IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR ENHANCING VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT

Prepared by: Kwanda Lande (LNDKWA002)

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DECLARATION

I, **Kwanda Lande (LNDKWA002),** declare that this research report is my own work except as indicated in the references and acknowledgements.

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Name: Kwanda Lande Signature: Signed by candidate

Signed at: Cape Town……

On the …….. day of …… 20…..

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ABSTRACT

Internationally, virtual project teams have surfaced as an essential organizational structure due to improved information and communication technology and changes in corporate values. Furthermore, virtual project teams are favoured for the flexibility they provide in terms of recruiting the best available experts regardless of their location, improving productivity by reducing commuting time and operational costs for organizations. Despite this, virtual project teams are also associated with many challenges, linked to communication, collaboration and sharing of information, that negatively affect Virtual Project Team Performance (VPTP). Hence, identifying what enhances VPTP is of great importance. This research aimed to identify Critical Success Factors (CSFs) for enhancing VPTP in the South African local government context (focusing on the City of Cape Town), determine the interrelationship between the identified CSFs, and identify CSFs to prioritize when implementing and managing virtual project teams.

The research participants for this study identified 20 CSFs using Interactive Management methodology techniques linked to CSF generation, and CSF clarification processes. Moreover, research participants generated an Interpretive Structural Model (ISM) that illustrates the CSFs that "significantly help to achieve" other CSFs. Using the transitive logic inferences embedded in the ISM program, this research has revealed that CSFs such as shared values among team members, regular team brainstorming sessions, reviewing lessons learned of previous projects, effective communication, technical skills competencies aligned to tasks, project progress and performance management, time management and boundaries, reliable technology and network system, and regular in-person engagements even when virtual working is the norm, are relatively important based on the number of other CSFs that they significantly help to achieve.

The benefit of this study is twofold: firstly, it helps to extend prior research on CSFs for VPTP by contributing new information based on the views and experiences of virtual project team stakeholders in the South African local government context. Secondly, this research is essential for South African municipalities as it identifies CSFs in one municipality that other municipalities can use as a base to build from in identifying and implementing CSFs for VPTP in their organizations.

Keywords: South Africa's Local Government, City of Cape Town, Critical Success Factors, Virtual Project Team Performance, Interactive Management.

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CSF	Critical Success Factor
CoCT	City of Cape Town
FWP	Flexible Working Programme
G2C	Government to citizen
G2B	Government to business
G2G	Government to government
G2E	Government to the employee
ICT	Information and Communication Technology
IT	Information Technology
IM	Interactive Management
ISM	Interpretive Structural Modelling
OECD	Organisation for Economic Co-operation and Development
PMI	Project Management Institute
TDMS	Travel Demand Management Strategy
UCT	University of Cape Town
VPTP	Virtual Project Team Performance
VPT	Virtual Project Team

CHAPTER 1 - INTRODUCTION

1.1. Introduction

Internationally, virtual project teams have surfaced as an essential organizational structure as a result of improvements in information and communication technology (ICT) and changes in corporate values (Roebuck, Brock, and Moodie, 2004, cited in Both, 2011:8). Topaloglu and Anac (2021: 107) note that the COVID-19 pandemic has speeded up the growth of virtual teams to record levels. In South Africa, disaster management regulations implemented during the COVID-19 pandemic to promote social distancing also accelerated the use of virtual platforms by local governments (Business Day, 2020: 4). Despite the widespread use and growth, virtual project teams continue to present many challenges that affect performance (Clark, Marnewick, and Marnewick, 2019: 40). Powell, Piccoli, and Ives (2004), cited in Behling (2019: 1), noted the importance of studying virtual project teams to gain insight into the design and operational characteristics that makes them successful. This research focuses on the Critical Success Factors (CSFs) for enhancing Virtual Project Team Performance (VPTP) in the South African local government, particularly in the City of Cape Town.

Curseu, Schalk, and Wessel (2008), cited in Matlala (2011: 1), note that the critical difference between virtual and traditional project teams is the considerable utilization of ICT by the former to enable communication and collaboration between geographically dispersed team members. Virtual project teams are effective in enhancing team performance as they provide flexibility for organizations to recruit the best available experts regardless of their location (Dube and Marnewick, 2016: 1). Virtual project teams can improve productivity by reducing commuting time and operational costs for organizations (Dube and Marnewick, 2016: 3; Huang, 2010: 1). However, OECD (2021: 2), illustrates the challenge to extend proven individual employee productivity to organizational productivity where synchronous and asynchronous interactions are needed. Therefore, identifying CSFs for virtual project team performance challenges is crucial for enhancing performance.

In the South African local government context, ICT as an enabling instrument for service delivery is not new; instead, it originated in the early 2000s, intending to effectively enable electronic government (e-government) (Söderström, Blake and Odendaal, 2021: 106). The realm of e-government is multifaceted and includes dimensions such as "government to citizen (G2C), government to business (G2B), government to government (G2G), and government to

the employee (G2E)" (Siau and Long, 2005, cited in Makwembere, 2015: 1). Scholarly and popular literature on e-government typically focuses on the interactions between citizens, businesses, and government agencies, referred to as G2C, G2B, and G2G, respectively (Makwembere, 2015: 1). There is limited scholarly attention paid to G2E, or e-government research that considers public sector employees as users of ICT to achieve government objectives (Rao, 2011: 1; Makwembere, 2015: 1; Iong & Phillips, 2023; 1). The limited attention paid to G2E presents a significant gap in the scholarly literature.

This study adopted the Interactive Management (IM) methodology to identify CSFs for enhancing VPTP in the South African local government context (focusing on the City of Cape Town), determine the interrelationship between the identified CSFs, and identify CSFs to prioritize when implementing and managing virtual project teams. The IM approach is appropriate for achieving the above objectives of this study because:

- It "embraces the relevant stakeholders to collectively identify the critical success factors through four phases: generating critical success factors, clarifying the generated CSFs, structuring a systemic digraph showing the interlaced relationships between the CSFs, and identifying the real CSFs in the systemic digraph" (Tuan, 2020: 1).

The four phases of the IM approach enable the identification of CSFs for VPTP in the South African local government context. It helps to determine interrelationships between identified CSFs and CSFs to prioritize when implementing virtual project teams in South Africa's local government context. The following sections describe the research context, research problem (highlighting the difference between the preferred condition of virtual teams and the current condition), the significance of this study, research question, and research objectives. This introductory chapter will also discuss the relevance of this research to local government in South Africa.

1.2. Research Relevance to South Africa's Local Government Context

Local government in South Africa is rightly known as that sphere of public administration closest to communities and the 'delivery arm' of government (Koma, 2010: 113). The proximity of local government to its inhabitants better places it as the most appropriate sphere of government to respond to local demands and community expectations (*Ibid.*). Van der Waldt (2006), cited in Koma (2010: 113), argues that "local government is the coalface of service delivery as it is usually the first instance of interaction between community members and

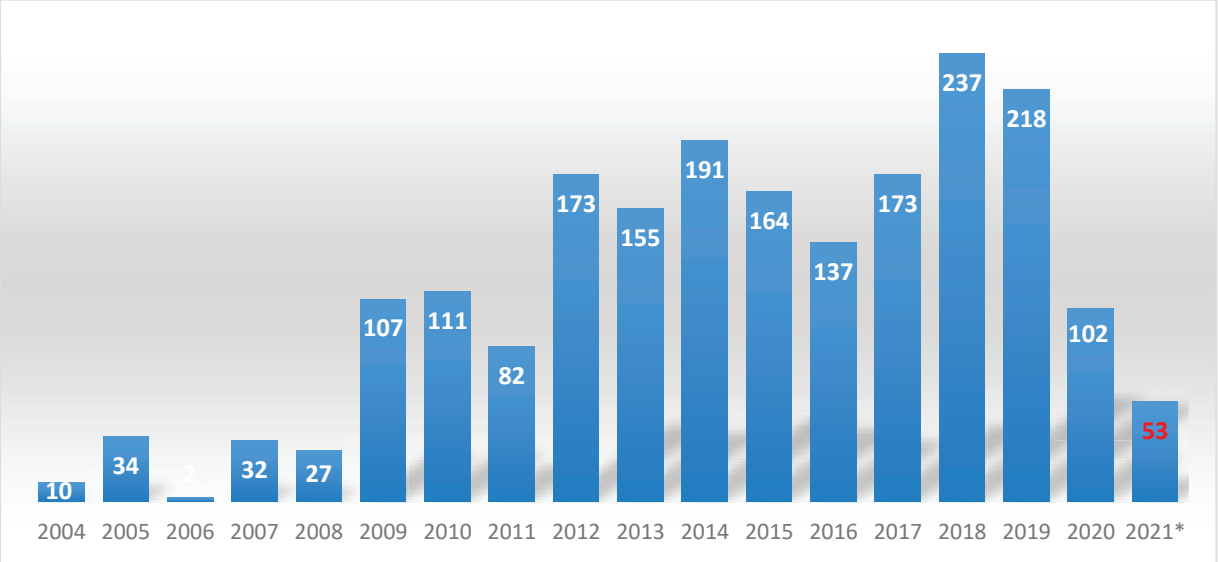
government." The Constitution of South Africa (1996), cited in Koma (2010: 113), mandates that the local government is responsible for governing and managing its community's government affairs in alignment with the legislation of national and provincial governments.

The White Paper on Local Government (1998), cited in Söderström, Blake, and Odendaal (2021: 106), emphasizes the idea of 'developmental local government', which promotes the involvement of ordinary community members in finding and implementing sustainable solutions to their socio-economic and environmental needs. Hence, the local sphere of government, working with its citizens and local community groups, is responsible for the provision of the below services (Constitution of South Africa, 1996: 136; 139):

Table 1.1: taken from Part B of Schedule Four and Part B of Schedule Five of the Constitution of the Republic of South Africa (1996: 136; 139).

Municipal planning Building regulations, fencing and fences	Child care facilities	Water and sanitation services limited to potable water supply systems and domestic wastewater	Markets, local tourism and street trading
Electricity reticulation and street lighting	Firefighting services	Stormwater management	Municipal health services
Beaches and amusement facilities	Municipal abattoirs and noise pollution	Municipal public transport, Roads, traffic and parking	Billboards and the display of advertisements in public places
Municipal parks, pounds and recreation, sports facilities	Cemeteries, funeral parlours and crematoria	Waste management	Licensing and control of undertakings that sell food to the public

Despite some success in service delivery, local municipalities in South Africa face several challenges that prevent them from providing sustainable service delivery solutions (Mamokhere, 2019; 373). The citizens and community groups have expressed the failure of service delivery through the increased number of service delivery protests observed (Joseph and Williams, 2022: 79). According to Municipal IQ (2021: 1), the number of major service delivery protests increased between 2004 and 2020, after which the number declined from 2020 to 2021, see Figure 1 below. Joseph and Williams (2022: 79) attribute the decline in service



delivery protests to COVID-19 and the related lockdown regulations that promoted social distancing and thus prevented communities from gathering for protests.

Figure 1.1: Taken from Municipal IQ (2021: 1) illustrates municipal service delivery protests between 2004 and 2021.

Mamokhere (2019: 375) identifies the reason behind service delivery protests, which include dissatisfaction with services such as water and sanitation, housing, power outages, and roads. Joseph and Williams (2022: 79) provide an analysis of how municipal service delivery protests are spread across provinces, illustrating that Gauteng and Kwa-Zulu Natal experienced the most service delivery protests in the Country in 2021, 2020, and 2019. Free State province also experienced the most service delivery protests following Gauteng and Kwa-Zulu Natal despite the province having a smaller population compared to Western Cape and Eastern Cape (*Ibid.*).

Koma (2010: 119) notes the importance of strengthening local government institutional capacity, structures, and systems as a critical condition for local municipalities to fulfil their

constitutional mandate of service delivery effectively. In addition, many policies, tools, and methods have been adopted to enable local municipalities to achieve service delivery (Odendaal, 2006: 30). Amongst the interventions is the adoption of ICT policies by some local municipalities to enable sustainable service delivery (Odendaal, 2006: 30). It is under this context that municipal officials in South Africa have explored virtual project teams as an approach to implementing various development projects aimed at achieving service delivery targets.

Past studies illustrate the potential of virtual project teams to improve capacity and performance by reducing project timelines, allowing for instantaneous communication, which improves turnaround for decision making, reducing operation costs for traveling costs, and rent for offices (and related costs), allowing for recruiting best available experts (Dube and Marnewick, 2016: 3; Huang, 2010: 1). Virtual project teams are, however, faced with the challenge of ensuring improved levels of collaboration, communication, and the sharing of information created by the diversity of cultures, lack of good ICT tools, lack of guidelines and training, and lack of trust among other factors (Swart, Bond-Barnard and Chugh, 2022: 70).

1.3. Single Organisation Focus: City of Cape Town

This research focuses on the City of Cape Town as an object of study. The City of Cape Town (CoCT) primarily comprises densely populated business districts and residential, industrial, and agricultural areas. According to Western Cape Government - WCG (2021: 5), the CoCT is the densest City in the Western Cape, with a population density of 1,915 persons per square kilometre. The CoCT accommodates a population of 4 758 433, projected to increase to 5 133 369 by 2025, based on a growth rate of 1.6 percent annually (WCG, 2021: 5). According to the CoCT (2022b: 22), the population growth in the City is marked by a decrease in the household size, which has increased the number of households from1,07 million in 2011 to 1,46 million in 2021. The Gini coefficient in the CoCT is at 0,63, which indicates growing income inequality (CoCT, 2022b: 24). Although the number of households earning R3 500 has increased from 22,6% in 2019 to 28,0% in 2020, the unemployed has remained stubbornly high at 30,2% based on the broad unemployment definition (CoCT, 2022b: 24). Access to housing and land in Cape Town remains challenging, leading to growing informal settlements (CoCT, 2022b: 22).

According to News24 (2020), the City of Cape Town has an overall staff component of 28,863 and 3,237 vacant positions servicing a population of 4,68 million people across an area of

2 446.4 square kilometres (CoCT, 2022b: 22). As discussed in section 1.4 above the Constitution of the Republic of South Africa assigns executive authority to municipalities regarding the function listed in Part B of Schedule Four and Part B of Schedule Five. The City Manager and the Executive Management Team (EMT) provide administrative leadership of the municipality. The members of the Executive Management Team include all executive directors of the municipality. The CoCT comprises twelve directorates, as highlighted in the organogram below (CoCT, 2022b: 141). Each directorate consists of departments and branches that are responsible for implementing projects.

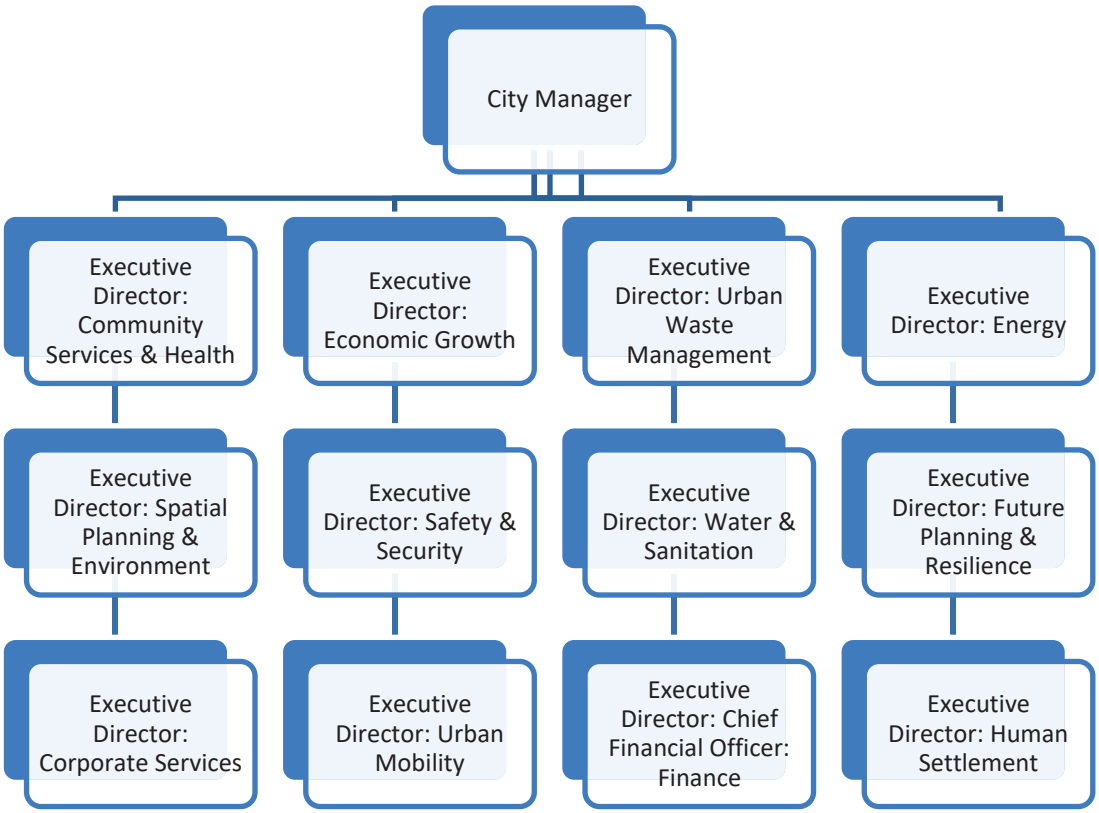


Figure 1.2: Taken from CoCT (2022b: 141), shows the CoCT Executive Management Team Organogram

In order to deliver on the constitutional mandate, the CoCT (2022a; 5) mentions that it wants to utilize technology solutions, amongst other strategies, to enhance service delivery further and future-proof the organization against shocks and stresses. The shifts since 2018 in the employee working arrangements better illustrate how the CoCT has used technology to ensure

the continuous provision of services while responding to shocks and stresses. In 2018, the CoCT adopted a Flexible Working Programme (FWP) to address traffic challenges in the Metropolitan (CoCT: 2018: 1). The FWP allowed CoCT project team members to work on a part-time (hybrid virtual teams) basis from a remote place of work. Hybrid working arrangements in the context of the FWP meant that project team members could work remotely for a few hours to avoid the peak traffic period or work remotely on certain days of the week (CoCT: 2019: 6).

The CoCT (2019: 2) gave the responsibility of implementing and monitoring the FWP to line management. In undertaking the implementation and monitoring responsibility, line management was required to take into account the unique realities and operational requirements of their departments, as well as the differing functional roles performed by their departments, individual employees, and teams (CoCT, 2018: 3). Line management needed to be convinced that the flexible working arrangement will contribute to productivity and that there is no need for the employee to meet face-to-face with customers and other stakeholders (CoCT, 2019: 4). In a case where the work of an employee requires them to work as part of a team, flexible working arrangement must only be approved if it does not require changing everyone's working schedule (CoCT, 2019: 4). The pilot of the FWP was short-lived due to the COVID-19 pandemic (CoCT, 2021: 1).

In April 2020, President Cyril Ramaphosa announced the first national lockdown following the outbreak of the COVID-19 pandemic (South Africa Government Communications, 2024: 1). The various national lockdowns announced during the period of the national state of disaster resulted in a radical shift in the working arrangements of many CoCT project team members where all non-essential departments were directed to work on an entire (pure virtual teams) basis from a remote place of work (CoCT, 2020: 2). The back to work plan of the CoCT (2020: 5) provides a list of essential services based on the definition of essential services in the national disaster regulations. As a result, during the different levels of national lockdowns, only employees from the below essential services were allowed to work from the office:

- Components of the trading services (Electricity, Water and sanitation, and Solid Waste Management)
- Transport services (only operations)
- Health services
- Safety and security services, including disaster risk management

- City support services, or part thereof, such as Finance, including Supply Chain Management; Human Resources, including Occupational Health and safety, Pay Roll and EAP and wellness, Communications, Information Systems, and Technology; Facilities management (only operations); Fleet services, Call centres, Legal Services, Informal settlements services (operations).

In April 2022, after two (2) years of national lockdown, the National State of Disaster was lifted by National Government bringing an end to lockdown regulations that were enacted to promote social distancing (South Africa Government Communications, 2024: 1). In June 2022 the CoCT showed its intention to continue with full-time or part-time (hybrid) virtual working arrangements for project team members, by adopting the remote working guidelines. In its remote working guidelines the CoCT (2022a: 5) mentions that it will continue investing on technological solutions, and develop a more flexible, accessible and responsive workforce that is able to adapt to new ways of work in pursuit of service delivery. Today, as the CoCT looks towards entrenching remote working, it can be said that the FWP and the experiences of the CoCT during and post national lockdowns set a valuable foundation for working from home (remote working) that is worth studying and documenting. Table 1.2 below provides a further comparison between traditional (face-to-face) project teams and virtual project teams.

Table 1.2: Taken from Dube (2012: 42), provides a comparison between traditional and virtual project teams.

Area of Comparison	Traditional	Virtual
Communication	Communication is primarily face-to-face Face-to-face communication carries "verbal and non-verbal cues, such as body language and tone of voice."	Communication is primarily through electronic forms Electronic forms of communication lack verbal and non-verbal cues. Communication must be clear and precise to avoid any potential misunderstanding.
Leadership and the structure of the team	There are fewer challenges in monitoring virtual team performance.	Managing diverse team members working across different boundaries and time zones is more challenging.

	Easy to implement standards, processes, and procedures governing the team. It is easy to read the attitudes and requirements of team members, which are critical for keeping members motivated.	Team leaders must have a specific skill to influence team members located away from them. Establishing and implementing standards, processes, and procedures to govern the team is difficult.
Trust	It is easy to build trust due to regular physical interaction and strong relationships.	Trust is challenging to establish due to a lack of solid relationships, in-depth personal interaction, absence of nonverbal cues, and lack of frequent interaction.
Social presence	Social presence motivates team members. Social presence is good for team building and cohesion. Regular physical contact between team members enhances social presence. Informal meetings or conversations commission co-located teams to enhance social presence.	Minimal contact and connection between team members limit social presence. Team members tend to feel alienated or isolated from the rest of the team. Lack of social presence creates difficulties in building team cohesion and trust.
Information technology tools	It only depends a little on electronic forms of communication.	It depends heavily on electronic forms of communication that can provide a variety of functions and are easy to use and maintain.

1.4. Problem Statement

Today, the CoCT has adopted remote working guidelines and practices that enable project team members to work on a full-time or part-time (hybrid) basis from a remote place of work. In implementing remote working arrangements, the CoCT seeks to leverage off the effectiveness of the employees in being able to work remotely and improve productivity levels through improved motivation levels (CoCT, 2022: 7). The CoCT believes that eliminating long commutes, especially where employees experience high levels of frustration with poor public transport systems and high levels of congestion, will improve productivity (CoCT, 2022: 7).

The CoCT also attempts to utilise remote working options to remain an employer of choice, where it can attract and retain talented employees (CoCT, 2022: 7). The CoCT believes that successful implementation of remote working will assist with overall costs through a reduction in external building leases, together with any associated facility expenses and overhead charges (CoCT, 2022: 7). The CoCT aims to reduce travel demands as attempt to contribute to the easing of traffic congestion during peak periods, through promoting remote working for some of its employees (CoCT, 2022: 7).

Despite the potential with remote working as discussed above, past research indicates challenges to virtual team performance, particularly concerning collaboration, communication, and the sharing of information. OECD (2021: 2) illustrates that productivity in remote working only improves individual employees and tasks that do not require collaboration or interaction with other team members. According to Pillai et al. (2022: 554), the absence of social presence and mobility in virtual teams hinders trust-building processes, which prevents the team from feeling cohesive, bonded, and satisfied. Trust is essential for collaboration in virtual "since trust determines whether team members ask each other for help, share feedback, and discuss issues and conflicts" (Morrison-Smith and Ruiz, 2020: 6). Hinds and Bailey (2003), cited in Morrison-Smith and Ruiz (2020: 9), argue that conflict in virtual teams is more extreme than in face-to-face teams since it is likely left undetected and unaddressed for an extended period.

Another challenge with remote work is that "some remote workers may lack a conducive work-from-home environment, so they cannot strike a balance between work and personal life" (Sundin, 2010, cited in Pillai et al., 2022: 554). According to Chakravarty (2020), cited in Pillai et al. (2022: 554), disturbances experienced from working from home make distinguishing between obligations to your family and your job difficult. Another challenge with virtual teams is that they do not provide the same opportunity for informal communication as face-to-face teams (Morrison-Smith and Ruiz, 2020: 7). Communication in virtual teams is mainly formal and does not often include informal communication that strengthens team members' work and social ties and mutual trust and understanding, which is essential for avoiding conflicts (*Ibid*.). Additionally, communication in the virtual environment tends to lose contextual information and non-verbal cues, such as members' body language and social status (Morrison-Smith and Ruiz, 2020: 8). Furthermore, insufficient provision of technical infrastructure, technical support or resources, skills, and competencies of virtual team members can create a challenge for virtual team performance (Morrison-Smith and Ruiz, 2020: 8).

1.5. Research questions

This research will address the research problem stated above by adopting the following research questions:

1. What are the critical success factors for virtual project team performance in South Africa's local government?

2. What are the interrelationships between critical success factors for virtual project team performance in the South African local government?

3. What are the critical success factors to prioritize when implementing and managing virtual project teams in South Africa's local government context?

1.6. Aim of the study

This research aimed to identify CSFs for enhancing VPTP in the South African local government context (with a particular focus on the City of Cape Town), determine the interrelationships between the identified CSFs, and identify CSFs to prioritize when implementing and managing virtual project teams.

1.7. Research objectives

To fulfil the research aim, the objectives of this study are as follows:

1. To identify critical success factors for enhancing VPTP in the South African local government context.
2. To determine interrelationships between identified CSFs for enhancing VPTP in the South African local government context.
3. To identify CSFs to prioritize when implementing virtual project teams in South Africa's local government context.

1.8. Critical Success Factors

Kumar, Pandey, and Singh (2023: 149) mention that the concept of "success factors" was introduced in the 1960s by Daniël. Daniël's primary objective with the concept of success factors was to emphasize the need to focus only on those factors associated with success by excluding any other issue that is not directly associated with success (Jonker, 2014: 58). Rockart builds on Daniel's concept of success factors by introducing the CSFs approach

(Kumar, Pandey, and Singh, 2023: 58). Rockart and Bullen (1981: 7) define CSFs as "the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department or organization."

Leidecker and Bruno (1984), cited in Kumar, Pandey, and Singh (2023: 149), define CSFs as "the characteristics, conditions, or variables that, when properly sustained, maintained, or managed, can have a significant impact on the success of a firm competing in a particular industry." Amberg, Fischl, and Wiener (2005: 5) concur with this definition by stating that CSFs of an organization do not necessarily represent standardized factors for other organizations to copy and apply. The criticism of generalization means that individual organizations must have distinct CSFs that combine external and internal factors to give them a unique competitive advantage in their respective industries (Jonker, 2014: 70).

In their seminal study on CSFs, Pinto and Slevin (1987: 26), cited in Chipanga (2021: 12), define CSFs as "those factors which, if addressed, will significantly improve project implementation chances." In their study, Pinto and Slevin's (1987) found that CSFs are time sequential in that their importance over time changes in a particular order throughout the project lifecycle instead of occurring randomly or concurrently in addition to the Pinto and Slevin (1987) approach, which examines the criticality of CSFs for the duration of the project, Amberg, Fischl, and Wiener (2005. p5) mention that other studies have decided to identify sets of CSFs for each stage of a project. In other words, different project stages have different sets of CSFs.

1.9. Virtual Project Team Performance

Project Management Institute (PMI) (2017: 4) defines a project "as a temporary endeavour to produce a product, service, or a particular result." A project team's role is to pull together different efforts to achieve project objectives and goals (Weimann *et al.*, 2013: 334). Project team members are responsible for their tasks but must work interdependently with others to achieve project objectives and goals (Cohen and Bailey, 1994, cited in Weimann et al., 2013: 334). Additionally, team members share responsibility for the project's success and represent social entities in one or more large social systems (*Ibid.*). Therefore, managing relationships across organizational boundaries is crucial for a project team's success (*Ibid.*). According to Settle-Murphy (2013), cited in Dube (2012: 35), a virtual project team is a short-term group assigned to complete a particular task, consisting of one or more individuals who work independently from the rest of the team, either with minimal or no face-to-face communication.

Performance within a project context involves measuring, monitoring, and evaluating progress against set project targets (Dube and Marnewick, 2016: 3). The project team must identify clear performance targets for individual team members and for the project (Dube and Marnewick, 2016: 4). According to Dube and Marnewick (2016: 4), a project's success depends significantly on the contributions of each team member as well as the team as a whole. Everyone's contribution is essential to ensure project performance and productivity. Therefore, virtual team members must achieve the project's goals and deliver quality outcomes. Individual performance is assessed against the team's set objectives, while team goals align with the organization's values, purpose, and vision (Jahagirdar and Bankar, 2020: 2). The project manager is responsible for ensuring clear task understanding and establishing performance indicators for individuals and teams as per their competencies (Jahagirdar and Bankar, 2020: 3).

Bissoonauth (2002: 24) focuses on people-related outcomes such as team member satisfaction and task-related outcomes (quality of project, adherence to budget and schedule) as project performance targets. This definition covers the elements of the iron triangle, which involves the individual and the team's ability to meet quality, cost, and time objectives (Bissoonauth, 2002: 24). The definition also refers to the satisfaction that team members express regarding their experience working with the project team (Bissoonauth, 2002: 25). Satisfaction with the project team reflects the team's morale, how the team satisfies individual members' needs, and the willingness to work together in the future (*Ibid*.). Furthermore, team members' satisfaction involves experiences with project processes and procedures (Ibid.).

1.10. Significance of the Study

Compared to conventional face-to-face teams, virtual project teams have a variety of unique difficulties. Virtual project teams, in particular, must overcome obstacles to cooperation, communication, and information sharing brought about by their heavy reliance on ICT tools. Despite the challenges of virtual project teams, today, more organizations than ever have adopted either pure virtual arrangements of work or hybrid working arrangements. This research seeks to extend prior research on CSFs for enhancing VPTP by contributing new information about the lived experiences of virtual project team stakeholders of the CoCT. This research contributes to the project management body of knowledge by deepening the understanding of CSFs for enhancing VPTP.

According to Laureani and Antony (2012), as cited in Keramida, Psomas, and Antony (2022: 4), organizations must identify CSFs for continuous improvement. Continuous identification of CSFs enables organizations to focus on these factors and ensure success. Similarly, when it comes to implementing virtual project teams in an organization, understanding the CSFs that enable virtual project team performance is essential. Tuan (2020: 2) suggests constantly reviewing organizational CSFs to respond to changing environmental dynamics. Moreover, Jonker (2014: 70) points out that organizations must identify their CSFs to give them a unique competitive advantage in their respective industries. This study is essential for municipalities in South Africa as it identifies CSFs in one municipality that other municipalities can use as a base to build from in identifying and implementing CSFs for VPTP in their organisations.

1.11. Chapter Outline

The overall structure of the study takes the form of five chapters, as listed below.

Chapter One: Introduction

This introductory chapter locates the study in its research context, provides motivation for conducting it, and discusses the problem statement. In addition, this chapter provides the research aim, objectives, and questions.

Chapter Two: Literature Review

The literature review aims to identify the research gap this research will address. The chapter discusses CSFs for virtual project team performance identified in other studies and reviews commonly used approaches to identifying CSFs.

Chapter Three: Research Methodology

This chapter discusses the research approach adopted in this study - Interactive Management (IM) methodology – in detail, including all its four steps: idea generation, idea clarification, idea structuring, and interpretation of structured ideas. The chapter also discusses the methodology limitations of this study.

Chapter Four: Data Presentation and Analysis

This chapter presents the identified CSFs of virtual project team performance in the South African local government context (with a particular focus on the City of Cape Town).

Moreover, the chapter presents the Interpretive Structural Modelling (ISM) model, illustrating the interrelationship between the identified CSFs and the CSFs to prioritize when implementing and managing virtual project teams.

Chapter Five: Conclusion and Recommendations

Chapter five is the final chapter of this research, which discusses recommendations and conclusions. The chapter also details this study's research limitations while recommending future research. The conclusions mainly focus on the scholarly contribution of this research.

1.12. Conclusion

The purpose of this chapter was to provide an introduction to this study by describing the background, research problem, research questions, study aims, objectives, and outline of this research dissertation. The focus of the background section was to unpack the relevance of this research to local government in South Africa, where the City of Cape Town was then identified as an object of study. As identified by the City of Cape Town, the preferred conditions were discussed and compared to the challenges of virtual project teams as reviewed from the literature to highlight the research problem. This chapter presented research questions, aims, and objectives adopted for this study to address the research problem of poor performance of virtual project teams. The chapter also defines how CSF and VPTP are understood in this study. It also motivates this study by highlighting the significance of this study. A succinct introduction to the remaining four chapters is also provided to give the reader an overview of the work. The following chapter provides a literature review of the discussions to offer an in-depth look into the research topic.

CHAPTER 2 – LITERATURE REVIEW

2.1. Introduction

According to Topaloglu and Anac (2021: 107), researchers have been interested in virtual team research since the late 1990s. COVID-19 has caused many firms to establish virtual project teams for the first time, leading to an unprecedented increase of these teams to record levels (*Ibid.*). This suggests that organizations and researchers will pay more attention to virtual project teams in the future. This chapter seeks to consolidate knowledge on critical success factors (CSF) for enhancing virtual project team performance (VPTP) as a base for comparing the findings of this study against CSFs identified in this literature review chapter.

2.2. Virtual Project Teams

A review of the relevant literature shows that arriving at an accepted definition of 'virtual project teams' has proven contentious. However, definitions of virtual project teams often include characteristics such as Information and Communication Technology (ICT) use, spatial dispersion of team members, temporal dispersion of members, and organizational dispersion (Clark, Marnewick and Marnewick, 2019: 40). According to Clear and MacDonell (2011), cited in Morley, Cormican, and Folan (2015: 189), virtual teams are composed of individuals in spatial dispersed locations but linked through computer and communication technologies. Huang et al. (2010), cited in Morley, Cormican, and Folan (2015: 189), "posit that virtual teams often consist of members who can span different organizations, time zones, geographic locations, and cultures."

The critical difference between an 'operational virtual team' and a virtual project team is that the latter's formation is temporary. Hence, Purvanova and Bono (2009), cited in Morley, Cormican, and Folan (2015: 189) characterize virtual project teams by temporary lifespan and membership. Team members come together for a defined period to work on a specific task, and the team disbands after project completion (Duarte, 2001: 9). A project team consists of individuals working independently on a specific task or several teams working on the same project but subdivided into smaller teams. (*Ibid.*). All the team members work under the leadership of a project manager who assigns individual project team members to different tasks (Swart, Bond-Barnard, and Chugh, 2022: 67). In addition, the project manager is responsible for ensuring a conducive virtual environment for the team to achieve project objectives (*Ibid.*).

2.3. Challenges of Virtual Project Teams

Lawley (2006), cited in Dube (2012: 56), posits that it is difficult to establish trust in virtual project teams because memberships change frequently, and there are limited possibilities of working together again. Trust plays a crucial role in fostering collaboration as it influences team members' willingness to seek assistance, exchange feedback, and discuss difficulties and disagreements (Morrison-Smith & Ruiz, 2020: 6). Dube (2012: 89) asserts that the absence of social and in-person interactions in virtual project teams, which many studies believe to be indispensable for establishing and mending trust, actually contributes to against restoration of trust in virtual project teams.

Virtual project teams typically face challenges related to disputes and conflicts, especially during the forming stages of the team, and these issues improve as the team matures (Settle-Murphy, 2013, referenced in Dube 2012; Morrison-Smith and Ruiz, 2020: 6.). One of the reasons of conflicts in virtual project teams include delays in communication, cultural differences, differences in working styles, and different time zones (Ahuja, 2016: 4). According to Hinds and Bailey (2003), cited in Morrison-Smith and Ruiz (2020: 6), conflict in virtual project teams is more severe than in face-to-face project teams because it is more likely to go unnoticed and unresolved for a more extended amount of time.

Virtual project teams have fewer opportunities for informal communication and engagements than face-to-face teams, which creates several communication issues (Morrison-Smith and Ruiz, 2020: 24). In virtual project teams, communication is primarily formal and seldom involves informal contact that fosters social bonds, mutual trust, and understanding among team members—all of which are crucial for preventing conflicts (*Ibid*.). Additionally, communication in the virtual environment tends to lose contextual information and non-verbal cues, such as members' body language and social status (*Ibid.*). Members of virtual project teams face additional difficulties if they come from distinct cultural backgrounds and have varied personal beliefs and languages (Dube, 2012: 52). This can lead to various interactions and behaviors that can negatively impact communication (Dube, 2012: 52).

According to Burton (2011), cited in Dube (2012: 63), the limited or non-existent social presence in virtual project teams makes it challenging to establish solid relationships that bind members together and foster reciprocity and confidence in each other. Social presence refers to "the moment-by-moment awareness of the co-presence of another sentient being

accompanied by a sense of engagement with the other" (Biocca, Harms and Burgoon, 2001:2). Morrison-Smith and Ruiz (2020: 5) state that the restricted or non-existent of social presence of others in virtual project teams hurts people's motivation, which encourages them to perform more when they are with other people. Similarly, another challenge facing virtual project teams is keeping track of colleagues' progress on their jobs and the inability to casually "look over on what other people are doing" (*Ibid.*).

Providing effective leadership in virtual project teams is challenging since leadership is "highly dependent on quality interactions that are more difficult across distance" (Morrison-Smith and Ruiz (2020: 13). The spatial dispersion of virtual project team members makes it difficult for project managers to give virtual project teams the proper structure, assess performance, inspire and grow team members, and provide guidance (Kahai et al., 2007, cited in Dube 2012: 66). Virtual project team members also confront the difficulty of seldom receiving praise for a job well done and of having no virtual celebration for excellent team performance (*Ibid.*). Another difficulty arises from the fact that one can never become proficient in every evolving technology virtual project teams utilize (Tabari and Kaboli, 2004, cited in Dube 2012: 66).

2.4. Critical Success Factors for Enhancing Virtual Team Performance

An analysis of the reviewed literature for this study suggests the following Critical Success Factors (CSF) for enhancing Virtual Project Team Performance (VPTP): communication, team cooperation, leadership, trust, social presence, clear project goals, objectives, roles and responsibilities, standardized team processes and procedures, human resource and training, electronic collaboration, and communication technology, time management and flexibility, commitment, senior management support, learning from virtual teams that operated successfully, and competent project team members (Dube, 2012; Amar and Haag, 2017; Swart, Bond-Barnard, and Chugh, 2022; Dube and Marnewick 2016; Ahuja, 2016, Topaloglu and Anac, 2021; Wahbi, Raharjo and Hardian, 2020; Morley, Cormican and Folan, 2015; Peters and Manz, 2007; Morrison-Smith and Ruiz, 2020; Bissoonauth (2002). The sub-section below unpacks the context of the papers reviewed for this chapter. The below sub-section is followed by a sub-section that discusses CSFs of VPTP in a synthesized manner.

2.4.1. Contextualising Critical Success Factors for Virtual Project Team Performance

Dube (2012), Doctor of Philosophy Thesis: This research is done in the South African context, and Dube (2012: i) creates a conceptual framework to enhance the VPTP of IT projects. Seventy-three respondents provided data for this study using an online questionnaire or survey. (Dube, 2012: 123). The main conclusions of this study identifies the following CSF for VPTP—"communication, trust, social contact, teamwork, and commitment"—improve VPTP in South African IT projects (Dube, 2012: 164).

Dube and Marnewick (2016), Journal Article: Using a systematic literature review research approach and qualitative content analysis tool, Dube and Marnewick (2016: 2) examined performance standards and developed a theoretical framework for enhancing the effectiveness of remote project teams. In this study, Dube and Marnewick (2016: 1) identified "motivation of team member, comfort of belonging to a team, communication, trustworthiness, team cooperation, reliability of project information, social presence, team leadership, and project goals and objectives" as CSFs for enhancing VPTP.

Ahuja (2016), Journal Article: In this study, Ahuja (2016: 2) utilised questionnaire/survey research approaches. Ahuja (2016: 1) distributed a questionnaire to 120 employees (working in virtual teams), and 96 usable responses were identified. Ahuja (2016: 1) identified a total of 13 CSFs, which include effective human resource practices, top management support, availability of technology, communication, team purpose, leadership, training, trust, and conflict management. Furthermore, Ahuja (2016: 2) conducted workshop sessions with Information Technology (IT) experts working in virtual teams to determine the relationship between the identified CSFs using Interpretive Structural Modelling (ISM).

Morley, Cormican, and Folan (2015), Journal Article: Using a multinational medical device manufacturer company based in Ireland as a case study, Morley, Cormican, and Folan (2015: 192) reviewed CSFs of virtual teams using the experiences and views of team project leaders. This study used semi-structured interviews to collect data that they used to develop a model that includes CSF such as senior management support, technological infrastructure, learning from virtual teams that operated successfully, establishing clear goals and responsibilities, encouraging regular interaction and trust development initiatives, and ensuring teams are aware

of how their work supports the overall goals of the organization (Morley, Cormican, and Folan, 2015: 197).

Topaloglu and Anac (2021), Journal Article: This study investigated CSFs influencing VPTP using a systematic literature review research approach (Topaloglu and Anac, 2021: 107). Topaloglu and Anac (2021: 108) identified more than 500 papers, all published within 20 years from the date of their research. Furthermore, Topaloglu and Anac (2021: 108) reduced the number to 134 after thoroughly reviewing the publications. This study identifies the following findings for virtual team performance: trust, diversity, empowerment, cohesiveness, leadership, communication, teamwork, conflict management, knowledge sharing, and constructive feedback (Topaloglu and Anac, 2021: 107).

Bissoonauth (2002), Master of Science Thesis: In this study a questionnaire was circulated a survey to 140 participants, including project managers and project team members, to investigate CSF that enhance VPTP (Bissoonauth 2002: 44). The participants represented workers in various industries in Canada, such as telecommunication and consulting companies (Bissoonauth, 2002: 39). The outcomes of this study show that the following CSFs have a significant positive correlation with VPTP: "affective commitment, perceived organizational support, management support, technological support, and perceived benefits" (Bissoonauth, 2002: iii).

Amar and Haag (2017), Journal Article: This research adopted qualitative methods and a grounded theory research approach in exploring CSFs of virtual project teams working on virtual-agile projects (Amar and Haag, 2017: 427). Amar and Haag (2017: 428) conducted 18 semi-structured interviews with professionals and practitioners from the United Kingdom, Canada, Germany, United Arab Emirates, Kuwait, and Pakistan to identify CSFs for VPTP on virtual-agile information technology projects. In this research, Amar and Haag (2017: 429) identify 12 CSFs: collaboration, communication, relationship building, involvement of stakeholders, time management, understanding of project paradigms, and team management.

Swart, Bond-Barnard, and Chugh (2022), Journal Article: This research adopted a systematic literature review approach to determine CSFs for enhancing VPTP (Swart, Bond-Barnard, and Chugh, 2022: 59). In this study, Swart, Bond-Barnard, and Chugh (2022: 59) identify the following eight mutually exclusive yet interrelated CSFs for VPTP - "trust, diversity,

collaboration tools and technology, communication and knowledge hoarding, leadership, communication guidelines and training, and resource planning".

Wahbi, Raharjo, and Hardian (2020), Paper Presented at an Academic Conference: In this study, Wahbi, Raharjo, and Hardian (2020: 228) conducted interviews with the management of a "major state-owned Telco company in Indonesia," and identified 12 CSFs for VPTP. Further, Wahbi, Raharjo, and Hadrian (2020: 228) circulated a 10-point choice questionnaire for interview participants to rank the identified CSFs (*Ibid*.). The identified CSFs include "efficient ICT tools, top management commitment, full support from family heads, family's perception of work-life balance, integrity, competent project teams, leadership, family commitment to share interior facilities, clear roles for team members, trust" *(Ibid*.: 229).

2.4.2. Discussion of Critical Success Factors for Virtual Project Team Performance

Communication is a CSF in virtual project teams because of its crucial role in relationship-building, information sharing, persuasion, motivation, integration, and socialization of team members (Topaloglu and Anac, 2021: 108). Swart, Bond-Barnard, and Chugh (2022: 66) claim that communication in virtual project teams depends on the necessary technological infrastructure and team members' skills and willingness to participate actively in engagements and knowledge sharing. In a virtual setting, project managers must keep an eye on team communications to avoid any messages that can be misinterpreted and harm the team's effectiveness (Dube, 2012: 88). According to Peters and Manz (2007: 125), having open lines of communication prevents team members from getting into arguments and having pointless conversations.

Team cooperation is CSF for achieving project goals and objects that require synchronous and asynchronous interactions from virtual project team members (Morrison-Smith & Ruiz, 2020: 1). Team cooperation refers to the degree of camaraderie and commitment among virtual project team members to collaborate towards accomplishing the given tasks and reaching the intended objectives (Balthazard, Potter and Warren, 2004), cited in Dube, 2012: 90). Virtual project team cooperation enhances productivity, creates some level of trust, and enables knowledge sharing between team members (Topaloglu and Anac, 2021: 109). Furthermore, virtual project team cooperation enhances the motivational effects of social presence and helps maintain good relationships between team members (Amar and Haag, 2017: 430).

According to Swart, Bond-Barnard, and Chugh (2022: 67), "e-leadership" or "virtual leadership" are standard terms for leadership in a virtual setting. Pullan (2016: 35) argues that effective virtual leadership starts with self, values, mind-set, attitude, and behaviours. It is about discovering more about yourself and developing as a virtual leader, plus how you can use your personality and identity to express yourself virtually (*Ibid.*). An effective virtual leader must facilitate collaboration between team members by encouraging team members to build connections and establish bonds with other members (Pullan, 2016: 54). Duarte and Snyder (2001: 74) argue that virtual leaders are more effective when they can assist project team members to develop common ground and understanding. Common ground or mutual knowledge is critical since team members can collaborate without frequent clarification (*Ibid*.)

Trust in virtual project teams is a CSF because it helps solve diversity, productivity, and conflict-related problems (Swart, Bond-Barnard, and Chugh, 2022: 64). Choi and Cho (2019), cited in Swart, Bond-Barnard, and Chugh (2022: 64), define trust as “one’s psychological state reflecting a strong expectation that the other will not seek self-interest at the expense of their welfare, thus increasing the willingness to accept vulnerability." Pullan (2016: 63) argues that virtual project leaders need to establish trust and a sense of community for virtual team members to perform better in collaboration. Trust as a CSF for virtual project teams relates to the members trusting each other and the systems they use to facilitate interaction and engagement (Swart, Bond-Barnard, and Chugh, 2022: 64). According to Dube and Marnewick (2016: 7), members of virtual project teams develop a sense of confidence that they will not be let down by other team members or the communication systems when they consistently succeed in communication and teamwork.

Morrison-Smith and Ruiz (2020: 5) discuss the motivational sense of the presence of others—social presence—as a CSF that possesses 'social facilitation' effects, particularly the observation that people tend to work harder when they are not alone. Biocca, Harms and Burgoon, (2001:2) define social presence as "the moment-by-moment awareness of the copresence of another sentient being accompanied by a sense of engagement with the other." Dube & Marnewick (2016: 7) recommend that virtual project team members use text messaging, audio, and video conferencing to communicate frequently to foster a sense of social presence. Yammarino et al. (2005), cited in Dube & Marnewick (2016: 8), posit that social presence affects the "social desirability of the team members to make their team and leader look good,” resulting in overall improvements in performance.

According to Morley, Cormican, and Folan (2015: 199), setting up clear goals, objectives, shared values, and roles early on is necessary for project team members to perform well in a virtual environment. Additionally, De Paolio and Ropo (2015: 69) found that "team performance drastically improves for those virtual teams that meet face-to-face at the beginning of the project to develop a joint understanding of goals and tasks." Establishing unambiguous goals, objectives, roles and responsibilities reduces uncertainty about members' expectations, improving performance (Wahbi, Raharjo, and Hardian, 2020: 227). According to Ahuja (2016: 4), there is a positive correlation between performance and the project team establishing a shared understanding of goals, objectives, roles, and responsibilities. The project manager must consolidate project goals and objectives and clarify and delegate duties to team members (Dube & Marnewick, 2016: 8). Moreover, the project manager must monitor and guide team members as they execute their responsibilities (*Ibid*.).

Virtual project teams must have uniform procedures for communication, collaboration, and information sharing to promote consistency and improve performance (Duarte & Snyder, 2001: 17). Uniform procedures in virtual project teams are a CSF that reduces the amount of time members spend establishing themselves and avoid reinventing new procedures (*Ibid.*). Standardized procedures also eliminate confusion by allowing people to use different means (*Ibid*.). As part of the project management plan, the project manager must clearly outline procedures detailing how the project will be managed, including communication, risk, scope, cost, and schedule management (Dube and Marnewick (2016, 8). This includes identifying instruments and tools to be used by the team (*Ibid*.).

Duarte and Snyder (2001: 11) write that virtual project teams are more successful when affected organizations adopt human resource policies that enable virtual work. Human resources policies are a CSF for virtual project teams when they recognize, support, and reward virtual employees (Ahuja (2016: 3)). Ahuja (2016: 3) further writes that parent organizations must adopt solid human resources strategies that prioritize recruiting bright, and experienced team members that can quickly adapt to working virtually. Morley, Cormican, and Folan (2015: 195) argue that parent organizations must frequently train virtual project team members to keep up with changes and upgrades with ICT solutions. Duarte and Snyder (2001: 17) write that virtual project team members must be trained on how to use technology and other relevant skills, such as skills for facilitating virtual meetings and communicating in the virtual setting.

Technological infrastructure is another CSF for enhancing VPTP (Swart, Bond-Barnard, and Chugh, 2022: 66). It consists of the availability of ICT tools (such as computers, software programs, the internet, telephones, and voice recorder equipment) required to facilitate communication, collaboration, and information sharing in virtual project teams (*Ibid*.). Duarte and Snyder (2001: 18) emphasize the importance of continuous investment in technological infrastructure to keep up with the global trends and demands of virtual project teams. "A significant facet of providing technological tools is ensuring personnel are trained and motivated to leverage their capabilities" (Nguyen, 2013: 87). In addition, it is crucial that even with technological advantages, communication can still be problematic in culturally diverse communities. Hence, communication guidelines are also important (*Ibid*.).

Time management and flexible working schedules are CSF when managers and employees negotiate them to respond to both personal home demands and project needs (OECD, 2021: 6). Time management is also critical for teams that work from different time zones in that "oversight is required to facilitate the transfer of work from one team member to the other, including setting aside time to discuss the arising issue"(Morrison-Smith and Ruiz (2020: 11). Virtual project teams allow organizations to recruit the best available experts regardless of their location (Dube and Marnewick, 2016: 1). Flexibility, especially in leadership styles of project managers, is crucial for accommodating diversity in virtual project teams (Lee, 2014: 53). Swart, Bond-Barnard, and Chugh (2022: 65) posits that diversity in virtual project teams is important for bringing innovation, creativity, ideas, and different perspectives that helps the team achieve its objectives.

The success of virtual project teams is influenced by senior management support and organizational attitude toward working virtually. Senior management must enable virtual teams by giving them freedom, flexibility, and the ability to make decisions (Ahuja, 2016: 3). Morley, Cormican, and Folan (2015: 198) argue that "the support of senior management is essential: not only are they required to advocate the use of virtual teaming, but they must drive the necessary corporate-wide changes to systems and policies that are required, and ensure that resources needed are made available." The strong correlation between senior management support of virtual project teams and performance indicates the need to ensure buy-in and approval of senior management before a virtual project team can be established (Bissoonauth, 2002: 85). Duarte and Snyder (2001: 15) provide an example of how senior management can

support virtual project teams by allocating important projects to virtual project teams and providing career opportunities for virtual workers to grow in their organizations.

Commitment to the parent organization and the project team is a CSF in virtual teams because it promotes dedication and loyalty amongst members, which enhances performance (Bissoonauth (2002: 15). Lippert and Dulewicz (2018), cited in Topaloglu and Anac (2021: 6) define commitment as “the attachment or determination to attain any goal or to extend efforts over time and to be unwilling to abandon a goal.” According to Holmes (2012), cited in Dube (2012: 71), commitment from members of a virtual project team guarantees participation in solving project issues and making decisions promptly, boosting creativity and productivity, which results in high performance. Garro-Abarca, Palos-Sanchez and Aguayo-Camacho (2021: 10) suggest that effective leadership is required to empower virtual team members to commit into the project by ensuring that the team has a shared vision and that regular communication with the leader is encouraged. In addition, Topaloglu and Anac (2021: 6) state that "inspirational leadership, the energy of knowledge leaders, and self-awareness and job satisfaction are antecedents of commitment in a virtual team."

2.5. Conclusion

Virtual project teams improve team performance because of the freedom to choose the most qualified specialists, wherever they may be located (Dube and Marnewick, 2016: 1). Further, virtual project teams help organizations to save money on operating expenses and commute times, which improves productivity for businesses (Dube and Marnewick, 2016: 3; Huang, 2010: 1). However, this literature review has demonstrated some challenges that negatively affect virtual project team performance, including difficulties on establish trust, disputes and conflicts, communication issues, lack of motivation created by lack of sense of social presence, difficulties of providing leadership. This chapter reviewed the literature on CSFs for addressing the challenges of VPTP, and the CSFs below were discussed in a synthesized manner.

Table 2.1: Summary of CSFs and Research Approaches

Author	Critical Success Factors	Research Approach
Dube (2012)	"Communication, trust, social interaction, team cooperation, and commitment"	Questionnaire/survey approach

Dube and Marnewick (2016)	"Motivation of team member, comfort of belonging to a team, communication, trustworthiness, team cooperation, reliability of project information, social presence, team leadership, project goals and objectives."	Systematic literature review research approach
Ahuja (2016)	“Effective human resource practices, top management support, availability of technology, communication, team purpose, leadership, training, trust, and conflict management”	Questionnaire/survey research approaches, Interpretive Structural Modelling (ISM)
Morley, Cormican and Folan (2015)	“Senior management support, technological infrastructure, learning from virtual teams that operated successfully, establish clear goals and responsibilities, encouraging regular interaction and trust development initiatives, and ensuring teams are aware of how their work supports the overall goals of the organization”	Case study research approach
Topaloglu and Anac (2021)	“Trust, diversity, empowerment, cohesiveness, leadership, communication, teamwork, conflict management, knowledge sharing, and constructive feedback”	Systematic literature review research approach
Bissoonauth (2002	“Affective commitment, perceived organizational support, management support, technological support, and perceived benefits”	Questionnaire/survey research approach
Amar and Haag (2017	“Collaboration, communication, relationship building, involvement of stakeholders, time management, understanding of project paradigms, and team management”	Grounded theory research approach
Swart, Bond-Barnard, and Chugh (2022)	"Trust, diversity, collaboration tools and technology, communication and knowledge hoarding, leadership, communication guidelines and training, and resource planning”	Systematic review research approach
Wahbi, Raharjo and	"Efficient ICT tools, top management commitment, full support from family heads, a family's perception of work-life balance, integrity, competent project	Literature review, interviews,

Hardian (2020)	teams, leadership, family commitment to share interior facilities, clear roles for team members, trust"	questionnaire/survey research approaches
Duarte and Snyder (2001)	Human resource policies, training and development, standardised team processes and procedures, electronic collaboration and communication technology, organizational culture, leadership support of virtual teams, project manager virtual leadership skills,	Systematic review research approach

This literature review chapter contributes to this study by offering consolidated knowledge on CSFs for enhancing VPTP as a base for comparing the findings of this study against them. The following chapter discusses the research methodology adopted for this study to unpack the logic behind the methods used to identify the CSFs for this study.

CHAPTER 3 – RESEARCH METHODOLOGY

3.1. Introduction

This chapter outlines the methodology used for this investigation. The first section of this chapter discusses the chosen research methodology. The second section of this chapter discusses ethical considerations relevant to this study. The third section of this chapter discusses the Interactive Management (IM) steps used in this study. This chapter's third and last section discusses the limitations of the selected methodology - Interactive Management (IM).

3.2. Research Methodology

Choices regarding research design and methodology are heavily influenced by the research situation, according to Amaratunga et al. (2002: 20). Different situations seldom provide clear research choices, so a researcher must "negotiate many complex variables" when making a research methodology choice (Amaratunga et al., 2002: 20). Khothari (2004: 8) emphasizes that research choices must be specific enough for other researchers to assess and evaluate them. A research methodology, therefore, not only refers to the research methods selected for a study but also to the logic behind the methods and reasoning for choosing them over others (Khothari, 2004: 8). This study has used the IM research approach to identify Critical Success Factors (CSFs) for enhancing Virtual Project Team Performance (VPTP) in the South African local government context (with a particular focus on the City of Cape Town), determine the interrelationship between the identified CSFs and identify CSFs to prioritize when implementing and managing virtual project teams.

3.2.1. Interactive Management

The IM research approach is a management system designed to handle issues or situations that are beyond the scope of typical organizational problem-solving methods (Ntoyanto and Tuan, 2019: 2). The foundation of the IM research approach is the notion that in complex and unfamiliar situations, a team of knowledgeable people should collaborate to address the key issues, by gaining a thorough understanding of the situation, and provide a workable solution (Warfield and Cárdenas, 2002: 1). As a result, the IM technique works best in situations when there is not a straightforward solution to the problem at hand (Warfield and Cárdenas, 2002, cited in Mkhize, 2019: 57).

According to Alexander (2002) and Jackson (2016), cited in Du Plessis (2021: 58), the IM approach involves a participatory process that considers the subjective views and objectives of participants representing different stakeholder groups. Additionally, Warfield and Cárdenas (1994), cited in Tuan (2017: 427), emphasize that "the IM approach is a learning process that involves exchanging mental models and examining the system from multiple perspectives." Tuan (2004), cited in Ntshangase (2017: 52), notes that the IM approach, through engagements and consensus, enables stakeholders to identify CSFs, create a model that explains the interrelations between the identified CSFs, and identify CSFs that need to be prioritized, as the final output of the research.

The IM approach aims to achieve three major outcomes, as described by Warfield and Cárdenas (2002: 131). The first outcome involves defining and understanding a complex problem, issue, or situation under investigation (*Ibid*: 17). The second outcome is about constructing alternative designs to address the problem, issue, or situation at hand (Warfield and Cárdenas 2002: 19). Lastly, the third outcome is to encourage participants to review alternative designs and reach a consensus on the most appropriate design for the defined problem or situation (Warfield and Cárdenas 2002: 21). The IM approach consists of three phases that support efforts to achieve the above outcomes: Planning, Workshop, and Follow-up (Warfield and Cárdenas, 2002: 29).

- **Planning Phase**: In this research, this phase laid a vital foundation for the two subsequent phases. This phase was about identifying stakeholders' "information and facility requirements necessary to undertake the remaining two phases" (Warfield and Cárdenas, 2002; Alexander, 2002, cited in Mkhize, 2019: 58). In the context of this research, the planning phase involved identifying a research problem, research questions, and research goals. Moreover, this phase involved developing a closed-ended and open-ended questionnaire. The planning phase involved obtaining ethical clearance from the University of Cape Town (UCT) and the City of Cape Town (CoCT). During the planning phase, the researcher also obtained consent from participants using the consent form, as shown in Annexure three. The facility used for IM workshops was identified as Skype for Business as it was suitable for all participants.

- **Workshop Phase**: According to Alexander (2002), cited in Mkhize (2019: 58), the workshop phase should create structured and meaningful interactions or engagements between everyone involved. During the workshop phase, participants came together to

clarify, structure, and interpret generated CSFs (Warfield and Cárdenas, 2002: 32). Warfield and Cardenas (2002), cited in Ntoyanto and Tuan (2019: 4) identified the following roles required to achieve successful IM workshop:

- between six to twelve participants
- IM workshop facilitator
- a computer operator and
- scribe to document critical comments

During the IM workshop phase, the facilitator can take on various roles (Warfield and Cárdenas, 2002: 36). However, the facilitator cannot act as a participant, as this is a fundamental principle of his/her role (Warfield and Cárdenas, 2002: 36). Following this requirement is essential for the facilitator's credibility and effectiveness (Warfield and Cárdenas, 2002: 36).

- **The phase of follow-up**: the last stage of the IM research approach, this phase entails putting the solutions found in the workshop phase into practice (Warfield and Cárdenas, 1993, cited in Mkhize: 59). The follow-up phase may require revisiting planning and workshop phases in order to execute the results in some circumstances (*Ibid.*). The follow-up phase is unique to each organization. However, the primary objective of the follow-up phase is to "answer the question of when will we do what we can do?" (Mkhize, 2019: 59, citing Alexander, 2002). The follow-up or implementation stage is crucial for demonstrating the validity of the solutions (Mkhize, 2019: 59). Nonetheless, this phase of the IM research approach is outside the purview of this study.

On the validity of IM solutions, Tuan (2017: 434) writes that the IM approach prioritizes learning rather than searching for universal laws. As such, IM solutions might differ every time participants decide to repeat the IM process because of learning from previous IM sessions (Tuan, 2017: 434). Therefore, the validity of IM solutions/models is not replicable experiments but recoverability (Tuan, 2017: 434). Checkland and Holwell (1998: 18) argue that recoverability "aims to clarify to interested observers the thought processes and models that enabled the team to make their interpretations and draw conclusions." While not

everyone may agree with the IM solutions/model for a particular issue, a debate that might yield different results through consensus is encouraged for learning (Tuan (2017: 434).

3.3. Ethical considerations

The researcher has considered ethical issues at every stage of the research process, including formulating the research question, gathering, analyzing, and reporting data. Since the research problem, as discussed in section 1.4, affects more people, this research is of interest not only to the researcher. This study benefits knowledge production as it seeks to extend existing knowledge on CSFs for enhancing VPTP. In addition, this study will benefit the broader project management community, particularly those project managers and team members working in the local government.

The researcher has safeguarded the CoCT and the participants throughout the data collection process. The researcher requested the CoCT's authorization to conduct research within the company; refer to annexure 2. The UCT's Faculty of Engineering and the Built Environment also granted ethical clearance permission (see annexure 1). For participants to participate in this study, they had to fill out a consent form that the researcher created as part of the data-gathering process (see annexure 3). This document gives participants an overview of the study, clarifies their voluntary participation, ensures participant anonymity, and gives them the confidence to discontinue participation at any moment.

The directors of the CoCT's targeted departments had to approve this research in order for it to receive ethical clearance. Furthermore, potential participants' also had to consent before participating in this research. Before the study started, the researcher informed participants that their participation was voluntary and that there was no compensation. The researcher maintained complete anonymity and confidentiality of all the information provided by participants, including their identities. The researcher utilized pseudonyms to refer to participants in this study. For example, the researcher referred to participants as participants 1 to participant 20.

Regarding data presentation and analysis of the findings, the researcher withheld no information and ensured that the correct data was presented and analyzed for this study.

Although the participants had initially consented to the research study, the researcher was cognizant of the possibility that their opinions would alter as the investigation progressed. As

a result, participants who initially provided CSFs during the idea generation phase and wanted to avoid involvement during the workshop phase, the researcher excluded them from participating. However, as explained in section 3.4.1 below, the requirement for all participants involved during the workshop phase was to have been involved in all stages of the research, from idea generation to idea structuring.

As a facilitator of the IM workshops, the researcher did not provide input or opinions regarding the generation of CSFs, clarification of CSFs, and structuring of the Interpretive Structural Model, as this is a fundamental principle of this role (Warfield and Cárdenas, 2002: 36). Additionally, in order to prevent distorting the data to fit the researcher's expectations, the researcher refrained from offering any subjective opinions during the data presentation and analysis phase of this study. Regarding data storage, the researcher has kept the information provided by participants in a locked filing cabinet in the researcher's home, where the researcher will keep it for seven years. After seven years, the researcher will destroy research data per appropriate methods.

3.4. Interactive Management Process for this Study

The aim of this research limits its scope to the planning and workshop phases of the IM approach. The two phases culminate in a four-step process: CSF generation, CSF clarification, CSF structuring, and interpretation of the structured CSF model. The four-step process utilizes "the idea writing technique, nominal group technique, and interpretive structural modelling technique (ISM)" (Dwyer et al., 2014: 695). The first two techniques are primarily used for CSF generation and clarification, while the last was utilized in this research to structure generated ideas into an ISM model (Dwyer et al., 2014: 695). The following section describes the IM process and its techniques, including how the researcher used them in this study.

3.4.1. Pre-workshop Preparation and Idea Generation Step

The primary purpose of the prep-workshop preparation and idea-generation step is to identify participants and solicit initial CSFs (Tuan, 2017: 427). As their purpose is to provide insights for learning and consensus building rather than finding a universal law, it is essential to note that the IM participants should not be viewed as human subjects, and it is inaccurate to use "sample size" to indicate the number of participants (Ntshangase and Tuan, 2019, cited in Du Plessis, 2021: 63). Tuan (2020: 4) notes that the criteria for choosing IM participants is not the number of participants but representation and knowledgeability. Representation and

knowledgeability were achieved in this research by identifying participants who are active virtual project team members and those who oversee the performance of virtual project teams in the CoCT.

Active virtual project team members included all virtual project workers, including specialists, administrators, and project managers. The CoCT (2022a: 17) allocates the responsibility to oversee and monitor virtual project team to line management, ensuring employees working remotely meet their measurable benchmarks or goals. Line managers and virtual project team members are also responsible for identifying training needs, required IT equipment, applications, repairs, and maintenance, which are essential as supporting resources. As discussed in section 4.1.1, seven departments formed part of this study, which included informal settlements, enterprise and investment, roads and infrastructure management, urban planning and design, information systems and technology, facilities management, sustainable energy markets, corporate projects, programmes, and portfolio management. The researcher emailed the research consent form to line managers and active virtual project team members from these departments.

The consent form, presented in Annexure 3, summarizes the study, clarifies that participation is voluntary, ensures participant anonymity, and that participants can withdraw their participation at any time. In addition, the content of the email sent to potential participants explained the process of this research, mainly that it involves both closed-ended questionnaires and open-ended questionnaires, as well as workshop sessions. Before they could begin answering the questionnaires for this study, participants were requested to sign and return the consent form. The closed-ended questionnaire, presented in Annexure 4, describes this research so that participants can understand the subject matter. Moreover, this closed-ended questionnaire asked participants to indicate their departments, their primary role in virtual project teams, the number of years they have worked on virtual project teams in the CoCT, and their job titles.

The closed-ended questionnaire was created on an online platform called Microsoft SharePoint and was shared as a link via email to all potential IM participants. The advantage of an online platform is that it allows the researcher to receive the result instantly after the potential participant has completed the closed-ended questionnaire. The researcher used a closed-ended questionnaire to ensure that participants meet the criteria of representation and knowledgeability, which is discussed in detail in section 4.1.1. The open-ended questionnaire,

presented in Annexure 5, represented the idea writing technique to solicit initial CSFs from participants. Warfield and Cardenas (2002), cited in Ntshangase (2017: 53), define the "Idea writing technique as producing various ideas for a stated issue from one or a small group."

The open-ended questionnaire for this research provided a triggering question for participants to provide as many CSFs as possible for enhancing VPTP. The triggering question provided was as follows: "In your opinion, and based on your experience in the CoCT, what CSFs need to exist to enhancing VPTP"? To prevent a power dynamic from arising during the inquiry process, the researcher requested participants to generate CSFs in silence (Tuan, 2020; 4).

The researcher created the open-ended questionnaire on an online platform called Microsoft SharePoint. The open-ended questionnaire was shared as a link via email to all potential IM participants, like the closed-ended questionnaire. Once all IM participants had completed the open-ended questionnaire, the researcher, with the assistance of a computer operator, arranged IM workshop sessions to clarify generated CSFs. In this research, the IM workshop sessions were conducted via Skype for Business and attended by eight participants. Due to time constraints, the researcher conducted two IM workshops, one in December 2023 and the second in January 2024.

3.4.2. Idea Clarification Step

In the first IM workshop conducted in December 2023, participants clarified identified CSFs. A total of eight participants attended the IM workshop for this study. As discussed in section 3.2.1 above, "the ideal number of stakeholders participating in the IM session," according to Warfield and Cárdenas (2002), cited in Tuan (2017: 427), is between 6 and 12 participants. Given the time required for debates, Janes (1988), cited in Tuan (2017: 428), proposed "that the group size in this session should not exceed eight participants."

During the IM workshop session, participants reviewed each generated CSF. IM workshop participants could review and identify areas with inconsistencies or similarities from the generated CSFs. This review allowed IM participants to rephrase CSFs that were not clear, merge those with the same meaning, and split those with more than one meaning (Tuan, 2017: 428). As a result, IM workshop participants reduced 124 generated CSFs to 41 CSFs. The IM workshop participants further reduced the 41 CSFs to 20 CSFs through the nominal group technique.

Warfield and Cardenas (2002: 88) suggest that each participant may select five ideas from the generated ideas that they deem essential regarding the issue. The nominal group technique adopted for this study involved asking each IM workshop participant to vote for five CSFs they deem essential from the 41 clarified CSFs. The scores provided by the eight IM workshop participants for this study were combined to rank the CSFs. The computer operator loaded all CSFs and votes to the ISM software. In addition, the computer operator then moved the 20 CSFs that received votes to structuring sets. The computer operator created the structuring sets as preparation for constructing the ISM model as part of the idea structuring step discussed in section 4.2.3 below.

3.4.3. Idea Structuring Step

The idea structuring step requires IM workshop participants to create an ISM model that explains the relationships between CSFs. In this study, IM workshop participants constructed the ISM model using the Interpretive Structural Modelling (ISM) technique. Malone (1975), cited at Ntshangase (2017: 55), defines ISM as "a computer-aided learning process that enables individuals and small groups to develop models of complex relationships between elements of complex systems." According to Malone (1975), cited in Ntshangase (2017: 55), "ISM is implemented in a man and machine interpretive environment such that human users are responsible for making subjective judgments while the computer is employed for performing and displaying the results of simple logical operations."

The idea structuring step examines if a contextual relationship exists between two identified ideas or subsystems belonging to one system (Ntshangase, 2017: 53). To determine whether a relationship exists in any given pair, the ISM software cross-checks each CSF with every other CSF (Poduval, Pramod, and Jagathy, 2015: 318). This research explains the contextual relationship between CSFs for enhancing VPTP through an “Intent Structure.” The “Intent Structure” refers to an element that helps to achieve another element (Poduval, Pramod, and Jagathy, 2015: 318). Therefore, the contextual question to identify a contextual relationship between a pair of CSFs is 'Does CSF1 significantly help to achieve CSF2.'

If established, the contextual relationship between CSFs is directional in that it can be one way or two ways (Poduval, Pramod, and Jagathy, 2015: 318). For example, if it is determined that trust significantly helps achieve better communication amongst virtual team members, then the relationship exists between trust and communication. "This is a one-way relationship; a two-

way relationship exists if both CSFs significantly help to achieve each other" (Poduval, Pramod, and Jagathy, 2015: 318).

Table 4.5 displays the binary matrix created during the IM workshop conducted for this study, using the pairwise relationships between the CSFs (Tuan, 2017: 428). For instance, '1' was typed into the cell corresponding to the two CSFs when IM participants concurred that a relationship existed between the two presented CSFs. If not, '0' was input into the relevant cell. According to Sorach (2014), referenced in Ntshangase (2017: 56), "in order to reduce the number of pairwise analyses necessary for the creation of the ISM model and to simplify the topology of the model the ISM software utilizes transitive logic."

In this study, a transitive relationship is used to structure the ISM model. For example, 'significantly helps to achieve' is a transitive relationship. If CSF1 significantly helps to achieve CSF2, and CSF2 significantly helps to achieve CSF3, it is plausible to infer that CSF1 significantly helps to achieve CSF3. As part of the structuring workshop, the facilitator encouraged dialogue for those CSFs with disagreements. The facilitator asked participants to share their reasons for their views until they achieved consensus. Once the participants completed all posed questions, an ISM model was extracted to represent the system in question and presented to IM workshop participants.

3.4.4. Interpretation of the Structured Model Step

The interpretation of the structured model is the last step of the IM methodology adopted for this research, where the researcher asked participants to review the produced ISM model during the IM workshop (Nthunya *et al*., 2017, cited in Ntshangase, 2017: 58). As the IM facilitator, the researcher read and interpret the generated model for all participants to give input, reconsider their votes if required, and agree on the core CSFs that positively influence virtual project team performance. IM workshop participants made some observations; however, IM workshop participants reached a consensus to accept the generated ISM model.

3.5. Limitations of the Research Methodology

The researcher conducted the IM workshops through Skype for Business. Using this virtual platform saved costs and time associated with traveling for interviews, thus making sure potential participants located/working far from the researcher are not excluded from this study. However, the limitation of this data collection instrument includes the loss of contextual information and non-verbal cues, such as members' body language, during the IM workshops.

General disadvantages include undertaking IM workshops according to this study's proposed schedule.

3.6. Conclusion

This chapter presented the interactive management methodology adopted for this study. This research methodology embraces relevant stakeholders to identify CSFs through the phases of CSF generation, CSF clarification, CSF structuring, and CSF interpretation. The output of the interactive management process is the ISM model illustrating the interrelationship between identified CSFs. This study identified the relationship between CSFs using the contextual relationship 'significantly helps to achieve' for structuring the ISM model. The IM research approach prioritizes consensus and learning rather than searching for universal laws. As such, IM solutions might differ every time participants decide to repeat the IM process because of learning from previous IM sessions. All the relevant ethical protective measures were taken to ensure that the research did not pose any risk to the participants and that the researcher remained objective throughout the research processes.

CHAPTER 4 – RESEARCH FINDINGS AND DISCUSSION

4.1. Introduction

This chapter aims to explore and provide study findings that align with the goals of this research report. This chapter aims to thoroughly explain the application of the Interactive Management (IM) approach, first presented in Chapter 3 (from the pre-workshop stage to the end of the workshop stage). This chapter will begin by outlining and presenting pre-workshop activities such as stakeholder identification and selection and the Critical Success Factor (CSF). The first section will also present the results from these activities, including unclarified Critical CSFs and the participants that provided the CSFs. The second section of this chapter will present workshop-related activities such as clarification of CSFs, voting of CSFs, structuring of the CSFs, and the participants involved. The second section will also present the result, including clarified CSFs, votes from each participant, decisions on the interrelationship between the CSFs, and the Interpretive Structural Modelling (ISM) model. The final portion of this chapter compares the results from the studied literature to what the participants collectively selected as the CSFs for enhancing Virtual Project Team Performance (VPTP) in the local government setting of South Africa.

4.2. Pre-Workshop Phase

Approvals for this research from the City of Cape Town (CoCT) and the University of Cape Town (UCT) allowed access to a local government virtual project worker database. The activities and results of the processes adopted in this study to identify participants and generate CSFs are the main focus of this section. The researcher of this study purposefully exceeded the maximum number of 12 participants suggested by Warfield and Cardenas (2002) cited in Tuan (2017: 427) to 20 participants that generated CSFs. There are two benefits to extending the number of participants during the idea-generation process, according to Ntoyanto and Tuan (2018: 5).

The first benefit is that it makes it possible to evaluate if a larger population perceives a variety of common CSFs (Ntoyanto and Tuan, 2018: 5). Second, it opens up the possibility of broadening the range from which additional CSFs might be gathered (*Ibid*.: 5). In this research, extending the number of participants during idea generation phase was also helpful in extending the spectrum from which Interactive Management (IM) workshop participants can be selected from. As discussed below, one of the challenges experienced during data collection was the unavailability of some of the key stakeholders to attend all the workshops. Establishing

an extended range of participants during the pre-workshop was helpful as it provided more options for key stakeholders to attend all workshops while maintaining the threshold of between 6 and 12 participants.

4.2.1. Stakeholder Identification and Selection

The researcher distributed the sample questionnaires in annexures 4 and 5 to potential research participants. The questionnaires were created on an online platform called Microsoft SharePoint and shared as a link via email to all potential participants. The first questionnaire was closed-ended and requested information only related to the criteria for selecting the participants for this research—the second questionnaire requested that participants individually provide as many CSFs as possible for enhancing VPTP. The principles of representation and knowledgeability guided the selection of participants.

This research achieved representation and knowledgeability by identifying participants who are active members of virtual project teams and those who oversee, monitor, and support Virtual Project Team (VPT). Figure 4.1 below illustrates the percentage of participants per role in VPTs who responded to the questionnaires. In total, 20 participants responded to the questionnaires. The majority group (55%) of the respondents represented active members of virtual project teams. The minority group (45%) represented participants overseeing and monitoring VPT.

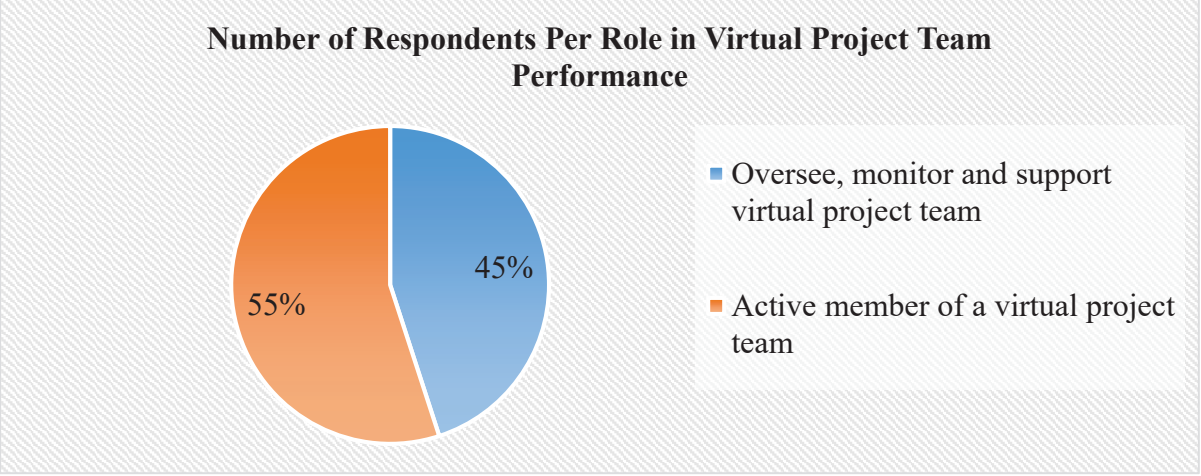


Figure 4.1: illustrates the percentage of participants that responded to the study's questionnaires per role.

In this research, representation and knowledgeability were also achieved by circulating the questionnaires to diverse potential participants ranging from professionals to directors of departments in the City of Cape Town. Figure 4.2 illustrates the percentage of participants who

responded to the study's questionnaires. The majority of respondents represent principal professional officers (40%), followed by senior professionals (20%), managers (15%), heads (10%), and professionals (5%).

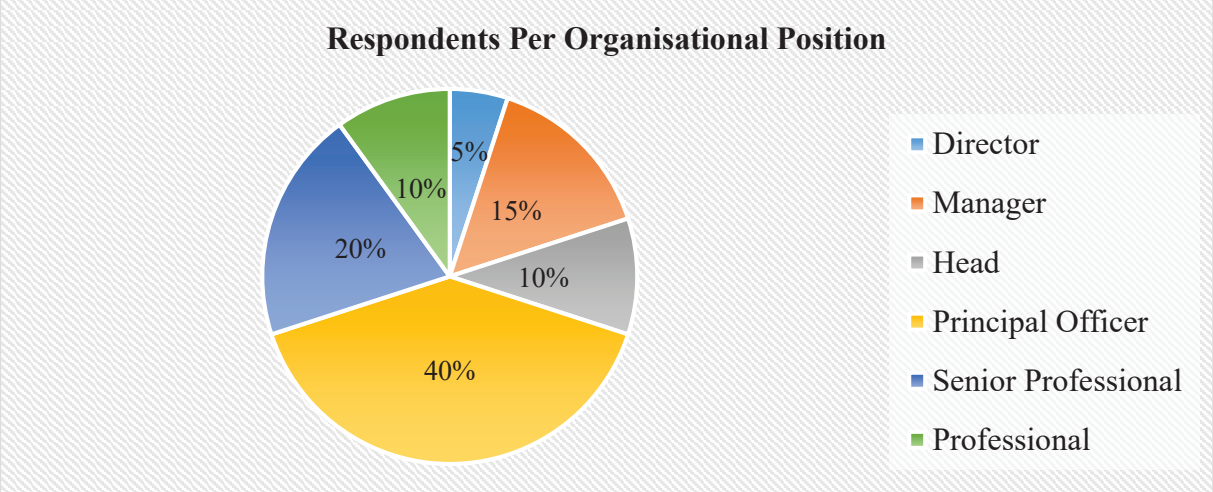


Figure 4.2: illustrates the percentage of participants who responded to the study's questionnaires per organisational position.

In this study, the researcher circulated questions to seven departments representing seven directorates of the twelve in the City of Cape Town. Figure 4.3 below illustrates the percentage of participants who responded to the study's questionnaires. The majority of participants are from Roads and Infrastructure Management (20%) and Enterprise and Investment (20%), followed by Informal Settlements (15%), Corporate Project, Programme and Portfolio Management (15%) and Sustainable Energy Markets (15%), Facilities Management (5%), Urban Planning and Design (5%), and Information Systems and Technology (5%).

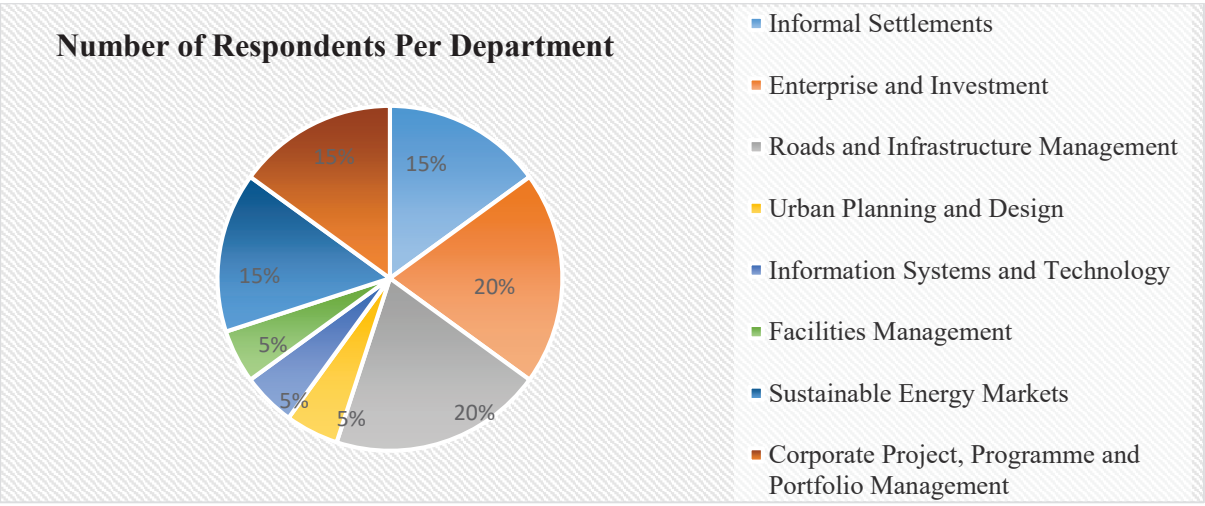


Figure 4.3: illustrates the percentage of participants who responded to the study's questionnaires per department.

4.2.2. Idea Generation

As discussed in Section 4.2.1 above, sample questionnaires depicted in annexures 4 and 5 were distributed to potential participants ranging from professionals to directors across seven departments in the City of Cape Town. The open-ended questionnaire, depicted in Annexure 5, was specifically designed to obtain an understanding of CSFs for enhancing VPTP in the South African local government context. The researcher sent the questionnaire to potential participants, asking them to individually provide as many CSFs for enhancing VPTP as possible without discussing their responses with anyone. A total of 124 CSFs for enhancing VPTP were generated by 20 participants, as illustrated in table 4.1 below. Additionally, the researcher requested participants to describe each CSF they identified; see Table 4.1 below for the original list and descriptions of generated CSFs.

Table 4.1: Original and unedited list of generated CSFs prior to clarification

Participants	Critical Success Factor	Description of the Critical Success Factor
Participant 1	Contextual time management	Online meetings consume energy, whereas in-person meetings might have energized people. Back-to-back virtual meetings can unexpectedly reduce productivity by deflating team members. The virtues of working from home, like convenience, space for reflection, and colleague distractions, must be balanced with the disadvantages, like the energy-sapping demands of concentrating on engagements and home-based distractions.
	Trust	Virtual teams need to establish trust; if not, this can create difficulties in facilitating meetings virtually.
	Use of Instant Messaging	Instant messaging is a powerful tool for managing the small details of workflow and keeping a sense of being accountable to a team working in parallel.

	Accountability and work ethic	Work flexibility requires discipline from all team members, and the basis for this is holding each other accountable and building a teamwork ethic.
	Keep things interesting	Human personality is adaptive. Conditions create responses. A dull, compliance-driven work environment where the bigger picture has been lost does not suit virtual teams because the flexibility and quiet space can't be leveraged by a spirit of striving and inquiry. There needs to be vision driven internal projects and sharing of lively incidental detail.
	IT systems	We sometimes like to hate on Information Systems & Technology and Enterprise Resource Planning of the City of Cape Town but what they did during COVID was miraculous from Dongle roll-out to Virtual Private Network set-up to integrating Work Form Home in leave applications in a matter of days. The Virtual Private Network is the big one. Combining that with Application Programming Interfaces, database management tools, and advanced data analysis work is possible with the City's incredibly rich (and still largely unmined) datasets.
	Whatsapp group	Smaller teams can benefit from a well-managed WhatsApp group. It's generally best if this sticks to 1) specific practitioner links of interest 2) encouraging messages.
	Intermittent physical meetings	It's healthy to meet in person periodically.
	Manager catch-ups	Managers should schedule regular catch-ups, particularly with sub-team leaders.
Participant 2	Communication	City of Cape Town should have modern information systems that meets the user requirements. Effective and clear communication is key in virtual teams. This includes

		both formal and informal channels, as well as the use of collaboration tools.
	Flexible Working	Virtual teams often work across time with diverse work schedules. Flexibility in terms of deadlines and meeting times can accommodate these variation.
	Team Building	Despite the physical distance, building a sense of camaraderie and trust within the team is vital. Virtual team-building activities and regular check-ins can contribute to this.
	Technology	A robust and reliable technological framework is essential. This includes the right project management tools, video conferencing platforms, and other software that facilitates virtual collaboration.
Participant 3 (6)	Effective Communication	In virtual project teams, clear and regular communication is crucial for success. This includes utilizing appropriate communication tools, setting expectations for response times, and ensuring that information is conveyed accurately. The ability to convey complex ideas in a concise and understandable manner is key to preventing misunderstandings and facilitating collaboration among team members.
	Technology Proficiency	Given the virtual nature of the project teams, team members should be proficient in the relevant technologies and tools. This includes not only the project management and collaboration platforms but also any specialized tools used in the context of the City of Cape Town projects. Proficiency in technology enhances efficiency, reduces errors, and promotes a seamless workflow within the virtual environment.
	Goal Alignment and Clarity	Ensuring that individual team members understand and align with the overarching goals of the project. This factor emphasises regularly revisiting project goals to maintain alignment with individual team member's goals.

		Alignment of goals contributes to a shared sense of purpose among virtual project team members. This factor emphasizes the importance of setting clear objectives, defining roles and responsibilities. Clarity of goals, tasks, milestones, and responsibilities enhances motivation and reduces ambiguity.
	Accountability and Ownership	Each team member should take accountability for their assigned tasks and deliverables. This involves setting realistic deadlines, providing regular updates on progress, and taking ownership of any challenges that arise. Fostering a sense of responsibility within the virtual team promotes reliability and ensures that everyone contributes to the overall success of the project.
	Honesty and Reliability	Building trust within the virtual project team is crucial. Team members should prioritize honesty in their communications, providing transparent and accurate information. Reliability involves consistently delivering on commitments and being accountable for one's actions. Fostering a culture of honesty and reliability strengthens team relationships and contributes to the overall success of the project.
	Continuous Feedback and Improvement	Establishing a culture of continuous feedback and improvement vastly contributes to success of virtual project teams. This includes constructive feedback sessions and a commitment to learning from both successes and failures. Emphasizing a growth mind-set within the team encourages ongoing improvement and adaptation to changing project requirements.
Participant 4 (7)	Self-motivated	If you are not self-motivated, self-driven and professional, working remotely can be very unproductive.
	Correct equipment	Good network access and internet connection.

	Good communication systems	For example, Microsoft teams to access team members when required.
	Clear tasks	Tasks set must be clear, with completion dates set.
	Time flexibility	Core hours must be set, but all people are different and some work better early in the morning, some work better late at night.
	Task orientated performance management	If members get the work done in time, it shouldn't matter when they do the work, as long as they are available during core hours if needed.
	Regular individual and team meetings with manager	Manager can ensure that work is being done, issues can be resolved and team members stay in touch and are on the same page.
Participant 5 (9)	A reliable interactive platform	Where participants can expressive their views and collaborate with ease – 2 way communication is important with both written and spoken engagement.
	Meeting summary producer	So that we can engage rather than be distracted by capturing the minutes (these exist already).
	Regular opportunities to engage	Virtual project team members should be willing to make themselves available for regular engagements with other team member. This should be encouraged due to the physical distance that exists between team members.
	The opportunity for in-person engagements, even when virtual is the norm	The opportunity for in person engagements even when virtual is the norm is important for relationship, trust and team building. The engagements could take place 2-4 times a year establish some form of connection from the team.

	For participants to feel heard and acknowledged	Inclusive participation by virtual team members is important because it makes people feel that they are being heard and that their input is valued.
	Structuring teams into levels for more personal contact	At a department level, it is important to structure virtual project teams in a way that can promote more personal contact. Where possible, small teams works better but also engagements should be promoted at different platforms including monthly departmental staff meetings, branch meetings and project teams or specialist teams.
	Opportunities for spontaneous contact	Platforms such as WhatsApp, Skype instant messaging should be promoted and used as they help to obtain quick response to issues that need urgent attention.
	Devolved decision making	Virtual project teams should be able to make most decisions without relying much senior management as this promotes efficiency.
	Mutually Agreed expectations of team members	It is important for the virtual team to set expectation from the start and agree on what is expected both from the team as whole and from individual team members.
Participant 6 (6)	Communication	Clear and concise communication regarding objectives, timelines, etc.
	Competence and Technical Skill	Individuals to be competent in the field they are working in and add value to the team as a whole, with the required technical skills.
	Policy and Standard Operating Procedure	A clear policy and Standard Operating Procedure on how the virtual team is to conduct themselves and carry out the required tasks.
	Regular engagements	Ensure that regular engagements are held to allow progress updates and communication of risks to all parties involved.

	Training	Ensure that all team members are trained and understand how tasks are intended to be carried out.
	Programme & Preparation	Programme the required tasks and deadlines, while allowing input from the team members.
Participant 7 (5)	Accountability	This includes individual team members knowing that they have deliverables that they need to produce and taking accountability. Furthermore, the team should promote accountability by holding each accountable. The team is accountable when it delivers on what is expected from them. Leadership also need to be accountable for the deliverables of the team.
	Service delivery mind-set	Virtual project team members should behave like public servants. This means that virtual team members are successful in achieving quality service delivery when they are driven by desire to help the public and get their satisfaction from that.
	Self-awareness	Being aware of capabilities, limitations. Being able to identify what you are capable of and not. Identify challenges about being oneself and finding remedies.
	Collaborative	Being able to work with others. There is a potential loss of ideas by not being able to work others.
	Effective communication	Communicating in the virtual setting can result in the loss of nausea or meaning in what is communicated due to the use of technology. Virtual project team members must communicate clearly enough for people to understand.
Participant 8 (7)	Performance Management	Individual performance management and related techniques will ensure that individual employees remain committed and accountable to their work.
	Reliable programmes and software	The organisation largely relies on desktop information to undertake projects and communication networks. It is important that these tools of information and communication are consistently working and dependable.

	Drive & commitment	Staff motivation and passion about what they do will enable success of projects. Staff need to be constantly made aware of the impact of their day-to-day work.
	Project Management Principles	Managing projects, adhering to timeframes and principles is key such as when to initiate a project, planning, implementation, monitoring, and execution /close up.
	Time Management	Managing time is among critical factors, every project has time attached to it. It is important to manage time precisely in order to ensure successful implementation and completion of tasks.
	Leadership	Good leadership skills normally enables staff to successfully perform their duties, remain motivated and dedicated to their work.
	Human Resources	Capacity to undertake and successful complete projects also relies of availability of human resources by the employer. Staff must have all the resources they require to deliver their projects successfully.
Participant 9 (16)	Clear Objectives and Goals	Ensure that the team has a well-defined purpose, clear project objectives, and specific targets to work towards. Everyone should understand their role in achieving these goals.
	Effective Communication	Strong communication is vital in virtual teams. Ensure regular and transparent communication through various channels, such as video conferences, chat platforms, and emails.
	Trust and Relationship Building:	Building trust among team members is crucial. Team members should get to know each other on a personal level, foster good relationships, and understand each other's strengths and weaknesses.
	Technology and Tools	Use reliable and up-to-date technology and collaboration tools that facilitate seamless communication, document sharing, and project management.

	Time Management	Set clear expectations for working hours and deadlines. Team members should manage their time effectively to meet project deadlines.
	Accountability	Ensure that each team member is accountable for their tasks and responsibilities. Regular check-ins and progress tracking can help maintain accountability.
	Diversity and Inclusion	Embrace diversity in your virtual team, including diverse backgrounds, skills, and perspectives. Encourage an inclusive environment where everyone feels valued.
	Leadership and Guidance	Appoint strong leaders who can provide direction, support, and motivation to the team. Leadership is crucial for keeping the team on track and aligned with goals.
	Training and Skill Development	Invest in training and skill development for team members to ensure they have the necessary competencies for the project. This can also improve job satisfaction.
	Conflict Resolution	Develop a process for resolving conflicts and address any issues that arise promptly. Conflicts are common in virtual teams, and handling them effectively is essential.
	Flexibility	Adaptability and flexibility are key in virtual teams, as situations and project requirements can change rapidly. Team members should be open to change and willing to adjust their approach as needed.
	Work-Life Balance	Promote a healthy work-life balance to prevent burnout and improve job satisfaction. Encourage team members to disconnect from work when needed.
	Feedback and Recognition	Provide regular feedback and recognition for individual and team achievements. Positive reinforcement can boost morale and motivation.
	Performance Metrics	Define clear performance metrics and key performance indicators (KPIs) to measure progress and success. These metrics can help track the team's performance against its targets.

	Security and Data Privacy	Ensure that sensitive data and information are secured and all team members are aware of data privacy and security protocols.
	Continuous Improvement	Encourage a culture of continuous improvement, where the team regularly evaluates processes, communication, and performance to identify areas for enhancement. By addressing these critical success factors, virtual project teams can not only achieve their targets but also create a satisfying and productive working environment for individual team members.
Participant 10 (2)	Participation - Inclusivity	Participation is of critical importance. I've noticed at virtual meetings people tend not to participate as effectively as they would in an in-person setting. It is important for the chair to structure the meeting to be a discussion so stimulate people and encourage participation. There's nothing worse than being in a meeting where only 1/2 people are participating in the discussion.
	Closing the feedback loop	Sometimes a lot happens outside of these virtual meetings that doesn't filter to all individuals involved. It is important to keep everyone updated on issues as these issues sometimes have transversal implications.
Participant 11 (10)	Team leader	Ability to lead a group of people while working on hybrid model, assist them on day to day with their needs and improve team performance.
	Innovative	Ability to think out of the box and come up with new ideas that will improve service delivery.
	Customer Centric	Ability to assist customers and respond to their requests timeously.
	Strategic focus	To achieve company permanent or long-term strategic goals.
	Communication	Effective communication is crucial because how you communicate can positively and negatively affect

		relationships within the team and outside the team with managers.
	Accountability	Promote ownership and accountability. On any team, things can go wrong, and people can make mistakes. But people need to take responsibility and resolve matters.
	Set Goals	At the outset, goals should be clearly set and defined. Getting this right at the start may take a little extra time and planning, but it pays major dividends.
	Trust	Trust is at the heart of any successful team. Without it, teams will be unable to progress due to fear of conflict or lack of commitment.
	Brainstorm with the entire team	Managing a virtual team requires managers to double down on the fundamentals of good management, including establishing clear goals, running great meetings.
	Celebrate success together	Share successes and issues with the team and encourage the team to work together to find solutions with your help.
Participant 12 (8)	Strategic goals clear	Project need to have clear link to strategic goals of the City of Cape Town and to the business plans of respective directorate/departments.
	Skills and competencies aligned to task	Virtual project team members need to have appropriate competencies or be given adequate training, information, support and reasonable work load to perform better in a team.
	Clearly defined roles and responsibilities	Virtual project teams need to put in place guidelines or a memorandum of agreement that details the roles and responsibility of each stakeholder. This is especially needed for transversal projects that involve more than one department.
	1 or 2 in-person meetings	Having a face to face meeting at the beginning of the project or in between at least once helps to establish connection between team members.

	Senior officials check in with project manager or member	Regular feedback and check ins with senior officials helps as part of mentoring and guiding the team. Moreover, senior officials are important for providing encouragement, and ensuring that targets are being met.
	Reviewing of lessons learnt of previous projects	Lessons learnt are important for identifying how future virtual project teams can improve. This is important for making the next virtual project team better, building networks between virtual project team workers and creating some form of cohesion.
	Acknowledge that some people work better virtually than others	Virtual project teams need to accommodate diversity of people and ensure that people are respected and heard with their differences.
	Facilitation skills of the chair or project manager	Working in the virtual environment is new in the City of Cape Town and many people are still finding ways of working in this setting. Sometimes it is not easy to ask questions to team members virtually, some people find it intimidating. This requires good facilitation skills from the project manager or chair of a virtual meeting.
Participant 13 (4)	Trust	The team leader needs to trust that team members are doing their part, and team members need to trust that other team members are pulling their weight.
	Measure progress	The team leader needs to have a system in place to measure performance and/or progress of team members and the project team as a whole.
	Positive energy	Maintain positive energy in the team by trying to address issues such as non-performance face-to-face and not in front of the entire team.
	Set clear milestones	Team leader to set very clear milestones in order for the team to know the deliverables and the dates linked to them.

Participant 14 (2)	Shared Values	A shared value system amongst team members will assist in overcoming personality and organisational challenges during the project.
	Common objective	Everybody in the team must agree and commit 110% to achieving the common objective of the project.
Participant 15 (4)	Leading by example and in support	Leadership is set by example - along with a willingness to support your team members on the ground/ with tasks when they need help.
	Sharing as much information as possible	Teams who share as much information as possible ensure that when any member is not available, the team can support that member by helping to take the project forward. Team members need to be able to ask any questions, as this ensures clear understanding.
	Acknowledging team success and good work	Sharing Management accolades and acknowledgement of good work by team members within the team helps to build morale and confidence in a virtual team.
	Encouraging confidence in team members	Team members need to know that if they make a mistake, in good faith, the trust in their ability to perform the task is still there. They must be confident to act without waiting for guidance on each and every issue.
Participant 16 (5)	Time Boundaries	Ability to set time boundaries in accordance with priorities of the day as well as what is set to be done for the day without being restricted to work from 8h00 to 17h00. Be able to set times for site visits during the day and still have time for administrative work.
	Communication needs and methods	All members to agree on method to be used in a way that accommodate their unique needs.
	Reliable electronic	Having active dashboard to your line Manager for active stuff that need his/her attention to be unblocked with stricter response to avoid backlog or project delays.

	High level of trust	Virtual team members must trust each in terms of deliverables and meeting deadlines. This creates a comfortable environment to work in, which is important for delivery.
	High degree of cooperation and collaboration	Cooperation and collaboration requires setting of clear roles and responsibilities in the project, awareness of each other's strengths and weaknesses, networking and awareness of other role-players in the project.
Participant 17 (5)	Communication	Communicating in the virtual setting is difficult, and a message can be easily misunderstood. Effective communication is important to ensure the message is correctly communicated.
	Distractions.	If the team is not motivated in some form or way distractions could easily sway them away and cost valuable time spent on project.
	Learning and understanding virtual programmes	Learning to manage and execute a project while working virtually requires one to learn and understand how to use programs such as Skype for Business and Microsoft Teams.
	Collaboration	Sometimes, some team members need help understanding the benefits of collaboration or may be unwilling to do so as they may be used to working individually. Encouraging and promoting collaboration for virtual project teams is important since people are already physically isolated from their teams.
	Trust.	Trust is a real challenge in big companies as people may feel that their work could be misused or shown as work done by others, and others may mistrust a colleague due to differences in culture or race.
Participant 18 (4)	Self-regulation	The ability of a team member to reflect on their current deliverables and identify potential risks (either for the

		project as a whole or certain tasks that likely not to be delivered on time).
	Emotional Intelligence	The ability of a team member or leader to identify where and when certain situations (not necessarily project-related or task-specific), may have an impact on the performance of the project or individual team members. Moreover, the ability to navigate this challenge affects performance in an amicable manner, or with at least disruption as possible, without compromising integrity.
	Awareness	Team members and leaders need to have some level of awareness regarding their capabilities, limitations, and that of other stakeholders. They need to be able to identify weaknesses, opportunities, and strengths about themselves and others and help in finding remedies that can improve working relationships.
	Realistic Expectations	A clear understanding of what is required to complete a task and programming projects accordingly so as to alleviate unnecessary pressure and stress.
Participant 19 (7)	Work Ethic	Without a work ethic, there will be limited to no desire to go the extra mile and/or prioritize the work. Procrastination will occur and work will be pushed out every day.
	Intrinsic Motivation	Intrinsic motivation provides the desire to do the work for no reason other than internal gratification. Where performance is driven by rewards, the team's performance drops in times where there are no rewards.
	Teamwork	Without teamwork, the work might not be aligned, and they will work in silos, producing less efficient and effective output and potentially contradicting or duplicating work.
	Passion	Passion is the one factor that provides the drive and could be the binder that brings the best out of all critical factors.

	Ability/Skills	You need a level of skills/ability to carry out the tasks and/or implement the work.
	Growth	Growth allows the team to grow and improve. Without growth, there will be stagnation, and improvement will be limited.
	Logical Thinking	Logical thinking allows team members to identify issues and not implement blindly. It also allows them to question things and come up with workable solutions.
Participant 20 (4)	Bandwidth	Virtual teams require high-quality bandwidth for true virtual teamwork.
	A functional video conferencing system	Virtual teams require a stable and functioning video conferencing system.
	Managed video-conference sessions	Recording of video meetings; a requirement for video-on always and the ability to do real-time virtual white boarding.
	Regular in-person meetings	Virtual meetings may enhance individual productivity, but team productivity depends on relationships requiring in-person meetings.

4.3. Workshop Phase

The IM methodology adopted for this research prioritizes consensus and learning (Tuan, 2020: 6). Moreover, the IM methodology supports representation and knowledgeability as criteria for participants (Tuan, 2020: 6). In order to sustain a productive conversation during the workshop phase, Warfield and Cardenas (2002) cited in Tuan (2017: 427) proposed that the IM workshop participants should be composed of six to twelve people with issue-related expertise. Furthermore, it is imperative to include representatives from every stakeholder group to ensure the quality of the outputs from the IM workshop (*Ibid.*). Eight respondents participated during the workshop phase of this research project; see Table 4.2. The researcher selected IM workshop participants from the 20 that participated during the idea generation phase. All eight

IM workshop stakeholders participated in all the activities of the workshop phase and during CSF identification.

Table 4.2: Interactive Management Workshop Participants

Participant's role	Participant's department	Number of participants per department
Oversee, monitor, and support VPTs	Roads and Infrastructure Management	1
	Informal Settlements	1
	Corporate Project, Programme, and Portfolio Management	1
Active members of a virtual project teams	Enterprise and Investment	1
	Urban Planning and Design	1
	Informal Settlements	1
	Corporate Project, Programme, and Portfolio Management	1
	Sustainable Energy Markets	1

The attendees of the IM workshop represented three participants who oversee, monitor, and support VPT, as illustrated in Table 4.2 above. Moreover, the attendees represented five active participants of a virtual project team. The workshop phase was conducted via video calling utilizing Skype for Business as a platform for participants to clarify generated CSFs and structure the Interpretive Structural Model for this study. The researcher facilitated two interactive management workshops due to time constraints and the availability of participants. The first workshop was arranged in December 2023 to clarify 124 CSFs. The second IM workshop was arranged in January 2024 to structure the ISM model, illustrating the interrelationship between the identified CSFs.

In between the two workshops, after the completion of the first workshop, participants were each asked to provide the top five CSFs for enhancing VPTP. The voting solicited top CSFs as perceived by participants. The voting of the top five CSFs preceded the structure modelling session. The objective for voting was to reduce CSFs further to minimize the time that it would take to model the interrelationship between the identified CSFs. The author of this research report, assisted by a computer operator, facilitated the idea clarification and the structuring of the ISM model sessions. Microsoft Excel was used to record the consensus decisions of

participants during idea clarification. In addition, the computer operator captured CSFs and the participants' votes regarding the top five CSFs to the ISM software. The computer operator also used the ISM software to record participants' votes regarding the interrelationship between identified critical success factors as discussed in section 4.3.2.

4.3.1. Idea Clarification

The idea clarification step allowed participants to clarify generated ideas by rephrasing, merging, splitting, and deleting generated ideas where applicable through consensus. As discussed in section 4.2.2, IM workshop participants reviewed 124 CSFs for enhancing VPTP and agreed on amendments. The description of each CSF assisted in merging, renaming, deleting, and splitting some identified CSFs. For example, the IM workshop participants agreed to merge 95 CSFs into 24 CSFs as a result of a consensus observation that they mean the same thing. As an output of the clarification phase, IM workshop participants reduced the initial 124 CSFs to 41 CSFs. As discussed in section 4.2.2 above, IM workshop participants were each asked to provide the top five CSFs, reducing the number to 20 CSFs. Table 4.3 and Table 4.4 below provide clarified CSFs that did not receive any vote and those that received a vote from participants respectfully.

Table 4.3: Clarified critical success factors that did not receive a vote

Critical Success Factor	Clarification
Goal setting and alignment of individual team member's goals to project goals.	Ensuring that individual team members understand and align the project's overarching goals. This factor emphasizes regularly revisiting project goals to align with individual team members' goals. Alignment of goals contributes to a shared sense of purpose among virtual project team members.
Risk management	The ability of a team member to reflect on their current deliverables and identify potential risks (either for the project as a whole or risks linked to their own individual tasks).

Project management plans to guide the implementation of projects	Project management plans that detail procedures and processes are critical in establishing uniformity and setting clear ways of doing things for everyone.
Self-motivated and confident team members	Each team member needs to show a desire to do the work for no reason other than internal gratification. They must be confident to act without waiting for guidance on every issue.
Commitment to the common objective of the project	Everybody in the team must agree and commit to achieving the project's common objective.
Responsiveness of line managers to queries from the team	Virtual project teams work efficiently when there is accessibility and support from decision-makers or the organization. This enhances decision-making at the project level and helps in fast-tracking project processes.
Leading the team by example and supporting individual team members in their project tasks	Virtual project teams need leaders who can provide direction, support, and motivate the team. Leadership is crucial for keeping the team on track and providing everyone with a competent and reliable support structure.
Policy and Standard Operating Procedure (SOP) guiding virtual working	A clear policy and Standard Operating Procedure on how the virtual team is to be supported by the parent organization and how the team should conduct itself in carrying out the required project tasks.
Conflict resolution skills	Virtual team members need to have conflict resolution skills to resolve conflicts and promptly address any issues. Conflicts are common in virtual teams, and handling them effectively is essential.

Facilitation skills of the chair or project manager	The ability of a virtual meeting chair or leader to facilitate discussions that lead to progressive outcomes that enable the project to progress.
Training and Skill Development	The parent organizations need to invest in the training and development of their employees on how to work in the virtual environment.
Flexible working	Virtual teams often work across diverse work schedules. Flexibility in deadlines and meeting times is required to accommodate these variations.
Security and Data Privacy	Virtual project teams must ensure that sensitive data and information are secured and that all team members know data privacy and security protocols.
Reliable interactive platforms or tools	Reliable inactive platforms such as Whatsapp applications and Skype instant messaging should be available to facilitate instant communication and sharing of information.
Closing the feedback loop	The team leader must ensure that everyone is updated about what everyone else is doing, as this might have transversal implications. This requires establishing systems that promote regular communication about what everyone is doing.
Structuring teams into levels for more personal contact	Virtual project teams are more effective when they are structured or composed of members who regularly have contact with each other, even beyond a specific project. This includes putting together people who have worked together or who are currently working for the same directorate.
Promote diversity and inclusion.	Embrace diversity in your virtual team, including diverse backgrounds, skills, and perspectives. Encourage an inclusive environment where everyone feels valued.

Team Building	Despite the physical distance, building a sense of camaraderie and trust within the team is vital. Virtual team-building activities and regular check-ins can contribute to this.
Trust and relationship-building	Building trust among team members is crucial. Team members should get to know each other personally, foster good relationships, and understand each other's strengths and weaknesses.
Service delivery mind-set	Virtual project teams are successful when they know and behave like public servants. This mind-set is required to deliver services in the public sector, where people need to be driven by a desire to improve people's lives.
Innovation	Ability to think and do things outside the normal. Virtual project team members need to develop new ideas to improve service delivery.

Table 4.4 below illustrates a list of 20 identified CSFs that the IM workshop participants voted as part of the top five selections, as discussed in section 3.4.2 and section 4.3. The majority of IM workshop participants (five of the eight) voted for CSF2 - clarification of goals, tasks, milestones, and responsibilities, followed by CSF8 - technology proficiency and skills (four of the eight), CSF1 - effective communication (three of the eight), CSF3 - positive work ethic (three of the eight), CSF5 - teamwork and cooperation (three of the eight). Seven CSFs, CSF4 - self-awareness and emotional intelligence, CSF6 - realistic project and individual team member expectations, CSF9 - technical skills competencies aligned to task, CSF10 - reliable technology and network system, CSF12 - shared values amongst team members, CSF4 - regular in-person engagements even when virtual working is the norm, and CSF19 - honesty and reliability, were voted by two participants.

The last group of CSFs received one vote from the IM workshop participants. This group includes CSF7 - reviewing lessons learned from previous projects, CSF11 - positive team environment, CSF13 - project progress and performance management, CSF15 - clear link of projects to strategic goals of the organization, CSF16 - human resource, CSF17 - Time management and boundaries, CSF18 - regular team brainstorming sessions, and CSF20 - regular feedback and recognition. In addition to the votes, IM workshop participants

categorized a majority of the 20 CSFs under project management (six CSFs), followed by team values (four CSFs), communication (three CSFs), guidance and motivation (two CSFs), team collaboration (two CSFs), proficiency and skills (two CSFs), and Time (one CSF), as shown in Table 4.4. The 20 CSFs shown in Table 4.4 was utilized in the following section - idea structuring as discussed in section 3.6.2 – to structure the ISM model for this study

Table 4.4: Clarified critical success factor that received a vote

CSF	Category	Critical Success Factor	Clarification	Votes Received
1	Communication	Effective Communication	In virtual project teams, clear and regular communication is crucial for success. This includes utilizing appropriate communication tools, setting expectations for response times, and ensuring that information is conveyed accurately. The ability to convey complex ideas concisely and understandably is critical to preventing misunderstandings and facilitating collaboration among team members.	3
2	Project management	Clarification of goals, tasks, milestones, and responsibilities	This factor emphasizes setting clear objectives and defining roles and responsibilities. Clarifying goals, tasks, milestones, and responsibilities enhances motivation and reduces ambiguity.	5
3	Team values	Positive work ethic	Virtual working provides work flexibility, which requires discipline from all team members, and the basis for this is holding	3

			each other accountable and building a teamwork ethic	
4	Guidance and motivation	Self-awareness and emotional intelligence	Team members and leaders need to be aware of their capabilities, limitations, and those of other stakeholders. Identifying weaknesses, opportunities, and strengths about oneself and others helps find remedies to improve working relationships.	2
5	Team collaboration	Teamwork and cooperation	Teamwork and collaboration are essential for more impact and to ensure that work is aligned toward achieving project objectives. Working in silos has proved to result in inefficiencies and ineffectiveness of output. Working in silos creates the potential for contradictions and duplication of work	3
6	Project management	Realistic project and individual team member expectations	A clear understanding of what is required to complete a task and programming projects accordingly to alleviate unnecessary pressure/ stress.	2
7	Project management	Reviewing lessons learned from previous projects	The team leader must facilitate peer-to-peer learning by leading and encouraging the team to learn from past mistakes and successes. This factor improves the next virtual project by building teams and creating networks and cohesion.	1

8	Proficiency and Skills	Technology Proficiency and skills	All virtual project team members must have the capabilities and skills to use technological equipment and tools.	4
9	Proficiency and Skills	Technical skills competencies aligned to the task	Virtual project teams work best when all members are competent in what they do. Competent team members add value to the team with the required technical skills.	2
10	Communication	Reliable technology and network system	A robust and reliable technological framework is essential. This includes proper project management tools, video conferencing platforms, and other software that facilitates virtual collaboration and sharing of information.	2
11	Team values	Positive team environment	Maintain positive energy in the team by addressing issues such as non-performance face-to-face and not in front of the entire team.	1
12	Team values	Shared values among team members	A shared value system amongst team members will assist in overcoming personality and organizational challenges during the project.	2
13	Project management	Project progress and performance management	Both team leaders and individual team members need to set and agree on clear performance metrics and key performance indicators that they will use to measure progress and success.	1

14	Communication	Regular in-person engagements, even when virtual working is the norm	Virtual project teams must set sporadic meetup sessions that strengthen relationships, trust, and team building. This is important for making virtual communication and sharing of information.	2
15	Project management	Clear link of projects to strategic goals of the organization	The project should be linked to the organization's strategic goals, the directorate/departments, and their business plans.	1
16	Project management	Human resource	The capacity to undertake and complete projects also relies on the availability of human resources by the employer. Staff must have all the resources they require to deliver their projects successfully.	1
17	Time	Time management and boundaries	Set clear expectations for working hours and deadlines. Team members should manage their time effectively to meet project deadlines.	1
18	Team collaboration	Regular team brainstorming sessions	Managing a virtual team requires managers to double down on the fundamentals of good management, including involving team members in decision-making through brainstorming sessions.	1
19	Team values	Honesty and Reliability	Team members should prioritize honest communications, providing transparent and accurate information. Reliability involves consistently delivering on commitments and being accountable for one's actions.	2

			Fostering a culture of honesty and reliability strengthens team relationships and contributes to the overall success of the virtual project.	
20	Guidance and motivation	Regular feedback and recognition	The project leaders and members must establish a culture of regular feedback and recognition for individual and team achievements. Positive reinforcement can boost morale and motivation.	1

4.3.2. Idea Structuring

As discussed in section 4.3, eight respondents participated during the workshop phase, encompassing CSF clarification, structuring of the ISM model, and interpretation of the structured model. This section focuses on the structuring of the ISM model. The ISM model was structured using the ISM software, as shown in Figures 4.4, 4.5, and 4.6 below. The computer operator loaded all 41 clarified CSFs and votes for the top five CSFs to the ISM computer software; see Figure 4.4 below. Moreover, the computer operator loaded categories for clarified CSFs, as decided by IM workshop participants, to the ISM software, as discussed in section 4.3.1. Utilizing the ISM software, voted CSFs by IM workshop participants were moved to a structuring set by the computer operator, see Figure 4.4. The structuring step of the ISM software involved setting up a contextual question for the group to decide the interrelationship between the CSFs. As discussed in section 3.4.3, the contextual question loaded on the ISM software was "Does CSF A significantly help to achieve CSF B"?

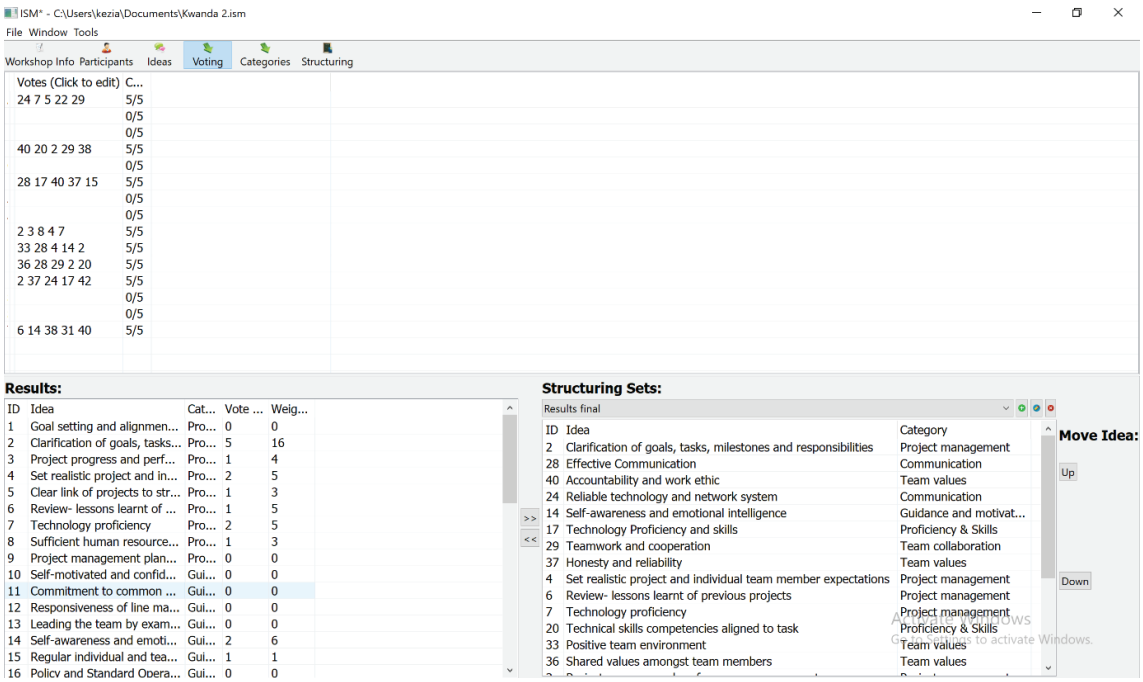


Figure 4.4: List of identified CSFs, Votes from ISM workshop participants, and CSFs loaded in the structuring set

During the IM workshop, the ISM software displayed a series of questions assessing the interrelationship between the pair of CSFs. Participants in the IM workshop held a group discussion for each pair of CSFs that were shown on the computer screen. The goal of the group discussion was to determine whether there was a yes or no relationship between the paired CSFs. For example, ISM workshop participants were asked, "Does CSF2 (clarification of goals, tasks, milestones, and responsibilities) significantly help to achieve CSF1 (Effective Communication)?" See Figure 4.5 below. Table 4.5 illustrates the voting decisions by IM workshop participants that were recorded by the ISM software during the workshop. In Table 4.6, CSF represents the structuring number given to each CSF as per Table 4.4 above. Moreover, in Table 4.5, 1 represents the existence of a relationship between a pair of critical success factors, and 0 represents that there is no relationship. For example, 1 means that IM workshop participants debated and agreed that CSF1 (effective communication) significantly helps to achieve CSF2 (Clarification of goals, tasks, milestones, and responsibilities).

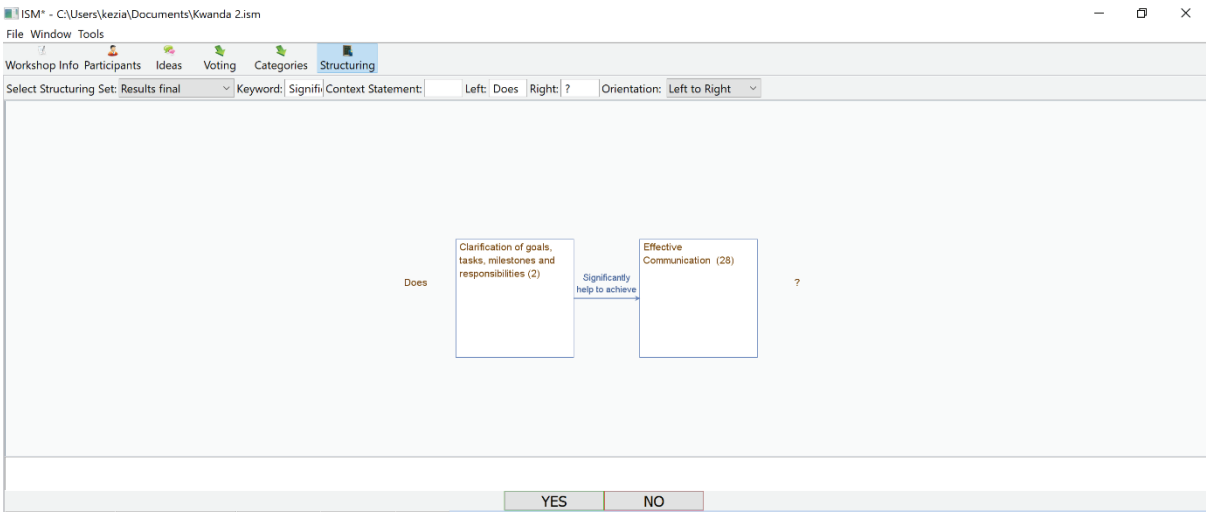


Figure 4.5: Example of the voting screen taken from the ISM workshop conducted for this study.

Table 4.5: ISM voting decision recorded by the ISM software (the CSFs from left to right were paired against CSFs from top to down).

	CSF1	CSF2	CSF3	CSF4	CSF5	CSF6	CSF7	CSF8	CSF9	CSF10	CSF11
CSF1	-	0	0	0	0	0	1	1	1	0	0
CSF2	1	-	0	0	0	1	1	0	1	1	1
CSF3	1	0	-	1	0	0	1	0	1	1	0
CSF4	0	0	0	-	0	0	1	0	0	0	0
CSF5	1	1	0	1	-	1	1	1	1	1	1
CSF6	1	0	0	0	0	-	1	0	1	1	0
CSF7	0	0	0	0	0	0	-	0	0	0	0
CSF8	0	0	0	0	0	0	0	-	0	0	0
CSF9	1	0	0	0	0	0	0	0	-	0	0
CSF10	0	0	0	0	0	0	1	0	0	-	0
CSF11	1	1	0	0	0	1	1	0	1	1	-
CSF12	0	0	0	0	0	0	0	0	0	0	0
CSF13	1	0	0	0	0	0	0	0	1	0	0
CSF14	0	0	0	0	0	0	1	0	0	0	0
CSF15	1	0	0	0	0	1	1	0	1	1	0
CSF16	1	0	0	0	0	1	1	0	1	1	0
CSF17	1	0	0	0	0	0	0	0	1	0	0
CSF18	0	0	0	0	0	0	0	0	0	0	0
CSF19	0	0	0	0	0	0	0	0	0	0	0
CSF20	0	0	0	0	0	0	1	0	0	0	0

	CSF12	CSF13	CSF14	CSF15	CSF16	CSF17	CSF18	CSF19	CSF20
CSF1	1	1	0	0	0	1	1	0	0
CSF2	1	1	1	1	1	1	1	1	1

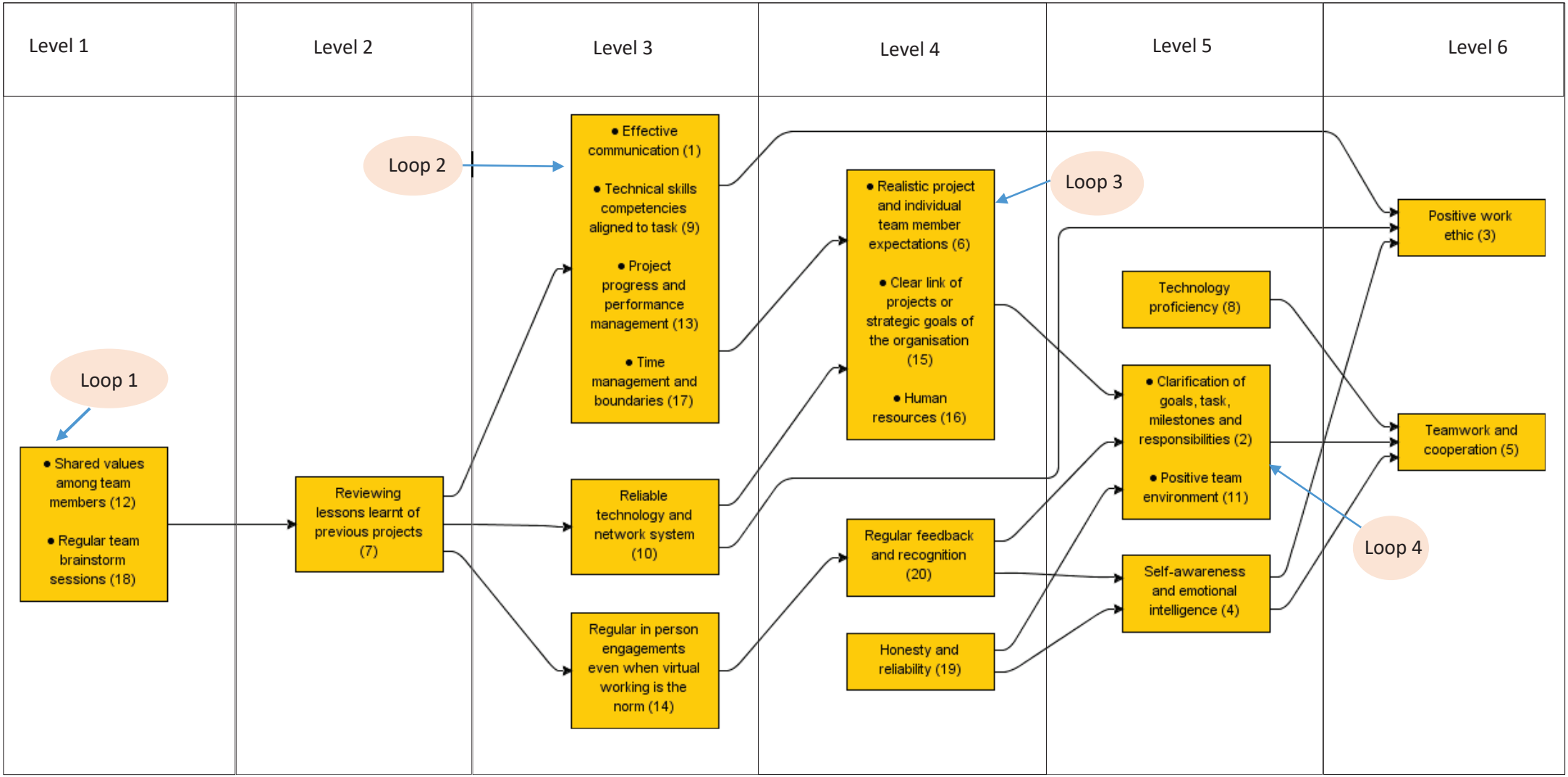
CSF3	1	1	1	0	0	1	1	1	1
CSF4	1	0	1	0	0	0	1	1	1
CSF5	1	1	1	1	1	1	1	1	1
CSF6	1	1	0	1	1	1	1	0	0
CSF7	1	0	0	0	0	0	1	0	0
CSF8	0	0	0	0	0	0	0	0	0
CSF9	1	1	0	0	0	1	1	0	0
CSF10	1	0	0	0	0	0	1	0	0
CSF11	1	1	1	1	1	1	1	1	1
CSF12	-	0	0	0	0	0	1	0	0
CSF13	1	-	0	0	0	1	1	0	0
CSF14	1	0	-	0	0	0	1	0	0
CSF15	1	1	0	-	1	1	1	0	0
CSF16	1	1	0	1	-	1	1	0	0
CSF17	1	1	0	0	0	-	1	0	0
CSF18	1	0	0	0	0	0	-	0	0
CSF19	0	0	0	0	0	0	0	-	0
CSF20	1	0	1	0	0	0	1	0	-

The ISM program created the final unformatted ISM relationship model based on group discussions and voting decisions made by participants in the IM workshop. Figure 4.6 below illustrates the generated ISM model of CSFs for enhancing VPTP. The researcher exported the ISM model from the software, and levels were added to Microsoft Word to illustrate different prioritization stages. The following section, 4.3.3, will interpret the ISM model generated in this research.

4.3.3. Interpretation of ISM Model

The ISM model of CSFs for enhancing VPTP in the South African local government context, shown in Figure 4.6 below, illustrates interrelationships between identified CSFs. This ISM model shows nine CSFs in their boxes and eleven CSFs grouped into four boxes. The eleven CSFs grouped into four boxes represent a feedback loop amongst the CSFs per box. The loop represents the intertwined relationships between the CSFs in one box in that a good effect on any CSF in that box creates a positive impact on other CSFs in that box. For example, CSF18 (regular team brainstorming sessions) significantly helps achieve CSF12 (shared values among team members), and CSF12 also significantly helps achieve CSF18. Figure 4.7 and Figure 4.8 below illustrate the feedback loop amongst two and three CSFs, respectively CSFs, from the ISM model presented in Figure 4.6.

Figure 4.6: ISM model of critical success factors for virtual project team performance in the South African local government context



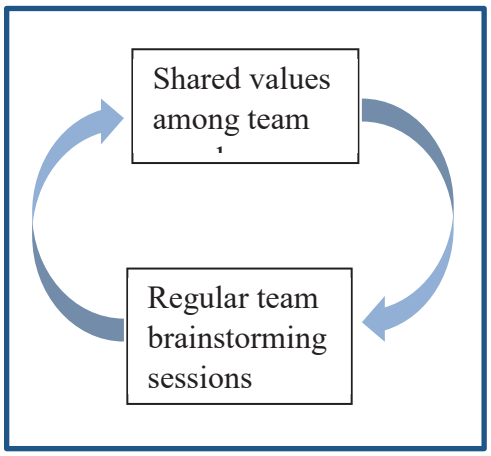


Figure 4.7: Two critical success factors in one box representing a feedback loop

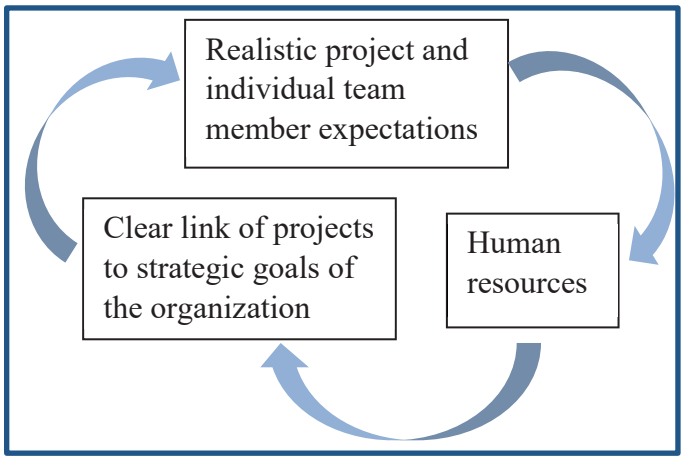


Figure 4.8: Three critical success factors in one box representing a feedback loop

The arrows connecting the boxes in Figure 4.6 represent the direction of the relationship between the CSFs. The direction of the relationship between the boxes, indicated by arrows between them, also explains the transitive logic (Tuan, 2020: 5). The IM software utilizes transitive relationship for inferences, such that in Figure 4.6, CSF14 significantly helps to achieve CSF20, and CSF20 significantly helps to achieve CSF4, then it can be inferred that CSF14 helps to achieve CSF4. "Applying such logic provides the greatest advantage in reducing the number of pairwise analyses, the time required to formulate the model, and its topology" (Sorach, 2014, cited by Ntshangase, 2017: 56).

According to Tuan (2020: 5), the transitive logic inferences utilized by the ISM software in constructing a relationship model between CSFs help to determine the relative importance of CSFs. CSFs located on the left side of the ISM model in Figure 4.6 require priority and strategic focus since they have the most leverage in accomplishing all of the other CSFs located on the right (Tuan, 2020: 6). Figure 4.6 shows six levels to illustrate the hierarchy of importance between the identified CSFs for enhancing VPTP. CSFs in loop one, CSF12 (shared values among the team), and CSF18 (regular team brainstorming sessions) are on the first level of the ISM model in the hierarchy or priority of CSFs for this study. Therefore, they are the most important CSFs for enhancing VPTP in the South African local government context.

As illustrated in Figure 4.6, CSFs in loop one, CSF12 (shared values among the team), and CSF18 (regular team brainstorming sessions) significantly help to achieve CSF7 (reviewing lessons learned from previous projects). CSF7 (reviewing lessons learned from previous projects) is on level two of the ISM model, as shown in Figure 4.6. Hence, this CSF is the

second most important CSF for prioritization. Figure 4.6 shows that CSF7 (reviewing lessons learned from previous projects) significantly helps achieve six CSFs in level three. In level three of the ISM model shown in figure 4.4, CSFs in loop two - CSF1 (effective communication), CSF9 (technical skills competencies aligned to tasks), CSF13 (project progress and performance management), CSF17 (time management and boundaries), and CSF10 (reliable technology and network system) significantly helps to achieve CSFs in loop three – CSF6 (realistic project and individual team member expectations), CSF15 (clear link of projects to strategic objectives of the organization), CSF16 (human resources), located in level four, and CSF3 (positive work ethic) located in level six.

In level three of the ISM model shown in Figure 4.4, CSF14 (regular in-person engagements even when virtual working is the norm) significantly helps to achieve CSF20 in level four. This CSF is less strategic than the other CSFs in level three because of the amount of CSFs it significantly helps achieve. However, all CSFs located in level three are the third most essential CSFs to prioritize for enhancing VPTP in the South African local government context, as per the findings of this study. In level four, CSF19 (honesty and reliability) and CSF20 (regular feedback and recognition) significantly help to achieve CSFs in loop four, CSF2 (clarification of goals, tasks, milestones, and responsibilities), and CSF11 (positive team environment), and CSF4 (self-awareness and emotional intelligence), located in level five. CSFs in loop three, CSF6 (realistic project and individual team member expectations), CSF15 (clear link of projects to strategic objectives of the organization), and CSF16 (human resources) significantly help to achieve CSFs in loop four, CSF2 (clarification of goals, tasks, milestones, and responsibilities), and CSF11 (positive team environment), located in level five.

In level five of the ISM model shown in Figure 4.6, CSF8 (technology proficiency), unlike other CSFs in this level, is not influenced by any CSF. CSF8 (technology and proficiency) significantly helps achieve CSF5 (teamwork and cooperation); as such, it is also less strategic than other CSFs in level five because of the number of CSFs it significantly helps to achieve. In level five of the ISM model shown in figure 4.6, CSFs in loop four, CSF2 (clarification of goals, tasks, milestones, and responsibilities), CSF11 (positive team environment), and CSF4 (self-awareness and emotional intelligence) significantly help to achieve CSF3 (positive work ethic), and CSF5 (teamwork and cooperation) both located in level six. CSFs in level six, CSF3 (positive work ethic), and CSF5 (teamwork and cooperation) have no power to achieve other

CSFs. Hence, they should receive the least priority or less attention from a strategic focus point of view when implementing the CSFs.

4.3.4. Comparison of Research Findings and the Voting Result by Participants

This section seeks to compare the top five CSFs for enhancing VPTP as voted by IM workshop participants through the use of nominal group technique, as discussed in sections 3.4.2, 4.3, and 4.3.1, against CSFs for enhancing VPTP that needs to be prioritized based on the number of CSFs that they significantly help to achieve, as discussed in section 4.3.3. Table 4.4 in section 4.3.1 illustrates that most IM workshop participants (five of the eight) voted for CSF2 (Clarifying goals, tasks, milestones, and responsibilities) as their top five CSFs. Table 4.4 in section 4.3.1 also shows that this study's second-highest number of participants (four of the eight) voted for CSF8 (technology proficiency and skills) as a significant factor. The third highest number (three of the eight) of participants voted for CSF3 (positive work ethic) and CSF5 (teamwork and cooperation) as significant factors.

During the interpretation of the generated ISM model for this study by IM workshop participants, a notable contrast between their votes regarding CSF2 (Clarification of goals, tasks, milestones, and responsibilities), CSF8 (technology proficiency and skills), CSF3 (positive work ethic), and CSF5 (teamwork and cooperation), and the constructed ISM model was identified. As discussed in section 4.3.3 (Clarification of goals, tasks, milestones, and responsibilities), CSF8 (technology proficiency and skills), CSF3 (positive work ethic), and CSF5 (teamwork and cooperation) are less strategic in terms of prioritization as they only significantly help to achieve few or no CSFs for enhancing VPTP in the South African local government context. IM workshop participants were surprised by this finding, and a discussion was held to decide the location of these CSFs in the ISM model. Participants in the ISM workshop decided to leave these CSFs in their current positions because, while casting their votes, they should have considered the total number of CSFs that each CSF must affect.

Another contrast was identified by IM workshop participants on their votes on CSF12 (shared values amongst team members), CSF9 (technical skills competencies aligned to the task), CSF10 (reliable technology and network system), CSF14 (regular in-person engagements even when virtual working is the norm), CSF7 (reviewing lessons learned of previous projects), CSF13 (project progress and performance management), CSF17 (time management and boundaries), CSF18 (regular team brainstorming sessions). These CSFs received two or fewer

votes from the IM workshop participants, whereas the ISM model depicted in Figure 4.6 locates these CSFs at levels one to three. As discussed in section 4.3.3, the number of CSFs that levels one to three CSFs significantly help to achieve is high. Hence, they must be prioritized more than CSFs at other levels. For the same reason noted in the previous paragraph, IM workshop participants decided not to change the model, and the contrasts were taken as lessons as they revealed something many participants did not initially think about when they voted.

The IM workshop participants for this study recognized the correlation between their votes and the output of the Interpretive Structural Model on CSF1 (effective communication), CSF4 (self-awareness and emotional intelligence), CSF6 (realistic project and individual team member expectations), CSF19 (honesty and reliability), CSF11 (positive team environment), CSF15 (clear link of projects to strategic goals of the organization), CSF16 (human resources), and CSF20 (regular feedback and recognition). As discussed in section 4.3.3, CSF1 (effective communication) needs to be prioritized because of the number of CSFs it significantly helps achieve. This correlates with the three votes received from the IM workshop participants, where they identified CSF1 as a significant factor. As discussed in section 4.3.3, CSF4 (self-awareness and emotional intelligence), CSF6 (realistic project and individual team member expectations), CSF19 (honesty and reliability), CSF11 (positive team environment), CSF15 (clear link of projects to strategic goals of the organization), CSF16 (human resources), and CSF20 (regular feedback and recognition) should be given less priority because of the number of CSFs that they significantly help to achieve. This correlates with the two or fewer votes received from the IM workshop participants for this study.

4.3.5. Comparison of Research Findings and Literature Review

This section of the research report seeks to present a high-level comparative assessment of the 20 CSFs identified in this study against the literature review identified CSFs, see section 2.4. It is important to note that the purpose of this study was not to identify new CSFs but to identify CSFs applicable to local government, particularly in the City of Cape Town. Hence, this research does not argue for novel CSFs but reflects on the applicability of reviewed CSFs in the local government context. Table 4.6 below present research findings on CSFs, CSFs from the literature review, and the number of researchers that identified the same CSFs. As shown in Table 4.6, most researchers (six) from the literature reviewed in this study also identified CSF1 (effective communication) in their different studies conducted in various industries. The second most identified CSF (five) from the reviewed literature is CSF10 (reliable technology

and network system), followed by CSF2 (Clarification of goals, tasks, milestones, and responsibilities), and CSF20 (regular feedback and recognition), which were both identified by four researchers.

Three researchers identified CSF5 (teamwork and cooperation), and two researchers identified CSF9 (technical skills competencies aligned to task), CSF11 (Positive team environment), and CSF16 (human resource). The remaining CSFs, CSF7 (reviewing lessons learned of previous projects), CSF8 (technology proficiency and skills), CSF12 (shared values amongst team members), CSF13 (project progress and performance management), CSF14 (regular in-person engagements even when virtual working is the norm), and CSF15 (clear link of projects to strategic goals of the organization) were each identified by one researcher from the literature reviewed.

Table 4.6 below shows that six CSFs, CSF3 (positive work ethic), CSF4 (self-awareness and emotional intelligence), CSF6 (realistic project and individual team member expectations), CSF17 (time management and boundaries), CSF18 (regular team brainstorming sessions), and CSF19 (honesty and reliability) were not identified by any of the researchers from the reviewed literature. This gap supports the argument for continued identification of CSFs to ensure their relevance to the organizational objectives.

Table 4.6: Comparison of Research Findings and Literature Review Critical Success Factors

CSF	Identified CSFs in this Study	Identified CSFs from the Literature Review		Number of appearances
		CSF	Author	
1	Effective Communication	Communication	Dube (2012)	6
		Communication	Amar and Haag (2017	
		Communication	Swart, Bond-Barnard, and Chugh (2022)	
		Reliability of project information	Dube and Marnewick (2016)	
		Communication	Ahuja (2016)	
		Communication	Topaloglu and Anac (2021)	

2	Clarification of goals, tasks, milestones, and responsibilities	Clear roles for team members	Wahbi, Raharjo and Hardian (2020)	4
		Project goals and objectives	Dube and Marnewick (2016)	
		Team Purpose	Ahuja (2016)	
		Establish clear goals and responsibilities.	Morley, Cormican and Folan (2015)	
3	Positive work ethic			
4	Self-awareness and emotional intelligence			
5	Teamwork and cooperation	Team cooperation and commitment	Dube (2012)	3
		Team cooperation	Dube and Marnewick (2016)	
		Collaboration	Topaloglu and Anac (2021)	
6	Realistic project and individual team member expectations			
7	Reviewing lessons learnt from previous projects	Identify virtual teams that currently operate successfully	Morley, Cormican and Folan (2015)	1
8	Technology Proficiency and skills	Technologically Advanced Corporate Culture	Morley, Cormican and Folan (2015)	1
9	Technical skills competencies	competent project teams	Wahbi, Raharjo and Hardian (2020)	2

	aligned to the task	Chose team members with appropriate skills	Morley, Cormican and Folan (2015)	
10	Reliable technology and network system	Collaboration tools and technology	Swart, Bond-Barnard, and Chugh (2022)	5
		Efficient ICT tools	Wahbi, Raharjo and Hardian (2020)	
		Availability of Technology	Ahuja (2016)	
		Robust IT Infrastructure	Morley, Cormican and Folan (2015)	
		Identify collaboration tools already in use.	Morley, Cormican and Folan (2015)	
11	Positive team environment	Comfort of belonging to a team	Dube and Marnewick (2016)	2
		Organizational Culture	Ahuja (2016)	
12	Shared values among team members	Cohesion	Topaloglu and Anac (2021)	1
13	Project progress and performance management	Performance	Ahuja (2016)	1
14	Regular in-person engagements, even when virtual working is the norm	Provide opportunities for interaction and trust development	Morley, Cormican and Folan (2015)	1
15	Clear link of projects to strategic goals of the organization	Ensure team are aware of how their work supports the overall goals of the organization	Morley, Cormican and Folan (2015)	1

16	Human resource	Effective Human Resource Practices	Ahuja (2016)	2
		Develop HR policies that support virtual teaming.		
17	Time management and boundaries			
18	Regular team brainstorming sessions			
19	Honesty and Reliability			
20	Regular feedback and recognition	Top Management Support	Ahuja (2016)	4
		Rewards/benefits of new technologies should be emphasized	Morley, Cormican and Folan (2015)	
		Support of senior management	Morley, Cormican and Folan (2015)	
		Feedback and Recognition	Topaloglu and Anac (2021)	

4.4. Conclusion

This chapter provides findings and a comprehensive step-by-step process illustrating the application of the IM research approach. The research participants for this study identified 20 CSFs and an ISM Model that illustrates the CSFs that "significantly help to achieve" other CSFs. Using the transitive logic inferences embedded in the ISM program, this research has revealed that CSFs such as shared values among team members, regular team brainstorming sessions, reviewing lessons learned of previous projects, effective communication, technical skills competencies aligned to tasks, project progress and performance management, time management, and boundaries, reliable technology and network system, and regular in-person engagements even when virtual working is the norm, are relatively significant based on the number of other CSFs that they significantly help to achieve. The next chapter will summarize findings, conclusions, and recommendations based on these findings.

CHAPTER 5 – CONCLUSION AND RECOMMENDATIONS

In order to guarantee that the findings of this study align with the study's goals, it is crucial to contemplate the research questions, aim, and objectives. This chapter aims to evaluate whether the research questions, aim, and objectives have been answered by the study's findings, which are presented in detail in chapter four. The research questions, aim, and objective were adopted to address the problem of poor performance of virtual project teams caused by the distance between team members. This research has addressed the research problem by adopting the below research question, aim, and objectives:

1. What are the critical success factors for virtual project team performance in South Africa's local government?
2. What are the interrelationships between critical success factors for virtual project team performance in the South African local government?
3. What are the critical success factors to prioritize when implementing virtual project teams in South Africa's local government context?

This research aimed to identify critical success factors (CSFs) for enhancing Virtual Project Team Performance (VPTP) in the South African local government context, determine the interrelationship between identified CSFs, and identify critical success factors to prioritize when implementing virtual project teams in South Africa's local government context.

To fulfil the research aim, this research adopted the below research objectives:

1. To identify critical success factors for virtual project team performance in the South African local government context.

This research adopted the Interactive Management (IM) methodology to identify CSFs for enhancing VPTP in the South African local government context using a single organization – the City of Cape Town - as an object of study. As discussed in chapter four, 20 CSFs were identified in this study using IM methodology techniques linked to idea generation, idea clarification, and idea structuring processes. Table 4.4 in chapter four depicts all 20 CSFs for enhancing VPTP in the South African local government context identified in this study.

As shown in Table 4.4, the identified CSFs for this study include effective communication, clarification of goals, tasks, milestones and responsibilities, positive work ethic, self-awareness and emotional intelligence, teamwork and cooperation, realistic project and individual team

member expectations, reviewing lessons learnt of previous projects, technology proficiency and skills, technical skills competencies aligned to task, reliable technology and network system, positive team environment, shared values amongst team members, project progress and performance management, regular in-person engagements even when virtual working is the norm, clear link of projects to strategic goals of the organization, human resource, time management, and boundaries, regular team brainstorming sessions, honesty and reliability, and regular feedback and recognition.

2. To determine interrelationships between identified critical success factors for virtual project team performance in the South African local government context.

The ISM software was utilised in a workshop setting to structure the ISM model of CSFs for enhancing VPTP in the South African local government context. The constructed ISM model for this study, shown in Figure 4.6, demonstrates the "significantly helps to achieve" interrelationship between the 20 identified critical success factors, shown in Table 4.4. Based on the generated ISM model for this study, this study makes the below conclusions regarding the interrelationship between the identified CSFs for enhancing VPTP:

- The ISM model for this study, as shown in Figure 4.6, demonstrates four boxes representing a feedback loop between CSFs. As discussed in section 4.3.3, a feedback loop represents the intertwined relationships between the critical success factors in one box, in that a good effect on any critical success factor in that box positively impacts other critical success factors in that box. The first box is located in level one of the ISM model and accommodates CSF12 (shared values among team members) and CSF18 (regular team brainstorming sessions).

  Reviewed literature identifies the importance or relationship between regular brainstorming sessions, especially at the beginning phases of team development, and establishing shared values. The literature also mentions that establishing shared understanding and values helps to address the need to consistently clarify project goals, tasks, and values, among other issues. This literature contrasts the findings made in this research, which suggest that the CSF of shared values significantly helps to achieve the CSF of regular brainstorming sessions.

- The second box, representing a feedback loop, is located in level three of the ISM model and accommodates CSF1 (effective communication), CSF9 (technical skills

competencies aligned to tasks), CSF13 (project progress and performance management), and CSF17 (time management and boundaries). The third box is located in level 4 and accommodates CSF6 (realistic project and individual team member expectations), CSF15 (clear link of projects to strategic objectives of the organization), and CSF16 (human resources). The fourth box is located on level five and accommodates CSF2 (clarifying goals, tasks, milestones, and responsibilities) and CSF11 (positive team environment).

- Both CSFs in loop one, CSF12 (shared values among team members) and CSF18 (regular team brainstorm sessions), significantly help to achieve CSF7 (reviewing lessons learned of previous projects), which is located on level two of the ISM model constructed for this study.

- CSF7 (reviewing lessons learned of previous projects), which is located on level two on the ISM model, significantly helps to achieve CSF1 (effective communication), CSF9 (technical skills competencies aligned to tasks), CSF13 (project progress and performance management), CSF17 (time management and boundaries), CSF 10 (reliable technology and network system), and CSF14 (regular in-person engagements even when virtual working is the norm).

- The CSFs in loop two, CSF1 (effective communication), CSF9 (technical skills competencies aligned to tasks), CSF13 (project progress and performance management), and CSF17 (time management and boundaries), significantly help to achieve CSFs in loop three, CSF6 (realistic project and individual team member expectations), CSF15 (clear link of projects to strategic objectives of the organization), and CSF16 (human resources), located in level four, and CSF3 (positive work ethic) located in level six.

- In level three of the ISM model, shown in figure 4.6, CSF10 (reliable technology and network system) also significantly helps to achieve CSFs in loop three, CSF6 (realistic project and individual team member expectations), CSF15 (clear link of projects to strategic objectives of the organization), and CSF16 (human resources), located in level four, and CSF3 (positive work ethic) located in level six.

- In level three of the ISM model, shown in figure 4.6, CSF14 (regular in-person engagements even when virtual working is the norm) helps to achieve CSF20 (regular feedback and recognition) in level four.

- In level four, CSF19 (honesty and reliability) and CSF20 (regular feedback and recognition) significantly help to achieve CSFs in loop four, CSF2 (clarification of goals, tasks, milestones, and responsibilities), and CSF11 (positive team environment), and CSF4 (self-awareness and emotional intelligence). Unlike other CSFs in level four, CSF19 (honesty and reliability) is not influenced by any CSF from the 20 CSFs identified in this study.

- CSFs in loop three, CSF6 (realistic project and individual team member expectations), CSF15 (clear link of projects to strategic objectives of the organization), and CSF16 (human resources) significantly help to achieve CSFs in loop four, CSF2 (clarification of goals, tasks, milestones, and responsibilities), and CSF11 (positive team environment).

- In level five, CSF8 (technology proficiency), unlike other CSFs in this level, is not influenced by any CSF identified in this study. CSF8 (technology and proficiency) significantly helps to achieve CSF5 (teamwork and cooperation).

- In level five of the ISM model shown in figure 4.6, CSFs in loop four, CSF2 (clarification of goals, tasks, milestones, and responsibilities), CSF11 (positive team environment), and CSF4 (self-awareness and emotional intelligence) significantly help to achieve CSF3 (positive work ethic), and CSF5 (teamwork and cooperation) both located in level six.

- CSFs in level six, CSF3 (positive work ethic), and CSF5 (teamwork and cooperation) have no power to help achieve other CSFs significantly.

3. To identify critical success factors to prioritize when implementing virtual project teams in South Africa's local government context.

As discussed in section 4.3.3, the transitive logic inferences utilized by the ISM software in constructing a relationship model between critical success factors help to determine the relative importance of critical success factors. Critical success factors that are positioned on the left side of the ISM model in Figure 4.6 are identified as critical and requiring priority and strategic

focus since they have the most leverage in accomplishing all of the critical success factors that are located on the right (Tuan, 2020: 6). In figure 4.6, six levels are depicted to illustrate the hierarchy of importance between the identified critical success factors. Therefore, this study has presented the prioritization of CSFs in descending order from left to right, from level one to level six. Table 5.1 below summarizes the prioritization of the critical success factors as identified in this study, with level one being the most important CSF to prioritize and level six being the least important CSF to prioritize.

Table 5.1: Summary of critical success factors to prioritize when implementing virtual project teams in the South African local government context.

Level of priority	Critical Success factors	Number of CSF
1	Shared values amongst team members; regular team brainstorming sessions.	2
2	Reviewing lessons learned from previous projects.	1
3	Effective communication; technical skills competencies aligned to the task; reliable technology and network system; project progress and performance management; regular in-person engagements even when virtual working is the norm; time management and boundaries.	6
4	Realistic project and individual team member expectations; clear link of projects to strategic goals of the organisation; human resource; honesty and reliability; regular feedback and recognition.	5
5	Clarifying goals, tasks, milestones, and responsibilities; self-awareness and emotional intelligence; technology proficiency and skills; positive team environment.	4

6	Positive work ethic, teamwork, and cooperation.	2

5.1. Type of Projects and CSF Relevance

Section 3.4.1 of this report discusses representation as a criterion for choosing relevant stakeholders to identify organizational CSFs. Hence, in this study stakeholders were also selected based on the diversity of the type of projects that they were involved in. The CSFs identified for this study apply to various teams in the City of Cape Town as an organization. This being said, some CSFs might be more relevant to specific projects than other types of projects. The different types of projects in the City of Cape Town include major, once-off, and routine projects. Major projects in the City of Cape Town are categorized as those projects exceeding R50 million and consisting of multiple coordinated, related, interdependent, and controlled components undertaken to achieve an objective conforming to specific requirements (CoCT, 2022: 10). Once-off projects are defined as a unique and temporary endeavour costing less than R50 million and undertaken to achieve a specific service delivery objective (*Ibid.*). Routine projects represent repetitive work essential for expanding infrastructure, plant, and equipment, not exceeding R10 million (*Ibid.*). Table 4.1 below summarizes the type of projects undertaken by each department selected for this study.

Table 5.2: Type of projects undertaken by each of the departments selected for this study

Department	**Projects and Programmes**	**Type of Projects**
Informal Settlements	Informal settlements upgrading projects such as re-blocking, provision of water taps, ablutions, and electrification of informal settlements	Routine projects
Enterprise and Investment	Employment and skills development programmes and projects	Routine projects
Roads and Infrastructure Management	Road resurfacing, maintenance of the storm water system, and street furniture within the road reserve	Routine projects
Urban Planning and Design	Multi-disciplinary projects such public spaces upgrading projects, and liveable streets projects	Projects

Information Systems and Technology	Enterprise resource planning (ERP) software system related projects	Projects
Sustainable Energy Markets	Power generation, procurement, and energy efficiency projects	Projects
Facilities Management	Upgrading, maintenance and repairs to Corporate City facilities such staff offices and residential buildings.	Routine projects
Corporate Project, Programme and Portfolio Management	Implementation of ad-hoc and corporate projects and programmes, including the establishment of COVID-19 vaccination stations, and upgrading of the Cape Town Stadium	Major projects

5.2. Research Limitations

This research identified CSFs for enhancing VPTP in the South African local government context, focusing on the City of Cape Town. Moreover, this research determined the interrelationship between identified CSFs and the prioritization of CSFs for enhancing VPTP in South Africa's local government context. However, the first limitation of this study is that it needs to provide guidelines on how the identified CSFs should be implemented by organizations that want to improve virtual project team performance. For example, guidelines are needed to guide organizations in creating a positive team environment (CSF11) or shared values among team members (CSF12).

As discussed in section 1.9, literature on critical success factors (CSFs) encourages organizations to study their specific CSFs, as this enables them to respond to their unique dynamics in a way that gives them a competitive advantage, see Laureani and Antony (2012) cited in Keramida, Psomas, and Antony (2022: 4), Tuan (2020: 2), and Jonker (2014: 70). Consequently, the focus of this research was to study CSFs for enhancing VPTP in the South African local government context, focusing on the CoCT. Hence, the second limitation of this study is its industry or sector focus since the research findings are only limited to this sector or industry.

Using a single organization is another limitation as it means that participants for this study were representing one municipality in the South African local government. The limitation of a single organization is that its research findings are specific and limited to its contextual setting. Finally, the findings of this study reflect the views and experiences of the participants involved and not all the actors involved in the local government sector in South Africa or the CoCT.

5.3. Future Research and Recommendations

The limitations discussed in section 5.1 above on industry focus, the use of a single organization, and subjective views of participants present an opportunity for future research to extend knowledge on CSFs for enhancing VPTP by studying other municipalities in South Africa, other industries or sectors of government, with different participants. Furthermore, Cooper (2008), cited in Tuan (2020: 2), discusses the risk of short-term memory in that managers might reduce CSFs to a manageable number. In addition, the CSF idea may result in other factors being overlooked. These CSF limitations and the dynamic environment of organizations require frequent re-visitation or continued identification of CSFs to ensure their relevance to the organizational objectives. Hence, future research must identify the relevance of the CSFs identified in this study as the local government environment changes. The participants of this study were involved in different types of projects, and some CSFs might be more relevant to some projects than others. Future research is required to explore the type of projects and CSF relevance.

5.4. Conclusion

This research has identified CSFs for enhancing VPTP, the interrelationship between identified CSFs, and the CSFs that need to be prioritized in implementing virtual project teams in the South African local government context. The benefit of this study is twofold: firstly, it helps to extend prior research on CSFs for enhancing VPTP by contributing new information based on the views and experiences of virtual project team stakeholders in the South African local government context. As discussed in section 1.9, this research contributes to the project management body of knowledge by deepening the understanding of CSFs for enhancing VPTP. Secondly, this research is necessary for municipalities in South Africa working or intending to implement projects through virtual project teams. Through this study, municipalities in South Africa will gain a deeper understanding of CSFs needed to improve the effectiveness of virtual project teams.

REFERENCE LIST

1. Ahuja, J. (2016) Modelling the Success Factors of Virtual Team, *Indian Journal of Science and Technology*, 9(48), 1 - 9.

2. Amber, M., Fiscal, F. and Wiener, M. (2005) Background of Critical Success Factor Research. Available on https://static.aminer.org/pdf/PDF/000/245/894/critical_success_factors_csfs_and_the_growth_of_it_in.pdf. Accessed on 04 April 2023.

3. Amar, H. and Haag, M. (2017) Exploring the Critical Success Factors of Virtual-Agile IT Projects: A Grounded Theory Study, *International Journal of Innovation, Management, and Technology*, 8(6), 427 – 434.

4. Antwi, S. K. and Hamza, K. (2015) Qualitative and Quantitative Research Paradigms in Business Research: A Philosophical Reflection, *European Journal of Business and Management*, 7(3), 217 – 225.

5. Atieno, O. P. (2009) An Analysis of the Strengths and Limitation of Qualitative and Quantitative Research Paradigms, *Problems of Education in the 21st Century*, 13, 13 – 18.

6. Behling, C.J. (2019). Project Success In Virtual Projects: A Qualitative Study Of Leadership Behaviors. Ph.D Dissertation. Capella University, United States of America.

7. Biocca, F., Harms, C. and Gregg, J. (2001) The networked minds measure of social presence: Pilot test of the factor structure and concurrent validity. In *4th annual international workshop on presence, Philadelphia, PA* (pp. 1-9).

8. Bissoonauth, B. (2002) Virtual Project Work: Investigating Critical Success Factors of Virtual Project Performance. Master's Dissertation. Concordia University, Canada.

9. Both, B. (2011) Examining the Critical Factors of Success in Virtual Team Performance. Ph.D Dissertation. Northcentral University, United States of America.

10. Boyle, L. (2020) The Way Forward For the City of Cape Town and What It Means to Be 'Smart' In Africa: URERU Smart City Series Part 4. Available on

https://open.uct.ac.za/bitstream/handle/11427/32097/Boyle_WayForward_2019.pdf?sequence=5. Accessed on 06 April 2023.

11. Boyle, L. (2019) The Current State and Characteristics of Cape Town's Smart City Development: URERU Smart City Series Part 2. Available on https://ebe.uct.ac.za/sites/default/files/content_migration/ebe_uct_ac_za/862/files/Final%25E2%2580%2593THE%2520CURRENT%2520STATE%2520AND%2520CHARACTERISTICS%2520OF%2520CAPE%2520TOWN%25E2%2580%2599S%2520SMART%2520CITY%2520DEVELOPMENT%2520.pdf. Accessed on 06 April 2023.

12. Buhlungu, S. (2020) An Analysis Of Risk Factors For Donor Funded Projects And Programs In The Health Sector In Zimbabwe. Masters Dissertation. University of Cape Town, South Africa.

13. Business Day (2020) The Impact of Covid-19 on the Business of Local Municipalities. Available on https://businessmediamags.co.za/wp-content/uploads/2020/09/LG_finalstrunglinked.pdf. Accessed on 24 March 2023.

14. Chipanga, F. (2021) Identifying the Critical Success Factors In the Implementation of Enterprise Resource Planning (ERP) In the Zimbabwe Electricity Energy Sector. Masters Dissertation. University of Cape Town, South Africa.

15. Choi, O.K. and Cho, E. (2019) “The mechanism of trust affecting collaboration in virtual teams and the moderating roles of the culture of autonomy and task complexity,” *Computers in Human Behavior,* 91, pp. 305-315.

16. Chopard, K. & Przybylski, R. (2021) Methods Brief: Case Studies. Available on https://www.jrsa.org/pubs/factsheets/jrsa-research-methods-brief-case-studies.pdf. Accessed on 06 April 2023.

17. Clark, D. A. G., Marnewick, A. L., and Marnewick, C. (2019) "*Virtual team performance factors: A systematic literature review"*, Proc. IEEE Int. Conf. Ind. Eng. Eng. Manage. (IEEM), pp. 40-44, Dec. 2019.

18. Connelly, L.M. (2016). Trustworthiness in qualitative research. Available on https://go.gale.com/ps/i.do?p=AONE&u=googlescholar&id=GALE|A476729520&v=2.1&it=r&sid=AONE&asid=c963f856. Accessed on 28 June 2023.

19. Creswell, J. (2009) *Research Design: Qualitative, Quantitative and Mixed Methods Approach*, 3rd edition, SAGE Publications: Thousand Oaks.

20. Creswell, J. (2007) *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*, 2nd edition, SAGE Publications: Thousand Oaks.

21. City of Cape Town - CoCT (2022) Master Data: Capital Long Term Financial Plan (LTFP). City of Cape Town, South Africa.

22. City of Cape Town – CoCT, (2020) *Back to Work: A Framework plan for a phased-in approach to return to productivity*. City of Cape Town, South Africa.

23. City of Cape Town – CoCT, (2019) *Flexible Working Programme: Frequently Asked Questions*. City of Cape Town, South Africa.

24. City of Cape Town - CoCT (2018) *Directive for the Flexible Working Programme (FWP)* (Directive from the City Manager). City of Cape Town, South Africa.

25. City of Cape Town - CoCT (2021) *Directive: Flexible Working Hours and Working from Home* (Directive from the City Manager). City of Cape Town, South Africa.

26. City of Cape Town - CoCT (2022a) Remote Working Guidelines. City of Cape Town, South Africa.

27. City of Cape Town – CoCT (2017) *Travel Demand Management Strategy for the City Of Cape Town (Policy)*. City of Cape Town, South Africa.

28. City of Cape Town - CoCT (2022b) *Five-Year Integrated Development Plan: July 2022 – June 2027*. City of Cape Town, South Africa.

29. Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A. and Sheikh, A. (2011) The case study approach. Available on https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/1471-2288-11-100. Accessed on 15 April 2023.

30. De Paoli, D. and Ropo, A. (2015). Open plan offices – the response to leadership challenges of virtual project work? *Journal of Corporate Real Estate*, 17(1), 63–74.

31. Duarte, D. L. & Snyder, N. T. (2001). *Mastering virtual teams: Strategies, tools, and techniques that succeed*, 2nd edition, Hoboken: Jossey-Bass Inc., San Francisco, California.

32. Dube, S. (2012) A Conceptual Framework to Enhance performance in Virtual Information Technology Project Teams. Ph.D Dissertation. University Johannesburg, South Africa.

33. Dube, S. & Marnewick. C. (2016) A conceptual model to improve performance in virtual teams, *South African Journal of Information Management,* 18(1): 1–10. 188 – 203.

34. Du Plessis, A. (2021) A Systemic Exploration of Risks in Mobile Application Development Projects and Environments. Masters Dissertation. University of Cape Town, South Africa.

35. El Hussein, M., Hirst, S., Salyers, V. and Osuji, J. (2014) Using Grounded Theory as a Method of Inquiry: Advantages and Disadvantages, *The Qualitative Report*, 19(13), 1-15.

36. Glasow, P. A. (2005). *Fundamentals of Survey Research Methodology*. MITRE Product, Washington C3 Center.

37. Garro-Abarca, V., Palos-Sanchez, P. and Aguayo-Camacho, M. (2021) Virtual Teams in Times of Pandemic: Factors That Influence Performance, *Frontiers in Psychology* 12(624637), 1 – 14.

38. Hansen, C.D. (2005) Grounded Theory Research Methods, *In Research in Organisations: Foundations and Methods of Inquiry;* Swanson, R. and Holton III, E. F., Eds.; Berrett-Koehler Publishers, San Francisco, USA, 265–280.

39. Jackson, B. and Madsen, S.R. (2004) Common Factors of High-Performance Teams. Available on https://eric.ed.gov/?id=ED492231. Accessed on 04 April 2023.

40. Jahagirdar, R., and Bankar, S. (2021). Performance in virtual teams: A conceptual overview, *Bilingual Research Journal*, 7(28), 262–267.

41. Jones, T.L., Baxter, M.A.J. and Khanduja, V. (2013) A quick guide to survey research, *The Annals of the Royal College of Surgeons of England*, 95(1), 5 - 7.

42. Jonker, J.A. (2004) Critical Success Factor. Chapter 3, University of Pretoria, Pretoria

43. Joseph, J. and Williams, R. (2022) A Retrospective Analysis: ICT For Improved Municipal Service Delivery Amidst Covid 19, *EUREKA: Social and Humanities*, 2: 70–85.

44. Junek, O. and Killion, L. (2012) Grounded Theory. In *Handbook of Research Methods in Tourism: Quantitative and Qualitative Approaches*; Dwyer, L., Gill, A., Seetaram, N., Eds.; Edward Elgar: Cheltenham, CA, USA, 325–338.

45. Iong, Y.K and Phillips, J.O.L. (2023) The transformation of government employees' behavioural intention towards the adoption of E-government services: An empirical study, *Social Sciences & Humanities Open*, 7(1), 1-8.

46. Keramida, E., Psomas, E.L. and Antony, J. (2022) Critical success factors of lean in the public services sector: the case of the greek citizen's service centers, The TQM Journal.

47. Khothari, C.R. (2004) Research Methodology: Methods and Techniques, 2nd revised edition, New Age International Publishers, New Delhi.

48. Koma, SB (2010) The State of Local Government in South Africa: Issues, Trends And Options, *Journal of Public Administration*, 45(1.1): 111 – 120.

49. Kumar, V., Pandey, A. and Singh, R. (2023) Critical Success Factor Models for Project Success, *Journal of Engineering, Project & Production Management*, 13(2).

50. Lee, M. R., (2014). *Leading virtual project teams: Adapting leadership theories and communications techniques to 21st century organizations*. Boca Raton: Auerbach.

51. Makwembere, S. (2015) Perceptions and Experiences of G2E E-Government Workplace Restructuring: The Cases of Buffalo City and City of Cape Town

Metropolitan Municipalities, South Africa. Ph.D Thesis. Rhodes University, South Africa.

52. Mallett, R., Hagen-Zanker, J., Slater, R. and Duvendack, M. (2012) The benefits and challenges of using systematic reviews in international development research, *Journal of Development Effectiveness*, 4(3), 445 – 455.

53. Mamokhere, J. (2019) An Exploration of Reasons Behind Service Delivery Protests in South Africa: A Case of Bolobedu South at the Greater Tzaneen Municipality. Available on http://ulspace.ul.ac.za/bitstream/handle/10386/2669/mamokhere_exploration_2019.pdf?sequence=1&isAllowed=y. Accessed on 23 March 2023.

54. Matlala, E. (2011) Critical Success Factors Required By Virtual Teams Members in Engineering Projects. Mastrer's Dissertation. University of Pretoria, South Africa.

55. Mohajan, D., and Mohajan, H. K. (2022) Development of Grounded Theory in Social Sciences: A Qualitative Approach, *Studies in Social Science & Humanities*, 1(5), 13-24.

56. Morley, S., Cormican, K. & Folan, P. (2015) An Analysis of Virtual Team Characteristics: A Model for Virtual Project Managers, *Journal of Technology Management & Innovation*, 10(1): 188 -203.

57. Morrison-Smith, S. & Ruiz, J. (2020) Challenges and barriers in virtual teams: a literature review. *SN Applied Sciences*, 2(1096), 1-33.

58. Municipal IQ (2021) Uptick in service delivery protests likely to show political tensions in pandemic election year: For immediate release. Available on https://www.municipaliq.co.za/publications/press/202106220908591507.doc. Accessed on 05 May 2023.

59. Nguyen, D.S. (2013) Success Factors for Building and Managing High Performance Global Virtual Teams. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*. 9(1), 72-93.

60. News24 (2020) The City of Cape Town currently has nearly 3,300 jobs available - here's how to apply. Available on https://www.news24.com/news24/bi-archive/the-city-of-cape-town-currently-has-nearly-3300-jobs-available-2020-2. Accessed on 25 April 2023.

61. Ntoyanto, S., & Tuan, N.-T. (2019). Using Interactive Management to Explore the Factors Causing Delay of Modification Project in a South African Power Station. *Proceedings of the 62nd Annual Meeting of the ISSS - 2018 Corvallis, OR, USA, 1(1)*. Available on https://journals.isss.org/index.php/proceedings62nd/article/view/3419. Accessed on 07 May 2023

62. Ntshangase, B. (2017) Identifying delay factors in electrical distribution projects at Eskom Northern Cape Operating Unit. Masters Dissertation. University of Cape Town, South Africa.

63. Odendaal, N. (2006) Towards the Digital City in South Africa: Issues and Constraints, *Journal of Urban Technology*, 13:3: 29-48.

64. Okoli, C. (2015) A Guide to Conducting a Standalone Systematic Literature Review, *Communications of the Association for Information Systems*, 37(43), 879 – 910.

65. Organisation for Economic Cooperation and Development – OECD – (2021). *The Future of (Remote?) Work In The Public Service: Five Ways to Find a Balance Between Remote and In-Office Presence in the Public Service*. Paris, France.

66. Peters, L.M. and Manz, C.C. (2007) Identifying antecedents of virtual team collaboration. *Team Performance Management*. 13(3/4), 117-129.

67. Pillai, R., Mahtta, M., Gunasekaran, A., Sivathanu, B. and Kaushik, N. (2022) A pathway to virtual team performance in the New Normal paradigm, *Journal of Organizational Effectiveness: People and Performance*, 9(4), 549-571.

68. Pinto, J. and Slevin, D. (1987). Critical Factors in Successful Project Implementation. In: *IEEE Transactions on Engineering Management, 34(1)*, 22-27.

69. Project Management Institute (PMI) (2017). *"A guide to the project management body of knowledge (PMBOK guide)*". 6th Edition. ed. Newtown Square, USA: Project Management Institute, Inc.

70. Ponto, J. (2015). Understanding and evaluating survey research, *Journal of the Advanced Practitioner in Oncology*, 6(2), 168 - 71.

71. Pullan, P. (2016). *Virtual Leadership: Practical Strategies for Getting the Best Out of Virtual Work and Virtual Teams.* Kogan Page Limited, London.

72. Rao, V.R. (2011) Collaborative Government to Employee (G2E): Issues and Challenges to E-Government, *Journal of E-Governance*, 34 (4) 214–229.

73. Republic of South Africa (1996) Constitution, 1996. Pretoria: Government Printers.

74. Republic of South Africa (1998) White Paper on Local Government. Pretoria: Government printers.

75. South Africa Government Communications (2024) About alert system. Available on https://www.gov.za/covid-19/about/about-alert-system. Accessed on 05 August 2024.

76. Rockart, J.F. and Bullen, C. (1981) A primer on critical success factors. *Center for Information Systems Research Working Paper*, 69.

77. Salmon, 2017. blog) The importance of case studies in social research. https://www.changeworks.org.uk/news-and-events/blog/the-importance-of-case-studies-in-social-research

78. Shenton, A.K. (2004) Strategies for ensuring trustworthiness in qualitative research projects, *Education for Information*, 22(2), 63–75.

79. Söderström, O., Blake, E. and Odendaal, N. (2021) More-than-local, more-than-mobile: The smart city effect in South Africa, Geoforum 122, 103–117.

80. Starman, A. B. (2013). The Case Study as a Type of Qualitative Research, *Journal of Contemporary Educational Studies*, 1, 28–43.

81. Swart, K., Bond-Barnard, T. & Chugh, R. (2022) Challenges and critical success factors of digital communication, collaboration and knowledge sharing in project management

virtual teams: a review, *International Journal of Information Systems and Project Management*, 10(4): 59-75.

82. Topaloglu, M. and Anac, A.S. (2021) Exploring Major Factors Affecting Virtual Team Performance, *European Journal of Business and Management Research*, 6(5), 107 – 114.

83. Tan, C.K., T., R., Teoh, AP and Cheah, J.-H. (2019), "Factors influencing virtual team performance in Malaysia", *Kybernetes*, 48(9), 2065–2092.

84. Tuan, N. T. (2020) Identifying Critical Success Factors through Interactive Management, In MATEC Web of Conferences (Vol.312). EDP Sciences. Available on https://www.researchgate.net/publication/340405836_Identifying_Critical_Success_Factors_through_Interactive_Management#:~:text=The%20Interactive%20Management%20process%20embraces,the%20interlaced%20relationships%20between%20the. Accessed on 15 May 2023.

85. Usadọlọ, Q.E., 2016. The impact of social exchange on volunteer's workplace outcomes in non-profit organisations. Ph.D Thesis. Southern Cross University, Australia.

86. Uttley, L., Quintana, D.S., Montgomerye, P., Carrolla, C., Page, M.J., Falzona, L., Suttona, A. and Moher, D. (2023) The problems with systematic reviews: a living systematic review, *Journal of Clinical Epidemiology*, 156, 30 – 41.

87. Wahbi, A., Raharjo, T. and Hardian, B. (2020) Critical Success Factors in Managing Project Using IS/IT: Case Study for Projects in Indonesia During COVID-19 Pandemic, *International Conference on Advanced Computer Science and Information Systems (ICACSIS)*, Depok, Indonesia, 2020, 225-232.

88. Warfield, J.N. and Cardenas, A.R. (2002) *A Handbook of Interactive Management*. Ajar Publishing Company Palm Harbor.

89. Weimann, P., Pollock, M., Scott, E., & Brown, I. (2013). Enhancing Team Performance Through Tool Use: How Critical Technology-Related Issues Influence

the Performance of Virtual Project Teams, *IEEE Transactions on Professional Communication*, 56(4), 332–353.

90. Western Cape Government - WCG (2021) *Socio-Economic Profile: City of Cape Town*. Western Cape Province. South Africa.

91. Williams, C. (2007) Research Methods, *Journal of Business & Economic Research*, 5(3), 65 – 72.

92. Yin, R. (1994) *Case Study Research: Design and Methods,* 2nd edition, SAGE: Thousand Oaks.

93. Yin, R.K., (1984). *Case Study Research: Design and Methods*, Beverly Hills, Califonia: Sage Publications.

94. Yuan, Y. and Hunt, H. (2009) Systematic reviews: the good, the bad, and the ugly. *The American Journal of Gastroenterology*, 104(5), 1086–1092.

95. Zahar, N.N., Ismail, F. and Rashid, U.K. (2021) Challenges and Critical Success Factors in Managing Virtual Teams: The Workplace of Future, *Advances in Humanities and Contemporary Studies*, 2(1), 8-14.

96. Zainal, Z. (2007) Case Study as a Research Method, in *Jurnal Kermanusiaan*, 9, June: 1 – 6.

LIST OF ANNEXURES

Annexure 1: University of Cape Town research ethics approval

UNIVERSITY OF CAPE TOWN
IYUNIVESITHI YASEKAPA · UNIVERSITEIT VAN KAAPSTAD

2023/09/05

EBE/00401/2023

RE: Research Ethics Committee Project Approval Letter

Dear Kwanda Lande,

Your application for ethics review of your project titled

IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT

has been reviewed and evaluated by the

Engineering & Built Environment Committee.

You may proceed with your research project titled:

IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT

Please note that should:

(i) any serious or adverse effects to participants occur and/or,

(ii) aspect(s) of your current project change and/or

(iii) any unforeseen events that might affect continued ethical acceptability of the project occur then you should immediately report this to the approving REC. You may be required to submit an amendment to this application, in order to determine whether the changed aspects increase the ethical risks of your project.

Based on the information supplied your application has been successful and is approved.

Please note the following additional conditions associated with this approval:

(i) Approved. It is noted that a potential or perceived conflict of interest has been declared related to the applicant's employment with the City of Cape Town. Applicant and supervisor are encouraged to be alert to the intrusion of any conflicts of interest on the ability to do the study diligently and without prejudices.

Regards,

Engineering & Built Environment Committee.

Annexure 2: Research approval request by City of Cape Town

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Date : 19 October 2023
To : Director: Policy & Strategy
Reference : PSRR-1046

Research Approval Request

In terms of the City of Cape Town System of Delegations (Research

In terms of the City of Cape Town System of Delegations (June 2023) - Part 35, No 2 Subsection 2, 3 and 4 "Research:

(2) To consider any request for the commissioning of an organizational wide (excluding directorate specific) research report in the City and to approve or refuse such a request.
(3) To grant authority to external parties that wish to conduct research within the City of Cape Town and/or publish the results thereof.
(4) In consultation with the relevant Executive Director: grant permission to employees of the City of Cape Town to conduct research, surveys etc. related to their studies, within the relevant directorate.) - Part 29, No 1 Sub-Section 4, 5 and 6

The Director: Policy & Strategy is hereby requested to consider, in terms of Sub-Section 6, the request received from

Name	Kwanda Lande
Designation	Masters Candidate
Affiliation	University of Cape Town
Research Title	IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT

Taking into account the recommendations below:

Recommendations

That the CCT via the Director: Policy & Strategy grants permission to Kwanda Lande in his/her capacity as a Masters candidate at the University of Cape Town on the topic "IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT", to conduct research subject to the following conditions:

General conditions
- Engagement is limited to the scope and scale of the study, and restricted to the participants' professional input;
- Additional CCT respondents or data to be identified and line approval sought via an addendum to initial (approved) request;
- Clear acknowledgement in the research report that the analysis generated from City data does not constitute official CCT policy;
- Clear acknowledgement in the research report that views of the CCT officials are not interpreted as official CCT policy where interviews are granted;
- Interviews and/or participation from CCT staff are not to interfere with staff assigned work and tasks;

POPIA compliance
- The researcher to familiarise him/herself with and ensure POPIA compliance, which is to be strictly and fully adhered to;

Limitations
- Approval is subject to staff capacity (time and resource availability) and the willingness of City officials to participate in the research, on a voluntary basis;
- The use of direct quotations in the report to be agreed in advance and in writing by the respondent concerned, and any text for direct quotation/s must be verified and signed off ahead of any publication of the report;

- City officials and their inputs, including any quotations, are to be anonymised, and referenced by the functional role, and not by name or designation in the City;
- The City logo and brand, not be used in the research publication unless with the City's consent;

CCT Engagements
- For the identification of officials for interviews, contact the following people from the respective departments:

- All applicants to be available to share a presentation on request by the CCT line department, on a shared platform;

Sharing of research products
- Pre-final analysis of the data to be shared with the following directorates and departments: Informal Settlements, C3PM, Sustainable Energy Markets, Spatial Planning and Environment, IS&T, Enterprise and Investment and Roads and Infrastructure, such as a findings report and/or presentation, via the designated contact person(s) for verification;
- The final draft of the academic publication and any other related future publications to be submitted to the above-mentioned directorates and departments and the Research Branch, for information;
- Submission of the completed research report to the Manager: Research, Policy and Strategy, within 3 months of completion of the research report;

Validity of Approval
- This approval is effective from date of signature/acceptance of the recommendations by the researcher, and is valid for three years, only if:
i. The scope and scale has not been amended;
ii.

The primary researcher(s) has not changed;

Delegated Authority:

Status : Approved

Comments:

Director: Policy & Strategy:
Date: 19 October 2023

Kwanda Lande Digitally signed by Kwanda Lande Date: 2023.10.19 14:26:14 +02'00'

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

Date : 03 November 2023
To : Director: Policy & Strategy
Reference : PSRR-1061

Research Approval Request

In terms of the City of Cape Town System of Delegations (Research

In terms of the City of Cape Town System of Delegations (June 2023) - Part 35, No 2 Subsection 2, 3 and 4 "Research:

(2) To consider any request for the commissioning of an organizational wide (excluding directorate specific) research report in the City and to approve or refuse such a request.
(3) To grant authority to external parties that wish to conduct research within the City of Cape Town and/or publish the results thereof.
(4) In consultation with the relevant Executive Director: grant permission to employees of the City of Cape Town to conduct research, surveys etc. related to their studies, within the relevant directorate.) - Part 29, No 1 Sub-Section 4, 5 and 6

The Director: Policy & Strategy is hereby requested to consider, in terms of Sub-Section 5, the request received from

Name	Kwanda Lande
Designation	Masters Candidate
Affiliation	University of Cape Town
Research Title	IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT

Taking into account the recommendations below:

Recommendations

That the CCT via the Director: Policy & Strategy grants permission to Kwanda Lande in his/her capacity as a Masters candidate at the University of Cape Town on the topic "IDENTIFICATION OF CRITICAL SUCCESS FACTORS FOR VIRTUAL PROJECT TEAM PERFORMANCE IN SOUTH AFRICA'S LOCAL GOVERNMENT CONTEXT", to conduct research subject to the following conditions:

General conditions
- Engagement is limited to the scope and scale of the study, and restricted to the participants' professional input;
- Additional CCT respondents or data to be identified and line approval sought via an addendum to initial (approved) request;
- Clear acknowledgement in the research report that the analysis generated from City data does not constitute official CCT policy;
- Clear acknowledgement in the research report that views of the CCT officials are not interpreted as official CCT policy where interviews are granted;
- Interviews and/or participation from CCT staff are not to interfere with staff assigned work and tasks;

POPIA compliance
- The researcher to familiarise him/herself with and ensure POPIA compliance, which is to be strictly and fully adhered to;

Limitations
- Approval is subject to staff capacity (time and resource availability) and the willingness of City officials to participate in the research, on a voluntary basis;
- The use of direct quotations in the report to be agreed in advance and in writing by the respondent concerned, and any text for direct quotation/s must be verified and signed off ahead of any publication of the report;

- City officials and their inputs, including any quotations, are to be anonymised, and referenced by the functional role, and not by name or designation in the City;
- The City logo and brand, not be used in the research publication unless with the City's consent;

CCT Engagements
- For the identification of officials for interviews, from Facilities Management, contact

- All applicants to be available to share a presentation on request by the CCT line department, on a shared platform;

Sharing of research products
- Final analysis of the data to be shared with the Facilities Management Department such as a findings report and/or presentation, via the designated contact person(s);
- The final draft of the academic publication and any other related future publications to be submitted to the Facilities Management Department and the Research Branch, for information;
- Submission of the completed research report to the Director: Facilities Managemennt Department, and the Manager: Research, Policy and Strategy, within 3 months of completion of the research report;
CCT risk management assessment

Validity of Approval
- This approval is effective from date of signature/acceptance of the recommendations by the researcher, and is valid for three years, only if:
i. The scope and scale has not been amended;
ii. The primary researcher(s) has not changed;

Delegated Authority:

Status : Approved

Comments:

Director: Policy & Strategy:
Date: 03 November 2023

Annexure 3: Information and consent form template

Identification of Critical Success Factors for Virtual Project Team Performance in South Africa's Local Government Context

Good day; my name is Kwanda Lande. I am researching for a Master's in Project Management at the University of Cape Town in the Department of Construction Economics and Management.

This study seeks to identify Critical Success Factors (CSFs) of virtual project team performance in the South African local government context, with a specific focus on the the City of Cape Town (CoCT). You have been identified as a potential research participant due to the direct or supporting role in facilitating a virtual working environment in the CoCT. Suppose you accept to participate in this study. In that case, you will be required to complete the attached research questionnaire and attend two workshops via Skype for Business, based on your availability.

Your participation is entirely voluntary, and there is no direct benefit to you by participating in this study. You are allowed to request not to answer questions you are uncomfortable answering. You will not have any consequences if you choose not to answer those questions or participate in this study. I will use the information obtained from you and all the other participants to prepare a research report to be submitted to the University of Cape Town, Department of Construction Economics and Management. However, before submitting, the knowledge obtained from this research will be shared with you before it is widely available. Also, the final finding will be presented to you, during which you can request any changes to the information you have initially submitted.

Your secrecy and confidentiality of all information revealed will be treated most respectfully. If you wish, I will refer you by the term Respondent and allocate a false name to you. Thank you for your willingness to participate in this study. Below is the consent form for you to complete.

I……., acknowledge that the researcher has explained my rights and the requirements of this study. By signing below and providing my contact information, I indicate that I am willing to participate in this study. I understand that my participation is involuntary and that I can withdraw from participating at any time without penalty or loss.

Signature of participant …… Date ……

E-mail Address…….…….

Thank you for your participation, and if you have any concerns regarding your participation in this research study, you may contact the researcher/research supervisor using the contact details provided below.

Researcher: Kwanda Lande

Department of Construction Economics and Management

University of Cape Town

E-mail Address: lndkwa002@myuct.ac.za

Research Supervisor: Dr. Nien-Tsu Tuan

Department of Construction Economics and Management

University of Cape Town

E-mail Address: nien-tsu.tuan@uct.ac.za

Annexure 4: Closed-ended questionnaire sample

Critical Success Factors for Virtual Project Team Performance Questionnaire

This questionnaire is the first phase of this research, which seeks to identify critical success factors necessary for the success of virtual project teams in the City of Cape Town.

The closed-ended questionnaire was used for the purpose of ensuring that participants meet the criteria of representation and knowledgeability. The closed-ended questionnaire was created on an online platform called Microsoft SharePoint. The format and content, however, is the same as provided below. The closed-ended questionnaire requires information about the participant and the virtual team project they have observed in the CoCT, as per below.

1. Please describe your Academic qualification

---

2. Please describe your job title below

---

3. Please indicate the number of years in the position

   □ < 1 year

   □ 1-3 years

   □ 3-6 years

   □ > 6 year

4. Kindly indicate your current Directorate in the City of Cape Town.

□ Community Services & Health	□ Urban Waste Management
□ Economic Growth	□ Energy
□Spatial Planning & Environment	□Safety & Security
□Water & Sanitation	□Future Planning & Resilience

□Corporate Services	□Urban Mobility
□Finance	□Human Settlement

5. How would you define your primary role within virtual project teams in the City of Cape Town?

   □ To oversee, monitor and support virtual project

   □ An active member of a virtual project team - your day-to-day task involves actively communicating, collaborating, and sharing project information using ICT tools with other virtual project team members

6. Please indicate the number of years working on virtual project teams in the CoCT

   □ < 1 year

   □ 1-3 years

   □ 3-6 years

   □ > 6 year

Annexure 5: Open-ended questionnaire sample

The open-ended questionnaire requires the participant to list as much critical success factors necessary for virtual project team performance as possible. The research participant must list as many possible critical success factors essential for project teams that utilize Information and Communication Technology (ICT) tools such as Skype for Business, Teams, Zoom, telephone, Microsoft Outlook, and Gmail to facilitate communication, collaboration, and information sharing.

The below triggering question is asked for participants to individually provide as many CSFs as possible for enhancing VPTP:

In your opinion, and based on your experience in the CoCT, what would you say are critical success factors that need to exist for individual team members and the team as a whole to achieve their targets and be satisfied working in virtual project teams. Kindly list as many critical success factors as possible in the table below.

Critical Success Factor		Description of the Critical Success Factor
1	Example Electronic - Leadership	Good leaders have motivational and cultural intelligence, positively impacting virtual project team performance. Leadership skills such as the ability to articulate goals clearly, assignment of responsibilities, and consistent feedback to team members help to improve virtual project team performance. A leader's ability to support struggling employees and create a positive work environment cultivates growth and success for the team.
2		
3		
4		

Annexure 6: Completed Closed-ended Questionnaire

Completed closed-ended questionnaire was extracted from Microsoft SharePoint as per below:

Participant Number	**Describe your highest academic qualification.**	**Describe your job title.**	**Department**	**How would you define your primary role within virtual project teams in the City of Cape Town?**	**Indicate the number of years working on virtual project teams in the City of Cape Town.**
Participant 5	Honours Degree	Director	Sustainable Energy Markets	To oversee, monitor and support virtual project team	3-6 years
Participant 3	BSc Eng (Mech)	Principal Professional Officer	Corporate Project, Programme and Portfolio Management	An active member of a virtual project team	1-3 years
Participant 20	MBA	Head	Information Systems and Technology	An active member of a virtual project team	1-3 years
Participant 6	BSc (Hons) Quantity Surveying	Principal Professional Officer	Corporate Project, Programme and Portfolio Management	An active member of a virtual project team	< 1 year
Participant 2	Masters	Principal Professional Officer	Corporate Project, Programme and Portfolio Management	To oversee, monitor and support virtual project team	< 1 year

Participant 9	Postgraduate Diploma in Project Management	Professional Officer	Facilities Management	An active member of a virtual project team	1-3 years
Participant 1	MSc (Eng)	Manager	Sustainable Energy Markets	An active member of a virtual project team	1-3 years
Participant 4	MEng	Manager	Roads and Infrastructure Management	To oversee, monitor and support virtual project team	1-3 years
Participant 7	Master of Public Administration	Principal Professional Officer	Enterprise and Investment	An active member of a virtual project team	< 1 year
Participant 8	Master's Degree	Principal Professional Officer	Informal Settlements	An active member of a virtual project team	1-3 years
Participant 10	Degree, Town and Regional Planning	Professional Officer	Enterprise and Investment	An active member of a virtual project team	3-6 years
Participant 11	MEng Civil Engineering	Manager	Roads and Infrastructure Management	To oversee, monitor and support virtual project team	3-6 years

Participant 12	MPhil Dev Studies UCT	Senior Professional Officer	Enterprise and Investment	To oversee, monitor and support virtual project team	1-3 years
Participant 13	B.Eng. (civil engineering)	Principal Professional Officer	Roads and Infrastructure Management	To oversee, monitor and support virtual project team	1-3 years
Participant 14	B tech Town & Regional Planning	Principal Professional Officer	Informal Settlements	An active member of a virtual project team	1-3 years
Participant 15	NH Diploma Public Management	Head	Enterprise and Investment	To oversee, monitor and support virtual project team	1-3 years
Participant 16	B.tech Civil Engineering	Senior Professional Officer	Informal Settlements	An active member of a virtual project team	1-3 years
Participant 18	Master Degree	Senior Professional Officer	Urban Planning and Design	An active member of a virtual project team	1-3 years

Participant 19	BTech Civil Engineering and Project Management	Principal Professional Officer	Roads and Infrastructure Management	To oversee, monitor and support virtual project team	3-6 years
Participant 17	Master's degree	Senior Professional Officer	Sustainable Energy Markets	To oversee, monitor and support virtual project team	1-3 years

Annexure 7: Completed Open-ended Questionnaire

Completed open-ended questionnaire was extracted from Microsoft SharePoint as per below

Participants	Critical Success Factor	Description of the Critical Success Factor
Participant 1	Contextual time management	Online meetings tend to consume energy, where in-person meetings might have energised people. Back to back virtual meetings can unexpectedly reduce productivity through deflating team members. The virtues of work from home like convenience, space for reflection, less colleague distractions need to be balanced with the disadvantages like the energy sapping demands of concentrating in engagements and home based distractions.
	Trust	Virtual teams need to establish trust, if not this can create difficulties in facilitating meetings virtually.
	Use of Instant Messaging	Instant messaging is a powerful tool for managing the small details of workflow and keeping a sense of being accountable to a team working in parallel.
	Accountability and work ethic	Work flexibility requires discipline from all team members and the basis for this is holding each other accountable and building a team work ethic
	Keep things interesting	Human personality is adaptive. Conditions create responses. A dull, compliance driven work environment where the bigger picture has been lost doesn't suit virtual teams because the flexibility and quiet space can't be leveraged by a spirit of striving and enquiry. There needs to be vision driven internal projects and sharing of lively incidental detail.
	IT systems	We like to sometimes like to hate on Information Systems & Technology and Enterprise Resource Planning of the City of Cape Town but what they did during COVID was miraculous from Dongle roll-out to Virtual Private Network set-up to integrating Work Form Home in leave applications in a matter of days. The Virtual Private Network is the big one.

		Combine that with Application Programming Interfaces, database management tools and advanced data analysis work is possible with the City's incredibly rich (and still largely unmined) datasets.
	Whatsapp group	Smaller teams can benefit from a well-managed WhatsApp group. It's generally best if this sticks to 1) specific practitioner links of interest 2) encouraging messages
	Intermittent physical meetings	It's healthy to meet in person periodically
	Manager catch-ups	Managers should schedule regular catch-ups particularly with sub-team leaders.
Participant 2	Communication	City of Cape Town should have modern information systems that meets the user requirements. Effective and clear communication is key in virtual teams. This includes both formal and informal channels, as well as the use of collaboration tools
	Flexible Working	Virtual teams often work across time with diverse work schedules. Flexibility in terms of deadlines and meeting times can accommodate these variation
	Team Building	Despite the physical distance, building a sense of camaraderie and trust within the team is vital. Virtual team-building activities and regular check-ins can contribute to this.
	Technology	A robust and reliable technological framework is essential. This includes the right project management tools, video conferencing platforms, and other software that facilitates virtual collaboration
Participant 3 (6)	Effective Communication	In virtual project teams, clear and regular communication is crucial for success. This includes utilizing appropriate communication tools, setting expectations for response times, and ensuring that information is conveyed accurately. The ability to convey complex ideas in a concise and understandable manner is key to preventing misunderstandings and facilitating collaboration among team members.

	Technology Proficiency	Given the virtual nature of the project teams, team members should be proficient in the relevant technologies and tools. This includes not only the project management and collaboration platforms but also any specialized tools used in the context of the City of Cape Town projects. Proficiency in technology enhances efficiency, reduces errors, and promotes a seamless workflow within the virtual environment.
	Goal Alignment and Clarity	Ensuring that individual team members understand and align with the overarching goals of the project. This factor emphasises regularly revisiting project goals to maintain alignment with individual team member's goals. Alignment of goals contributes to a shared sense of purpose among virtual project team members. This factor emphasizes the importance of setting clear objectives, defining roles and responsibilities. Clarity of goals, tasks, milestones and responsibilities enhances motivation and reduces ambiguity.
	Accountability and Ownership	Each team member should take accountability for their assigned tasks and deliverables. This involves setting realistic deadlines, providing regular updates on progress, and taking ownership of any challenges that arise. Fostering a sense of responsibility within the virtual team promotes reliability and ensures that everyone contributes to the overall success of the project.
	Honesty and Reliability	Building trust within the virtual project team is crucial. Team members should prioritize honesty in their communications, providing transparent and accurate information. Reliability involves consistently delivering on commitments and being accountable for one's actions. Fostering a culture of honesty and reliability strengthens team relationships and contributes to the overall success of the project.
	Continuous Feedback and Improvement	Establishing a culture of continuous feedback and improvement vastly contributes to success of virtual project teams. This includes constructive feedback sessions, and a commitment to learning from both successes and failures. Emphasizing a growth mind-set within the team encourages ongoing improvement and adaptation to changing project requirements.
	Self-motivated	If you are not self-motivated, self-driven and professional, working remotely can be very unproductive.

Participant 4 (7)	Correct equipment	Good network access and internet connection.
	Good communication systems	For example, Microsoft teams to access team members when required.
	Clear tasks	Tasks set must be clear, with completion dates set.
	Time flexibility	Core hours must be set, but all people are different and some work better early in the morning, some work better late at night.
	Task orientated performance management	If members get the work done in time, it shouldn't matter when they do the work, as long as they are available during core hours if needed.
	Regular individual and team meetings with manager	Manager can ensure that work is being done, issues can be resolved and team members stay in touch and are on the same page.
Participant 5 (9)	A reliable interactive platform	Where participants can expressive their views and collaborate with ease – 2 way communication is important with both written and spoken engagement.
	Meeting summary producer	So that we can engage rather than be distracted by capturing the minutes (these exist already).
	Regular opportunities to engage	Virtual project team members should be willing to make themselves available for regular engagements with other team member. This should be encouraged due to the physical distance that exists between team members.

	The opportunity for in person engagements even when virtual is the norm	The opportunity for in person engagements even when virtual is the norm is important for relationship, trust and team building. The engagements could take place 2-4 times a year establish some form of connection from the team.
	For participants to feel heard and acknowledged	Inclusive participation by virtual team members is important because it makes people feel that they are being heard and that their input is valued.
	Structuring teams into levels for more personal contact	At a department level it is important to structure virtual project teams in a way that can promote more personal contact. Where possible, small teams works better but also engagements should be promoted at different platforms including monthly departmental staff meetings, branch meetings and project teams or specialist teams
	Opportunities for spontaneous contact	Platforms such as WhatsApp, Skype instant messaging should be promoted and used as they help to obtain quick response to issues that need urgent attention.
	Devolved decision making	Virtual project teams should be able to make most decisions without relying much senior management as this promotes efficiency.
	Mutually Agreed expectations of team members	It is important for the virtual team to set expectation from the start and agree on what is expected both from the team as whole and from individual team members.
Participant 6 (6)	Communication	Clear and concise communication regarding objectives, timelines, etc.
	Competence and Technical Skill	Individuals to be competent in the field they are working in and add value to the team as a whole, with the required technical skills.

	Policy and Standard Operating Procedure	A clear policy and Standard Operating Procedure on how the virtual team is to conduct themselves and carry out the required tasks.
	Regular engagements	Ensure that regular engagements are held to allow progress updates and communication of risks to all parties involved.
	Training	Ensure that all team members are trained and understand how tasks are intended to be carried out.
	Programme & Preparation	Programme the required tasks and deadlines, while allowing input from the team members.
Participant 7 (5)	Accountability	This includes individual team members knowing that they have deliverable that they need to produce and taking accountability. Furthermore, the team should promote accountability by holding each accountable. The team is accountable when it delivers on what is expected from them. Leadership also need to be accountable for the deliverables of the team.
	Service delivery mind-set	Virtual project team members should behave like public servants. This means that virtual team members are successful in achieving quality service delivery when they are driven by desire to help the public and get their satisfaction from that.
	Self-awareness	Being aware of capabilities, limitations. Being able to identify what you are capable of and not. Identify challenges about being oneself and finding remedies.
	Collaborative	Being able to work with others. There is a potential loss of ideas by not being able to work others.
	Effective communication	Communicating in the virtual setting can result in the loss of nausea or meaning in what is communicated due to the use of technology. Virtual project team members must communicate clear enough for people to understand.
Participant 8 (7)	Performance Management	Individual performance management and related techniques will ensure that individual employees remain committed and accountable to their work.
	Reliable programmes and software	The organisation largely relies on desktop information to undertake projects and communication networks. It is important that these tools of information and communication are consistently working and dependable.

	Drive & commitment	Staff motivation and passion about what they do will enable success of projects. Staff need to be constantly made aware of the impact of their day-to-day work.
	Project Management Principles	Managing projects, adhering to timeframes and principles is key such as when to initiate a project, planning, implementation, monitoring, and execution /close up.
	Time Management	Managing time is among critical factors, every project has time attached to it. It is important to manage time precisely in order to ensure successful implementation and completion of tasks.
	Leadership	Good leadership skills normally enables staff to successfully perform their duties, remain motivated and dedicated to their work.
	Human Resources	Capacity to undertake and successful complete projects also relies of availability of human resources by the employer. Staff must have all the resources they require to deliver their projects successfully.
Participant 9 (16)	Clear Objectives and Goals	Ensure that the team has a well-defined purpose, clear project objectives, and specific targets to work towards. Everyone should understand their role in achieving these goals.
	Effective Communication	Strong communication is vital in virtual teams. Ensure regular and transparent communication through various channels, such as video conferences, chat platforms, and emails.
	Trust and Relationship Building:	Building trust among team members is crucial. Team members should get to know each other on a personal level, foster good relationships, and understand each other's strengths and weaknesses.
	Technology and Tools	Use reliable and up-to-date technology and collaboration tools that facilitate seamless communication, document sharing, and project management.
	Time Management	Set clear expectations for working hours and deadlines. Team members should manage their time effectively to meet project deadlines.

	Accountability	Ensure that each team member is accountable for their tasks and responsibilities. Regular check-ins and progress tracking can help maintain accountability.
	Diversity and Inclusion	Embrace diversity in your virtual team, including diverse backgrounds, skills, and perspectives. Encourage an inclusive environment where everyone feels valued.
	Leadership and Guidance	Appoint strong leaders who can provide direction, support, and motivation to the team. Leadership is crucial for keeping the team on track and aligned with goals.
	Training and Skill Development	Invest in training and skill development for team members to ensure they have the necessary competencies for the project. This can also improve job satisfaction.
	Conflict Resolution	Develop a process for resolving conflicts and address any issues that arise promptly. Conflicts are common in virtual teams, and handling them effectively is essential.
	Flexibility	Adaptability and flexibility are key in virtual teams, as situations and project requirements can change rapidly. Team members should be open to change and willing to adjust their approach as needed.
	Work-Life Balance	Promote a healthy work-life balance to prevent burnout and improve job satisfaction. Encourage team members to disconnect from work when needed.
	Feedback and Recognition	Provide regular feedback and recognition for individual and team achievements. Positive reinforcement can boost morale and motivation.
	Performance Metrics	Define clear performance metrics and key performance indicators (KPIs) to measure progress and success. These metrics can help track the team's performance against its targets.
	Security and Data Privacy	Ensure that sensitive data and information are secured, and all team members are aware of data privacy and security protocols.

	Continuous Improvement	Encourage a culture of continuous improvement, where the team regularly evaluates processes, communication, and performance to identify areas for enhancement. By addressing these critical success factors, virtual project teams can not only achieve their targets but also create a satisfying and productive working environment for individual team members.
Participant 10 (2)	Participation - Inclusivity	Participation is of critical importance. I've noticed at virtual meetings people tend not to participate as effectively as they would in an in-person setting. It is important for the chair to structure the meeting to be a discussion so stimulate people and encourage participation. There's nothing worse than being in a meeting where only 1/2 people are participating in the discussion.
	Closing the feedback loop	Sometimes a lot happens outside of these virtual meetings that doesn't filter to all individuals involved. It is important to keep everyone updated on issues as these issues sometimes have transversal implications.
Participant 11 (10)	Team leader	Ability to lead a group of people while working on hybrid model, assist them on day to day with their needs and improve team performance.
	Innovative	Ability to think out of the box and come up with new ideas that will improve service delivery.
	Customer Centric	Ability to assist customers and respond to their requests timeously.
	Strategic focus	To achieve company permanent or long-term strategic goals.
	Communication	Effective communication is crucial because how you communicate can positively and negatively affect relationships within the team and outside the team with managers.
	Accountability	Promote ownership and accountability. On any team, things can go wrong, and people can make mistakes. But people need to take responsibility and resolve matters.
	Set Goals	At the outset, goals should be clearly set and defined. Getting this right at the start may take a little extra time and planning, but it pays major dividends.

	Trust	Trust is at the heart of any successful team. Without it, teams will be unable to progress due to fear of conflict or lack of commitment.
	Brainstorm with the entire team	Managing a virtual team requires managers to double down on the fundamentals of good management, including establishing clear goals, running great meetings.
	Celebrate success together	Share successes and issues with the team and encourage the team to work together to find solutions with your help.
Participant 12 (8)	Strategic goals clear	Project need to have clear link to strategic goals of the City of Cape Town and to the business plans of respective directorate/departments.
	Skills and competencies aligned to task	Virtual project team members need to have appropriate competencies or be given adequate training, information, support and reasonable work load to perform better in a team.
	Clearly defined roles and responsibilities	Virtual project teams need to put in place guidelines or a memorandum of agreement that details the roles and responsibility of each stakeholder. This is especially needed for transversal projects that involve more than department.
	1 or 2 in-person meetings	Having a face to face meeting at the beginning of the project or in between at least once helps to establish connection between team members.
	Senior officials check in with project manager or member	Regular feedback and check ins with senior officials helps as part of mentoring and guiding the team. Moreover, senior officials are important for providing encouragement, and ensuring that targets are being met.
	Reviewing of lessons learnt of previous projects	Lessons learnt area important for identifying how future virtual project teams can improve. This is important for making the next virtual project team better, building networks between virtual project team workers and creating some form of cohesion.

	Acknowledge that some people work better virtually than others	Virtual project teams need to accommodate diversity of people and ensure that people are respected and heard with their differences.
	Facilitation skills of the chair or project manager	Working in the virtual environment is new in the City of Cape Town and many people are still finding ways of working in this setting. Sometimes it is not easy to ask questions to team members virtually, some people find it intimidating. This requires good facilitation skills from the project manager or chair of a virtual meeting.
Participant 13 (4)	Trust	The team leader needs to trust that team members are doing their part and team members need to trust that other team members are pulling their weight.
	Measure progress	The team leader needs to have a system in place to measure performance and/or progress of team members and the project team as a whole.
	Positive energy	Maintain positive energy in the team by trying to address issues such as non-performance face-to-face and not in front of the entire team.
	Set clear milestones	Team leader to set very clear milestones in order for the team to know the deliverables and the dates linked to them.
Participant 14 (2)	Shared Values	A shared value system amongst team members will assist in overcoming personality and organisational challenges during the project.
	Common objective	Everybody in the team must agree and commit 110% to achieving the common objective of the project.
Participant 15 (4)	Leading by example and in support	Leadership is set by example - along with a willingness to support your team members on the ground/ with tasks when they need help.

	Sharing as much information as possible	Teams who share as much information as possible ensure that when any member is not available the team can support that member by helping to take the project forward. Team members need to be able to ask any questions as this ensures clear understanding.
	Acknowledging team success and good work	Sharing Management accolades and acknowledgement of good work by team members within the team helps to build morale and confidence in a virtual team
	Encouraging confidence in team members	Team members need to know that if they make a mistake, in good faith, the trust in their ability to perform the task is still there. They must be confident to act without waiting for guidance on each and every issue.
Participant 16 (5)	Time boundaries	Ability to set time boundaries in accordance with priorities of the day as well as what is set to be done for the day without being restricted to work from 8h00 t0 17h00. Be able to set times for site visits during the day and still have time for administrative work.
	Communication needs and methods	All members to agree on method to be used in a way that accommodate their unique needs.
	Reliable electronic	Having active dashboard to your line Manager for active stuff that need his/her attention to be unblocked with stricter response to avoid backlog or project delays
	High level of trust	Virtual team members must trust each in terms of deliverables and meeting deadlines. This creates a comfortable environment to work in, which is important for delivery.
	High degree of cooperation and collaboration	Cooperation and collaboration requires setting of clear roles and responsibilities in the project, awareness of each other's strengths and weaknesses, networking and awareness of other role-players in the project.

Participant 17 (5)	Communication	Communicating in the virtual setting is difficult and a message can be easily misunderstood. Effective communication is important to ensure the message is correctly communicated.
	Distractions.	If the team is not motivated in some form or way distractions could easily sway them away and cost valuable time spent on project.
	Learning and understanding virtual programmes	Learning to manage and execute a project while work virtually requires one to learn and understand how to use programmes such as Skype for business, and Microsoft teams.
	Collaboration	In some instances some team members do not understand the benefits of collaboration or may be unwilling to do so as they may be used to working individually. It is important to encourage and promote collaboration for virtual project teams since people are already physically isolated from their teams.
	Trust.	Trust is a very real challenge in big companies as people may feel that their work could be misused or shown as work done by others, others may mistrust a colleague due to differences of culture or race.
Participant 18 (4)	Self-regulation	The ability of a team member to reflect on their current deliverables and identify potential risks (either for the project as a whole or certain tasks that likely not to be delivered on time).
	Emotional Intelligence	The ability of a team member or leader to identify where and when certain situations (not necessarily project-related or task specific), may have an impact on the performance of the project or individual team members. Moreover, the ability to navigate this challenge affecting performance in an amicable manner, or with at least disruption as possible without compromising on integrity.

	Awareness	Team members and leaders need to have some level of awareness regarding their own capabilities, limitations and that of other stakeholders. They need to be able to identify weakness, opportunities, and strengths about oneself and others helps in finding remedies that can improve working relationships.
	Realistic Expectations	A clear understanding of what is required to complete a task and programming projects accordingly so as to alleviate unnecessary pressure and stress.
Participant 19 (7)	Work Ethic	Without work ethic, there will be limited to no desire to go the extra mile and/or prioritise the work. Procrastination will occur and work will be pushed out everyday
	Intrinsic Motivation	Intrinsic motivation provides the desire to do the work for no reason other than internal gratification. Where performance is driven by rewards, the team's performance drops in times where there are no rewards.
	Teamwork	Without teamwork the work might not be aligned and they will work in silos, producing less efficient and effective output and potential contradicting or duplicate work.
	Passion	Passion is the one factor that provides the drive and could be the binder that brings the best out of all critical factors
	Ability/Skills	You need a level of skills/ability to carry out the tasks and/or implement the work.
	Growth	Growth allows the team to grow and improve. Without growth, there will be stagnation and improvement will be limited
	Logical Thinking	Logical thinking allows team members to identify issues and not implement blindly. It also allows them to question things and come up with workable solutions
Participant 20 (4)	Bandwidth	Virtual teams require high-quality bandwidth for true virtual team working
	A functional video conferencing system	Virtual teams require a stable and functioning video conferencing system

	Managed video-conference sessions	Recording of video meetings; a requirement for video-on always and the ability to do real time virtual white boarding
	Regular in-person meetings	Virtual meetings may enhance individual productivity, but team productivity is dependent on relationships, which require in-person meetings