative focuses on the stages to be accounted for planning, implementation maintenance and operation activities. Several resources are available for professionals in the industry published by the CIDB some are the Practice Guides.

According to the Delivery Management Guidelines: Practice Guide 2, published by the (CIDB, 2011), it is stated that this IDMS application is designed around sets of control points located within an infrastructure asset management cycle and are strategic, like the pre-construction and post-construction stages and has the potential to:

- Improvement in the position of service delivery with available funds
- Appropriately scoped and entirely cost at an early stage in the asset life cycle
- Reduction of cost and overrun time
- Improve procurement discipline, especially for appointed consultants
- Better aligned the project with policy objectives
- Risks are managed more effectively
- Enforcement of responsibility and accountability for decisions to both appointed consultants and public servants; and

South Africa has introduced several initiatives concerning infrastructure industry enhancement in terms of planning, procurement, and management of infrastructure delivery at the provincial level. This initiative is aligned with the promotion of service delivery in effective ways.

The South African National Treasury designed an “Infrastructure Delivery Improvement Programme” (IDIP) in collaboration with these government departments and SOEs like the Health and Public Works Gauteng Departments of Basic Education, the Development Bank of Southern Africa (DBSA) and the CIDB (Provincial Budgets and Expenditure Review Report, 2017).

This IDIP focuses on the different government funding mechanisms focuses on the infrastructure, including schools, housing healthcare facilities, and roads, and invests in them to provide citizens with access to services and to promote social wellbeing” (Provincial Budgets and Expenditure Review Report, 2017). The aim is to deliver infrastructure while also transferring skills of management and monitoring of these projects.

The CIDB has established several practice notes concerning infrastructure delivery and indicates that the objectives include ‘value for money’ but does not introduce the VM application during the design phase. Between the design team, client, and contractor, VM practices are not clearly stated. CIDB practice guidelines furthermore discuss the *Best Value* system that should be applied within the procurement system. This is indicative in the structures that VM is not further understood but the packaging of the application.

As previously mentioned by Simango (2017) the then Minister Jeff Radebe stated “that the current construction processes have failed dismally (DPW), 1998). The observation by the minister was growing dissatisfaction among clients in South Africa; both in the private and public sectors expressing the opinion that construction projects were unpredictable. Minister Radebe went as far as commenting that it was widely believed that projects in the construction sector do not provide the *Best Value* for clients on most occasions.

Even though VM has been in existence for many decades and has continued to prove its usefulness and effectiveness as a tool to reduce the redundant costs of a project, it remains a vague concept in the SA construction industry. Bowen *et al.* (2010) mention that “while VM, and more particularly its Value Engineering (VE) antecedent, is generally known among professionals in the private sector within SA, it is less widely practised”. VM is seen predominantly utilised as a cost reduction tool. Less emphasis is given to the problem identified since there is insufficient understanding and awareness about VM in the SA construction industry. Whyte & Cammarano (2012) echo this and state that the “lack of knowledge and experience is believed to be the main reason any matter knowing that professional knowledge is the key element to perform the management tasks.”

If the case above is true, then it should not be that the South African public sector continues to lag when it comes to incorporating the concept of VM into the construction industry. It is for this reason those other countries continue to reap the successes that emerge from VM, particularly in the context of PPP. Cowan and Thomas (1992) advocate for partnerships such as the PPP as a cooperative approach to project management and delivery to reduce costs and risk reduction in projects. Furthermore, they go on to mention that such partnerships, particularly in the Portland District in the USA, have been used as an application to the process on a variety of projects which resulted in 80 – 100% reductions in cost growth over major contracts, time growth in schedules virtually eliminated, project goals met and exceeded, and completion of projects with no outstanding financial claims.

In the South African public sector, VM might not be known and identified and might not be recognised or prioritised as an effective application that can decrease or eliminate unnecessary costs and life-cycle costs and boost the merit of a project. Therefore, this matter of public and private sector creates a huge difference in the practice of VM in construction projects in South Africa and that difference needs to be bridged to have successful delivery of projects. In a study where participants were public service senior managers, the results show that government institutions need to significantly improve their public value by focusing on relational governance (Pooe & Munyany, 2022). This means that government institutions must deliver superior public value and they need to focus mainly on the management of their relational governance. Added to the above, government institutions must develop information sharing, process innovation, plus stakeholder engagement (*ibid*).

The incorporation of VM within the policies and legislations will set the infrastructure project delivery for successful implementation and result in additional benefits beyond design and cost savings. Therefore, this study investigates the explanations for excluding the VM process in the IDMS system and the potential for integration and the benefits as well as to understand the benefits and how it can be implemented in the delivery process of construction projects.

2.6 Standardization of Value Management Practices

Standardization for the infrastructure delivery process seems like a key application for VM implementation and international countries are succeeding in using this technique. Thiry (2000) citing Chan, Ibrahim, & Ghafar (2023) underscored that the VM process will benefit from sensemaking and its influence on participants' readiness to accept or decline a change process. The research highlights that this transition is imperative for VM implementation and the intent of VM workshops and affiliated research necessitate re-evaluation when incorporating sensemaking.

2.6.1 Defining standardizing

It is imperative, as a point of departure, to explore the diverse definitions that exist for standardizing. This exercise will reveal the extent of global and local consensus and discrepancies that currently exist in academic literature.

Some definitions take on a rather technical approach, where standards are used in various fields to ensure consistency, interoperability, quality, safety, and efficiency. Here are some ways in which standards are commonly utilized: Interoperability: quality assurance, safety, regulatory

compliance, efficiency and cost reduction, international trade, benchmarking, and comparison consumer confidence. However, for this argument, various definitions will be explored and synthesised as this will inform the chapters that will follow. Before exploring these definitions, it is important to note that different regions use different terms for standardizing, however, the descriptions and definitions of these terms often coincide.

The first definition is from Yang, Gao, and Zhou (2023) where they refer to standardizing as a process of developing and implementing standards for products, processes, or services to ensure consistency, quality, safety, and interoperability. Furthermore, underlined that it involves setting national and international standards in various fields in support of development, enhancing competitiveness, and improving cooperation with foreign standard developers.

Baron and Larouche (2023) defined standardising as a process of creating, implementing, and maintaining standards within a specific industry or field. In the context provided, standardization is discussed in relation to the development of common specifications and technical norms within the European Standardisation System. It involves establishing guidelines, rules, or criteria that products, processes, or services must meet to ensure consistency, quality, safety, and interoperability.

The third definition is Hrymak (2023) who regards standardising as a preventive approach to monitor and enforce at a national level by the public with enterprises. This is done through identification, evaluation, controlled and specifically detailed resulting risk assessments and implement.

Lastly, Klungseth, Nielsen, Alves da Graça, and Lavy (2023) defined standards as relevant to research by defining terms, creating backgrounds, guiding research, supporting the development of new standards and encouraging more collaboration between research and standardization. Some studies have shown how standards influence research, but only a few have explored how research influences standards.

From the above four definitions, it can be deduced that Standards are used in various fields to ensure consistency, interoperability, quality, safety, and efficiency. The different terms used for standards are utilised in different contexts and industries but for this research, standards will be defined as national or international standards that are enforced, evaluated, controlled,

and specifically detailed in resulting risk assessments and implemented by government authorities.

2.6.2 Standardizing; An international perspective

Each industry is governed by guidelines, standards, policies, and regulations. Standards are initiated by the public sector to enforce, evaluate, control and specifically detail in resulting risk assessments and implementation. One factor that has been observed is that the adoption of standards, policies and regulations are formulated to create structure and accountability. Lack of adoption of standards, policies and regulations can indeed hinder the growth of organizations from optimizing their processes and operations effectively. Examples include the Australian Value Standard AS 4183-2007 (Standards Australia, 2007), the British/European VM Value Standard BS/EN 12973:2000 (British Standards Institution, 2000), and the SAVE International Value Standard (SAVE International, 2007).

Internationally countries have regulations, including regulating VM and standardising the use of different international standards, such as ISO 9001 (Quality Management Systems) and ISO 10006 (Guidelines for Quality Management in Projects), that provide frameworks and best practices for enhancing value delivery and improving organizational performance. To address the issue of standards, Yang *et. al*, (2023) argue that implementing standardization in China is primarily the responsibility of the government.

Besides, culture has a significant influence over the inter-collaboration of the involved organizations. Organizational characteristics can be categorized into policies and statutes, management's direction, organizational structure, and culture will impact the efficiency of the inter-organizational partnership; notably in a VM team comprised of various disciplines and organizations (Kozuch & Sienkiewicz-Małyjurek, 2016). VM adoption has been classified as an organisational culture and can influence the stakeholders whether in the private or public sector. Baron and Larouche (2023) also echoed that standardising can involve different stakeholders, such as industry representatives, government bodies, and technical experts, working together to develop these standards to attain a common goal.

It can be deduced that the adoption of different regulations plays a significant role in providing a legal framework for standardization in Europe (Baron & Larouche, 2023). The regulation incorporates principles from laws and emphasizes stakeholder participation, including SMEs

and societal stakeholders like consumers, the environment, and labour organizations with a common goal.

Standardising is an organisational culture that requires a slow introduction with the stakeholders, and it is impossible to expect the change over-night. Adopting standards and best practices, proper training and education for construction professionals, and developing effective metrics and methods for measuring and demonstrating the benefits of value management can also bring significant improvements in the industry through the process of introducing policies and regulations (Jiya, Ogunleye, Onuzulike, Akande, & Tiza, 2023). It requires the application to be consistent to achieve the expected outcomes.

Jiya *et. al.* (2023) conducted a study in the Nigerian construction industry underlining that VM has not been widely used in Nigeria's construction industry, despite its potential advantages. The absence of regulation and standards for value management procedures is one of the key causes of this. Furthermore, elaborates that, the adoption of industry standards and best practices for value management is among the most promising. As a result, the application of VM consistently and transparently will raise the calibre of construction projects.

It is important to note that the adoption of regulation and standards requires out-of-the-box thinking e.g.. embracing technology. Baron and Larouche (2023) echo that the role of standardization in constructing technological solutions becomes more important. Jiya *et. al.* (2023) additionally commented, that by offering more precise and effective techniques for recognizing and delivering value, advancements in technology and data analytics can help support VM. The increased integration of VM with other project management procedures is a significant future development.

Organisations must know that changing and standardizing require patience and willingness to change the perceptions; and increase participation and contributions before total embracing is achieved. Chan *et. al.* (2023) witnessed this while conducting a study on Malaysian construction projects, and further mentioned that achieving the VM workshop dynamics with certain standardization, such as VM workshop would help the stakeholders to achieve the optimum value for their respective projects. Shah and Tirumala (2022) cited a study that was conducted in India on the National Infrastructure Pipeline (NIP) development which is seen as a foundation for achieving India's economic goal of becoming a 5 trillion economy by 2024-2025.

They further state that that, the India public sector managed to set the strategic direction and long-term goals for infrastructure development (*Ibid.*). The direction involves identifying key priorities, such as transportation, energy, water, and digital infrastructure, based on national development objectives, economic growth targets, and social welfare considerations. The public sector increasingly acts as a facilitator to attract private investment and expertise. Furthermore, these national policies have assisted in terms of participation from the private sector, there has been a paradigm shift in the role and outlook of various stakeholders. This involves creating an enabling environment for private sector participation through regulatory reforms, public-private partnerships (PPPs), and investment incentives. The India case can thus be regarded as an example of best practice through successful compliance with recognized standards enhanced trust and confidence among stakeholders, including customers, partners, investors, and regulatory agencies.

A comparative research study conducted in China focusing on the effectiveness of Public Private Partnership (PPP) that emphasizes the legal framework, and standardized procurement guidelines that enhance transparency and accountability. The research recommended valuable insights and guidance for informed decision-making and policy development, contributing to the successful implementation of PPP initiatives and the sustainable development of infrastructure in the country.

The government's role in standardization can be multifaceted and can evolve (Baron & Larouche, 2023) . In the context provided, the Chinese government has been observed to play various roles in standardization processes. These roles include founder, risk undertaker, interest moderator, collaboration facilitator, and process monitor. At different stages and contexts, the government's role has shifted from being an implementer to a facilitator and guider of standardization efforts.

In summary, the objective of standardizing VM is to develop an organizational culture model for key stakeholders involved in the VM process to achieve optimum value in Malaysian construction projects. Furthermore, apart from recognizing the need for the involvement of stakeholders to achieve optimum value for projects, this study proposes to researchers to study how their participation in the current VM process would affect the value outcomes (Chan, Ibrahim, & Ghafar, 2023).

Lastly, Yang, *et. al*, (2023) emphasised that the Chinese government has been actively involved in standardizing processes through various policies and strategies to advance technology and counter international competition. Further elaborates that, the government is the sole provider of national standards and is responsible for investing in standardization, establishing standard-setting organizations, training standardization personnel, and promoting standards.

The intent of having policies and standards is an interpret the values of society, the aim is to promote excellence, innovation, safety, and efficiency across various domains, ultimately contributing to sustainable economic growth, societal well-being, and environmental stewardship.

2.6.3 Infrastructure Delivery Systems

In 2021, the UK government instituted the National Infrastructure Planning Reform Programme for the planning and delivery of infrastructure (DLUHC, 2021a) policy. The said policy aims to promote best practices in the review of National Policy Statements providing recommendations and standards to ensure that the review process adheres to recognized industry standards and follows established procedures for policy development and review.

The establishment of these mechanisms is for regular review and evaluation of the effectiveness and impact of integrated decision-making approaches. This includes assessing the alignment of projects with mission objectives, the achievement of 'capital' development targets, and the overall contribution to broader government priorities. Clifford and Morphet (2023) are also in agreement that, infrastructure delivery is driven by government agencies, and with involvement by the private sector. Positive results are yielded with the involvement of multiple stakeholders. Furthermore, the UK policy aims to promote consistency in the application, promote fairness, and enhance transparency that is beneficial to all stakeholders involved in the process of infrastructure delivery (*ibid*).

With this available mechanism Department for Levelling Up Housing and Communities (DLUHC), the UK introduced the Nationally Significant Infrastructure Planning (NSIP) system is the process by which local people are consulted and development receives consent, ensuring infrastructure is delivered in ways which contribute to our ambitions for levelling up and to enhance and protect the environment (DLUHC, 2022). This was established under the UK Planning Act 2008, which aims to simplify and expedite the delivery process of the major project.

One factor that has been observed in the literature regarding the infrastructure delivery systems in the UK, was multiple policies need to work together to achieve positive results. Best practices are observed and refined to better suit the environment which has evolved over the years, infrastructure delivery cannot handle the quick-fix approach. The initial aim of the policies and regulations is to offer a standardized infrastructure delivery system with fairness, transparency, and a balanced review of national policies, benefiting all stakeholders involved in the process. Evidently, by implementing these measures, governments can strengthen the integration of missions, 'capitals', and infrastructure projects in decision-making processes, leading to more coherent, effective, and sustainable policy outcomes.

The above concept has been adopted by the USA (Leccis, 2015), where several funding mechanisms have been used to fund the infrastructure delivery system. This system is utilised specifically for transportation infrastructure like highways. Furthermore, the infrastructure projects are funded through a combination of federal, state, and local government budgets.

In summary, various systems exist within various countries to regulate, simplify and expedite the infrastructure delivery process. For the success of the infrastructure delivery system, regulations and policies are also adopted to simplify the process. These systems ensure the efficient and effective delivery of infrastructure projects that meet the needs of its population and economy.

2.6.4 Standardizing in South African Context

The bibliometric analysis shows that there is an inadequate study on VM implementation barriers and insufficient studies on implementing VM in developing countries (Kineber, Othman, Oke, Chileshe, & Zayed, 2023). The South African construction sector has faced various challenges that hindered the adoption of VM, such as non-standardization, insufficient regulations, and low stakeholder engagement. PICC (2012) identified infrastructure as being the first job driver, laying the basis for higher growth, inclusivity, and job creation. In response to the continued decline of employment, the Government of the Republic of South Africa has taken a bold decision to pledge recurrent spending driven by accelerated infrastructure investment.

An efficient infrastructure delivery system is required. PICC (2012) further mentioned that the aim for accelerating infrastructure delivery is to strike a fine balance between protecting our sovereign integrity and leveraging the multiplier impact of fixed capital formation.

Infrastructure investment is a key priority for both the National Development Plan and the New Growth Path. This statement reinforces the importance of infrastructure delivery playing a vital role in SA including curbing unemployment. For the infrastructure delivery, investment is required in terms of having a standardized infrastructure delivery system to assist hence the introductions of IDMS, Value Management, quality assurance tools etc.

Unfortunately, the infrastructure delivery processes are hampered by challenges and barriers to the implementation of value management in the Nigerian construction industry, such as lack of standardization and lack of expertise Jiya *et. al*, (2023) similar challenges as in South Africa. Bowen, Edwards, Cattell, and Jay (2010) underscored that the VM awareness among South African engineers is prevalent but the actual application in the industry is relatively limited. Bowen *et al*. (2010) also highlighted that VM activities have yet to be benchmarked against international standards - and existing standard methodology. Therefore, evidently VM process will be improved when it is benchmarked against international standards with a project direction derived at the early stage through effective communication between the project stakeholders, i.e. public sector.

The above literature review regarding the VM process is likely to improve the organizational culture of key stakeholders involved in the VM process and the subsequent proposed conceptual framework and the public sector has shown continued interest in moderating and facilitating collaborations for standardization alliances or associations as other roles have weakened. The public sector has used a mix of different policy tools to support specific objectives in standardization, emphasizing tools such as "technology and organization" and "goal planning" while reducing the use of tools like "government subsidy" and "regulation control" over time (Baron & Larouche, 2023)

Various stakeholders' involvement in the VM process will determine the success of the VM outcomes. To comprehend the success of the VM process or to determine whether the optimum values have been achieved through the VM process, the following section will examine the definition of optimum value or VM success. As previously alluded to in South Africa, VM is known but is not widely implemented and there is limited understanding of the factors impacting its implementation. This includes the adoption of policies, regulations standards etc. Adopting best practices and industry standards can also assist the public sector in opening new markets, technologies, and working methods.

In summary, in embracing change revolving with time and keeping up with international standards, our public sector will have to adapt to VM policies, legislations, and regulations by also adopting and standardizing. Furthermore, Chan *et. al.* (2023) elaborated that VM does not only focus on cost savings but contributes to value creation from VM methodologies. Also, VM emphasis is on achieving a shared understanding of the value criteria of individual projects.

2.6.5 Infrastructure Delivery Post 1994 and the need for the IDMS

For many years, since 1994, the South African government has been organizing and constructing infrastructure across all branches of the government. Since then, significant progress has been made to expand the availability of general services to a historically underserved population. While the enhanced provision over the past 30 years is commended the provision of social infrastructure remains slow and is mostly the cause of ongoing service provision demonstrations across the country (Malete & Khatleli, 2019). Further elaborated that, the above circumstance birthed the implementation of IDMS to address the delivery of infrastructure a model that forms the backbone of delivery of the public sector.

The IDMS the forefront of the infrastructure delivery benchmark and it intends to have a standardized infrastructure delivery system, and it is a starting point in the application of VM. International literature mentioned that adoption requires assistance and direction from specialists with relevant knowledge and active participation in the activities. Similar to the IDMS objective is to not only concentrate at getting the value in terms of cost saving but by the impact created around and during the implementation of the project.

Therefore, the inclusion of VM with the standards, regulations and policies could provide a lot of benefits which over weigh the negatives. The negatives include inconsistency of delivery and quality, higher project costs and inefficiency to name a few. The positives outweigh the negatives and indicate the international studies with successful case studies and that should be enough to advocate for the inclusion. The main challenges discussed in VM are lack of research and implementation, lack of adoption of international standards and best practices, lack of training and education for construction professionals, and limited use of technology and data analytics to support value management. The starting point is addressing the challenges to effectively implement, monitor, facilitate and enforce to ensure adequate performance.

Based on the above literature review, this section of the study has established that standardization is a process driven by the government with support from key stakeholders. The

purpose of government is to implement general procedural and institutional principles for the development of certain standards and ensure participation and adherence. The role of government is ever-changing and revolves as time continues, starting as implementor and going forward to monitor, facilitate and enforce to ensure adequate performance.

The role of standardizing will result in VM being applied consistently and transparently, which will raise the calibre of construction projects. However, that requires the advancement in project management, and technology for adoption in the developing future to support the implementation.

2.7 Infrastructure Delivery Management System

Introduced in 2012, the IDMS was intended to facilitate the “effective delivery of infrastructure; it encompasses the planning, procurement and recognises “Best Practices”. This application is directed to managers for effective delivery” (Treasury, 2012). IDMS consists of gateways to be signed off after the completion of milestones. Deliverables are clearly stated, and approval is required for the project to move to the following stage. The primary aim of IDMS is to provide managers with tools to monitor and deliver value for money, as well as provide reliable and efficient projects. The delivered infrastructure should be affordable, considering life-cycle costs and, as far as possible, be delivered within a controlled budget.

As cited by Fong and Shen (1999) “application of VM was originally used by for cost reduction by technicians but has developed to integrate with more abstract entities such as organisations, lines of management, processes, and controls; and that VM is not limited to technical fields but found in other places in management activities”. Furthermore, they elaborate that “if VM is implemented or rather adopted as a methodology can contribution towards a better solution to the challenges in the construction industry”. In other words, IDMS and VM both encompass similar values, objectives and aims which are cost reduction by reducing, value for money, dropping unwarranted costs and improving the necessary performance.

Best Value can be achieved by combining VM and IDMS. IDMS has been proven to be successful in terms of applications and gatekeeping the quality of work submitted to government departments. Hunter and Kelly (2004) produced “ten relevant study elements ranging from a literature review to government regulations on VM in the public sector that has had an effect and one of them is the implementation of VM was made possible by government *Best Value* Legislation, which highlighted similar principles and goals for achieving optimal

value for the consumer. Therefore, the above exercise can be conducted to outline and identify similar principles and objectives between VM and IDMS. Of course, VM will have to be customised to suit the public sector but not change the fundamentals of the application.

2.8 Challenges

The introduction of public-private partners (PPP), for the benefit of applying the VM application, represents a step in a positive direction as it shapes rapport before the actual project or selection of procurement strategies are selected. PPP is the collaboration between the public sector and private sector designed to finance, build and operate projects that offer public service infrastructure (Jayasena, Chan, Kumaraswamy, & Saka, 2023).

Burger & Hawkesworth (2011) mention that “best value should be the driving force to address traditional infrastructure public procurement. Furthermore, they mention that PPP is increasingly being utilised to address the value for money, however, the practising of best value is often blurred, and the choice between using a PPP and traditional infrastructure procurement may be skewed by factors other than value-for-money”.

The VM application process includes teams’ workshops to emphasize the project objectives to maintain focus, improve costs, safety growth, and improve the project schedule; however, these cannot be fulfilled without challenges and external influence. The selection of correct procurement strategies by governments should be preferred as the method, that would create the most value for money. However, in practice, selecting an appropriate strategy might be a challenge and the choice is not always as simple because transparency is the first challenge, which creates a stumbling block for the next phases.

2.9 Proposed solutions

Several techniques have been developed by the South African government to address the issue of value-for-money and VM in the same context and the legislation and policies in place require applications and practice. Sections 38 and 51 of the Public Finance Management Act, 2000 (PFMA) require accountability by supply chain management authorities or rather in the supply chain management, respectively. This ensures that their public service has and maintains several systems relating to financial management and risk, internal control, internal audit, procurement, provisioning, and the evaluation of major capital projects.

The PFMA Supply Chain Management regulations also prescribe those institutions implement a supply chain management system. But still, enforcement of these systems is not policed by

the public institutions and that hampers the progress. Yes, these legislations and policies in theory and on paper are in place but applications are in disarray.

2.10 Construction Procurement Strategy

The CIDB informs practice notes and there are construction procurement notes to guide in achieving clients' objectives. These notes offer guidance on IDMS to assist in managing the risks, financial resources etc. There are 2 types of strategies offered, either by project or programme, attached to the implementation of strategies that are key activities highlighted in the following stages:

- Gathering, and analysing information;
- formulating procurement objectives;
- making strategic delivery management decisions;
- deciding on delivery mode (project or programme); and,
- the package works CIDB (2010).

2.11 Literature review findings

As Aghimien and Oke (2015) mention Nigeria is Africa's leading nation when it comes to incorporating the VM application within its projects, as well as the benefits that come from this implementation, it has been urged that built environment professionals in Nigeria for the further embracement of the practice by project stakeholders". Additionally, the literature also indicated Nigeria is big on utilizing the PPP approach and yielding successes by other countries such as the USA and Australia, amongst others. The overall view within South Africa is that VM is only practised within the private sector.

The literature findings also mention that SA is in no position to incorporate the relevant VM legislation due to the limited knowledge available about VM applications. It is also clear that some developing countries are not incorporating VM applications into practice and are consequently failing to keep up with the adaptations that emerge from VM and thus continue to lag within this field. Furthermore, CIDB seems to be heading in the right direction by involving professionals, government and other institutions in introducing the *Best Value* initiatives, but also requires regulations and enforcement within the industry.

2.12 Gaps Identified

- Capturing and documentation of successful research on the implementation of VM in SA

- Fragmented application of VM by construction industry professionals in SA
- Fundamental knowledge and application of VM within the post-graduate studies
- Thorough research on the benefits of VM vs Cost Management. Comparisons of the two will be beneficial to the book of knowledge.

The literature suggests that VM could be legislated as a requirement by law in the Procurement Act (Oluwabukunmi, Aigbavboa, & Thwala, 2015).

2.13 Key Literature Findings

The literature review has revealed that VM is still a challenge worldwide, but how is dealt with from country to country makes a difference. Compared to South Africa, other countries have invested time and capital in the elimination of these challenges.

To address the causes of problems in the industry, the idea of transforming the project delivery process has been regarded internationally. The adoption and inclusion of VM within the legislation, policies, procurement act, etc. simplified the project delivery process.

For instance, in the UK there is an understanding that VM intends to improve the ratio between benefits and costs and also concentrate on eliminating unnecessary costs from the project or asset, or systems, components or processes associated with it, hence the incorporation within the legislations. Furthermore, literature revealed that in South Africa, there are still challenges in the construction industry both the public and private sectors. These persisting challenges include late delivery of projects, cost overruns, and unsatisfactory quality of products. The causes of these problems and challenges that have been identified in the literature are industry complexity, capacity and fragmentation.

Since South Africa understood that the challenges faced in the delivery and implementation of public infrastructure projects required a shift in policy and direction in the delivery of infrastructure, IDMS was birthed. IDMS was introduced as the public sector response to VM not being achieved in the SA public sector.

For IDMS to be effective and further address these challenges was to change the preconstruction and the delivery process and the implementation of infrastructure projects. Several initiatives are in place for instance the Public Finance Management Act, 2000 (PFMA), procurement policies etc., but adhering to those initiatives seems to be a challenge. The implementation of IDMS by the South African Treasury is heading in the right direction with enforcement in implementation.

Similarly, the literature also mentions that the public and private sectors collaborate and spearhead the implementation of VM within the legislations and policies with universal understanding is effective. This PPP approach has been successful in several countries and seems to be the bridge in tackling the challenges of implementation, adhering to the budget and yielding positive results.

As mentioned in the above scenario, the South African public sector is heading in the correct direction with the IDMS initiative, CIDB etc. as a starting point however, the literature revealed that the policies and legislations are in place merely implementation needs to be enforced.

3 RESEARCH METHODOLOGY

3.1 Introduction

The methodology of research is an approach that is used to determine the methods that were used to solve the research problem and answer the research question. It can be defined as the science of studying how research is conducted and expresses the research approach, research design, techniques, and methods while explaining how the results will be evaluated (Kothari, 2004). Thus, the current chapter seeks to clarify the selected research design utilized in carrying out the study.

3.2 Study design

The study design is defined by Majid (2018) “as the utilization of evidence-based procedures, protocols, and prescriptions that provide the tools and structure for conducting a research study. The choice of the study design is a methodological decision made by the investigators before submitting the study for ethics review and starting data collection”. The study will be based on the proposition derived from theory and responses from participants to formulate the results from the sample. The present study will make use of all nine provinces in SA.

3.3 Research Design

This study aims to investigate the importance of VM in the South African construction industry specifically concerning public sector projects. It is guided by the philosophical assumptions of solving a practical problem through inquiry in the real world. The pragmatic paradigm’s epistemological underpinning is that knowledge is gained through experience (Maarouf, 2019). This paradigm supports the use of mixed methods for collecting and analysing data about the experiences of people, to make the needed changes or transformations (*ibid*) which will be used to collect data for the study.

3.4 Research approach

A hybrid research approach was used in this study because both inductive and deductive reasoning were applied. When using the inductive approach, the researcher starts by making empirical observations, identifies patterns in those observations, and then theorises about those patterns. The deductive approach entails beginning with a theory, developing a proposition from that theory, followed by the collection and analysis of data to test those propositions (Proudfoot, 2023).

This study followed the hybrid approach because of the use of both the inductive and deductive approach where qualitative and quantitative data were collected and analysed, while the quantitative part of the analysis followed the inductive approach the qualitative part followed the deductive approach. The findings from the two approaches were then synthesised, providing more rigour. Furthermore, the hybrid approach offers flexibility to adapt research methods to the specific research question, context, and data availability. Therefore, the hybrid approach suits the nature of the study as limited data was obtained.

3.5 Research design

The mixed methods research design was followed in this study and it entailed the collection and analysis of both qualitative and quantitative data. The benefit of using a mixed-methods research design is that it integrates and synergises multiple data sources, helping to study complex problems (Poth & Munce, 2020). This design provides a data consolidation that allows a researcher to obtain a wide view of the study, so the investigated phenomenon can be viewed from different perspectives or research lenses (Shorten & Smith, 2017).

3.6 Sampling and data collection methods

The methods used for sampling were both random and non-random while both secondary and empirical were collected. Primary data was collected using a structured questionnaire, and it formed part of the quantitative data. Secondary data were collected in two forms, first, a literature review included academic literature, documents, and reports, as well as policies and legislation that speak to this theme within the construction industry. The second form of primary data was the empirical data that was collected using unstructured interviews with representatives and directors from various government departments who are extensively involved in the IDMS adoption and process, most of which included those employed by the National Treasury and the National Department of Public Works and Infrastructure located in various provinces within the South African jurisdiction.

3.7 Data analysis

A meta-synthesis literature review was conducted as part of the analysis of secondary data and it entailed a synthesis of the existing knowledge so gaps could be identified, while clarity was obtained concerning associations between concepts investigated in this study (Chrastina, 2018). To analyze qualitative data from interviews, the researchers used the Thematic Analysis approach where themes were identified and analyzed accordingly, following the guidelines of (Braun & Clarke, 2006).

3.8 Rationale of the study

The rationale of this study is to understand the thinking about the IDMS and establish whether VM was embedded in the design and implementation of IDMS.

It has been established in the literature review that there is minimal information known about the existence of VM applications within the IDMS system within the private and public domains in SA. Thus the empirical components of this research delve into the existing processes to address challenges faced during infrastructure delivery, mainly addressing getting the *Best Value* and value for money whilst considering the delivered quality, risks, and constraints.

As the motivation for conducting this research is to improve the knowledge of VM within the South African built environment field and to make the private and public sectors aware of the different terminologies having the same meanings. The results of this research will contribute towards a greater understanding of the implementation of VM by the public sector.

3.9 Research Approach and Design

Within the above-mentioned context, this research is general but directed at a specific topic which has been covered previously. A combination of qualitative and quantitative data was collected for the study, using a mixed methods approach. In terms of the qualitative approach, the study was undertaken using the positivist epistemological (positivism) position. Alharahsheh & Pius (2020) cited Myers (1997); Neuman (2011); and Orlikowski (1991) “it is highly important for researchers to understand the key underpinning ontological and epistemological assumptions, and to further understand how the given assumptions determine researchers’ selection of an appropriate methodology and methods”, hence, the selection of epistemological approach, understanding fundamental assumptions as per previously stated, Lowhorn (2017) also agrees that research that does not seek statistical conclusion which provides a broader and conclusive view of a phenomenon to be generalized should use a qualitative research approach.

Alharahsheh & Pius (2020) furthermore mention that epistemology is concerned with how a researcher aims to uncover knowledge to reach reality. Moreover, epistemology is considered an internal factor within the researcher as it is also concerned with how a researcher can distinguish between right and wrong, and it is about how a researcher views the world around them.

3.10 Quantitative approach

Quantitative research involves the customary and experimental way to address the identified problem. Fraenkel and Wallen (2003) argue that quantitative methods aim to decide whether the predictive generalizations of a theory hold. The quantitative approach in the present study supports well the findings of Fourie (2018), who stated that for the past decade quantitative method has been employed in economic and economic policy analysis.

3.11 Qualitative approach

According to Fischer and Guzel (2022), a qualitative method is a non-numerical scientific data collection methodology that entails a targeted place of population, observing social sciences activities that exist in that place as a means to acknowledge social life when translated. Qualitative research reveals people's values, interpretative schemes, mind maps, belief systems and rules of living so that respondent's reality can be understood. It is a constructivist type of research which emphasizes that knowledge is active and creative (Namanji & Ssekyewa, 2012).

Overall, a mixed methods approach entails the use of a combination of qualitative and quantitative methods and techniques for collecting and analysing data. The benefit of using the mixed methods approach is that it offers methodological flexibility while the study's research questions will be answered with sufficient depth, helping to obtain an in-depth understanding of the investigated concept (Maxwell, 2016).

Therefore, the study followed a mixed methods research approach for the collection and analysis of primary plus secondary data. The study was carried out using structured in-depth questionnaires, focus groups and field observations, a questionnaire was used and followed up by an interview. The interviews were concluded to get more information from respondents.

3.12 Research area

Initially, the researcher assumed that the research would be within the Gauteng province boundaries, but as the research and references unfolded, it was clear that the participants should expand outside of the administrative boundaries of Gauteng and filtrate into other parts of SA. The participants were identified through referrals from other participants thus making it difficult to pinpoint the exact area and location.

3.13 Target population

A target population is a group of units the study aims to make inferences from who meet the selection criteria of the particular study (Asiamah, Mensah, & Oteng-Abayie, 2017). This

included those in managerial and executive positions, including managers, supervisors, and heads of departments who were involved during the inception and formation of the IDMS and who were employed in various departments and divisions in the public sector.

The sampling procedure was non-probability sampling, and it entails the use of non-random and subjective techniques (Vehovar, Toepoel, & Steinmetz, 2016). When using non-probability sampling, a researcher can either choose quota, accidental, purposive, expert, or snowball sampling (Etikan & Bala, 2017). Accidental sampling is popularly applied by marketers and newspaper researchers. Purposive sampling is used when potential participants are pre-judged to possess the information needed for answering a study's research questions (Naderifar, Goli, & Ghaljaie, 2017). Expert sampling entails a researcher approaching only experts in a particular field for participating in the study, or when a researcher needs information validity of another sampling technique. In snowball sampling, a researcher uses networks for selection, and (Chan, 2020) states that snowball sampling is "an iterative procedure of collecting vertices' information that is linked with vertices collected in the previous iteration".

In this study, snowball sampling was used and the researcher identified a few potential participants through platforms such as LinkedIn and social media, as well as referrals from people in the field. The identified participants were then asked to refer others they knew of until there were no longer any referrals.

3.14 Data Collection

In Latin, the word data means to give. In research, data is regarded as those pieces of information that any situation gives an observer or researcher some insight (Leedy & Ormond, 2005). Furthermore, data is also regarded as not the actual reality of the phenomenon studied or researched. Research seeks through data to uncover the underlying truths about a problem or a phenomenon under investigation (Leedy & Ormond, 2005).

The current study gathered information through a well-structured questionnaire that was distributed to the respondents by the researcher. A descriptive survey was chosen because it provides an accurate overview of the characteristics, such as behaviour, opinions, abilities, beliefs, and knowledge of a particular individual, situation or group. This method was chosen to meet the objectives of this study, namely to identify the implementation of value management.

3.14.1 Primary data collection

Primary data was obtained using structured in-depth interview questions. Interview questions produced a higher cognitive load in the sense that the respondent must think harder to come to an answer however they required additional time on the part of the researcher to analyze and code the responses (Guest, Namey, & Chen, 2019). The questions used were designed based on existing literature, theory, pilot study, and informal group discussions with construction experts. Before the interview commenced, participants were required to give consent to participate in the study. During the interview process the researcher, after seeking permission from each participant, made use of an electronic distribution of structured in-depth questions. These questions were designed in a Microsoft Excel spreadsheet and were then converted to an online web survey, making it easier for respondents to complete.

3.14.2 Secondary data collection (literature review)

Secondary research requires the gathering of information from studies that other researchers and policymakers have done on a particular concept of interest (Dawson, 2007). It is typically used to complement primary data and is useful in the analysis of social and economic change, hence it is not possible to conduct studies that can sufficiently capture past changes or developments (Kabir, 2016). The commonly used sources of secondary data include journals, government publications, textbooks, institutional documents, newspapers, dissertations, and conference proceedings.

These were the chosen secondary data as per the definition of Coetzee (2010): Textbooks (a rich source of data); Journals and articles (contain insightful information which is approved before it is issued); Internet sources (lively method to obtain a multitude of data); and Institutional documents (help provide interested parties with information or any other services concerning the subject in question).

3.14.3 Unstructured interviews

For this study, unstructured interviews were selected. Respondents opted to have unstructured interviews within the selected topic to offer additional information concerning IDMS within the public sector. During the data collection phase, it was evident that respondents were keen to share additional information that was not addressed in the questionnaire.

3.14.4 Questionnaire design

Compared to other data collection methods, such as interviews or observations, administering questionnaires is often quicker and requires less effort. Therefore, the questionnaire was

selected as a reliable tool to capture the respondents' responses. The questionnaire designed in a single language, in this case, English, ensures consistency in the interpretation of questions and responses. This can be important for maintaining the reliability of the data collected.

The questionnaire consists of 4 sections, namely A, B, C, and D and is described as follows;

Section A is aimed at gaining demographic data such as organization type, years in construction, location etc. This information was utilized by the researcher when interpreting the results and comparing the implementation of demographical areas.

Section B, this section of the questionnaire explores the knowledge and understanding of value management by respondents.

Section C wanted to understand the challenges of implementing value management. This is captured by indicating your answers by using the following 5-point scale where 1 = Strongly disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly agree (SA)

Section D captures different opportunities that exist in the construction industry to improve value management within the public sector

Table 3.1: Research Variables.

	VARIABLES	LITERATURE REVIEW
1	Do the policy and legislation makers understand the concept of VM?	Measure the understanding of VM
2	Where in public sector project delivery processes are VM practices applied?	Understanding the application of VM
3	What are the hindering factors for the SA public sector to adopt and implement VM?	Compliance with legislation, adoption, challenges, benefits
4	Understanding of practitioners of the role of VM in enhancing project delivery	Minimal application of VM to public-sector, transparency requires decisions taken (accountability)
5	Do you understand the introducing of VM within IDMS?	Measure the understanding of IDMS, planning tool
6	Do you regard IDMS as a solution to public infrastructure delivery?	An initiative by the government for infrastructure delivery Measuring output, quality outputs
7	Ways to address the implementation of VM in the South Africa public sector	Standard, mandating, legislation, and policies, risk reduction on public sector
8	Opportunities that exist in the construction industry for Value Management within the public sector	Partnership, PPP, common goals, strengthening public project preparation, a central point for project monitoring
9	Do you think IDMS as a system has achieved the objectives set to achieve?	Benchmarking, measuring output, mandating and implementation, cost improvement, the client value system in projects, products processes, and systems, opportunity, clear responsibility & accountability, ensure total compliance for the built environment. regulations and requirements, timeous delivery of infrastructure projects

3.14.5 Instrument of data collection

The data collection was assisted by the questionnaire to evaluate the extent of VM within the IDMS system. The questionnaire was mostly given to specific professionals in the built industry identified beforehand meant that it was distributed to individuals who were employed in decision-making positions to complete the questionnaire.

This research was based on a structured questionnaire and formulating the research questions was to translate the research question into possible secondary research questions to support the hypotheses. This was completed by identifying these possible questions, within the scope and delineation of the research problem. An analysis of these possible secondary questions was completed on the Vgrid and from the analysis, developed an initial secondary question.

The idea was to distribute approximately 100% of the questionnaires to people who had a high level of knowledge about IDMS. Generally, some "homework" was done beforehand on which individuals would have some knowledge. Because the study used a mixed methods research approach, question 9 in Table 3.1 was mostly answered by structured interviews.

3.14.5.1 Distribution of the data collection instrument

A list of potential respondents was created after the questionnaire was approved by the ethics committee for the study. The compiled list was generated using LinkedIn, focusing mainly on the type of work participants did and the extent of their involvement within the IDMS system. The respondents were contacted prior by email to request and notify them of the intended study, and if they agreed, a questionnaire had been sent to them to complete. Many of the targeted population declined to participate, citing that they were not in a strategic position and were not involved in the IDMS development process.

During the distribution and targeting of individuals, it became clear that there is an IDMS champion or rather a key individual that continues to rise but many ways of contacting this individual did not yield any results. This key individual has insight into the IDMS and its formulation and development.

The questionnaire was circulated through that first contact and other potential respondents would respond with a referral. Data collection took about one month, although respondents are free to take time when completing the questionnaires without any compulsion. The questionnaire took approximately 20 minutes to complete. The questionnaire was sent to 40 potential respondents and of this, only 15 questionnaires were received. However, the response

from respondents has been poor due to the targeted participants. This study targeted individuals involved and contributed to the inception of the IDMS. Respondents were emailed, using electronic copies and the interviews were done through the telephone and online meetings.

3.14.5.2 Questionnaire design

Acharya (2010) mentions that a questionnaire design is a crucial component of research. When creating a questionnaire, it must be designed in such a way that will not mislead the participants as this may compromise the quality and accuracy of results. A set of appropriate questions were drafted in a sequential order. The language used was English because it is a universal language and one of the official languages of SA and was used simplistically and unambiguously to ensure that all respondents would accurately answer the questions.

At the start of the questionnaire, respondents are cautioned and assured of the enormity of their responses. The questionnaire is divided into 4 sections. The first section (Section A) focuses on demographic data such as current employment, location, and qualifications. The second section (Section B) introduces the concept of IDMS and aims to gain knowledge on the respondent's knowledge regarding IDMS.

Section C focuses on the challenges of the application of VM within IDMS. This section is beneficial because it indicates the views of the extent of VM and the understanding of this application. One of the questions in this section questions the respondents whether they believe IDMS to be the solution for public infrastructure delivery. This will aid in further understanding the general views and understanding of VM. Furthermore, a rating scale was utilized to capture the extent of the issue or area.

In the last section (Section D), respondents were required to add any more information that the researcher might have overlooked about their experience with the workforce concerning IDMS incorporation.

Table 3.2: Summary of Survey Responses

SURVEY RESPONSES	RESPONDENTS
Questionnaires sent out	40
Questionnaires received	15
Usable questionnaire	5
Usable response rate (%)	38%

3.15 Period of collection

The data collection was completed by the researcher between October and November 2021.

3.16 Rating scale

Sections C and D of the question had a 5-point scale, which is as follows:

- 1 – Not important
- 2 – Important
- 3 – Very important
- 4 – Extremely important
- 5 – Important

3.17 Ethical considerations

Ethical considerations are essential in research to ensure that the rights and well-being of participants are protected, and the research is conducted with integrity. This research did not encounter any ethical issues, in terms of handling the information. However, the ethical considerations in this research involved acknowledging professionals in the industry whose work had been cited and therefore contributed to the literature.

The researcher who collected the questionnaires or data from human subjects made certain that always a source of ethical concerns in the possibility of harming the subjects, and other stakeholders including the researcher and always threaded carefully.

Consequently, there were ethical issues that the researcher encountered, in terms of handling the information since the researcher was working in the public environment. This was also noted when some of the respondents were employed by public sector consulting practices and

academic institutions within the construction industry. The researchers thus had to take particular care to ensure that anonymity and confidentiality were maintained.

Respondents were fully aware of the nature, purpose, and potential risks or benefits of the study and voluntarily participated, without coercion. Adhering to these ethical principles assists with maintaining the integrity of the research process and contributes to the responsible and respectful advancement of knowledge.

3.18 Ethical Considerations

The ethical component of this study was considered throughout the entire duration of curating this paper, particularly in the data collection phase. All respondents were requested to give consent to their voluntary participation in the survey and unstructured interviews. The consent forms are attached as part of Appendix A and the process discussed.

3.19 Conclusions

The chapter offered an overview of the methodology selection, questionnaire design and data collection process that was undertaken. The questionnaire was relatively small, but in comparison with the targeted sample it is at the exact size intended. This sample has good knowledge of the reasons IDMS was developed. The presented research methodology justifies the selected approach and processes that followed for conducting research in a method that was objective, and unbiased.

4 DATA PRESENTATION AND ANALYSIS

4.1 Introduction

The purpose of this chapter is to present the findings of the data that was collected. The data was collected in the form of questionnaires and findings for an allocated sample that represents the population of employees in the public sector who work within the context of IDMS. Thereafter, these findings will be analysed, unpacked, and discussed in an attempt to answer the research question that was posed. Furthermore, presents the conclusions and recommendations.

The questionnaire was distributed to the targeted respondents in strategic and decision-making government positions who have had experience and have participated in the formulation of IDMS and who are actively involved in the built environment profession throughout SA. The respondents were provided with an option of either selecting an open-ended interview or a questionnaire of which some opted for the open-ended interview. The study used target-based research because a handful of individuals are actively involved in the formulation of the IDMS at a strategic level.

As outlined in the previous chapters, the main objective is to develop an understanding of the extent of the existence of VM within the IDMS application in infrastructure delivery. While the research was primarily to identify the above, it also sought to understand and unpack the following:

- To identify the use of VM in existing public sector project delivery processes.
- To establish if the application of IDMS is achievable without the inclusion of VM.
- To establish if the existing applications include the VM application as a system.
- To establish if VM techniques deliver ‘Best Value’ in a public sector environment.
- To establish the awareness and understanding of VM by policy and legislation formulators
- To identify the factors that hinder the adoption and implementation of VM.

The first section of data collection included the background information of the respondents; Section A is general bibliographical information about respondents; Section B aims to address the extent of the incorporation of VM within the IDMS; and Section C addresses the challenges in implementing the VM within the public sector.

4.2 Grouping the data

The questionnaires were collected and answers that appeared similar were grouped into themes.

4.3 Data Analysis

Section A: Biographical data

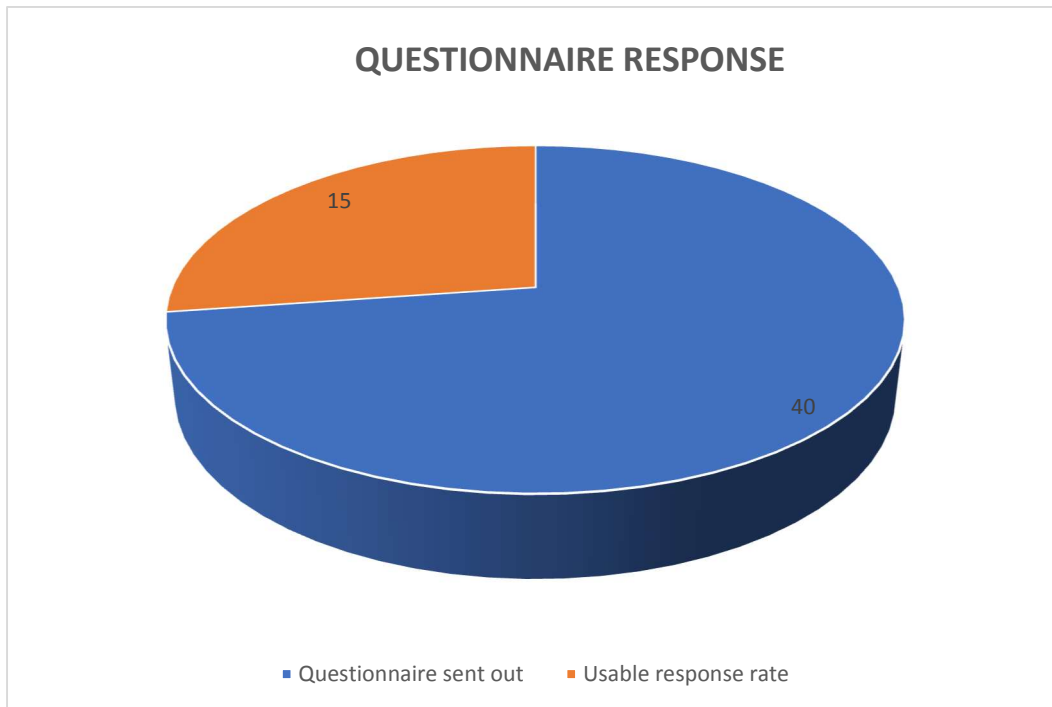


Figure 4.1: Ratio between questionnaires issued and usable returned responses

The graph above (Figure 4.1) indicates that forty questionnaires were distributed to respondents and from this, only fifteen respondents returned the completed questionnaire. This is likely because of the nature of the study as it was a target-based study. The study intended to target a population and respondents who are in decision-making positions and involved in the establishment process of IDMS. Furthermore, referrals played a big part in the contacts established during the data collection period.

The successful response rate was quite low; however, this was expected because of the small number of targeted individuals that are involved in the formulation of IDMS in SA. While distributing the questionnaire, several respondents indicated that a particular individual is heavily involved in IDMS processes, however, the individual was unavailable and could not be included in the targeted sample.

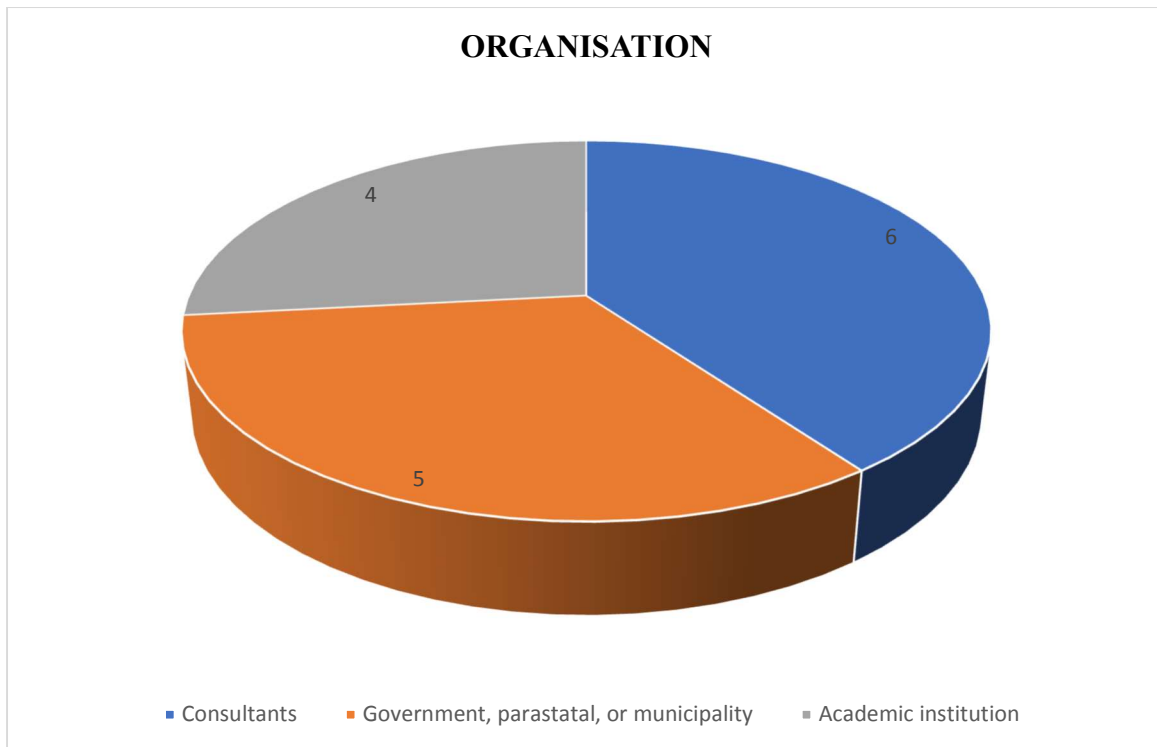


Figure 4.2: Type of Employing Organisations of Respondents

Figure 4.2. reveals that most respondents who participated in the formulation of IDMS are external consultants to the IDMS and amounted to six in total; while five were employed in academic institutions and the remaining four were employees within various departments in the public sector. This pattern indicates that the public sector is understaffed and, thus, lacks the appropriate capacity to fulfil some of the organisational functions, resulting in the outsourcing of external professionals (predominantly in the private sector). This is echoed in several South African Auditor-General reports that the government a large amount of its budget on consultants to narrow the gaps that exist in the need for critical skills and capacity gaps in the public sector. The identities of these organisations were withheld for anonymity reasons.

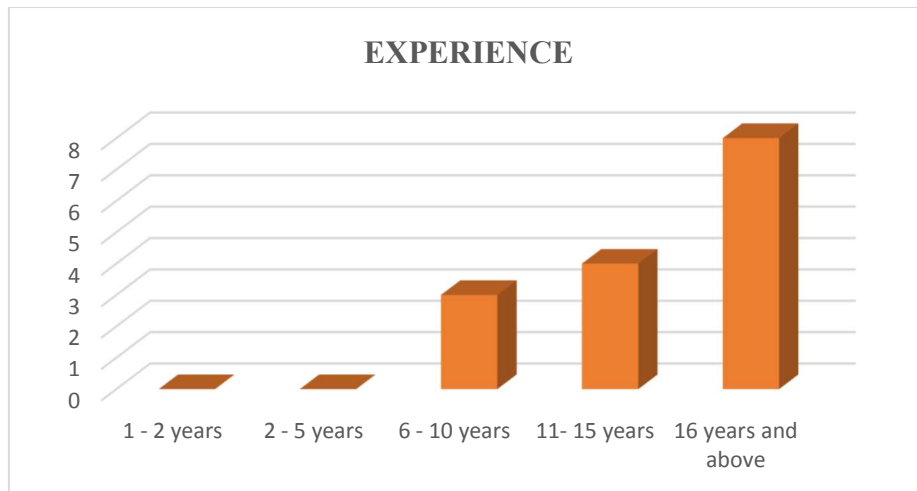


Figure 4.3. Work Experience of Respondents

Figure 4.3. shows the number of years of work experience the respondents hold within this field. It was revealed that three of the respondents have 6 – 10 years of experience; four have more than 10 years, and the remaining eight hold 16+ years of experience.

This data indicates that individuals with more experience are most likely to hold senior, strategic positions and have contributed to the development of policies at this level. This is in correlation between managerial, and strategic positions with the educational qualifications and experience.

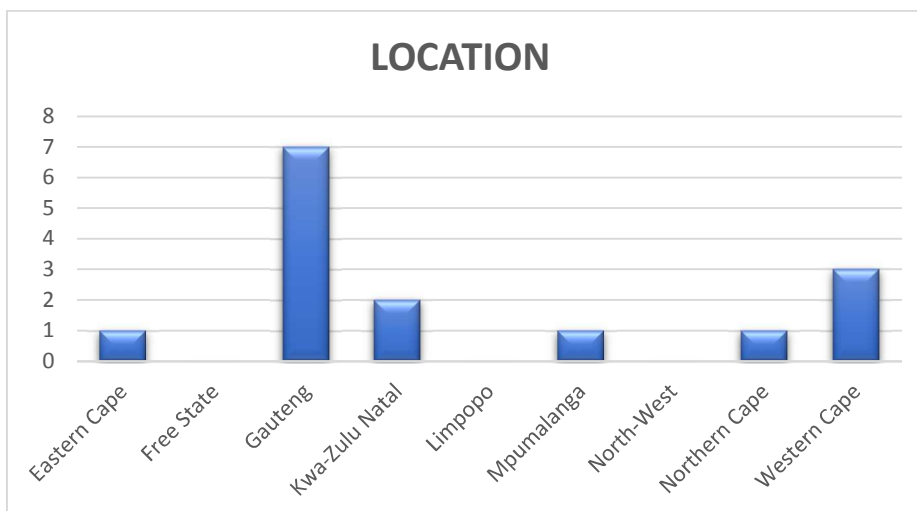


Figure 4.4: Provincial Distribution of Respondents

Figure 4.4. above indicates the provinces in which the respondents are located within SA. The majority is based in Gauteng province which amounted to seven; one each in the Eastern Cape, Mpumalanga, and the Northern Cape; three in the Western Cape province; and two in Kwa-Zulu Natal.

It was anticipated that the Gauteng province would lead because it is the economic hub of the country, while also housing the SA's administrative capital, the City of Tshwane; therefore, many highly skilled professionals are located here.

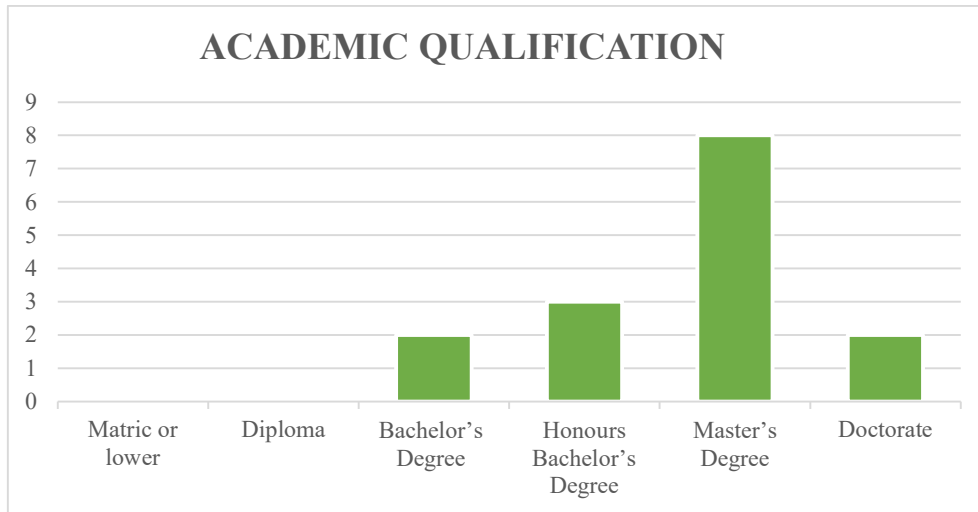


Figure 4.5: Highest Academic Qualification of Respondents

Figure 4.5. shows the respondents' highest level of education qualifications. It indicates that two have a bachelor's degree, three have obtained Bachelor of Honours Degrees, eight have obtained master's degrees, and the remaining two obtained Doctorate degrees.

Most of the respondents' highest levels of education are master's degrees, which is typically a compulsory requirement for senior and strategic positions in SA.

The two respondents with Doctorate degrees hold 6-10 years of working experience. The level of qualification and years of experience thus correlates, in that respondents in higher positions such as these will most likely hold higher qualifications, which is what the study was targeting.

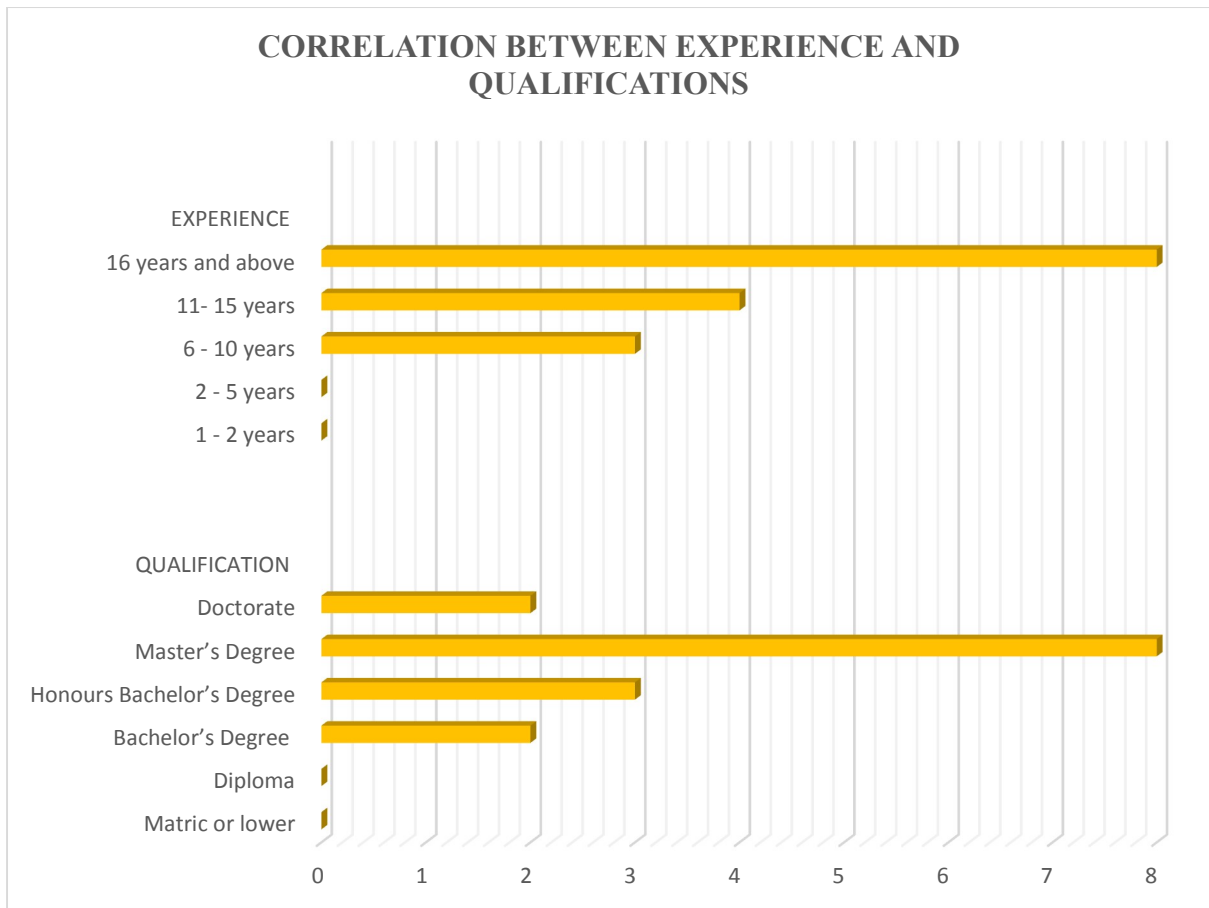


Figure 4.6: Relationship Between Education and Work Experience

Figure 4.6. above indicates the correlation between the respondents' level of education and the number of years of experience they have acquired. From these results, it was anticipated that the bulk of the respondents would at least have acquired a master's degree as their highest level of qualification, while simultaneously having acquired more than a decade of work experience within their areas of expertise.

Section B: Introduction of IDMS

Question: Do the policy and legislation makers understand the concept of VM?

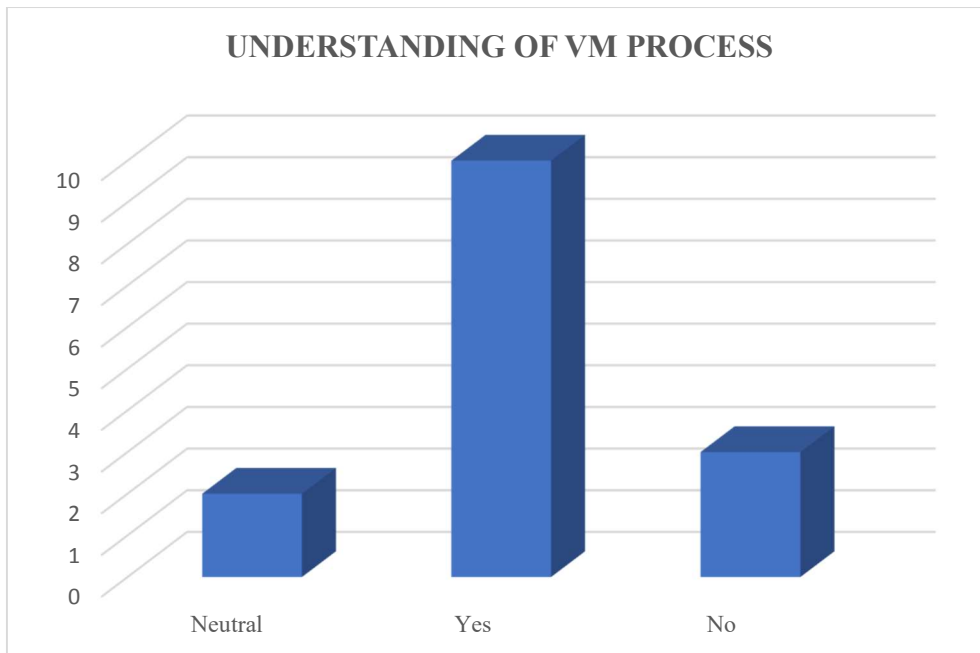


Figure 4.7: Level of Understanding of VM

In the graph above, respondents were asked whether they are of the view or understanding that policy and legislation formulators/ contributors understand the concept of VM, where most answered *yes*.

Most respondents responded that there is an element of understanding in this regard and that even though policies are drafted at a strategic level, the process of drafting allows for inputs from individuals and/ or departments at operational and tactical levels. One of the respondents mentioned that policy and legislation are drafted from a long-term sustainability point of view and that there may be a lack of understanding of VM in the implementation phase. This indicates that there is some understanding of VM within the policymakers but does not indicate the depth of the understanding.

Research question: Where in public sector project delivery processes are VM practices applied?

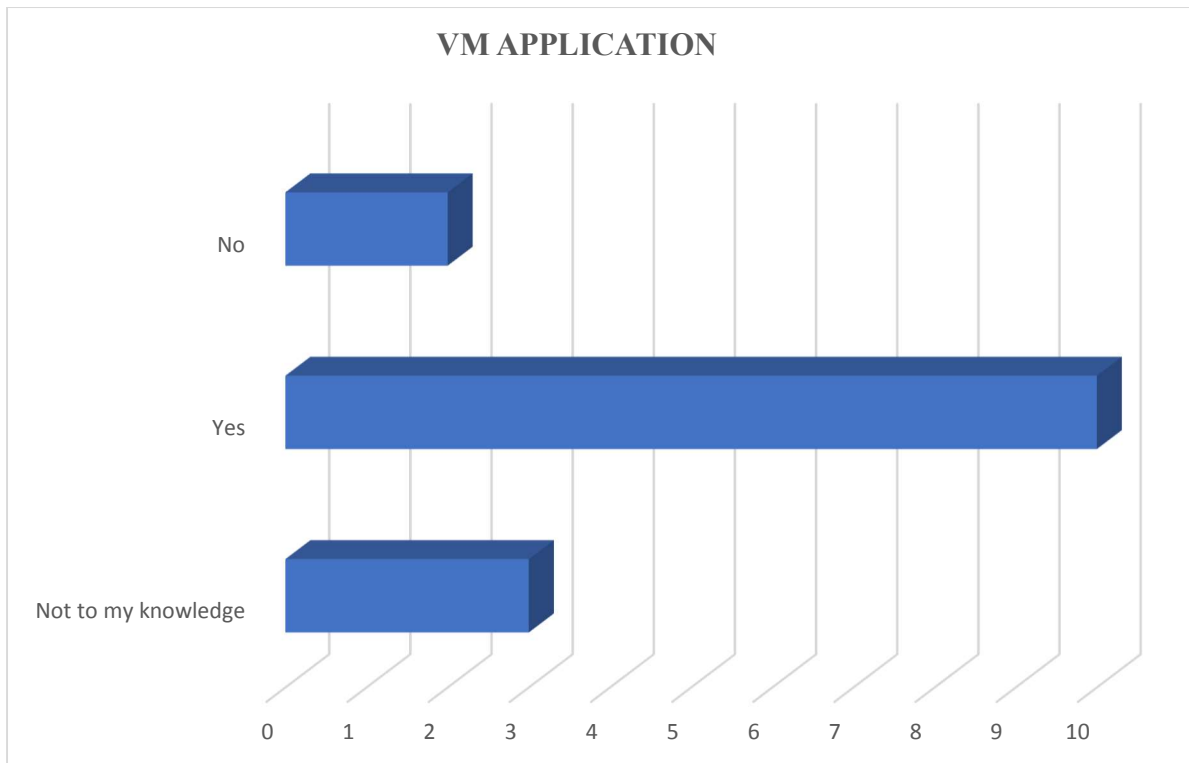


Figure 4.8: Exposure to the Application of VM

Figure 4.8 above indicates the level of the respondents' knowledge and understanding of the extent to which VM practices are applied. The questionnaire did not ask about an example where VM was effectively applied, successful, and where it yielded results. This could be a new area of focus for further investigation in the future.

In some responses, it was said that within the planning stages of projects, the overall VM of a project is considered insofar as anticipated/ projected benefits. Furthermore, and in another response, it was mentioned that it is a process in one of the procurement options and should refer to the CIDB website on Contracting Strategies or the IDMS Toolkit. Another respondent summed up and mentioned that VM practices need to be applied to ensure that the needs of society are met while public sector resources are utilised in the best possible manner.

Lastly, it was indicated in one of the responses that VM processes are applied throughout the lifecycle of the project, with an in-depth focus on Infrastructure Planning, Infrastructure Procurement, Infrastructure Packaging and Design stages.

Therefore, the above indicates that VM exists within the IDMS but is not clearly or openly stated. Only when supporting documents within CIDB contracting strategies, that it is clearly stated but using *Best Value*.

Research question: What are the hindering factors for the SA public sector to adopt and implement VM?

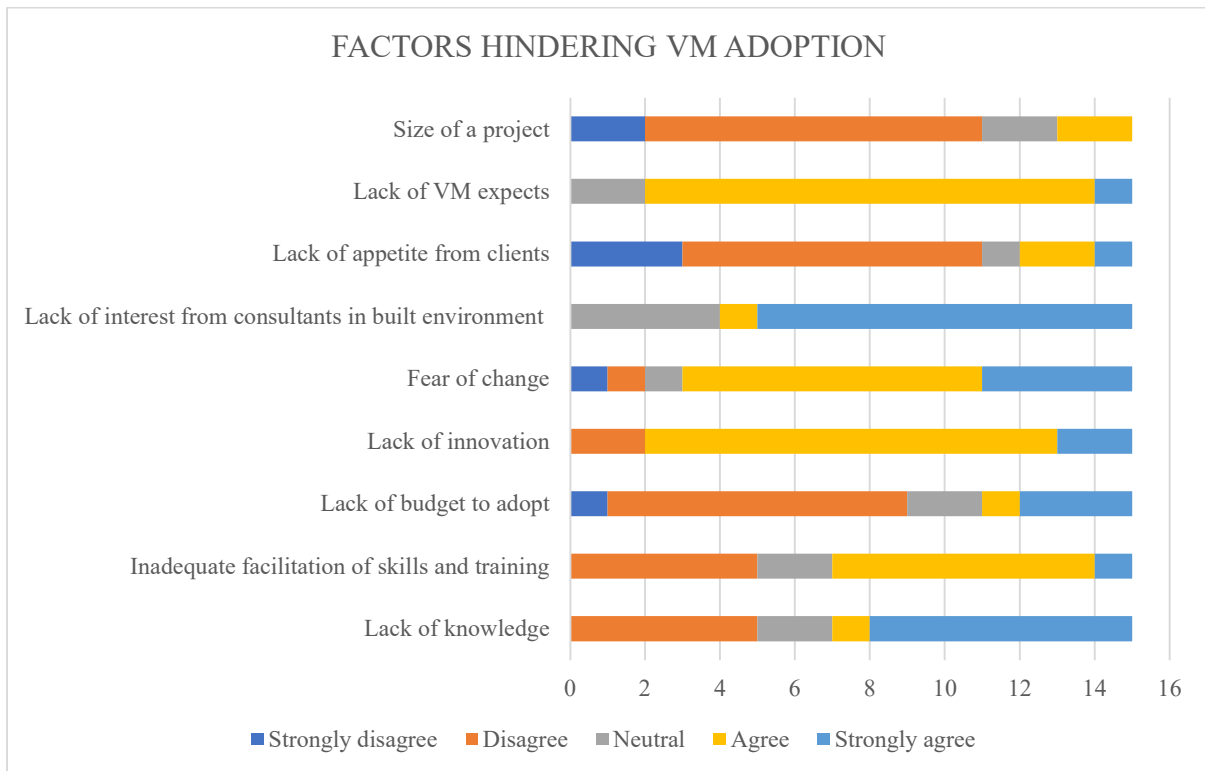


Figure 4.9: Hindering factors on the implementation of the VM process in the public sector within SA

Figure 4.9 illustrates the response regarding the hindering factors within the South African public sector in terms of the adoption and implementation of VM. It indicates the capacity of public officials within the public sector, with government departments ranked first.

Using a structured rating system, respondents were requested to rate the factors that are hindering the inclusion of VM within the IDMS. The respondents were requested to rate from strongly disagree, disagree, neutral, agree and strongly agree.

Firstly, the respondents believe that lack of knowledge is the biggest hindering factor in the implementation of VM. Respondents also agree that inadequate skills and lack of innovation hinder the implementation of VM.

Secondly, the size of the project is not considered an important hindering factor, but the lack of insistence from the VM experts affects the application. Maybe lack of interest might not be the correct analysis but lack of enough VM experts in South Africa. The insistence of clients takes effect in the application and costs can be the cause of not applying VM. That is where

lack of budget to adopt is not regarded as important, government departments can cite budget issues.

The results in Figure 9 also show that the minimum requirement for educational qualifications for the understanding of VM application is a master's degree.

Furthermore, the hindering factors of VM incorporation have been cited as the lack of appetite for considering the impacts of projects beyond implementation as well as the lack of adequate consideration for operation throughout the lifecycle of the asset and its value to the users (provision of adequate budgets and ensuring compliance of maintenance regimes). In addition to this, the use of VM is dependent on the contracting strategy adopted, the one that uses VM is not normally used in the public sector.

Moreover, the lack of capacity of public officials, corruption, the poor performance of officials, and the lack of professional capacity to continuously monitor and evaluate the performance and quality of projects, which in most cases cause an escalation in project cost contributes to these hindering factors.

The results in Figure 4.9 also indicate that there is no consensus, or common hindering factors that were discussed by the respondents. Each respondent indicated their personal view, therefore, there is generally no agreement with the adoption.

To conclude, the graph indicates that there is no major reason for VM not to be adopted within the IDMS and that there might likely be a multi-faceted problem.

Research Question: What is your understanding of the role of VM in enhancing project delivery? Provide an example of a project where VM within IDMS is applied.

Results: Concerning the question above, it was found that the respondents generally had difficulties in accurately responding to this question.

To some respondents, VM is understood to be an application that delivers quality and sustainable products/outputs with a cost-benefit and within the required timeframes.

In other cases, it was evident that other respondents have a clear understanding of the role of VM in enhancing project delivery and, therefore, have a clear brief in delivering the project objectives that will ultimately ensure benefits for the clients.

It can be assumed that respondents' lack of agreement and understanding in this question is an indication that VM is not accurately applied within the IDMS. It also indicates that VM was most likely never intended to be incorporated within IDMS. This lack of understanding is, therefore, indicative of a lack of awareness of the VM application.

Research question: Do you regard IDMS as a solution to public infrastructure delivery?

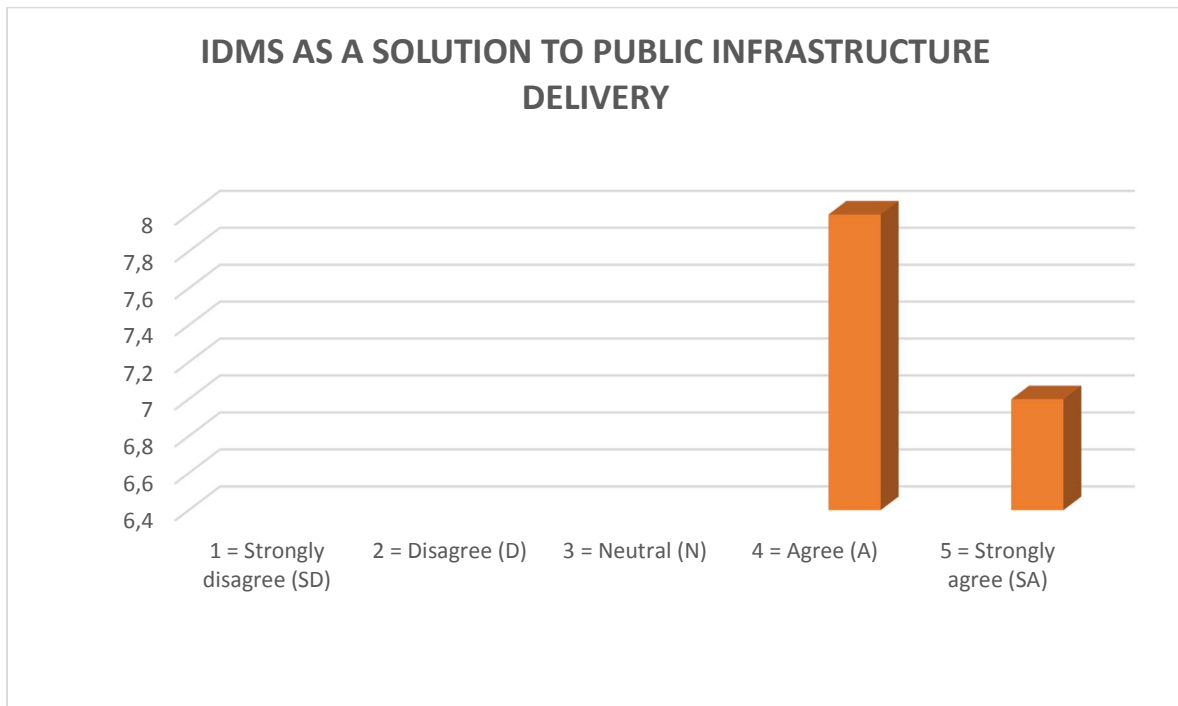


Figure 4.10: IDMS as a solution to public infrastructure delivery.

According to the results obtained, there was a consensus that IDMS is or should be a solution to public infrastructure delivery, as indicated in Figure 4.10.

Furthermore, respondents are also of the understanding that VM is already embedded in the objectives of the IDMS and that IDMS is meant to ensure standardised infrastructure delivery, thus ultimately adding value for money in the delivery of infrastructure projects. In addition to this, the introduction of VM will be more beneficial to the clients, as it will provide them with an in-depth understanding of the functions and benefits that will be derived at each stage of the IDMS.

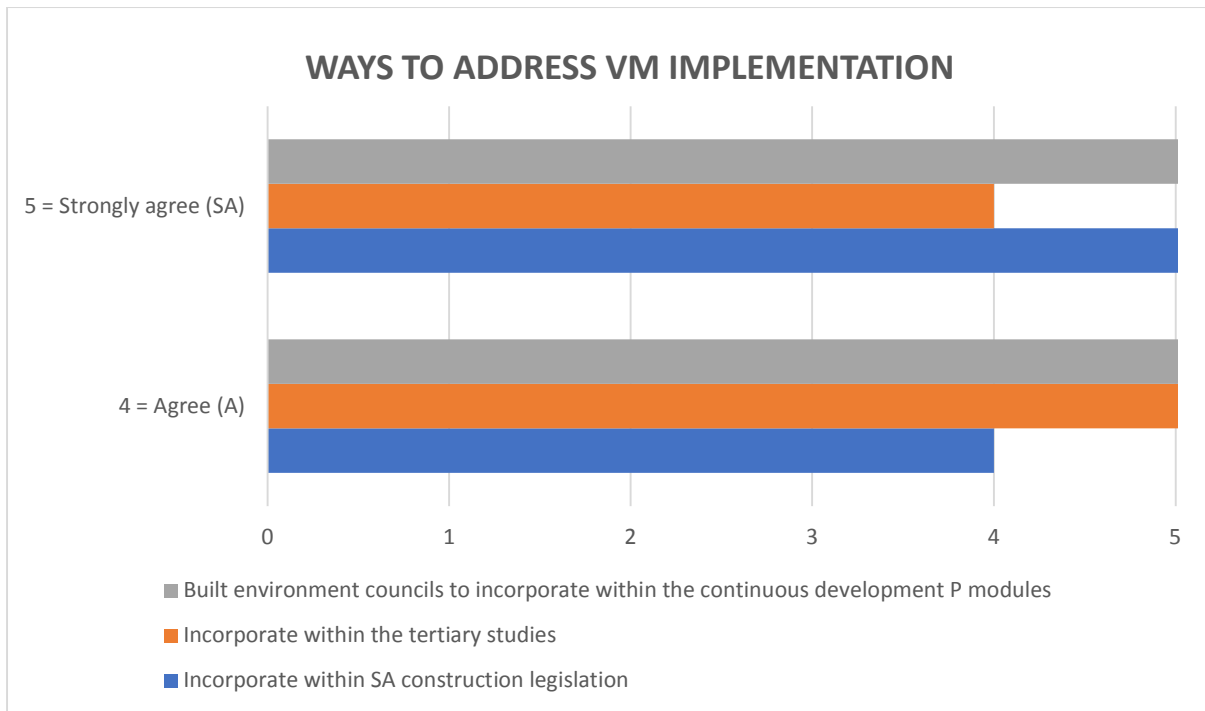


Figure 4.11: Ways of addressing VM implementation

Figure 4.11. above describes the extent to which respondents agree with ways to address the implementation of VM in the South African public sector.

The respondents strongly agree that VM should be incorporated within South African policies and legislation. Respondents also agree that VM should be incorporated within the relevant higher education syllabi, particularly those in the School of Built Environment. In the comments section, respondents further mention that only VM incorporation is in post-graduate studies, which indicates why there is a general lack of understanding of the VM application as discussed earlier.

Collected data similarly indicates that respondents agree that built environment council statutory professional bodies should incorporate VM within the CPD (Continues Professional Development) in their modules.

Table 3.3: Summary of Participants' Responses

SUMMARY QUESTIONS	NAME OF PARTICIPANT														
	PARTICIPANT 1	PARTICIPANT 2	PARTICIPANT 3	PARTICIPANT 4	PARTICIPANT 5	PARTICIPANT 6	PARTICIPANT 7	PARTICIPANT 8	PARTICIPANT 9	PARTICIPANT 10	PARTICIPANT 11	PARTICIPANT 12	PARTICIPANT 13	PARTICIPANT 14	PARTICIPANT 15
Do the policy and legislation makers understand the concept of VM?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Do you understand the of introducing VM within IDMS?	Yes	Yes	*	*	**	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Do you think IDMS as a system has achieved the objectives set to achieve?	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes	Yes	Yes	***

* Denotes “not understand the question”.

** “Not sure”

*** “No response”

Table 3 above describes the response from respondents who agree with ways to address the implementation of VM in the South African public sector.

Respondents acknowledged the existence and understanding of the VM approach and mentioned that even though policies are drafted at a strategic level, the process of drafting it allowed for inputs from individuals and/ or departments at operational and tactical levels.

Some of the respondents further indicated the introduction of VM will be more beneficial to the clients, as it will provide them with an in-depth understanding of the functions and benefits that will derive at each stage of the IDMS. The IDMS is meant to ensure standardised infrastructure delivery, thus ultimately adding value for money in the delivery of infrastructure projects.

4.4 Conclusion

Data obtained from the structured questionnaire sent out were completed by the targeted respondents involved in strategic and decision-making government positions who have had experience and have participated in the formulation of IDMS and who are actively involved in the built environment profession throughout SA. The respondents were provided with an option of either selecting an open-ended interview or a questionnaire of which some opted for the open-ended interview. The following chapter will focus findings of the research.

5 CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Research Problem and achievements of this study

Table 5.1: Summary of the study.

Research aim	Research problem	Research question	Research objective	Methodological choice	Research contribution
Exploring the use of VM in public sector project delivery system and how VM is embodied within the public sector project processes	The construction industry's inability to manage the delivery of infrastructure while ensuring the client receives value for money.	What is the use of VM in the existing public sector delivery process?	To identify the use of VM in existing public sector project delivery processes	Literature review	There is a need for the facilitation of a holistic adoption of all VM components in the public sector, as opposed to adopting some of the components in the South African public sector.
		Is the application of IDMS achievable without the inclusion of VM?	To establish if the application of IDMS is achievable without the inclusion of VM	Mixed methods	There needs to be the inclusion of VM to achieve significant success in providing the best value in the public sector.
		Do the existing applications include the VM application as a system?	To establish if the existing applications include the VM application as a system	Mixed methods	There is a limited inclusion of VM in existing applications and that necessitates policy actions, where there is a development of strategic mitigation strategies in the public sector.
	State-owned projects often tend to exceed the estimated budget, costs snowballing and doubling up the budget which burdens the taxpayers.	Do VM techniques deliver 'Best Value' in a public sector environment?	To establish if VM techniques deliver 'Best Value' in a public sector environment	Literature review	VM exists within IDMS, however, the "Best Value" is not delivered because it is not clearly stated. Therefore, there is a need for more transparency, which will promote ownership, accountability, and actions for continuous improvements.
	The construction industry's	Is there awareness and understanding	To establish the awareness and understanding	Literature review	There is a need for a strategy on awareness and

	inability to manage the delivery of infrastructure while ensuring the client receives value for money.	of VM by policy and legislation makers?	of VM by policy and legislation makers	Mixed methods	training of policy and legislation makers concerning VM and the importance of its optimal application in the South African public sector. There seems to be a certain level of understanding, however, it has not been quantified.
		What are the factors that hinder the adoption and implementation of VM?	Identify the factors that hinder the adoption and implementation of VM.	Literature review Mixed methods	The existing VM application needs to be customised to suit optimal use in the public sector. There is a lack of knowledge about VM that is coupled with a lack of appropriate skills, as well as a lack of innovation. When these factors are addressed, the adoption of VM can be improved in the public sector.
		What are the benefits of VM in the public sector delivery?	To identify the benefits of VM in the public sector delivery	Mixed methods	VM will greatly benefit the public sector when it is fully adopted, through a facilitation of the delivery of quality and sustainable products and outputs, in a cost-efficient manner, and within the required timeframes.

5.2 General research conclusion

The objectives of this research were set out at the beginning of this research as identifying the inclusion of VM within IDMS, establishing if the existing applications include the VM application as a system and establishing the awareness and understanding of VM by policy and legislation makers.

The objectives of this study have been met, there is minimal inclusion of VM within the IDMS application. Yes, a certain degree of VM is included in IDMS, depending on the view of the public or private sector.

While conducting this study, it has been evident that the management of capital projects is a complex activity between handling aspects such as time and cost management, and risk management. The custodianship of IDMS seems to be hampering its progress and adoption. There is no doubt that gatekeeping of deliverables is required and may be the answer to effective capital project delivery.

Although the response from the questionnaires is minimal, respondents believe that infrastructure delivery policies and legislation are in place, but the application thereof seems to be a challenge. It is evident that IDMS encompasses aspects of VM in terms of the concept of *Best Value*, but research indicates that there is still a lack of inclusion.

This paper also reveals that the implementation of IDMS has brought significant change and a more structured approach to how government departments plan and deliver infrastructure.

Furthermore, it emerged that there is a link between VM and IDMS as stipulated in South African legislations and policies, but challenges such as bureaucracy within the public structures are still prominent. The review of policies and legislation indicates massive evidence is available, but implementation of the policies is not in line. Most of these policies and legislations have been in existence for some time, nevertheless, only a few individuals from the target sample are familiar with this existence. These legislations and policies exist on paper, but the application might be different.

It was also highlighted that the terminology utilised between public and private sectors is hindering the progress concerning the cohesion of the two sectors. The processes run parallel to one another and have the same target, but the two parties are not in sync. There is, therefore, a dire need for the sectors to find ways in which their processes coincide with one another.

Non-compliance by public sector personnel policing the gateways of IDMS is also a challenge. Stricter procedures should thus be put in place to police the application.

Finally, the study revealed that CIDB plays a crucial role in making available the “Informed Practice Notes” on different topics, however, the study discovered that there exists minimal access to information or awareness programmes about the availability of the notes.

5.3 Findings

VM is not fully embraced and implemented in SA. The study has revealed that there are different terms utilised between the public and private sectors, and that VM as a term is largely not used in the public sector; instead, the public sector utilises the concept of *Best Value* in its current policies and legislations.

It is recommended that to successfully narrow the gap between the private and public sectors, the private sector should adopt IDMS.

It is also essential to ensure that total compliance with IDMS is appropriately enforced IDMS due to the levels of corruption within the public sector as this hinders the strategic direction and progress of the application.

The bureaucratic approach within the public sector hinders the approach and adoption of any system. Some individuals employed by the government understand the IDMS system and the politics surrounding this.; while others only have limited knowledge regarding this.

A clear understanding is required as a way forward and custodianship of the IDMS that will enable employees to adopt and embrace the application. This process will simplify responsibility and accountability.

5.4 Recommendation for further studies

The study recommends the following further studies:

- The study revealed that further investigations should be conducted on the extent of IDMS being utilised within the various South African government departments, if not fully utilised.
- Post-graduate programmes by the private sector within SA should be investigated.
- The objectives of the IDMS application should be further investigated.
- Government departments should address the non-compliance of their employees.

5.5 Conclusion

It was discovered in the study that VM is a vital tool required in the construction industry because it contains a variety of planning tools that are crucial in achieving successful delivery of infrastructure. It is, therefore, urgent that the SA government incorporate this accordingly to improve its success rates of projects.

The literature review indicated that partnerships, stakeholders, professionals, and public office need to have a common goal of introducing and implementing VM. This partnership between the government and private sector involvement is key in making VM a success. Thus, from the research findings, the potential of VM has not been fully realised because stakeholders are generally not in sync.

The research has also found that some respondents were not familiar with VM within IDMS because of the terminology utilised within the public sector. The public and private sector, therefore, needs to correlate and start intertwining their documentation, regulation, and policies in such a way that will put them in alignment.

Respondents agree that VM application is required to ensure that the needs of society are met while public sector resources are utilised sustainably. Furthermore, during the planning stages of IDMS projects, the overall VM of a project is generally considered in so far as anticipated/projected benefits.

Finally, it was recommended that infrastructure funding allocations should be strictly linked to adherence to the IDMS; while another stated that the implementation of the IDMS brought about a significant change and a more structured approach in how government departments plan and deliver infrastructure. The linking of planning, performance and/or delivery in the IDMS with an incentive, would improve the quality of planning and delivery of infrastructure.

5.6 Recommendations

The following recommendations are put forth:

- Efforts should be made in concluding and finalising the custodianship of the IDMS as this will enable the application to be easily monitored and evaluated.
- Public and private sectors within the built environment should find ways in which discussions are held that will help with the integration of the two sectors so that the terminologies used can be streamlined. Opening effective and impactful channels of communication will yield positive results.

- Creating awareness among the stakeholders of the built environment for the effective use of VM and the inclusion within IDMS.
- Linking planning, performance and/or delivery in the IDMS with an incentive to public sector personnel will improve the quality of planning and delivery of infrastructure.
- Infrastructure funding allocations should be strictly linked to adherence to the IDMS/ CIDMS.
- The concept of PPP should be fully embraced and utilised, using case studies from other countries with common objectives. This will assist in honing the skills of public sector personnel

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7 ANNEXURE 1: RESPONDENTS QUESTIONNAIRE

Dear Sir/Madam

My name is Sithela Sithole-Makgatho with student number 1387734. I am currently enrolled for a Master of Science degree in Quantity Surveying at University of the Witwatersrand, Faculty of Engineering and Built Environment, School of Construction Economics and Management.

I am conducting my research on: “INCORPORATING VALUE MANAGEMENT IN PUBLIC SECTOR PROJECT DELIVERY PROCESSES: THE CASE OF THE INFRASTRUCTURE DELIVERY MANAGEMENT SYSTEM (IDMS). To complete my degree, I am required to indicate my competence in conducting research and completing a research report. The research aims to research and explore the use of Value Management in the public sector project delivery and how Value Management is embodied in public sector project processes.

As part of this project, I would like to invite you to take part in answering a questionnaire. This activity will involve approximately 14 questions and will take around 15-20 minutes to complete.

Be assured that the data collected will remain private, treated with the utmost confidentiality, and be held securely on a password protected laptop. Participating in this research study is entirely voluntary and anonymous, you may choose to withdraw from this research study at any stage. Participants who chose not to participate or who withdraw from the study will have no adverse repercussions. Note that submitting the completed questionnaire is taken to mean consent for participating in the research study.

This study will be written up as a research report which will be available online through the university library website.

If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University of Witwatersrand, School of Construction Economics and

Management Ethics Committee, telephone +27(0) 11 717 7001, email Thabelo.Ramantswana@wits.ac.za. alternatively, you can contact either one of the contacts listed below.

Thanking you in advance, your participation is immensely appreciated.

Researcher: Sithela Sithole-Makgatho 082 362 0329
1387734@students.wits.ac.za

Research Supervisor: David Root David.Root@wits.ac.za

CONSENT FORM - REESPONDENT

I have been asked to participate in the above study. I have been informed about my involvement in the research, and what is required of me. I understand that:

- My participation in the research study is voluntary;
- I may withdraw from the research at any time with no negative consequences for myself;
- My answers will not be used if I do not provide written, informed consent;
- My answers will be kept confidential and the anonymised data will be safely stored on password protected computers;
- The data and results may be used for journal publications and/or conference presentations;
- The data may also be used in related studies in future;
- Other researchers may have access to the data but my name will not appear on any of the data base that is sent to other researchers;
- I can contact the researchers, whose details have been provided above, if I have any uncertainties or concerns that relate to the study;
- I have received the contact details of the researchers on the participant introduction sheet;
- All my questions about the research have been answered and I agree that my responses from the interview can be used for the research;

I have read the abovementioned information and agree to participate as per the above conditions. I understand everything and consent voluntarily to participate in this study.

Initials /Signature

Date

SECTION A: DEMOGRAPHICS

This section of the questionnaire refers to the background or biographical information. Although we are aware of the sensitivity of the questions in this section, the information will allow us to compare groups of respondents. Once again, we assure you that your response will remain anonymous. Your cooperation is appreciated.

Name

Surname

1. Which of the following best describes your organization?

Consultant

Government, parastatal, or municipality

Building site

Corporate, banking etc.

Academic institution

2. How many years have you worked in the construction industry?

1 - 2 years	3 - 5 years	6 – 10 years	11 – 15 years	16 years & above

3. Which part of South Africa are you located?

Gauteng	Mpumalanga	Limpopo	North West	Free State	Western Cape	Eastern Cape	Kwa-Zulu Natal	Northern Cape

4. Please state your highest educational qualification.

Matric or lower	Diploma	Bachelor's Degree	Honours Bachelor's Degree	Master's Degree	Doctorate

SECTION B - INTRODUCTION OF IDMS

This section of the questionnaire explores your knowledge regarding technologies available to improve health and safety on the construction site.

5. Does the policy and legislation makers understand the concept of VM?

6. Where in public sector project delivery processes is VM practices applied?

7. What are the hindering factors for SA public sector to adopt and implement VM?

8. What is the understanding of practitioners of the role of VM in enhancing project delivery?

9. Do you understand the of introducing VM within IDMS?

SECTION C – CHALLENGES FOR IMPLEMENTING VALUE MANAGEMENT

Please indicate your answers by using the following 5-point scale where:

1 = Strongly disagree (SD); 2 = Disagree (D); 3 = Neutral (N); 4 = Agree (A); 5 = Strongly agree (SA)

10. Do you regard IDMS as solution to the public infrastructure delivery?

No	Obstacles against VM practice	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
B101	Lack of knowledge in VM	1	2	3	4	5

11. What are the obstacles that prohibits application of value management to projects?

No	Obstacles against VM practice	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
C101	Lack of knowledge in VM	1	2	3	4	
C102	Inadequate facilitation skills and training	1	2	3	4	5
C103	Lack of budget to adopt	1	2	3	4	5
C104	Lack of innovation	1	2	3	4	5
C105	Fear of change	1	2	3	4	5
C106	Lacks interest from consultants	1	2	3	4	5
C107	Lacks of appetite from client	1	2	3	4	5
C108	Lack of VM experts	1	2	3	4	5
C109	Size of project	1	2	3	4	5

12. To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

No	Opportunities exist in the following areas to improve VM implementation	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
C1014	Incorporate within SA construction legislation	1	2	3	4	5
C1015	Incorporate within the tertiary studies	1	2	3	4	5
C1016	Built environment councils to incorporate within the continuous development P modules	1	2	3	4	5

13. To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

No	Opportunities exist in the following areas to improve Value Management	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
D101	Better collection of data platform	1	2	3	4	5
D102	Saves on cost	1	2	3	4	5

LESSONS LEARNED

14. Do you think IDMS as a system has achieved the objectives set to achieve?

8 ANNEXURE 2: UNSTRUCTURED INTERVIEWS

8.1 Annexure 1.1.: Respondent 1

What do you understand about IDMS?

IDMS is a tool utilised by the government department to assist in the public infrastructure delivery process. IDMS is defined as pockets, that define activities attached to timelines, procurement completes an open bidding process.

The tool assists the government department Supply Chain Management (SCM) uses to monitor the different gate deliverables. The government with the assistance of IDMS has adopted the none soliciting, fair procurement which addresses competition approach. SCM is informed by the Constitution of SA and Preferential Procurement Policy Framework Act (PPPFA) has requirements and regulations, these are in place to curb corruption, extract information and relevance. Responded 1 specifically mentioned PPPFA regulation 9 – requirements to be followed by SCM to procure services from the public. The IDMS does highlight the PPPFA procurement policies as guide with regards to SCM.

The other function of IDMS is monitoring the quality, technical, pricing, skill development and total outputs of the appointed consultants.

Progress of IDMS within various department

The views of the participants have been summaries as follows:

Respondent 1 stated that South African National Treasury is leading custodian pertaining to IDMS, yes other government departments were involved in the process of formulating and consultation. Hence, discussion and negotiations are still underway to whether Gauteng Department of Public Works or National Treasury will be leading custodian of the IDMS and is a time-consuming process.

Gauteng Department of Public Works is currently leading in terms of systems, application etc. but unfortunately no proclamation from National Treasury to Gauteng Department of Public Works, the logistics are still pending. Both departments have not signed an MOA. Office of the President released a statement to move IDMS from Treasury to Gauteng Department of Public Works but not implemented yet.

This process is hampering the progress of moving forward with IDMS. The monitoring of the IDMS system is still under National Treasury, it is difficult to evaluate the effect and impact of IDMS until it is fully adopted or implemented with public infrastructure

Views on the IDMS from policies

Furthermore responded 1 highlighted the different regulations that are in place to address the procurement in support of the IDMS. It was also mentioned that these government policies and regulations including the PPP procurement act are good on paper, but implementation of these policies is impossible due to corruption.

These government policies should include VM

Government policies should be informing the research

Terminologies from public sector and private sector are different

Public sector utilises the “Best Value” in the policies and regulations

Challenges

VM in public sector is unknown but that is due to different terminology utilised

IDMS not utilised in the private sector procurement

VM term is not relevant in the public sector

Political sensitivity around the issue of IDMS and Public sector has a bureaucratic approach

8.2 Annexure 1.2.: Respondent 2

The views of the participant have been summaries as follows:

Respondent 2 suggested “Informed Practice Notes” focusing on the construction procurement strategy that assists the public servants with guidance. Further mentioned that the practice notes guide the professionals in terms of selecting the appropriate strategy in the planning phase, directing the how, what, when and who. The design concept for different participating practitioners (contractors, professional service providers etc).

Respondent 2 also mentioned that a study should be conducted focus on the success rate of application and extent of implementation, i.e. examples of projects where VM is used and increased or reduced. This will also assist the department on the way forward in terms of application.

Respondent 2 also mentioned that public sector should be able to assess if IDMS has achieved its objectives and issues in legislation by relooking at implemented projects. This exercise could be verified by auditing the system and framework infrastructure.

Furthermore, mentioned that local government, provincial government has different construction procurement strategies from the national and minimum requirements and that hamper the application of IDMS

Respondent 2 Within the Division of Revenue Act (DORA) – revenue act, there is an infrastructure grant

Challenges

Participant 2 echoes the response of participant 1 that VM is not terminology utilised in the public sector

8.3 Annexure 1.3.: Respondent 3

Views on policy and legislation makers understand the concept of VM

The participant's views were that VM is understood on theory and had no interaction with policy makers on the IDMS, and only supported implementation.

Where in public sector project delivery processes is VM practices applied?

Not to my knowledge deliberately anywhere.

What are the hindering factors for SA public sector to adopt and implement VM?

The capacity of public officials

What is the understanding of practitioners of the role of VM in enhancing project delivery?

Not considered to my knowledge

Do you understand the of introducing VM within IDMS?

Yes

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – very important

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – extremely important

Inadequate facilitation skills and training – important

Lack of cost to adopt – not important

Lack of innovation - not important

Lacks interest from consultants – important

Lacks client insistence - extremely important

Fear of change - not important

Lack of VM experts – important

Size of project - not important

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation - very important

Incorporate within the tertiary studies - very important

Built environment councils to incorporate within the continuous development P modules - very important

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform – extremely important

Saves on cost – extremely important

Do you think IDMS as a system has achieved the objectives set to achieve?

In some provinces yes. However, infrastructure funding allocations should be strictly linked to adherence to the IDMS/CIDMS.

8.4 Annexure 1.4.: Respondent 4

Views on policy and legislation makers understand the concept of VM

I believe in theory they do.

Where in public sector project delivery processes is VM practices applied?

In ensuring that the needs of society are met while public sector resources are utilised in the best possible manner

What are the hindering factors for SA public sector to adopt and implement VM?

Corruption, poor performance of officials ,

What is the understanding of practitioners of the role of VM in enhancing project delivery?

To deliver quality and sustainable products/outputs with a cost benefit and within the required timeframes.

Do you understand the of introducing VM within IDMS?

Yes. The IDMS is meant to ensure standardised infrastructure delivery, thus ultimately adding value for money in the delivery of infrastructure projects.

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – extremely important

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – extremely important

Inadequate facilitation skills and training – extremely important

Lack of cost to adopt – very important

Lack of innovation - very important

Fear of change - very important

Lacks interest from consultants – important

Lacks client insistence - important

Lack of VM experts – very important

Size of project - important

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation – extremely important

Incorporate within the tertiary studies - extremely important

Built environment councils to incorporate within the continuous development P modules - extremely important

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform – very important

Saves on cost – extremely important

Do you think IDMS as a system has achieved the objectives set to achieve?

Not yet. Implementation is still a challenge

8.5 Annexure 1.5.: Respondent 5

Views on policy and legislation makers understand the concept of VM

I think so, policy and legislation is drafted from a long term sustainability point of view. There may be a lack of understanding of VM in the implementation phase.

Where in public sector project delivery processes is VM practices applied?

Planning stages of projects these days generally consider the overall value management of a project, in so far as anticipated/projected benefits.

What are the hindering factors for SA public sector to adopt and implement VM?

The lack of appetite for considering the impacts of projects beyond implementation (construction). The lack of adequate consideration for operation throughout the lifecycle of the asset and its value to the users (provision of adequate budgets and ensuring compliance of maintenance regimes).

What is the understanding of practitioners of the role of VM in enhancing project delivery?

Difficulty responding to the question. Does practitioner refer to Implementing Agents/Departments of Professionals appointed by the public sector.

Do you understand the of introducing VM within IDMS?

Not quite, I thought it was already embedded in the objectives of the IDMS.

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – very important

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – extremely important

Inadequate facilitation skills and training – very important

Lack of cost to adopt – very important

Lack of innovation - very important

Fear of change - extremely important

Lacks interest from consultants – very important

Lacks client insistence - very important

Lack of VM experts – very important

Size of project - very important

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation – extremely important

Incorporate within the tertiary studies - very important

Built environment councils to incorporate within the continuous development P modules - very important

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform – extremely important

Saves on cost – extremely important

Do you think IDMS as a system has achieved the objectives set to achieve?

No, largely due to non-compliance by the departments/entities that are required to apply it.

8.6 Annexure 1.6.: Respondent 6

Views on policy and legislation makers understand the concept of VM

Yes, even though policies are drafted at a strategic level, the process in drafting it allows for inputs from individuals and/ or departments at operational and tactical levels.

Where in public sector project delivery processes is VM practices applied?

VM processes are applied throughout the lifecycle of the project, with an in-depth focus at Infrastructure Planning, Infrastructure Procurement, Infrastructure Packaging and Design stages.

What are the hindering factors for SA public sector to adopt and implement VM?

The lack of professional capacity to continuously monitor and evaluate the performance and quality on projects, which in most cases cause for escalation in project cost.

What is the understanding of practitioners of the role of VM in enhancing project delivery?

The Practitioners clearly understand the role of VM in enhancing project delivery, and therefore have a clear brief in delivering the project objectives that will ultimately ensure benefits for the clients.

Do you understand the of introducing VM within IDMS?

Yes, the introduction of VM will be more beneficial to the clients, as it will provide them with an in-depth understanding of the functions and benefits that will derive at each stage of the IDMS.

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – very important

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – very important

Inadequate facilitation skills and training – very important

Lack of cost to adopt – important

Lack of innovation – extremely important

Fear of change - important

Lacks interest from consultants – important

Lacks client insistence - important

Lack of VM experts – very important

Size of project - not important

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation – extremely important

Incorporate within the tertiary studies - extremely important

Built environment councils to incorporate within the continuous development P modules - extremely important

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform – extremely important

Saves on cost – extremely important

Do you think IDMS as a system has achieved the objectives set to achieve?

Yes, the implementation of the IDMS has brought a significant change and a more structured approach in how government departments plan and deliver infrastructure. The linking of planning, performance and / or delivery in the IDMS with an incentive, improved the quality in planning and delivery of infrastructure.

8.7 Annexure 1.7.: Respondent 7

Views on policy and legislation makers understand the concept of VM

Yes

Where in public sector project delivery processes is VM practices applied?

It is a process in one of the procurement options, please check the CIDB website on Contacting Strategies or the IDMS Toolkit

What are the hindering factors for SA public sector to adopt and implement VM?

Use of VM is dependent of the contracting strategy adopted, the one that uses VM is not normally used in the public sector

What is the understanding of practitioners of the role of VM in enhancing project delivery?

I do not know. However, all professionally registered project managers should know what VM is because it is part of the training.

Do you understand the of introducing VM within IDMS?

N/A

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – extremely important

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM –

Inadequate facilitation skills and training –

Lack of cost to adopt –

Lack of innovation -

Fear of change -

Lacks interest from consultants –

Lacks client insistence -

Lack of VM experts –

Size of project -

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation

Incorporate within the tertiary studies

Built environment councils to incorporate within the continuous development P modules -

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform

Saves on cost

8.8 Annexure 1.8.: Respondent 8

Views on policy and legislation makers understand the concept of VM

Yes

Where in public sector project delivery processes is VM practices applied?

In policies

What are the hindering factors for SA public sector to adopt and implement VM?

Availability of resource

What is the understanding of practitioners of the role of VM in enhancing project delivery?

Better quality delivered

Do you understand the of introducing VM within IDMS?

Yes

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Agree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Agree

Inadequate facilitation skills and training – Agree

Lack of cost to adopt – Agree

Lack of innovation - Agree

Fear of change - Agree

Lacks interest from consultants – Agree

Lacks client insistence - Agree

Lack of VM experts – Agree

Size of project - Agree

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation - Agree

Incorporate within the tertiary studies - Agree

Built environment councils to incorporate within the continuous development P modules - Agree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Agree

Saves on cost - Agree

8.9 Annexure 1.9.: Respondent 9

Views on policy and legislation makers understand the concept of VM

Yes, I believe they do

Where in public sector project delivery processes is VM practices applied?

Mostly in policies but not legislated

What are the hindering factors for SA public sector to adopt and implement VM?

Lack of understanding

What is the understanding of practitioners of the role of VM in enhancing project delivery?

Infrastructure delivery within costs, duration and good quality

Do you understand the of introducing VM within IDMS?

Yes, depends though

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Agree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Neutral

Inadequate facilitation skills and training – Strongly Agree

Lack of cost to adopt – Disagree

Lack of innovation - Agree

Fear of change - Agree

Lacks interest from consultants – Neutral

Lacks client insistence - Neutral

Lack of VM experts – Agree

Size of project - Neutral

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation - Strongly Agree

Incorporate within the tertiary studies - Strongly Agree

Built environment councils to incorporate within the continuous development P modules - Strongly Agree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Agree

Saves on cost - Strongly Agree

8.10 Annexure 1.10.: Respondent 10

Views on policy and legislation makers understand the concept of VM

Yes, I believe in theory they do.

Where in public sector project delivery processes is VM practices applied?

Making certain that the needs of society are met while public sector resources manner *What are the hindering factors for SA public sector to adopt and implement VM?*

Its because of Corruption of officials

What is the understanding of practitioners of the role of VM in enhancing project delivery?

I do not know. However, all professionally registered project managers should know what VM is because it is part of the training.

Do you understand the of introducing VM within IDMS?

N/A

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – extremely important

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM –

Inadequate facilitation skills and training –

Lack of cost to adopt –

Lack of innovation -

Fear of change -

Lacks interest from consultants –

Lacks client insistence -

Lack of VM experts –

Size of project -

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation

Incorporate within the tertiary studies

Built environment councils to incorporate within the continuous development P modules -

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform

Saves on cost

8.11 Annexure 1.11.: Respondent 11

Views on policy and legislation makers understand the concept of VM

Yes, I believe in theory they do.

Where in public sector project delivery processes is VM practices applied?

Making certain that the needs of society are met while public sector resources manner *What are the hindering factors for SA public sector to adopt and implement VM?*

Its because of Corruption of officials

What is the understanding of practitioners of the role of VM in enhancing project delivery?

I do not know. However, all professionally registered project managers should know what VM is because it is part of the training.

Do you understand the of introducing VM within IDMS?

N/A

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Strongly disagree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Strongly disagree

Inadequate facilitation skills and training – Strongly disagree

Lack of cost to adopt – N/A

Lack of innovation - Agree.

Fear of change - Agree.

Lacks interest from consultants – Neutral

Lacks client insistence - Neutral

Lack of VM experts – Agree.

Size of project - Neutral

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation - Strongly disagree

Incorporate within the tertiary studies - Strongly disagree

Built environment councils to incorporate within the continuous development P modules -
Strongly disagree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Agree.

Saves on cost - Strongly disagree

8.12 Annexure 1.12.: Respondent 12

Views on policy and legislation makers understand the concept of VM

Probably in theory.

Where in public sector project delivery processes is VM practices applied?

No.

What are the hindering factors for SA public sector to adopt and implement VM?

Capacity

What is the understanding of practitioners of the role of VM in enhancing project delivery?

I am not sure

Do you understand the of introducing VM within IDMS?

I am not sure

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Agree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Strongly Agree

Inadequate facilitation skills and training – Neutral

Lack of cost to adopt – Strongly disagree

Lack of innovation - Disagree

Fear of change - Strongly disagree

Lacks interest from consultants – Neutral

Lacks client insistence - Strongly Agree

Lack of VM experts – Neutral

Size of project - Strongly disagree

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation – Agree

Incorporate within the tertiary studies – Agree

Built environment councils to incorporate within the continuous development P modules – Agree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Strongly disagree

Saves on cost - Strongly disagree

8.13 Annexure 1.13.: Respondent 13

Views on policy and legislation makers understand the concept of VM

No there is no understanding.

Where in public sector project delivery processes is VM practices applied?

It is applied but in a different context

What are the hindering factors for SA public sector to adopt and implement VM?

Lack of knowledge and understanding of VM

What is the understanding of practitioners of the role of VM in enhancing project delivery?

There is no understanding.

Do you understand the of introducing VM within IDMS?

Yes

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Agree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Strongly agree

Inadequate facilitation skills and training – Neutral

Lack of cost to adopt – Strongly disagree

Lack of innovation - Disagree

Fear of change - Strongly disagree

Lacks interest from consultants – Neutral

Lacks client insistence - Strongly agree

Lack of VM experts – Neutral

Size of project - Strongly disagree

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation – Agree

Incorporate within the tertiary studies – Agree

Built environment councils to incorporate within the continuous development P modules – Agree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Strongly agree

Saves on cost - Strongly agree

8.14 Annexure 1.14.: Respondent 14

Views on policy and legislation makers understand the concept of VM

Probably in theory. But I had no interaction with policy makers on the IDMS, I supported implementation

Where in public sector project delivery processes is VM practices applied?

Not to my knowledge deliberately anywhere.

What are the hindering factors for SA public sector to adopt and implement VM?

The capacity of public officials

What is the understanding of practitioners of the role of VM in enhancing project delivery?

Not considered to my knowledge

Do you understand the of introducing VM within IDMS?

Yes

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Agree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Strongly agree

Inadequate facilitation skills and training – Neutral

Lack of cost to adopt – Strongly disagree

Lack of innovation - Disagree

Fear of change - Strongly disagree

Lacks interest from consultants – Neutral

Lacks client insistence - Strongly disagree

Lack of VM experts – Neutral

Size of project - Strongly disagree

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation - Agree

Incorporate within the tertiary studies - Agree

Built environment councils to incorporate within the continuous development P modules - Agree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Strongly disagree

Saves on cost - Strongly disagree

8.15 Annexure 1.15.: Respondent 15

Views on policy and legislation makers understand the concept of VM

A small percentage understand VM.

Where in public sector project delivery processes is VM practices applied?

In the strategies, policies, it does exist

What are the hindering factors for SA public sector to adopt and implement VM?

Capacity is the main issue to implementation

What is the understanding of practitioners of the role of VM in enhancing project delivery?

Not sure

Do you understand the of introducing VM within IDMS?

Yes

Do you regard IDMS as solution to the public infrastructure delivery?

Lack of knowledge in VM – Disagree

What are the obstacles that prohibits application of value management to projects?

Lack of knowledge in VM – Neutral

Inadequate facilitation skills and training – Neutral

Lack of cost to adopt – Disagree

Lack of innovation - Agree.

Fear of change - Agree.

Lacks interest from consultants – Strongly agree

Lacks client insistence - Disagree

Lack of VM experts – Neutral

Size of project – Strongly disagree

To what extent do you agree with the following as ways to address the implementation of VM in the South Africa public sector?

Incorporate within SA construction legislation - Strongly agree

Incorporate within the tertiary studies - Strongly agree

Built environment councils to incorporate within the continuous development P modules -
Strongly agree

To what extent do you agree with the following as opportunities that exist in the construction industry for Value Management within the public sector?

Better collection of data platform - Strongly agree

Saves on cost - Strongly agree

9 ANNEXURE 3: ETHICS CLEARANCE CERTIFICATE

10 ANNEXURE 4: TURNITIN REPORT