

**ENABLERS AND STRATEGIES OF KNOWLEDGE SHARING IN SMALL, MEDIUM
AND MICRO-ENTERPRISES (SMMES): A CASE OF THE CONSTRUCTION
INDUSTRY IN SOUTH AFRICA**

by

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Declaration

I declare that **ENABLERS AND STRATEGIES OF KNOWLEDGE SHARING IN SMALL, MEDIUM AND MICRO-ENTERPRISES (SMMES): A CASE OF THE CONSTRUCTION INDUSTRY IN SOUTH AFRICA** is my own work. All the sources that I have used, or quoted, have been indicated and acknowledged by means of complete references.

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Abstract

The Small, Medium and Micro-Enterprises (SMMEs) form the backbone of employment and economic growth in South Africa. However, despite this, their sustainability remains a significant challenge, mainly due to poor knowledge transfer and limited access to resources. Consequently, this study investigated the enablers and strategies of knowledge sharing among SMMEs in the South African construction industry, particularly black-owned SMMEs. The existing literature reveals a scarcity of studies examining a particular demographic at this intersection of factors, and thus a significant gap in awareness of their distinct influence on knowledge sharing. This mixed-methods research study was based on a pragmatic paradigm. Quantitative data were collected through structured questionnaires administered to a purposive sample of black-owned SMMEs. In tandem, the qualitative data were obtained through semi-structured interviews with selected industry experts and firm owners. For the quantitative data, analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 29.0. Furthermore, the qualitative data were analysed using thematic analysis in ATLAS.ti software. The results established that multiple barriers, including the absence of formal systems, a lack of trust, poor leadership and inadequate technology infrastructure, inhibit knowledge sharing in South African construction SMMEs. Moreover, historical exclusion and inequality continue to manifest as systemic barriers to training and industry collaboration. Nevertheless, key enablers cited include leadership support, organisational culture of openness, access to Information Communication and Technology (ICT) tools and the creation of Communities of Practice (CoPs). The study found that mentorship, structured learning programmes and effective communication systems significantly boost knowledge-sharing outcomes. The study concludes that while historical and structural challenges persist, they can be mitigated through intentional strategic interventions that prioritise human capital development and digital integration. Based on these findings, it is recommended that construction business owners and policymakers implement leadership development initiatives, formalise mentorship programmes, adopt scalable knowledge management systems, and institute recognition and reward structures to enhance competitiveness. This study theoretically addresses a significant research gap in the understanding of how factors such as history, organisations, and technology influence knowledge-sharing practices in SMMEs within a South African context. It

pragmatically offers practical recommendations for construction business owners seeking to enhance learning within their organisations to improve competitiveness, while also providing a justified focus for future research on knowledge management.

Keywords: Construction industry; Enablers; Knowledge management; Knowledge sharing; SMMEs; South Africa; Strategies.

Tshobokanyo (Setswana)

Tlhotlhomisi (*thesis*) eno ene e batlisisa ka ga dinatlafatsi le matlhale a kabelano ya dikitso mo lekaleng la Dikgwebopotlana, Dikgwebo tsa Magareng le Dikgwebokgolwane (di-KPMK/SMME) mo madirelong a botlhama-dikago a Aforika Borwa, bogolobogolo di-KPMK/SMME tse beng ba tsona e leng Bantsho. Erentswa di-KPMK/SMME e le tsona maikaego-magolo a bothapiwa le tswelelopele ya seikonomi mo nageng ya rona, botshwarelelo jwa tsona bo bokoa thata, fa gongwe e le ka lebaka la go tlhoka neeletsano ya dikitso e e tiileng, go tlhabela ga ditlogo, le go tlhoka kemonokeng go tswa mo ditheong tse di jaaka tsa puso. Patlisiso eno e tshamile gape le moko a wa kitso e e mabapi le makaelo a a rileng a dikemo le ditaolo tsa kabelano ya dikitso mo makaleng a botlhama-dikago. Ke patlisiso e e dirisitseng mmeo-tswako, e e ikaegileng ka pharadaeme ya Molebo wa Bokgonegi. Go kokoantswe dinewane tsa Sekwantitatifi/Dipalopalo ka go dirisa mebotsotso e e rulagantsweng go ya ka ngotelo/sampole ya boithomo mabapi le di-KPMP/SMME tsa Bantsho, mme dinewane tsa sekhwatitafi tsona di kokoantswe ka tiriso ya dipotso-therisano tsa seka-thulaganyo tse di tshwerweng le palo e e kgethilweng ya baitseanape ba madirelo le beng ba difême. Dinewane tsa Sekwantitatifi/Dipalopalo di tsharolotswe ka setsharolodi sa *SPSS*, go dirisiwa dipalopalo tsa botlhalosi, tsharololo ya ditlhotlheletsi, le Mmotlolo/Mmetlelo wa Tlhotlheletsano ya Dithalethale, mme dinewane tsa sekhwatitafi tsona tsa tlhatlhabiwa ka tsharololo ya semerero ka tiriso ya *ATLAS.ti*. Tsharololo e nnile ya botlhalosi le boranodi, e e lekang go senola dikgolagano le maitemogelo a dipalopalo ka mokgwa o o tebileng. Dipholo tsa ditsharololo di senotse gore: maparego a a maphata-mantsi, a a akaretsang tlhokego ya ditlhamakanyo tse di tlhomameng, le tlhokego ya botshepegi, le boeteledipele jo bo bokoa, le ditlhaelo tsa sethekenoloji, ke tsona dilo tse di kgoreletsang kabelano ya dikitso mo lephateng la di-KPMP/SMME tsa botlhama-dikago mo Aforika Borwa.

Mo godimo ga moo, lefatshe la rona le sa ntse le na le matsapa a hisetori ya tlhaolele le tlhoka-tekatekano, a a sa ntseng a tsweletse go nna maparego a a kgoreletsang katiso le tirisano mo madirelong. Le fa go le jalo, go na le dinatlafatsi tsa botlhokwa tse di nopotsweng, tse di akaretsang kemonokeng ya boeteledipele, setlwaedi sa pontsheng sa semokgatlho, phitlhelego ya Didiriswa tsa Thekenoloji ya Tlhaeletsano (DTT/ICT), ga mmogo le go tlhamiwa ga Dimphato sa Patlisiso (SSP/CoPs). Patlisiso eno e lemogile gore botataisi, mananeo a dithutano le ditlhamakanyo tsa tlhaeletsano tse di kwenng di oketsa diphitlhelelo tsa kabelano ya dikitso mo go utlwalang. Go feta moo, patlisiso e tlhagisa maremelo a a popota a a tlaa tokafatsang kabelano ya dikitso mo di-KPMP/di-SMME tse dinnye tsa botlhama-dikago. Mo ntlheng ya tiori, patlisiso eno e kaba diphatlha mo dipatlisisong tse di mabapi le tsamaisano ya ditlhotlheletsi tsa sehisetori, tsa semekgatlho le tsa sethekenoloji tse di amang kabelano ya dikitso ntlheng ya di-KPMP/SMME mo Aforika Borwa.

Se e tlaa nnang mosola-mogolo mo go beng ba dikgwebo tsa botlhama-dikago, baeteledipele ba madirelo le batlhama-dipholisi, ke gore patlisiso eno e ba naya dikatlanegiso tse di ka diragatsegang, mme maikaelelo e le go tokafatsa boithuti jwa tsa semekgatlho le bophamphadisani mo kgwebong. Mo godimo ga moo, patlisiso eno e tlaa nna motheo o mo go ona go ka agelelwang dipatlisiso tsa isago mabapi le tsamaiso ya dikitso mo makaleng le mo makaelong a mangwe a diikonomi tsa matla-bošweng.

Mareo a dikonokono: botlhama-dikago; dinatlafatsi; tsamaiso ya dikitso; kabelano ya dikitso; di-KPMP/SMME; Aforika Borwa; ditogamaano

Isifingqo (Isizulu)

Lolu cwaningo luhlaziya ngokuhlinzekwa ngamandla nobuchule bolwazi olusatshalaliswa phakathi Kwamancane, Naphakathi Nendawo amabhizinisi (SMMEs) eNingizimu Afrika embonini yezokwakha, ikakhulukazi kulawo mabhizinisi anabanikazi abamnyama bama (SMMEs). Ngaphandle nje kokuthi amaSMMEs awumngogodla onikezela ngamathuba omsebenzi nokuthuthuka komnotho waleli zwe, kufanele kube nozinzo oluyisisekelo sezimboni.

Ngakolunye uhlangothi ukungasatshalaliswa kolwazi, ukugqoza kwezinsizakusebenza nokungafinyeleli kwabantu ezikhungweni ezelekelela ngolwazi kuyalukhubaza uzinzo. Lolu cwaningo lusungule ulwazinqolobane olumayelana nezimo eziyingqikithi nokulawulwa kolwazi oluyisizinda sokusatshalaliswa kolwazi embonini yezokwakha ngokulandela isihloko esithile kuyo. Kuthathelwa kupharadayimu yokuqonda ulwazi, lolu cwaningo lusebenzisa indlelakwenza exubile. Ulwazi ngendlelakwenza yekhwantithethivu luqoqwe kusetshenziswa amaphepha anohlu lwemibuzo ngokuqoka ngenhloso labo abangosomabhezini abancane (*SMMEs*). Ngakolunye uhlangothi indlelakwenza yekhwalthethivu isetshenziswe ngenhlolokhono engahlelekile eqhutshwe kongcweti bezimboni ezikhethiwe nabanikazi bamafemi. Ulwazi lwekwantithethivu luhlaziye nge *SPSS*, kusetshenziswa izibalo ezichazayo nokuhlaziya kwamaqiniso ayo. Ngakolunye uhlangothi ikhwalthethivu isebenzise ukuhlaziya ngokwendikimba kuthathelwa ohlelweni oluhlehla nyova oluku-ATLAS. Ukuhlaziya bekuchaza futhi kwenaba, ukuze kujule ekuxhumaneni kwezibalo mayelana nolwazi olutholakele ngokusebenza eminyakeni ethile. Okuzuzwe ucwaningo kuveze imigoqo eminingi, efakwa phakathi ukungabibikho kwenqubo ehlelewe ukulandelwa, ukungethembani, ukusweleka kolwazi lokuhola kanye nokungabibikho kwezinsizakusebenza zobuchwepheshe okuyizona zinto ezikhubaza ukwabelana ngolwazi embonini yezokwakha eNingizimu Afrika kosomabhezini abancane. Ngaphezu kwakho konke nokungafakwa komlando, ukungalingani kwezizwe nokunye okuyizithiyo kuyaqhubeka nokuveza imigoqo ekuvivinyeni umsebenzi nasekubambisaneni kulezi zimboni. Noma kunjalo, okuyizinsika ezihlinzeka ngamandla ezicashuniwe zimbandakanya ukwesekwa kwezokuhola, ukuvuleleka ngezinqubo zezinhlango, ukufinyelelisa amathuluzi e-ICTkuzona zonke izisebenzi nokusungulwa Kwemiphakathi Ezibambeke Mathupha (*CoPs*). Lolu cwaningo luzuze ukuthi ukutholakala kwabantu asebenkantshubomvu, izinhlelo zokufundisa ezilungiselelwe, nokuxhumana okunemivuzo emihle kungelekelela ekufukuleni ukwabelana ngolwazi nemiphumela emihle. Lolu cwaningo lubuye lwethule injula yohlaka oluzokwelekelela ngolwazi ezimbonini zokwakha ezincane ezibizwa ngama *SMMEs*. Ngokwenjulabuchopho, lapha kwengezwe ulwazi oluhlanganisa umlando, izinkampani nezobuchwepheshe, konke okubonakale njengesithikamezo sokwabelana ngolwazi eNingizimu Afrika kuma *SMMEs*.

Ekwenzeni umsebenzi, lolu cwaningo luhlinzeke ngokufanele kwenziwe okubhalwe ezinconyweni eziqondene nabanikazi bezimboni ezincane, abaholi bazo nabasungula imithetho nezinqubo. Lokhu kuhloswe ngakho ukuthuthukisa ukufunda ezinkampanini nokuthi abasebenzi bakwazi ukuqhudelana nabakwezinye izimboni nabakwezinye izizwe. Okungaphezu kwakho konke lolu cwaningo luhlinzeke ngolwazi lokuhola neminye iminxa engeseka izwe ukuze kusimame umnotho osafufusa.

Amagama asemqoka: imboni yezokwakha; ukuhlinzeka ngamandla; ulwazi lokuhola, ukwabelana ngolwazi; amaSMMEs; iNingizimu Afrika; amasu

Acronyms

CICCs	Chinese International Construction Companies
COS	Collaborative Organisation Ecosystem
(CoPs)	Communities of Practice
DSBD	Department of Small Business Development
EC	European Commission
EFA	Exploratory Factor Analysis
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
(ICT)	Information and Communication Technology
IoT	Internet of Things
KM	Knowledge Management
KMO	Kaiser-Meyer
MDeC	The Multimedia Development Corporation
NSBAA	National Small Business Amendment Act
SMMEs	Small, Medium and Micro-sized Enterprises
SACI	South African Construction Industry
SASBA	South African Small Business Amendment Act
SEDA	Small Enterprise Development Agency
SMSCE	Small and Medium Scale Construction Enterprises
SPSS	Statistical Package for the Social Sciences
UNESCAP	United Nations Economic and Social Commission for Asian and the Pacific
UNISA	University of South Africa
US SBA	United States Small Business Administration
UN	United Nations
4IR	Fourth Industrial Revolution

PCA

Principal Component Analysis

TVE

Total Variance Explained

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Chapter 1: Study Introduction

1.1. Introduction

The construction industry in South Africa has been at the forefront of infrastructure development, urbanisation, and job creation within an ever-changing post-apartheid South African economy (Watermeyer & Phillips 2020). The construction industry physically builds the nation's future by constructing roads, schools, and hospitals needed to support and enhance social progress (ILO 2025). The Small, Medium and Micro-Enterprises (SMMEs) make up the majority of the large-scale supply chain and delivery mechanism of the construction sector. Additionally, SMMEs provide most opportunities for historically marginalised communities to be economically included (Sibiya, Van der Westhuizen & Sibiya 2023). Despite their positive reputation as drivers of growth and transformation, many of these organisations are on the brink of collapse and are generally unable to shift from "survival"-based operations to "growth" or "competitive" companies (Maduku & Kaseeram 2021).

The difference between stagnation and growth often lies not merely in capital assets, but in intellectual assets. In an era increasingly defined as the "knowledge economy," the ability to capture, share, and leverage knowledge has become a critical determinant of organisational survival (Alhamoudi 2023). Knowledge is the unseen scaffold that supports successful projects; it is the accumulated wisdom of how to navigate complex regulations, how to manage volatile cash flows, and how to execute technical tasks with precision (Sogaxa 2024). However, for most black-owned SMMEs within the South African Construction Industry (SACI), knowledge remains fragmented and transient, confined to individuals' minds; it vanishes when they leave the company or becomes severely restricted by the transient, project-specific nature of the construction environment (Adesina & Ocholla 2024). Consequently, this disconnection presents a major challenge; how can these enterprises use knowledge sharing to overcome resource shortages and previous disadvantages?

Against this backdrop, this study moves beyond merely acknowledging the importance of SMMEs. Instead, the study concentrates on highlighting the drivers and mechanisms for knowledge sharing that would facilitate such growth in the industry. The analysis examined which organisational elements (technology-related; culturally

related; leader-related) enabled an organisation to overcome barriers to knowledge sharing and ultimately transformed the intellectual capital developed by the sector into tangible economic output.

1.2. Background of the Study

To better understand why knowledge sharing is important among construction SMMEs, it is vital to examine these businesses in the context of South Africa's past and current economic environment. Apartheid has had a deep influence on South Africa's economic history. Apartheid created a very unequal economy with most of the opportunities and money being concentrated among the better-established (generally the whites) conglomerates (Bell, Ncayiyana, Sholomon, Goel, Zuma & Emch. 2022). Since the formation of South Africa's new democratic government, one of its primary goals has been to assist SMMEs (Basson & Omoruyi 2025). Therefore, SMMEs are vital for a successful South African economy because they significantly contribute to employment and GDP (Makanda & Ngalawa 2025). They serve as major job creators in a country where unemployment is very high. However, despite their importance in this competitive modern world, defining SMMEs remains complex, with substantial variation across different countries.

As stated earlier, SMMEs play a significant role towards the economy of South Africa and aid in driving employment and economic growth. However, due to diverse interpretations across groups when it comes to defining SMMEs, it has been challenging to contextualise the term. According to Adesina and Ocholla (2024), over 50 categories of SMMEs in 75 different countries have created uncertainty in international research. The absence of a universally agreed-upon definition in many countries makes it difficult to compare policies across borders or develop a cohesive strategy to support SMMEs (Muriithi 2021). The Department of Small Business Development (DSBD) (2023) defines and categorises SMMEs based on income and the number of employees to ensure compliance with regulations and to facilitate targeted assistance at different levels. The DSBD specifies that micro-enterprises are those employing fewer than 10 people and earning less than R2 million per annum (DSBD 2023). There are many informal micro-enterprises, mainly existing to satisfy immediate financial requirements and lacking formal business structure(s). Small enterprises employ fewer than 50 people and generate annual revenues between R2

million and R10 million. Although some of these may have formal structures, they often encounter challenges in expanding their operations (DBSD 2023). Medium-sized enterprises employ fewer than 200 employees and have annual revenues between R10 million and R50 million. They are generally seen as the link between smaller SMMEs and larger, commercial enterprises.

Despite this formal classification, the operational reality for these businesses is harsh. "We need to be more present in rural regions since we work in the informal sector", reflects the sentiment of many operators who feel disconnected from formal support structures (Utete & Zhou 2024). South African SMMEs face barriers inherent in the system, including the inability to secure funds for their businesses, limited access to appropriate skills and expertise, and limited infrastructure. The study undertaken by Msomi and Olarewaju (2021) further emphasise that finance is the most significant constraint to SMMEs. As they note, many small and medium enterprises have difficulty securing funding because they lack collateral and/or credit history. Furthermore, the International Labour Organisation (ILO 2019) identifies a lack of management, technical, and marketing skills as a key limitation preventing these firms from competing effectively. Due to the lack of an overarching and consistent definition of SMMEs in South Africa, it is difficult for the government or policymakers to find and support SMMEs throughout all sectors, which hinders its ability to implement policies, develop programs for SMMEs, as well as provide SMMEs with access to legal and technological tools (Adesina & Ocholla 2024; Mabotja & Maloka 2018; South African Government 2014).

For this study, the construction sector is viewed within a challenging economic environment. In the Republic of South Africa, the construction sector encompasses all organisations and individuals involved in planning, designing, and executing infrastructure projects nationwide. It covers a wide range of activities, such as building construction, engineering works, and specialised contracts (Statistics South Africa 2021). In the economic context, the sector plays a significant role and contributes substantially to the country's total GDP (Kissi *et al.* 2023). Despite its importance, the industry faces considerable challenges in its operations and development. Currently, the South African construction industry experiences persistently low productivity, limited innovation, and a critical shortage of skilled workers (Ditthebe, Thwala, Aigbavboa & Madumelane. 2022; Mukuka & Mbohwa 2021). These problems are even

more pronounced for SMMEs, which find survival particularly difficult due to the need to compete against well-established players and cope with the inherent fragmentation in the construction industry. The construction sector is characterised by a project-based environment in which teams are temporarily constituted to implement specific projects, then disintegrate and reform to implement other projects. The project environment leads to erosion of knowledge because the teams formed to implement projects are only temporary.

To address these inefficiencies, one strategy that has been consistently utilised to enhance information exchange and collaboration within the South African construction industry is the formation of industry groups and professional bodies (Nwachukwu, Aigbavboa & Oke 2021). These organisations serve as platforms that bring together stakeholders from various sectors of the construction industry, providing a forum for them to interact, share information and collaborate. This can include exchanging experiences, best practices and industry standards, as well as fostering innovation (Nwachukwu *et al.* 2021). In addition, the adoption of new technologies has been increasingly recommended to assist in solving some of the issues confronting the South African construction sector, such as inefficient project delivery, cost overruns and poor productivity levels. For instance, building information modelling (BIM) technology is a digital platform that allows construction professionals to cooperate on projects, exchange knowledge and information and enhance project results (Akinade *et al.*, 2019). Construction is a key sector of the South African economy; therefore, it makes a significant contribution to the nation's economic development. This being the case, the problems in this industry will require creative alternatives to address them (for example, by introducing technology, increasing communication, coordination, and collaboration, and improving education or training for workers).

Within this convergence of economic pressure and sector-related instability, knowledge sharing emerges as a vital strategic trait. For SMMEs in the construction industry, several issues are prominent, including limited access to resources, finance, and knowledge. To remain resilient in the current competitive landscape and sustain long-term growth, SMMEs in the construction sector must do more than just complete projects rapidly; they must focus on learning from their experiences and projects. Sharing knowledge will be a key way in which organisations address the many challenges they face in contemporary settings and achieve success in the working

environment. By employees sharing their knowledge and experience, the organisation attains a higher level of performance. Sharing knowledge among employees in an organisation is directly related to the knowledge-sharing process as defined by Emere and Oguntona (2025) and the transfer of explicit knowledge from one employee to another. Furthermore, the organisational environment and management play a key role in facilitating the exchange of tacit knowledge among employees. Tacit knowledge, which is difficult to codify and share, plays a vital role in attaining sustainable competitive advantage. In contrast, explicit knowledge, with its clearly articulated form, is more easily shared and understood because “explicit knowledge in an organisation refers to the well-explained and clear form of knowledge in an organisation” (Emere & Oguntona, 2025). In the black SMME construction sector, where access to well-established business networks and the related institutional memory and experience is limited, the ability to swiftly apply and generate knowledge is especially important.

Knowledge-sharing requires certain conditions, known as “knowledge-sharing enablers”, which facilitate or promote knowledge-sharing between organisations or individuals. Current literature has identified several enablers of knowledge-sharing that are relevant to information exchange within SMMEs in the South African construction sector. Firstly, supporting leadership has been recognised as a key factor in the success of knowledge-sharing initiatives in organisational contexts. Leaders need to understand the importance of knowledge sharing and create a supportive work environment (Yeboah, 2023). Yeboah (2023) also emphasises that leadership is essential for creating a climate of trust and openness, thereby facilitating knowledge sharing between project teams and project leaders on South African construction projects. Trust and openness foster an ideal environment for successful knowledge exchange; they require a dependable and transparent communication channel culture. Employees should feel free to share their knowledge and opinions without fear of criticism or negative consequences. A study by Imam and Zaheer (2021) found that trust and openness were significant enablers of knowledge-sharing in construction companies. Technology may also enable knowledge sharing through various means, such as expert management systems, social media, and collaborative platforms, which facilitate the easier sharing of employees' knowledge and better teamwork. Phaladi, Mashwama, and Aigbavboa (2022) highlighted the potential of technology to enhance

knowledge sharing in the South African construction industry. In addition, the authors indicated that technology increases the frequency with which employees share knowledge by improving communication among team members, providing easier access to information, and enhancing collaboration, thereby improving team dynamics. Additionally, communities of practice (COPs) exemplify how technology can be used to enhance knowledge sharing among groups of individuals with common interests or similar professional expertise, as they enable these groups to collaborate on problem-solving and share knowledge and best practices. CoPs can facilitate knowledge exchange by providing an environment where learning and sharing can occur.

Knowledge sharing plays a vital role in the development and success of SMMEs across various sectors, and the construction sector in South Africa is no exception (Nyallu, Deng & Ibrahim 2025). In addition, information flows in SMMEs not by coincidence but as a result of careful planning. The literature suggests numerous methods and approaches to improve knowledge sharing in SMMEs (Sogaxa, 2024). Enhancing knowledge management in SMMEs can be achieved through implementing these strategies and methods, with learning and development programmes serving as key means to facilitate knowledge flow. Such programmes will increase the effectiveness and efficiency of SMMEs in South Africa's construction sector (Sogaxa, 2024). They will also foster the exchange and dissemination of knowledge, contributing to the improvement of the country's construction industry, potentially making it one of the best globally and on the continent (Nyallu *et al.* 2025). Other approaches include the application of communities of practice and Knowledge Management Systems (KMSs) within SMMEs and across the construction sector in the country and on the continent.

Despite the existence of such strategies, the rate of adoption has been slow. Many SMMEs in the construction industry fail to develop well-defined strategies for their knowledge-sharing initiatives. Furthermore, the lack of a complete understanding of how these unique entities operate, interact, and learn makes it challenging to develop effective strategies and technological interventions to address the issue (South African Government 2014; Mabotja & Maloka 2018; Adesina & Ocholla 2024). Based on the issues and challenges faced by SMMEs, the motivation behind this research is to

explore the enablers and strategies of knowledge-sharing in the South African construction industry.

1.3. Research Problem

Although SMMEs are regarded as a driver for transforming the South African economy, they face the risk of being substantially limited by a high failure rate, particularly in the construction sector (Zulu, Ngwenya & Zondi 2023). A primary limitation of SMMEs in South Africa is a critical shortcoming in managing intellectual capital rather than just financial capital (Makore & Eresia-Eke 2021). The nature of construction projects means that there is a unique fragmentation and project-based environment; temporary teams assemble and disassemble for each project. The aforementioned structural issues create an environment where a knowledge silo forms, preventing vital information about solutions to problems and safety issues from being shared across projects (Nyallu *et al.* 2025).

Construction SMMEs in South Africa experience significant loss of intellectual assets and poor sustainability, as well as the "knowledge silo" effect identified above, due to a lack of resources, including knowledge-sharing. According to Hailu and Tshehla (2025), many South African construction SMMEs face significant sustainability challenges due to limited resources and a lack of knowledge-sharing practices. This limitation on retaining institutional knowledge results in repeated errors and excessive dependence on a few key employees who will ultimately leave, causing severe damage to the firm. In addition, Emere and Oguntona (2025) note that many emerging or small firms lack the formal systems necessary to maintain explicit knowledge and thus become highly vulnerable when experienced employees leave.

This loss of knowledge sharing is measurable and, at times, profound. It is evident that inadequate information sharing results in substandard project planning, in turn leading to cost overruns and reduced production (Kodua Ntim & Fombad, 2024). This same issue with the dissemination of critical project data and safety procedures creates an environment where not only can the organisation's efficiency be impacted, but the physical safety of all employees working on the project may also be compromised. As such, for SMMEs with limited financial resources, a single project failure due to inadequate knowledge transfer can result in the company filing for bankruptcy.

Additionally, while there is widespread recognition of the role knowledge sharing plays in addressing the issues facing the South African construction SMME sector, these entities are confronted with significant, systemically embedded barriers to implementing knowledge sharing. While large corporations possess the formal systems, technological infrastructure, and leadership culture necessary to enable knowledge sharing, small and medium-sized construction companies lack these capabilities. The historical legacy of marginalisation has created a barrier between many Black owned SMMEs and the established industry networks they need to tap into to bridge the knowledge gap.

Therefore, the specific research problem of this study is that South African SMMEs currently lack a context-specific strategy to address the structural and cultural barriers to sharing knowledge. Presently, the literature has mainly focused on general knowledge management practices in large companies or developed countries, leaving a significant gap regarding the specific facilitators needed for small businesses to shift from survivalist operations to sustainable, learning organisations.

1.3.1 Purpose of the Study

This study investigated the enablers and strategies of knowledge sharing in SMMEs within the construction industry of South Africa to propose a framework for enhancing knowledge sharing in the industry to make the construction industry more efficient and effective. This main objective is succinctly categorised into five secondary objectives outlined below:

1.4. Research Objectives

- i. To assess the historical legacy of knowledge sharing in SMMEs within the construction industry in South Africa.
- ii. To explore strategies for knowledge sharing among SMMEs in the construction industry in South Africa.
- iii. To identify the factors enabling or hindering knowledge sharing among SMMEs within the construction industry in South Africa.
- iv. To determine the impact of knowledge sharing on SMMEs within the construction industry in South Africa.

- v. To propose a framework for enhancing knowledge sharing in SMMEs within the construction industry in South Africa.

1.5. Research Questions

The following research questions were designed to align with the study's objectives and to help explore the factors that facilitate knowledge sharing, as well as the strategies employed by SMMEs in South Africa's construction industry:

- i. How does the historical legacy of knowledge sharing affect SMMEs within the construction industry in South Africa?
- ii. What are the strategies of knowledge sharing among SMMEs in the construction industry in South Africa?
- iii. What factors enable or hinder knowledge sharing among SMMEs in the construction industry in South Africa?
- iv. What impact does knowledge sharing have on SMMEs within the construction industry in South Africa?
- v. What framework can be recommended for enhancing knowledge sharing in SMMEs within the construction industry in South Africa?

For the purpose of theoretical refinement, the following research questions at the macro-level directly relate to the constructs in the Integrated Conceptual Framework (as outlined in Chapter 2). The alignment shown in Table 1.2 was developed using a cumulative theoretical approach; the premise being that larger organisational or industry-wide events are directly caused by the aggregation of individual actions (Anand & Walsh 2020). Accordingly, this study employs both Social Exchange Theory and the Theory of Planned Behaviour; it examines how individuals' attitudinal beliefs and social exchange evaluations combine to produce the "Immediate Outcomes" of organisational learning and the "Terminal Outcomes" of sustainable competitive advantage (Li et al., 2020). Therefore, by establishing the proposed framework at the level of individual behaviour, this research aims to identify the core drivers needed to transform an entire industry.

Table 1.2: Alignment of Research Questions with the Conceptual Framework

Research Question	Framework Construct	Alignment with Conceptual Framework Components
RQ1: Historical Legacy	Antecedent Conditions	Macro-historical context is conceptualised as a foundational antecedent that shapes the "Subjective Norms" and "Attitudes" (TPB) of individuals, creating the initial environment for knowledge exchange.
RQ2: Strategies	Knowledge Sharing Behaviour	Organisational strategies are operationalised as the aggregate of individual "Knowledge Sharing Behaviours" (both tacit and explicit). These are the manifest actions resulting from the "Intention to Share" (TPB).
RQ3: Enablers & Barriers	Enabling & Hindering Factors or Perceived Behavioural Control	This question investigates the inputs of the framework. "Enablers" (for example, trust) influence the Cost-Benefit Analysis (SET), while "Barriers" (for example, lack of technology) negatively impact "Perceived Behavioural Control" (TPB).
RQ4: Impact	Immediate & Terminal Outcomes	The impact is measured through the framework's outcomes. Individual acts of sharing aggregate to produce "Organisational Learning" (Immediate Outcome) and ultimately contribute to "Sustainable Competitive Advantage" (Terminal Outcome).

Research Question	Framework Construct	Alignment with Conceptual Framework Components
RQ5: Framework	Integrated Model	This question synthesises the entire decision-making loop, from antecedents to outcomes, and proposes a holistic intervention model.

1.6 Research Hypotheses

To provide a statistical basis for understanding the relationships between the identified variables, the study formulates the following five null and alternative hypotheses. These hypotheses will be tested using regression analysis in the quantitative phase of the study:

Hypothesis 1

H₀: Knowledge sharing strategies (KS) have no significant impact on the benefits of information sharing (IMS) in SMMEs.

H₁: Knowledge sharing strategies (KS) have a significant positive impact on the benefits of information sharing (IMS) in SMMEs.

Hypothesis 2

H₀: A collaborative organisation ecosystem (COS) has no significant impact on the benefits of information sharing (IMS) in SMMEs.

H₁: A collaborative organisation ecosystem (COS) has a significant positive impact on the benefits of information sharing (IMS) in SMMEs.

Hypothesis 3

H₀: Factors influencing knowledge sharing (FKS) have no significant impact on the benefits of information sharing (IMS) in SMMEs.

H₁: Factors influencing knowledge sharing (FKS) have a significant positive impact on the benefits of information sharing (IMS) in SMMEs.

Hypothesis 4

H₀: Factors hindering information sharing (FHIS) have no significant relationship with the perceived impact of knowledge sharing (IMS) in SMMEs.

H₁: Factors hindering information sharing (FHIS) have a significant relationship with the perceived impact of knowledge sharing (IMS) in SMMEs.

Hypothesis 5

H₀: The challenges faced by SMMEs (C) have no significant relationship with the perceived impact of knowledge sharing (IMS) in SMMEs.

H₁: The challenges faced by SMMEs (C) have a significant relationship with the perceived impact of knowledge sharing (IMS) in SMMEs.

1.7 Justification of the Study

SMMEs are crucial for job creation and economic expansion in South Africa's economy. However, SMMEs in the construction sector often require assistance with information-sharing issues, which can hinder their productivity and competitiveness (Emere, Aigbavboa, & Oguntona. 2025). Therefore, examining the mechanisms and approaches for knowledge exchange for SMMEs in the South African construction sector is crucial.

Good leadership is a significant tool SMMEs utilise in knowledge sharing. Leaders who are set on enhancing employee engagement and the growth of the organisation, can create environments where value is placed on open sharing of information and knowledge (Haider, Zubair Tehseen, Iqbal & Sohail. 2023). Rather than accumulating knowledge as a power base, successful leaders enable its flow by defining a clear vision of its application and showing its significance by their own example. This fosters psychological safety by enabling the sharing of insights regardless of employees' status, whether they are proven, untested, or critical (Sundiman *et al.* 2019). Ultimately, leadership shifts from issuing direct instructions to creating an environment in which everyone can share their insights.

A corporate culture that encourages learning and innovation may also support knowledge sharing. For example, social media platforms and knowledge management systems may give employees quick access to information and facilitate knowledge exchange.

Organisations can use strategies that encourage knowledge sharing. Mentoring, training and Community of Practice (CoPs) are some of the knowledge-sharing initiatives used in the construction sector (Ebekozi, Aigbavboa, Samsurijan, Aliu, & Nwaole. 2024). Mentoring programs can provide a channel for experienced workers to share their experience and knowledge by working with inexperienced workers. Training programs will provide the tools and training an employee needs to effectively communicate their expertise. Additionally, CoPs (Communities of Practice) can support the sharing of expertise by creating an environment where employees with common interest and goals work together to share their knowledge and experiences (Senaratne & Warren 2018; Sucena et al. 2025).

The information flow between SMME's will increase productivity and competition to a higher level in South Africa's construction sector. Information flow can be promoted by factors such as leadership, corporate culture, ICT Infrastructure, and other knowledge-sharing enablers, including mentorship, training, and Communities of Practice (CoP). SMME's within the construction sector should implement these enablers and strategies to improve knowledge-sharing practices and ultimately improve overall performance.

1.8 Originality of the study

The concept of originality in academic research has been widely discussed in various fields, including engineering (Shaheen 2021), tourism (Rodriguez Sanchez, Mantecón, Williams, Makkonen & Kim. 2022), science (Shibayama & Wang 2020) and even in the context of PhD studies (Gill & Dolan 2015). The term "originality" relates to how novel and distinctive a research study is, and therefore how much it differs from previous studies and adds new knowledge to a field of research. Originality in the proposed study exists across several dimensions. One such dimension involves addressing a recognised need for increased awareness and understanding of knowledge sharing concerning SMMEs in South Africa, as described by Mendes Calo

et al. (2012); Adesina and Ocholla (2021); and Tsai, Cabrilo, Chou, Hu, and Tang (2022). While prior research has considered knowledge sharing and knowledge management across various sectors and contexts, the investigation of knowledge sharing within the South African construction industry and its relevance to SMMEs remains limited. Moreover, the study seeks to identify the most effective methods to promote knowledge sharing, thereby improving the competitive edge of SMMEs, which could help close the existing knowledge gap and ultimately support SMMEs in the construction sector. This underscores that the proposed research tackles a significant challenge to the growth and development of SMMEs in South Africa.

Furthermore, this study focus solely on the construction sector as it is a highly specialised field that has not been extensively studied regarding the knowledge sharing practices of SMMEs in South Africa; thus, this research offers an original addition to the existing body of knowledge about a sector where knowledge sharing could significantly enhance innovation, productivity, and competitive advantage (Arsawan, Koval, Rajiani, Rustiarini, Supartha & Suryantini. 2022). Additionally, there is a growing need to increase awareness and conduct further research on knowledge sharing practices among SMMEs in South Africa to support their development and growth. Wierzbinski (2014) suggests that more research is needed to understand the different forms of information sharing practised within SMMEs. Adesina and Ocholla (2021) also highlight that knowledge sharing in SMMEs remains a relatively under-researched area. Furthermore, the slow adoption of knowledge-sharing practices by SMMEs is highlighted by Tsai *et al.* (2022), who argue that small businesses often need more resources and capabilities to implement knowledge-sharing strategies.

Moreover, this study is unique in that it employs a mixed-methods approach, combining qualitative and quantitative methods for data collection and analysis to address limitations identified in the prior literature. Unlike the study by Emere et al. (2025), this research employs a more in-depth qualitative analysis, distinguishing it from their purely quantitative study, which used an online survey of professionals to identify overall trends in sustainable building in the construction industry in South Africa. Hailu and Tshehla (2025) in a concurrent study approached exclusively qualitative interviews and a literature review to evaluate SMEs in Gauteng's construction sector challenges, generating in-depth views but without statistical evidence. Through a combination of both quantitative and qualitative research

strategies, this study presents a broader-based and better-balanced understanding of knowledge sharing in construction SMMEs. This approach allows for a more comprehensive understanding of the complex factors that affect knowledge sharing in SMEs, enabling researchers to gather both in-depth insights and numerical data.

The use of a case study design also provides a detailed and contextualised understanding of the research problem, which is another unique aspect of the study. Creswell and Creswell (2018) emphasise that case study research allows for an in-depth exploration of a bounded system within its real-life context, making it particularly valuable for examining complex organisational processes. This makes the approach especially appropriate for investigating knowledge sharing in construction SMMEs, where practices are context-specific and dynamic. Additionally, this proposed research aims to investigate the factors and approaches employed by black-owned SMMEs regarding knowledge sharing in the construction industry. The inclusion of this aspect adds a new dimension to the proposed work, thereby providing insight into how black-owned SMMEs in South Africa face distinct challenges in the construction industry and how they employ approaches to disseminate knowledge.

In summary, the need for greater awareness and research on knowledge sharing among SMMEs in South Africa remains a pressing concern, particularly in the construction industry. The proposed study aims to close this knowledge gap and offer valuable insights into the facilitators and tactics of knowledge sharing among black-owned SMMEs in the construction industry.

1.9 Significance of the Study

In addition to its relevance to the academic sphere, this study is significant for all stakeholders and the broader community of researchers and policymakers. In particular, it is highly relevant to SMME managers or owners of construction companies, and to entrepreneurs interested in improving the sustainability, competitiveness, efficiency, and effectiveness of their organisations. The research has provided these individuals (practitioners) with practical strategies and enablers to address the constraints of informal, ad hoc processes.

From a theoretical standpoint, this study addresses a significant gap in the literature on the obstacles to establishing successful knowledge-sharing strategies in South

Africa. Additionally, the research contributes to the body of knowledge by identifying the interaction among historical legacies and organisational barriers or enablers, and by refining current knowledge management theories to accommodate resource-constrained environments.

In practical terms, the research findings offer a management-based diagnostic tool for managers to evaluate the state of knowledge sharing within their organisation. The results also provide an empirically based comparative framework for assessing the effectiveness of the strategies currently employed by organisations to promote knowledge sharing. Furthermore, it offers a new management-based framework for managers to utilise to enhance the efficiency of knowledge transfer. This framework has been specifically adapted to the unique context of the South African construction industry.

Methodologically, this study contributes to the field by developing and validating effective research instruments, specifically questionnaires and interview guides, that can be utilised by scholars globally to understand knowledge sharing strategies in similar SMME sectors. Finally, regarding policy, the study offers practical recommendations focusing on improving organisational structures and enhancing coordination among employees. It proposes a dedicated framework tailored to the South African economy which can assist policymakers in fostering an environment where the industry can withstand competition and achieve swift growth.

To visually synthesise these multi-dimensional impacts, Figure 1.1 illustrates the four key domains of contribution: theoretical, practical, methodological and policy that collectively define the significance of this study.

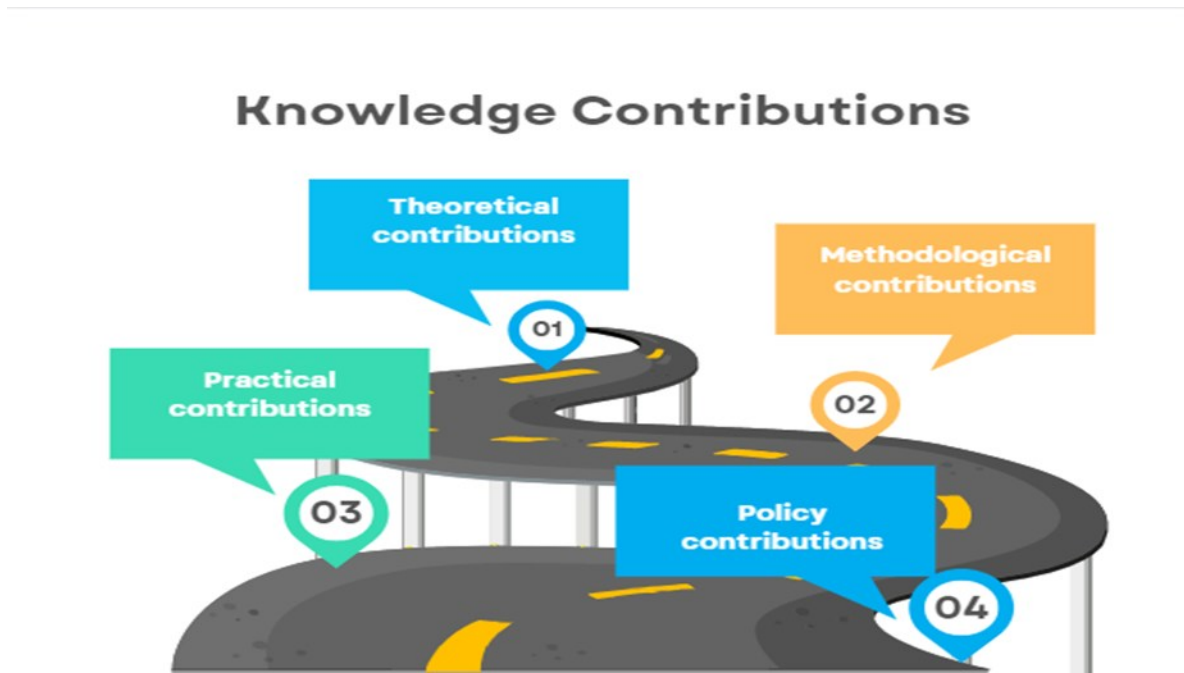


Figure 1.1: Knowledge Contributions (Researcher: 2022)

1.10 Clarifying Concepts Used in the Study

To ensure conceptual clarity and theoretical alignment throughout the thesis, the following key terms are defined, drawing on the current literature and their specific operationalisation in this study.

1.10.1 South African Construction Industry (SACI)

The construction industry is broadly defined as the collective network of organisations, individuals, and stakeholders involved in the planning, design, creation, and maintenance of infrastructure. Kissi et al. (2023) highlight that the construction sector in South Africa is a substantial part of the economy, with construction and civil engineering work making a considerable contribution to the country's Gross Domestic Product (GDP). In the current study, the country's construction sector refers to both the public and private sectors engaged in engineering infrastructure development, with a focus on Black SMMEs serving as contractors or subcontractors.

1.10.2 Small, Medium, and Micro-sized Enterprises (SMMEs)

Defining SMMEs remains complex due to the variation in global standards. The Department of Small Business Development (DSBD, 2023) provides the official South African classification based on turnover and employee numbers, categorising firms

into Micro (turnover less than R10 million), Small (turnover less than R50 million), and Medium (turnover less than R220 million). Adesina and Ocholla (2024) emphasise that, in the context of developing economies, these entities are often characterised by resource constraints and informality. Consequently, the working definition for this study restricts SMMEs to black-owned construction enterprises operating in South Africa that fall within CIDB grading levels 1 to 6, which typically face acute sustainability and resource challenges.

1.10.3 Knowledge

Conceptually, knowledge is distinct from data or information. While traditional definitions like Nonaka and Takeuchi (1995) describe it as "justified true belief," modern scholars in the construction domain view it as a strategic asset. Adesina and Ocholla (2024) distinguish between tacit knowledge (personal, experience-based) and explicit knowledge (codified, documented). In this research, knowledge is defined as the collective intellectual capital of the firm, encompassing both the tacit expertise of skilled workers and the explicit technical and safety protocols required for project execution.

1.10.4 Knowledge Management (KM)

The Knowledge Management process is a systematic approach to developing, collecting, and using knowledge to enhance organisational performance. Rossignoli et al. (2024) define KM as the strategic management of key knowledge to ensure long-term viability. In the same vein, Alo *et al.* (2025) highlight the significance of KM, particularly as an indispensable tool for pursuing sustainable development for enterprises in general and, more particularly, in an environment of uncertainty. Therefore, the definition of Knowledge Management, within the context of this study, is understood as the overt operations and processes undertaken by SMMEs in the construction industry, aimed at acquiring and sharing intangible assets and reducing the risk of employee turnover and project disintegration.

1.10.5 Knowledge sharing

Knowledge sharing is the fundamental activity through which the entire KM process is achieved. Castaneda and Cuellar (2020) describe it as a voluntary process of sharing knowledge with others. Studies by Emere and Oguntola (2025) indicate that

construction industry activities involve the transfer of both tacit and explicit project information to prevent the recurrence of project issue errors. The corresponding definition of the activity, in light of current studies in the sector, is therefore the two-way transfer of project information and skills between workers to solve problems collectively.

1.10.6 Enablers of Knowledge Sharing

Enablers are the antecedent conditions that facilitate knowledge exchange. Lee and Choi (2003) originally identified these as social and technical factors, a view supported by recent research. Gwangwava and Aigbavboa (2019) identify trust and leadership as critical enablers within the South African construction context. In this study, enablers are defined as the specific organisational, cultural, and technological factors, such as supportive leadership and digital tools, that positively influence the intention and ability of SMME employees to share knowledge.

1.10.7 Strategies for Knowledge Sharing

Knowledge-sharing strategies are mechanisms that deliberately encourage the flow of knowledge. The mechanisms may include formally codifying knowledge or informally socialising it. Both Al-Zoubi, Masa'dah and Twaissi (2025) and Ojasolo, Wait and Mac Lavery (2023) emphasise the importance of CoPs as a strategy for encouraging interaction among members. Both authors also highlight that well-structured mentoring and training programmes are essential tools for overcoming challenges; furthermore, they are highly effective in facilitating the transfer of critical business information from the mentor to the mentee through mentorship and digital resources. This is the primary approach utilised in this research study. The SMME owners will be able to develop strategies to overcome their own obstacles and to pass along vital business knowledge and skills by using mentorship and digital tools to do so.

1.11 Overview of Literature Review

The literature on knowledge sharing in SMMEs reveals that effective knowledge management is crucial for organisational performance and sustainability. Studies by Durst, Edvardsson and Foli (2023) and Rossignoli et al. (2024) emphasise that knowledge transmission between individuals and teams significantly impacts company

performance, with both tacit and explicit knowledge playing pivotal roles. Research consistently identifies key enablers of knowledge sharing, including organisational culture, leadership support, technological infrastructure, and trust-based relationships (Saka et al. 2022; Yilmaz et al. 2023). Furthermore, various strategies such as Communities of Practice (CoPs), mentorship programmes, and digital knowledge management systems have been shown to facilitate knowledge exchange in small business contexts (Al-Zoubi, Masa'dah & Twaissi 2025; Ojasolo, Wait & Mac Lavery 2023).

Within the South African construction industry context, the literature reveals unique challenges stemming from historical exclusion, cultural diversity, and limited resources that affect knowledge-sharing practices in black-owned SMMEs. Research by Gwangwava and Aigbavboa (2019) and Mantje and Rambe (2021) revealed that knowledge management positively influences the competitiveness of SMMEs in emerging countries, but barriers such as trust, leadership capacity, and technology need to be overcome. Based on this, the current study aims to examine the effective implementation of these facilitators and strategies within the context of SMMEs in the construction industry in South Africa to enhance sustainability and competitiveness. The relevant theoretical frameworks and studies are reviewed in detail in this study's Chapter 2.

1.12 Scope and Limitations of the Study

1.12.1 Scope

This study's scope is precisely defined based on geographical, demographic, conceptual, and temporal factors to enable a focused, workable approach to examination. Geographically, the research pertains to South Africa as a whole. The focus was nationwide (across all 9 provinces), and data were collected from participants in each of the provinces listed above (Gauteng, Western Cape, KwaZulu-Natal, Eastern Cape, Free State, Limpopo, Mpumalanga, Northwest, Northern Cape). Thus, the nationwide spread of this study provides an overview of the various operational settings for construction SMMEs.

The study explicitly limits its focus to SMMEs in the South African construction industry; this exclusion applies to all large publicly listed construction conglomerates

and entities not owned by Black people. This defined sphere will facilitate the examination of the unique legacies, structural challenges, and resource limitations encountered by black-owned new-entrant contractors in the current economic environment.

The research has a conceptual scope aimed at understanding the knowledge-sharing aspects of the broader discipline of knowledge management. The other elements of KM such as the knowledge creation process, how knowledge can be organised, how it can be archived, are all part of the same larger picture however they are outside of the scope of this particular research project as the focus is specifically on the enablers, strategies and barriers that affect the transfer of both tacit and explicit knowledge from individual to team or from one team to another. The investigation explores how leadership, culture and technology facilitate or hinder this specific exchange process within the construction project environment.

The temporal aspects of this study capture the business and operating environment as it existed during the time frame that primary data were gathered. Primary data were collected through qualitative interviews and a quantitative survey over a six-month period, beginning with ethics approval in June of 2024. As such, these results reflect the industry's status at the time of primary data collection.

1.12.2 Limitations

The current study employed an interview survey to gain a comprehensive understanding of the research subject. Undoubtedly, the technique assists in core understanding but is also associated with drawbacks, such as researcher bias. The interpretation of responses and transcripts may be subject to researcher bias, which can affect study results and constitute a major limitation of the current study. The use of a questionnaire in the study may also introduce biases, such as selection bias or skewing of results due to feedback from a particular segment of the population. Response bias may also have occurred, as respondents may not have provided sufficient information for the study, which is harder to measure and predict during the study. However, the researcher took every measure to avoid influencing the study's outcome by adopting a neutral stance and reporting only participants' responses. Information about the study was again collected until saturation to address the inadequate data provided by some participants.

Furthermore, the exclusive focus on black-owned SMMEs, while necessary for the study's specific goals, restricts the generalisability of the findings to the wider, diverse South African construction sector. The results may not fully reflect the dynamics within established large-scale construction companies or SMMEs in other demographic groups.

1.13 Research Methodology

This section discusses the research methodology utilised to understand and gather information on factors that enable or hinder knowledge sharing among SMMEs within the South African construction industry. The study took a pragmatic stance. Pragmatism is situated at the centre of the philosophical spectrum in terms of the method of research (Kaushik & Walsh 2019), and its focus is on practical rather than theoretical assumptions (Saunders, Lewis & Thornhill. 2019). The pragmatist approach or establishment of a proposition in a study, as it can be provided through analysis of past information or data collected during the study, aided in better analysing the enablers, factors and strategies that could be deployed for knowledge sharing in the SMME segment of the construction industry in South Africa. The pragmatic approach also aided in the development of effective strategies based on finding the most effective and viable solution to the problem.

1.13.1 Research Approach

The current study employed a mixed research approach in which a questionnaire survey was circulated to the small–medium contractors and construction organisations in South Africa. The interviews were also conducted with industry experts and selected SMMEs in the construction industry in South Africa to better analyse their perspectives on the study's domain. The secondary data were also collected from government websites and industry reports and analysed for the study.

The main purpose of using a mixed-method approach in a research study is to maximise the use of combining qualitative and quantitative designs to answer research problems (Onojetah 2020). A mixed-method approach was adopted in this study to collect both objective and subjective data as well as secondary data collected by the government or past literature sources. This approach aided in establishing both the

objective validity of the data and ensuring that the experiences and reflections of managers and firm owners were adequately covered and represented in the study.

1.13.2 Research Design

For the research, a mixed-methods approach was employed, specifically the explanatory sequential mixed-methods design (Creswell & Creswell 2023). The reason for selecting this research design was its ability to first gather quantitative data, then use qualitative data to expand on the quantitative results (Saunders *et al.* 2023). By adopting this design, the study first identified broad patterns and relationships within the construction SMME sector through a survey and then used in-depth interviews to explore the underlying mechanisms and personal experiences that provided depth to those statistical findings. This design approach seeks to validate current practices and propose new ideas based on prior findings (Yeboah 2018; Sharma, Bidari, Bidari, Neupane & Sapkota. 2023). Thus, this study aids in understanding the factors that both enable and hinder knowledge sharing among SMMEs in the context of the South African construction industry.

1.13.3 Population of the Study

The targeted population of this study was personnel from small-to medium-sized contractors and construction organisations that are black-owned and established in South Africa. These were purposively selected following their knowledge pertaining to strategies of knowledge sharing in SMMEs within the construction industry in South Africa (Etikan, Musa & Alkassim. 2016). Therefore, black members and contractors from the construction industry in South Africa, who are primarily involved in knowledge sharing activities in the construction industry in South Africa, constitute the target population.

1.13.4 Data Collection Methods

The study used a mixed-methods approach with questionnaires, interviews and secondary data analysis as data collection tools. Data were collected through questionnaire surveys with small-medium contractors and construction organisations that were black-owned and established in South Africa. Interviews with industry experts as well as black businessmen from the community were conducted. The questionnaire surveys were circulated to small-medium contractors and construction

organisations in South Africa. These questionnaires consisted of both open-ended and closed-ended questions, with the closed-ended questions developed on a five-point Likert scale and predominantly consisting of several sections. The first section focused on the demographics of the respondents. The second section contained statements regarding the enablers of knowledge sharing among SMMEs in the construction industry in South Africa. The third section contained statements pertaining to the strategies of knowledge sharing in SMMEs, and the fourth section identified the advantages and challenges pertaining to the process of knowledge sharing in SMMEs, which were operated primarily by black people in South Africa. The interview structure was developed based on past studies as well as responses collected through the utilisation of the questionnaire.

1.13.5 Data Analysis

The analysis of the quantitative data was done through several statistical tests and the IBM SPSS version 29.0. The open-ended responses were then analysed using thematic analysis or qualitative analysis. The thematic analysis was employed with the use of the latest version of ATLAS.ti, which is the research software tool used to code and analyse data, create network diagrams, construct data visualisations and build literature reviews, according to New York University libraries (2022).

1.14 Ethical Considerations

Various ethical principles were adhered to throughout the study. This was a means of protecting participants from inhumane treatment and safeguarding their privacy and rights as research participants.

1.14.1 Ethical Principles

- i. Research planning: The researcher has applied ethical clearance before the start of the research study. The clearance is crucial during framework development to specify the ethical issues. This included privacy, legitimacy and stability concerns. As the study also relied on primary data gathered from the selected individuals, Turnitin was utilised on to detect plagiarism at different stages of the study. The development of each chapter went through Turnitin assessment to evaluate the similarity index.

- ii. Honesty: The research was conducted in an honest manner. The researcher adhered to the principles set in the research ethics policy provided by the University of South Africa (UNISA) regarding integrity and honesty (University of South Africa, 2016). The integrity and honesty of the research was addressed by clearly reporting on all the research principles and properly addressing all the researchers. All the respondents were protected during the research, and any potential conflicts of interest were properly disclosed during the study.
- iii. Responsibility: The no-harm principle was implemented as participants were not exposed to any harmful environment or situation by the researcher. This approach did not risk or expose the participants to mental, physical or emotional risk.
- iv. Anonymity: The issue of anonymity is also key in any research. To achieve this, the respondents were promised that their participation would be on a no-name basis that the researcher followed and preserved. Anonymity, which also entails participants' confidentiality, was established by storing all the information in a secure computer and properly encrypting the data in accordance with the guidelines of UNISA's higher degree committee (University of South Africa 2013). The anonymity of the data was maintained by ensuring that no sensitive information regarding the respondents was published during any period of the study.
- v. Informed consent: This is one paramount principle in research; thus, expressed consent was obtained from the participants regarding their willingness to voluntarily contribute to the study. The participants were provided with the option to remove their information regarding the data collected during the study.

1.15 Organisation of the Thesis

The study is systematically organised into seven chapters that provide a logical progression from the research problem to the final recommendations.

Chapter 1: Study Introduction

This chapter establishes the foundation of the research by outlining the background research problem aim objectives and significance of the study. Furthermore, it defines

the scope and limitations, providing a clear roadmap for the investigation into knowledge sharing within South African construction SMMEs.

Chapter 2: Literature Review and Theoretical Framework

This chapter provides a comprehensive literature review pertaining to knowledge and knowledge management. It again outlines the study's Conceptual and Theoretical Framework, taking into cognisance the theory of Planned Behaviour and the Social Exchange theory, with explanations for factors that affect knowledge sharing.

Chapter 3: Contextual Literature Review: SMMEs in the Construction Industry and the Role of Knowledge Sharing

In this chapter, SMMEs are defined within the South African regulatory environment context, highlighting the dynamics of the construction industry. The chapter also critically assesses the role of knowledge sharing in identifying challenges that are industry specific.

Chapter 4: Research Design and Methodology

This chapter reveals the empirical approach used to answer the research questions. The chapter also offers justifications for the applicability of the pragmatic research philosophy and a mixed-methods design to the study. This chapter again explains the adopted population sampling techniques, the data tools utilised, and the ethical frameworks employed throughout the study.

Chapter 5: Presentation of Findings

This chapter reports on the survey questionnaires results, which were analysed statistically through SPSS. This facilitates the interpretation of the descriptive results and the inferential analyses used to measure the impact of knowledge sharing and to examine the relationships among the variables. By establishing this statistical baseline first, the study identifies the broad trends and correlations that require further in-depth exploration in the subsequent phase.

Chapter 6: Data Presentation, Analysis and Discussion

Building on the quantitative results from the previous chapter, this chapter presents the results of the qualitative study, focusing on the themes derived from the thematic analysis of the in-depth interviews. The chapter also presents contextual descriptive

data on strategies, facilitators, and inhibitors that affect knowledge sharing, as identified by industry experts. This chapter's primary purpose is to explain the statistical patterns identified in Chapter 5 by exploring the lived experiences and socio-cultural dynamics of the participants.

Chapter 7: Main Findings, Conclusions and Recommendations

This chapter synthesises the findings from the qualitative and quantitative phases of the study, offering a discussion of the theoretical and practical contributions. It concludes with valuable recommendations and suggestions for future research.

1.16 Chapter Summary

In summary, this chapter provides a brief overview of the current study, which investigates the enablers and strategies for knowledge-sharing practices among SMMEs operating in South Africa's construction industry. The research seeks to curb the existing gaps in the literature by exploring the factors that influence knowledge-sharing among SMMEs in South Africa and by identifying strategies to improve these practices. The significance and relevance of this study can help SMMEs in the South African construction industry achieve higher levels of sustainability, competitive advantage, productivity, and ultimately, performance. This research will offer valuable insights into developing effective strategies for knowledge sharing among SMMEs and serve as a foundation for future studies analysing the challenges and limitations associated with the knowledge-sharing process.

The details provided in this chapter provide the background, problem statement, research objectives and questions and the significance of the study. The ground laid in this chapter emphasises the study interest in reflecting on the importance of industry groups and professional bodies as enablers of knowledge sharing in the South African construction industry. These organisations can play a vital role in facilitating information exchange, collaboration and innovation among stakeholders in the construction sector. The study aims to shed light on the role of these organisations in promoting knowledge sharing practices and their potential impact on the construction industry in South Africa.

Overall, this chapter discusses how the current research is expected to contribute to the existing body of knowledge on knowledge-sharing practices among South African construction industry SMMEs. The current research findings are expected to benefit owners and senior management within businesses, who could be markedly affected by greater knowledge-sharing activity in SMMEs operating in the South African construction industry. In conclusion, this research is expected to contribute to more effective knowledge management in the aforementioned industry. The next chapter discusses the current literature review conducted as part of the current research.

Chapter 2: Literature Review and Theoretical Framework

2.1 Introduction

This chapter describes the standard theoretical basis on which this study is based, focusing on its basic concepts of knowledge, knowledge management, and knowledge sharing. The literature review addresses several research objectives. Primarily, it corresponds with objective two, in which the knowledge sharing strategies for the South African construction industry's SMMEs are explored. In doing so, it also contributes to objective one by exploring the historical record of knowledge sharing, to objective three by exploring the conditions facilitating or inhibiting knowledge-sharing practice, and to objective four by exploring the impact on the organizational benefit. Objective five, with its concern for the proposition of the resulting framework, is illuminated by indirect means by the theoretical and conceptual results the current chapter yields but will receive fuller discussion itself in the following chapters.

The chapter starts with the dismantling of the amorphous nature of "knowledge" itself, followed by an in-depth examination of knowledge management (KM) as a key organisational practice. The chapter then focuses predominantly on knowledge sharing (KS), discussing its processes, approaches, and factors facilitating or inhibiting its effective implementation within organisations. In addition, the chapter provides a timeline of knowledge-sharing practices to emphasise their relevance to modern environments. By closely examining these concepts, this chapter provides the theoretical foundation needed before their application in the context of the construction industry.

Knowledge

The concept of knowledge is broad and is portrayed in a plethora of ways. The following section contributes to the second objective by reviewing how knowledge is both conceptualised and defined, thereby forming the basis for examining strategies of knowledge sharing. The term itself can derive and attract many meanings. Analytic philosophy views knowledge as a mental state that an individual possesses. Gao, Chai and Liu. (2018) noted that the term at times is used to refer to the characteristics of a group of people as group knowledge and social knowledge, or collective knowledge. The term knowledge in the English version is a broad term that other languages clearly

distinguish using several words. In Latin, the concept of knowledge is conveyed through the terms *cognitio* and *scientia*. Similarly, in Spanish, one encounters the words *conocer* and *saber*, both signifying the act of "knowing." The ancient Greeks, renowned for their multifaceted understanding of knowledge, employed four distinct terms to delineate various facets of knowledge. These terms included *epistēmē*, representing unchanging theoretical knowledge; *mētis*, denoting strategic knowledge; *technē*, referring to expert technical knowledge; and *gnōsis*, encompassing personal intellectual knowledge (Koenig 2021). It is the *gnosis* knowledge that the study takes more into account in most instances where the term is utilised.

Various philosophers view knowledge as justified true belief (JTB), that is, knowledge is a belief that is true and justified (Zaim, Muhammed, & Tarim. 2019). However, this definition has been criticised by most theorists, including the ancient Greek philosopher Plato. The argument is that if something is labelled true, it does not necessarily mean it is right and can be deemed knowledge. A person can put his or her beliefs in something that is entirely false. In a very slightly different vein, knowledge is viewed as information stored in documents, housed in libraries or an expert system and can be retrieved if needed. Thus, knowledge is portrayed as information captured and stored systematically or manually.

Furthermore, Gao, Chai and Liu. (2018) view knowledge as a theoretical or practical understanding of a subject. Forouzan, Mohammad and Paria. (2021) further elaborate on knowledge as the understanding, awareness, or cognition created through studying, observing, experiencing and researching the outside world. Knowledge is portrayed as an intangible resource and an invisible asset. According to Abubakar, Elrehail, Alatailat, and Elçi. (2019), the acquisition of knowledge involves a complex cognitive process of perception, learning, communication, association and reasoning. The skill, experience and vision also provide a framework for creating, evaluating and using the acquired information (Shujahat, Sousa, Hussain, Nawaz, Wang and Umer. 2019). Thus, knowledge is generally divided into two types: tacit and explicit. Tacit knowledge refers to personal and context-specific knowledge of a person who resides in the human mind, behaviour and perception. In contrast, explicit knowledge refers to information or knowledge that is set out in a tangible form. Tacit knowledge is unwritten or unspoken knowledge and very difficult to transmit in formal language, considering

that it often resides with the individual and that explicit knowledge is codified and transferrable in formal language (Yeboah 2023).

Various scholars consider knowledge to be an important measure of prosperity and success (Abubakar *et al.* 2019; Zaim *et al.* 2019). It is essential for entrepreneurial and small organisations to boost their performance and attain a competitive advantage. Organisations need to be able to manage this knowledge effectively. An organisation with the right knowledge experience has increased productivity, increased performance and improved innovation capability (Islam, Ahmed, Usman, & Ali. 2021). Thus, knowledge is crucial for an organisation's survival and continued sustainability, and it has become a prerequisite to enact a culture of knowledge sharing to become more abreast of the prevailing and popular trends at that time (Rafique, Hameed, & Agha. 2018).

Knowledge Management

This section again contributes towards objective two by exploring the theoretical foundations and empirical perspectives surrounding knowledge management. This provides the context for the understanding of knowledge-sharing strategies. KM has become the topic of the twenty-first century, considering its application to various activities and areas aimed at managing, creating and enhancing intellectual assets. Knowledge management is a management field closely integrated with information and communication technologies (Gao *et al.* 2018). Over the past two decades, many knowledge management perspectives have been introduced by researchers. Managing knowledge has been found to be important, especially in this dynamic world, as this will lead to an organisation's increased competitive advantage. Durst, Edvardsson and Foli. (2023) note that knowledge management is utilised to capture, document, retrieve and reuse knowledge. This also enables the creation, transfer and exchange of the same knowledge. There is no limit to knowledge management, as it applies to large multinational corporations and the smallest existing enterprises.

Various versions exist in regard to defining and describing knowledge management. However, their goal is to help individuals improve their learning efficiency and integrate different information resources to improve their competitive advantages. Thus, knowledge management possesses the prowess to equip individuals with the necessary or relevant tools and techniques to surmount the overwhelming information

they encounter and enable them to improve learning efficacy and increase their competitive advantage (Forouzan *et al.* 2021).

Forouzan *et al.* (2021) view knowledge management as an organised approach precisely designed to manage the production, sharing and harvesting of knowledge leveraged towards organisational achievement, that is, the enhanced ability, speed and effectiveness of an organisation in its delivery of services and goods. Knowledge management has gained popularity because of its ability to provide organisations (large and small) with strategic outcomes closely related to competitiveness, profitability and development of capacity. Li, Ashraf, Shahzad, Bashir, Murad, Syed and Riaz. (2020) define knowledge management as the explicit and effective management of knowledge deemed paramount. The availability of resources in an organisation ensures its ability to manage and share knowledge. Butt, Nawaz, Hussain, Sousa, Wang, and Sumbal. (2019), however, argue that organisations face the challenge of acquiring the knowledge resources that make them remain in the competitive market and enhance entrepreneurial and organisational performance. However, despite this realisation, SMMEs have been found to develop and expand due to effective knowledge management, hence being sustainable for longer periods of time (Abuaddous, Al Sokkar, & Abualodous. 2018; Li, Ashraf, Shahzad, Bashir, Murad, Syed, & Riaz. 2020; Antunes & Pinheiro 2020).

There is a direct link between knowledge management and the competitiveness of an SMME (Shujahat, Sousa, Hussain, Nawaz, Wang, & Umer. 2019). Knowledge management involves collecting, organising and transforming the knowledge to be implemented, leading to increased performance of a small business. The process of knowledge management operation in an organisation is complex, and the activities in knowledge management involve knowledge acquisition, encoding, storage, transfer, application and sharing (Deng & Lu 2022). One notable importance of knowledge management is influencing knowledge sharing and application to create value. Thus, knowledge sharing is a major part of the knowledge management process (Mehmood, Jian, Akram, Akram, & Tanveer. 2022; Chatterjee, Chaudhuri, & Vrontis. 2022).

Knowledge-sharing competence is crucial for a host of organisational processes and performance outcomes (Ahmad & Karim 2019). Organisations that put themselves in a position to effectively gather, store and share knowledge can trigger a culture of

curiosity and collaboration. This leads to improved efficiency and employee satisfaction. A system of knowledge management that effectively streamlines company knowledge while making it accessible to everyone. Knowledge management enables employees to access best practices quickly, information on past projects and other key information that informs their work. Previewing this information can improve employees' performance and decision-making. As alluded to earlier, effective knowledge management relies on successful knowledge sharing; however, many organisations face the challenge of promoting knowledge sharing with others.

Knowledge Sharing

Objectives two and four are addressed in this section. This is done through the examination of knowledge sharing as a process within knowledge management and highlighting on its impact on organisational effectiveness. Lee, Tao, Li, -Y and Sun. (2021) regard knowledge sharing as a social interaction in which employees exchange their skills, experiences and knowledge across the firm. In the same vein, Yeboah (2023) views knowledge sharing as human behaviour, which encompasses activities that include exchanging explicit and/or implicit experiences and embedding ideas and skills that facilitate knowledge for innovation in the workplace. In addition, Nguyen, Siri, and Malik. (2021) view knowledge sharing in the following scope as an employee-to-employee learning procedure aimed at assisting one another in enhancing their potential, finding solutions to problems, and increasing work performance. Thus, knowledge sharing targets making available knowledge that is relevant to co-workers within an organisation.

Knowledge sharing is a tool that an organisation can utilise to be innovative and, ultimately, enhance competitiveness. Yeboah (2023) posits that knowledge sharing entails a process in which individuals commonly exchange their implicit and explicit knowledge to create new knowledge. Through knowledge sharing, organisation and different personnel are armed with the privilege of sharing task-related information, expertise and advice, which leads to both personal and organisational development. Knowledge can only be deemed to be successfully shared if the individuals, groups and organisations in the process are practised towards yielding something positive from the information.

Knowledge sharing has three main characteristics: First, a process or procedure for sharing is involved in knowledge sharing. This means that knowledge sharing relies on the communication medium, as it is not an event. Second, individuals share expertise or experiences with others, meaning that knowledge sharing involves the willingness to donate accumulated knowledge and experience with the willingness to receive. The last characteristic notes that knowledge sharing is zeroed on finding solutions to organisational problems or moulding new ideas. Thus, knowledge sharing is promoted by innovation and sustained performance (Islam *et al.* 2021). Knowledge sharing brings together knowledge sources, manipulating them into knowledge structures and routines that are new (Li *et al.* 2020).

Knowledge sharing is one of the paramount processes in knowledge management, considering that it has effects at both the individual and organisational levels (Centobelli, Cerchione, & Esposito. 2019). The sharing of knowledge between individuals may culminate in the creation of value and the gain of competitive advantage by knowledge-intensive organisations. An individual enables a conducive knowledge sharing process among a complex set of factors. The behaviour of knowledge sharing has been found to have a significant influence on team cohesion and group performance (Obrenovic, Jianguo, Tsoy, Obrenovic, Khan & Anwar. 2020). Various factors affect knowledge-sharing behaviours, including the personal characteristics of the bearer of knowledge and then groups and organisations. This study adopted the definition of knowledge sharing, which involves the transfer or sharing of tacit (undocumented) and explicit (documented) information from one SMME to the other. Knowledge sharing has been highly linked to increased productivity, employee empowerment, effectiveness and efficiency.

2.5 Historical Legacy of Knowledge Sharing in SMMEs

In this section, Objective One is explored through the analysis of how historical factors affect knowledge sharing in SMMEs. Based on this analysis, it can be deduced that history shapes the knowledge-sharing process in SMMEs because it reflects their evolution over time, driven by changes in economic structures and the degree of priority SMMEs accord to intellectual capital, a significant aspect of knowledge sharing. Global trends indicate that the formalisation of knowledge management began in developed economies before influencing practices in developing nations.

Mungai (2019) analysed the practices adopted by Nairobi and found that, by the 1990s, developed countries such as Japan and the United States had incorporated knowledge sharing into their business models. In contrast, developing countries had taken longer to do so. Again, the paper stresses that the shift towards knowledge management in countries such as Malaysia was driven by initiatives undertaken by the Malaysian government, specifically the Knowledge Economy Master Plan, which redirected attention from production-related activities to knowledge-related ones.

In the specific context of Sub-Saharan Africa, Gimenez Fernandez, Sandulli and Bogers (2020) conducted a study on the liabilities of newness in innovative start-ups. Their findings revealed that the full potential of SMMEs is frequently constrained by a lack of technological capabilities and human resource limitations, which are often legacies of historical underdevelopment. Furthermore, Mazorodze and Mkhize (2022) examined knowledge sharing practices for innovation in higher education institutions and found that despite these historical constraints, the adoption of knowledge sharing has become a critical survival strategy for South African entities seeking to overcome resource scarcity.

Due to the project-based nature of the construction sector, it has been slower than other sectors to adopt new methods of knowledge sharing. Howorth and Robinson (2020) studied knowledge consolidation in family-owned businesses. They argued that small businesses rely primarily on the transfer of tacit knowledge from one generation to the next, using family ties to ensure the continuity of the family-owned company. Dikotla (2019), who conducted research on knowledge sharing in municipalities in Limpopo, also found that cultural and trust issues continue to hinder the adoption of formalised knowledge-sharing models in both the South African public and private sectors. As such, South Africa's construction SMME legacy continues to be characterised by a conflict between older, closed systems of knowledge retention and newer, collaborative systems of knowledge exchange.

2.6 Strategies for Knowledge Sharing Among SMMEs in South African Construction

Various strategies exist that support knowledge sharing among SMMEs in South Africa and across the globe. This section directly addresses objective two by

identifying and reviewing strategies that SMMEs employ to facilitate effective knowledge sharing. Knowledge has been discovered to be an intangible resource and intellectual capital that cannot easily be shared with other people considering the reluctance to do so. People desire to have an upper hand over their colleagues (Wen & Ma 2021). In their study on the antecedents of knowledge hiding, Wen and Ma (2021) found that the organisation's competitive environment has a direct positive relationship with employees' unwillingness to share their intellectual capital. This is because people view knowledge in the context of leverage. However, it has been realised that for effective knowledge sharing to take place, the organisation must share a culture that goes against individualism and competition every time.

A culture of teamwork must be established that fosters motivation, commitment, communication and a sense of belonging, thereby making the environment conducive for knowledge sharing. Those receiving and sharing knowledge should be afforded ample time for the shared information to be effective. This should be coupled with management support and the availability of resources that may be needed for effective knowledge sharing. A knowledge sharing framework contributes to the success of knowledge sharing within SMMEs, regardless of which sector of the economy it is in. The management of the organisation should be able to support knowledge sharing initiatives, offering guidance and at times delegating tasks in line with the sharing of knowledge (Anundel & Wunsch-Vincent 2021). Anundel and Wunsch Vincent (2021) highlight the importance of management support, describing it as a key enabler of strategy. Their study on knowledge transfer metrics shows that management support should involve more than just encouragement; it should also include the allocation of tasks requiring knowledge transfers. Some employees need to experience some degree of power to share with their work colleagues the knowledge they possess.

This is labelled effective leadership. It will then be easier in such instances to encourage employees to share their knowledge and tolerate mistakes as a learning step to perfection, not harshly criticising them. The literature suggests that teamwork improves performance and knowledge sharing even in instances of high pressure in the workplace. Being in a group may guarantee recognition for personal achievement, a sense of belonging, bounded power and creative autonomy, which means that an atmosphere of openness is created, which leads to sharing of ideas (Ainsworth *et al.* 2020). In the area of conflict resolution and collaboration, Ainsworth *et al.* (2020)

consider teamwork approaches a critical link in the integration of local and scientific knowledge. The study clearly indicated that belonging to a cohesive group provides recognition of personal achievement and the freedom for creativity, thereby fostering a culture of openness that reduces fear of judgment.

Within teams, there is a vast amount of experience that creates new knowledge within the organisation. The construction SMMEs would benefit from this, as the solutions they seek to a problem may be found in one of the team members and shared to the benefit of all. Knowledge sharing is not a process that comes naturally. A workforce that is motivated and committed is in a better position to share knowledge than one that is not. The reward system can be put into play to foster motivation, which may then culminate in commitment and successful knowledge sharing (Nsubuga-Mugoa, Williams & Gaytan. 2021). To tackle the issue of barriers to competitiveness, a systematic review on reward schemes conducted by Nsubuga Mugoa et al. (2021) focused on SMMEs. This study shows that fostering a teamwork culture, alongside implementing reward schemes, results in significant improvements in motivation and commitment towards knowledge sharing. It was found that there is a link between perceptions of benefits and the intention to share knowledge.

In the same vein, trust guarantees knowledge sharing, as employees trust that leadership is directing them in the right direction. Thus, management may be better positioned to drive knowledge sharing processes through employees without much resistance. This trust also involves both ways for management, which does not trust that its employees cannot put itself in a position to include them in decision-making processes, including knowledge sharing. Thus, fostering trust, motivation and commitment is key to successful knowledge sharing among South African construction SMMEs (de Andrade, Pinheiro, Pontes & Pontes. 2023). De Andrade et al. (2023) analysed knowledge sharing in emerging economy startups and found that trust-based strategies are particularly effective in resource constrained environments. Their findings confirmed that fostering trust, motivation, and commitment is key to successful knowledge sharing, a strategy that is highly relevant for South African construction SMMEs operating under similar economic pressures.

2.6.1 Relevance and Applicability of Knowledge Sharing Strategies in South Africa

The complexity of the knowledge sharing process in the South African context poses some challenges. Without a doubt, knowledge sharing is important and relevant in South Africa, as it is in any other country. South Africa has been under colonialism, with black business shunned and discouraged. However, after independence, there was a turn around on the SMMEs of minority groups of society (Yeboah 2023). This comprehensive review of knowledge sharing in organisations found that the post-apartheid era necessitated a shift in organisational culture, where knowledge sharing became a critical tool for integrating previously marginalised groups into the mainstream economy. Knowledge sharing then became one of the ultimate weapons for black communities to develop their small businesses and be more competitive at the national scale. However, this does not mean that every organisation or SMME adopted and benefitted from the concept.

Evident from well-established entities in South Africa reveals why even governmental institutions fell short of the mandate of knowledge sharing (Barbier & Tenengeh 2023). The local government of South Africa is characterised by top management, which negatively affects the attitude of employees towards knowledge sharing. Nsubuga-Mugoa (2021) argues that employees share knowledge freely and effectively when top management provides undivided support. The author's systematic review of reward systems within SMMEs found that this support is the primary driver of knowledge sharing behaviour, concluding that without visible endorsement from leadership, employees perceive knowledge sharing as a risk rather than a strategic imperative (Kokt & Makumbe 2020). Thus, this will instil a positive attitude and confidence in employees.

A study carried out in Stellenbosch Municipality in South African by Ncoyini and Cilliers (2016) revealed that top management fell short of knowledge sharing in terms of awareness and culture, especially in the ICT Department (Nelufule & Abrahams 2024). Senior management demonstrated being unaware of the concept of knowledge sharing. This meant that the concept was not practised and hence was not easily applicable to them. This picture is present in municipalities, and the same prevails in SMMEs, showing how deep the roots of ignorance of the concept run in different

sectors of South Africa's employment. The culture of the organisation plays a significant role in facilitating the learning, sharing and creation of knowledge. South Africa is characterised by diversity even in its workplaces. These cultural differences have been found to have a negative impact on knowledge sharing.

Dikotla (2019), who quoted a study performed by Dikotla, Mahlatji and Makgahlela. (2014), provides a relevant example using Limpopo Province individuals from different ethnic groups employed in the government sector. This study on knowledge sharing in selected municipalities shows that cultural barriers are a significant obstacle to the flow of information. It is observed that workers from diverse backgrounds face difficulties in establishing sufficient trust for sharing tacit knowledge. The existing cultural differences made it impossible to share the knowledge they possessed. The northern Sotho expression reads "*kgomo ga e ntšhe boloko ka moka*", which means that one should not or cannot share with others his or her entire knowledge. This was the case in workplaces characterised by diversity. The older generation of South Africa is yet to fully realise the concept of knowledge sharing and is still cling to the belief that knowledge is power. This can be the colonial era kind of thinking which is still common in most structures of large or small organisations in South Africa. Thus, the concept of knowledge sharing has yet to be fully accepted or understood and inapplicable in the South African context.

2.7 Factors Enabling Knowledge Sharing Among SMMEs

This section directly addresses objective three by analysing the factors—individual, organisational, technological, and relational—that enable knowledge sharing in SMMEs. Several factors can motivate employees to share their expertise, including mutual benefits, rewards, and trust (Yeboah, 2023). The factors that enable knowledge sharing in SMMEs can be categorised into personal factors, organisational factors, technological factors and other external factors, such as government policies, industry networks and collaboration that facilitate knowledge sharing.

2.7.1 Individual or Personal Factors

Yeboah (2023) believes that knowledge sharing rests on the quality of the relationship that exists between the one seeking knowledge and the knowledge provider. This is a matter of mutual trust and reciprocity, which are the most essential factors for

knowledge sharing, even in SMMEs. However, Anand *et al.* (2019) argue that organisations can benefit from knowledge sharing only if workers establish a connection that is deep enough to understand the thoughts of the knowledge provider. In addition, this also works if there is a strong social bond between the seeker of knowledge and its provider. This empirical investigation into the role of humility and social bonds in knowledge sharing found that organisations only benefit from knowledge sharing when workers establish a deep social connection that allows them to understand the provider's intent

In addition, Anand, Walsh and Moffett. (2019) established that trust in teamwork influences individuals' knowledge sharing behaviour, both externally and internally. Their findings confirmed that trust in teamwork significantly influences individual knowledge sharing behaviour, both externally and internally, creating a safe environment for exchange. This also prevails in multinational corporations, where distance and diverse cultures create mutual trust and reciprocity that enable knowledge sharing.

Rewards and motivation are other individual factors that support knowledge sharing (Yeboah 2023). People tend to share if they perceive that they will benefit from it financially or in any other way, such as recognition at work. Chaughary, Islam, Ali, and Jamil (2022) reported an association between paternalistic leadership and the Islamic work ethic. In terms of motivation, the researchers found a strong positive association among motivation, rewards, and knowledge sharing. In other words, employees are more willing to share their knowledge when they perceive an opportunity to receive compensation, whether monetary or nonmonetary.

The reward mechanism is very important, given the people's time, energy and knowledge, which are in short supply. The pursuit of reputation within a team or organisation motivates employees to engage in knowledge sharing, as it helps them attain promotions and exposes dysfunctional team members. Several studies have confirmed a positive relationship among motivation, reward, and knowledge sharing (Chaughary et al. 2022).

2.7.2 Organisational Factors

According to Podrug, Filipović, and Kovač (2017), at the organisational level, there are also various factors that have been shown to have a positive influence on knowledge

sharing. These include, among others, the culture of the organisation, leadership, the reward system of the organisation and organisational structure. The support of top management and leadership is essential for effective and successful knowledge sharing with organisations, well-established organisations and SMMEs alike. The empowerment of leadership has been found to significantly affect knowledge behaviours (Yeboah 2023).

Contemporary research on knowledge sharing has argued that organisational structure is a very important factor that either facilitates or impedes the sharing of knowledge in the organisation (Gupta & Achhnani 2024). The authors argued that organisational structure is a critical determinant. Their research indicates that structures promoting flexibility are more effective at nurturing dynamic capabilities than rigid hierarchies.

The organisational structure should be tailored in a way that promotes flexibility to encourage collaboration and the sharing of knowledge within and across organisational boundaries and stakeholders. An organisational structure that puts emphasis on centralisation, rules and regulations and control systems may act more as a barrier than as an enabler to knowledge sharing; thus, there is a need for participatory management practices that balance management or leadership involvement and subordinates in areas of information processing, decision-making and problem solving (Yeboah 2023).

As alluded to earlier, perceived or real rewards and penalties for individuals who are willing to share or hide knowledge influence the process of knowledge sharing. The reward system of organisations shapes the knowledge-sharing behaviour of employees through monetary and non-monetary incentives, which range from salaries and bonuses and promotions to job security (Javed, Javed, Mukhtar, & Qiu. 2019). Reward systems influence behaviour in two ways - financial and non-financial, as described by Javed et al. (2019). Employees are more likely to share their knowledge with colleagues when they are appropriately rewarded; this can be through payment, incentives, or job security, and it demonstrates their contribution to the team.

Knowledge sharing must be adequately compensated if SMMEs or organisations in general want to glean the most out of it. Therefore, employees are more willing to share knowledge when adequate compensation is involved. In addition, Yeboah

(2023) posits that an organisational culture that offers encouragement, respect for the ideas of employees, practices effective communication and feedback and facilitates creative skills and risk-taking tends to encourage employees to share their knowledge. The stronger the culture of an organisation, the greater the chances of sharing knowledge among its employees. Employees also tend to share knowledge in an organisation whose environment is characterised by a clear vision, mission and goals.

2.7.3 Information Communication and Technology (ICT)

It has been established that it is individuals and not organisations who share knowledge; however, the use of data at the organisational level has been a common feature in most knowledge sharing studies (Andersson, Angels, Ram, & Torben. 2016; Yeboah 2022). Knowledge is examined chiefly at the individual level but acquired, stored and used at the organisational level through ICT. ICT facilitates and enhances knowledge sharing by enabling individuals to reach beyond formal lines of communication. Through ICT, collaborative work and knowledge sharing are enabled. According to Islam *et al.* (2020), there are four roles of ICT in relation to knowledge sharing: overcoming constraints, improving task performance, increasing the range and speed of information access and identifying elements using technology. Islam *et al.* (2020) empirically verified that the role of ICT in knowledge sharing extends beyond simple connectivity. Their findings demonstrated that technology acts as a moderator for overcoming abusive supervision by providing alternative channels for knowledge flow, thereby improving task performance even in constrained environments.

With the recent advancements in ICT, there are increasingly sophisticated IT tools such as social media, that is, WhatsApp, Twitter and LinkedIn and Web 2.0 technologies, which include blogs and wikis that have been found to be more instrumental in knowledge sharing (Farooq 2018; Hag & Anwar 2019). Farooq (2018) developed a conceptual model confirming that Web 2.0 technologies significantly enhance the speed and reach of knowledge sharing. The study found that these tools democratise access to information, enabling employees to bypass traditional hierarchies and share tacit knowledge more freely.

2.7.4 Team Interactions

Having regular face-to-face work sessions or workshops facilitates knowledge sharing. Conferences, knowledge networks, team-building exercises and organisational

learning foster knowledge sharing (Anand & Walsh 2020). In their study on knowledge-sharing processes among SMEs, Anand and Walsh (2020) found that the learning potential of interactive learning is higher than that of passive learning. According to the findings, the ideal platform for this learning is the social interaction prevalent among SMMEs, as it helps build the necessary trust for sharing confidential business information. Interactive learning offers more ammunition for knowledge sharing than does passive learning. The sharing of knowledge can involve interactions that are informal, such as organisational parties, or voluntary interactions with the community members in which an organisation works. Informal face-to-face social interaction has been found to be more efficient in the context of SMMEs in terms of knowledge sharing. However, all this may depend on the eagerness and willingness of individuals to share, as interaction does not guarantee fruitful or educative conversations.

2.7.5 Leadership Style

The type of leadership governing an organisation can encourage or discourage knowledge sharing within it. Empirical evidence indicates that transformational leadership promotes a culture of knowledge sharing more than other leadership styles. Transformational leadership promotes organisational innovation and the risk of employees; hence, it encourages open discussion and the sharing of ideas that may be beneficial to the development of an organisation (Ayestarán, Gómez, Martínez-Moreno, Lira & Costa. 2022). Ayestarán *et al.* (2022) developed a framework for 21st-century organisations and identified transformational leadership as a key antecedent of knowledge sharing. Their empirical findings showed that when leaders communicate their vision and provide intellectual stimulation, employees' willingness to share both tacit and explicit knowledge increases significantly.

A positive relationship has been observed between transformational leadership and employee creativity, as mediated by intrinsic motivation and self-perception of creativity (Chaubey & Sahoo 2019; Chaubey, Sahoo & Khatri. 2019). Chaubey and Sahoo (2019) conducted a study on organisational innovation in the automobile industry and found a positive relationship between transformational leadership and employee creativity. Their analysis revealed that this relationship is mediated by knowledge sharing, suggesting that leadership mainly boosts creativity by first fostering an environment in which knowledge flows freely. Notably, transformational

leadership promotes a collaborative and inclusive environment that values open communication and trust. Teamwork is also encouraged, and hierarchical barriers are minimised to ensure that employees feel more comfortable sharing their insights or knowledge across the different levels of the organisation (Shafique, Ahmad, & Kalyar. 2019).

2.8 Factors Hindering Knowledge Sharing in SMMEs

This section addresses the third objective of the study, exploring the barriers and challenges that impede effective knowledge sharing in SMMEs. There are different reasons why people are reluctant to share knowledge. Yeboah (2023) noted that the knowledge source's lack of motivation is a major hindrance to knowledge sharing. In a systematic review of knowledge sharing in organisations, the author found that without intrinsic motivation or extrinsic rewards, employees perceive the cost of sharing time and effort to outweigh the benefits. A lack of knowledge-sharing awareness benefits, a lack of social networks, differences in gender, status inequality and educational level differences have been identified as individual barriers to knowledge sharing by researchers (Maitlo, Ameen, Peikari & Shah. 2019). Maitlo *et al.* (2019) examined knowledge-sharing barriers and found that status inequality and educational differences create psychological distance between employees, significantly reducing their willingness to share tacit knowledge.

There is little empirical evidence on the factors that hinder knowledge sharing among SMMEs, particularly when they operate in a single location. This environment is very conducive for knowledge sharing, considering the small numbers that an SMME possesses and the close contacts of employees. The situation becomes worse only when an SMME starts to expand, especially to multiple locations (Lartey, Shi, Jaladi & Afriyie. 2022). Lartey *et al.* (2022) examined barriers to tacit knowledge transfer. They found that as companies grow and become geographically dispersed, their social capital declines, leading to the formation of information silos. At this stage, they begin to face some of the same issues experienced by large enterprises, such as resource constraints, which may or may not facilitate knowledge transfer.. Employees then feel entitled not to share knowledge with another department, fearing loss of control and authority over that knowledge. It may then become departmental competition that does

not foster openness and effective communication, which undoubtedly impacts knowledge sharing.

2.8.1 Organisational Culture

If every employee could enjoy the benefits of shared knowledge without bearing the costs of contributing, no one would cooperate; that is, everyone would free-ride. This is another risk inherent in knowledge-sharing processes (Yeboah, 2023). The influential organisational barrier to knowledge sharing is organisational culture. SMMEs should encourage knowledge sharing, as obstacles to successful knowledge sharing are primarily attributable to organisational culture (Kokt 2020). The people in an SMME are usually aligned by shared beliefs and cognitive schemes that can be relatively easily shaped by the owners of the entity (Al-Kurdi *et al.* 2020). The culture fostered by the owners of small businesses is not always suitable for knowledge sharing, but in most instances, since they want to control all the strategic management of their firms, they end up lacking in knowledge management processes and demotivating the employees to share the knowledge they possess openly, as they receive no reward or enough recognition (Javed *et al.* 2019). Such firms may also take time to realise the immediate benefits of knowledge sharing and its utilisation for short- or long-term goals, such as establishing an SMME (Al-Kurdi *et al.* 2020). The scholars conducted empirical analysis on the role of organisational climate and found that an environment of distrust and lack of open communication has a highly negative relationship with employees' willingness to share knowledge (Al-Kurdi *et al.* 2020). The data showed that when senior management does not demonstrate a desire to share their own knowledge and instead requires employees to share theirs, employees perceive this as a necessary evil (burden) rather than as something they do for the good of the organisation.

2.8.2 Internal Culture

This pertains to the leadership mechanism, which comprises the style and philosophy by which an organisation is identified. The culture of an SMME or organisation can be bureaucratic in nature, extremely rigid, high in ethical standards, less concrete in terms of supervision and lacking in openness and collectively (Khaksar, Chu, Rozario & Slade. 2020). Khaksar *et al.* (2020) investigated knowledge-based dynamic capabilities and found that rigid, bureaucratic cultures stifle the spontaneity required

for tacit knowledge exchange. Their study confirmed that internal cultures characterised by strict hierarchy and a lack of autonomy negatively affect knowledge workers' productivity. If interpersonal relationships and social trust, which are effective for internal communication, are lacking, so is knowledge sharing. The reward systems with the organisational structure also determine the flow of information between people. In an organisation, if individuals start to be extremely conscious of their titles and seniority or rank, this becomes an obstacle to knowledge sharing. Seniors may be reluctant to share their knowledge for fear of being challenged in their positions or surpassed in rank by their subordinates. Thus, this kind of thinking does not support knowledge sharing.

2.8.3 Technology Impacts

Technology is gaining more ground every day in twenty-first century organisations. For an organisation to sail through technological advancements, a central database that stores and disseminates knowledge among people in an organisation must be designed. Technology offers the fastest means of communicating any information to be shared in a timely manner (Ode & Ayavoo 2020). Ode and Ayavoo (2020) examined the mediating role of knowledge application and found that while technology facilitates speed, it cannot compensate for a lack of knowledge application processes. Their findings highlight that without user-friendly interfaces and training, technology becomes a barrier rather than an enabler. Technology facilitates effective knowledge sharing regardless of geographical location, enabling employees from different locations to be constantly in touch. However, this noble it may be that technology comes with expenses, most of which the SMMEs are not able to cater to. The machinery and expertise may prove to be expensive for SMMEs; thus, by the end of the day, they do not share the benefits of technology, which include successful knowledge sharing. Technology has made it possible for large volumes of data to be available and accessible more rapidly; however, it now depends on the organisational culture if it is in support of the adoption of this technology. Additionally, risk may be encountered by SMMEs who adopt technology if leadership or management fails to initiate effective control and protect access to important documents except authorised persons (Lartey, Shi, Jaladi & Afriyie. 2022). According to Lartey *et al.* (2022), one of the major technological challenges is posed by security threats. This indicates that fear of breaches and unauthorised use of valuable intellectual property has, in most

cases, led SMME owners to restrict access to knowledge platforms, thereby hindering knowledge flow.

2.8.4 Individual Characteristics

A particular knowledge resource an individual possesses is key to great accomplishments and performance. An organisation with greater knowledge capital can enjoy long-term sustainability (Castellani, Rossato, Giaretta & Davide. 2021). Castellani et al. (2021) explored tacit knowledge sharing in knowledge-intensive firms and found that individual characteristics, specifically the 'expert mindset', can act as a barrier. Their analysis revealed that individuals with high levels of specialised knowledge are often less willing to share it if they perceive that their unique value to the firm will be diminished. This means that an individual is a valid stakeholder and custodian of this knowledge, which benefits the organisation (Kim & Park. 2020). It then becomes the individuals' decision to either share or retain this knowledge. However, because individuals fear their job security and possible replacement, they tend to cling on this knowledge, which they believe will keep them a valid asset to the organisation as long as they can leverage it (Yao, Crupi, Di Minin & Zhang. 2020). Yao et al. (2020) studied technological innovation in SMEs and found a negative correlation between job insecurity and knowledge sharing. Their empirical results demonstrated that employees are significantly more likely to hoard knowledge when they feel their position is threatened, using knowledge as a shield against redundancy. Individuals crave control and promotion and feel that it is within their right to experience that, through knowledge, which will be unique to them. This has been found, however, to have negative consequences for the growth and sustainability of an organisation, considering that information that would have empowered the majority of employees and led to organisational growth would be inhibited within a single person (Ode & Ayavoo 2020).

2.9 Theoretical and Conceptual Framework for Understanding Knowledge-Sharing Behaviour

While the preceding sections have defined knowledge sharing and its contextual factors, a robust theoretical framework is required to analyse the underlying drivers of

an individual's decision to share knowledge. This section contributes to objective five by presenting the theoretical and conceptual frameworks that inform the study and serve as the basis for developing a framework to enhance knowledge sharing. Knowledge sharing is not a simple action; it is a complex socio-psychological behaviour. Therefore, a single theory cannot explain its various aspects. For this reason, the current research adopts a comprehensive conceptual framework that aims to integrate three prominent theories to provide a complete perspective for analysis. This framework will utilise the theory of reasoned action (TRA) and, by extension, its successor, the theory of planned behaviour (TPB), to try and identify the mental processes involved in sharing intentions. It then incorporates social exchange theory (SET) to understand the relational dynamics, motivations, and cost–benefit calculations that moderate this intention. By integrating these perspectives, the framework helps to investigate not only why an individual might want to share knowledge but also the social and motivational factors that determine whether that intention translates into action within the context of construction SMMEs. These theories integration enables the study to curb the gap between micro-level individual decision-making and macro-level organisational outcomes, addressing the specific structural constraints of the construction industry.

2.9.1 The Cognitive Pillar: Intention, Attitude, and Control

The foundation for understanding an individual's behaviour lies in their intention to act. The TRA provides the initial model for this, positing that behavioural intention is the most direct predictor of behaviour and is shaped by two key constructs: attitudes and subjective norms (Fishbein & Ajzen 1967; Luturmas & Indarti 2016). The first of these is Attitude Towards Behaviour, which refers to an individual's positive or negative evaluation of performing a specific behaviour. It is determined by their belief that the behaviour will lead to certain outcomes and their assessment of those outcomes (Vallerand *et al.* 1992). In the context of this study, Ghasrodashti (2017) applied similar behavioural reasoning and found that an SMME operator is likely to have a positive attitude toward knowledge sharing if they believe it will lead to desirable outcomes, such as winning more contracts, solving problems more efficiently, or increasing profitability. The second element is the subjective norm, which represents the perceived social pressure from important referent others like peers, mentors, or industry leaders, to either perform or not perform the behaviour (Doswell *et al.* 2011).

Abdullah (2022) found that an operator is more likely to intend to share knowledge if they believe that respected figures in the construction industry approve of and engage in such practices.

Recognising that human action is not always under complete volitional control, Ajzen (1985; 1991) expanded the TRA to develop the TPB. The TPB retains the core components of attitudes and subjective norms but adds a crucial third dimension of perceived behavioural control (PBC). This is the perceived availability or lack of ease of performing the behaviour in question, encompassing internal sources such as self-efficacy and ability and external sources such as the availability of time, technology, and resources (Yang & Xu 2021). For a construction SMME, high PBC would thus mean that the owner feels that they have the necessary software, efficient team structure, and individual capability to implement knowledge-sharing practices successfully. The TPB hence proposes a more inclusive cognitive model, suggesting that the intention to share knowledge is highest when a person has a favourable attitude, perceives supportive social norms, and believes that they exercise high levels of control over the action (Bosnjak, Ajzen, & Schmidt. 2020; Conner 2020). The TPB has repeatedly been validated as a predictor of intentions to share knowledge and has been shown to outperform theories that neglect the crucial component, perceived behavioural control (Bock et al. 2005; Giselle 2021). Specifically, Bock *et al.* (2005) empirically demonstrated that perceived behavioural control is a significant predictor of knowledge-sharing intention, particularly in environments where external barriers, such as time pressure in construction projects, are prevalent.

2.9.2 The Relational Pillar: Costs, Benefits, and Trust

Social Exchange Theory (SET) is an essential element in explaining the relational and motivational processes that underlie the transition from intention to behavioural performance, as proposed by the Theory of Planned Behaviour (TPB). SET is derived from Homans' (1961) work. It maintains that all social behaviour is best understood as an exchange process, where an actor typically behaves to maximise rewards and minimise costs (Cropanzano *et al.* 2017). Unlike in strictly economic exchanges, however, those rewards and costs may be both material and immaterial, with trust, reciprocity, and social approval central to the exchange (Wang *et al.* 2015). In the case

of knowledge sharing by an SMME operator, SET would then mean that even with a favourable intention to share, an unconscious weighing of certain factors would occur.

On the one hand, for the perceived benefits, the returns one hopes to receive from sharing. A monetary reward is the intangible value of a better professional reputation, increased self-esteem, the satisfaction of helping others, and the expectation of acquiring valuable knowledge in return (Zhou *et al.* 2019). Zhou *et al.* (2019) further examined the role of self-image and peer influence. They found that intangible rewards, such as professional reputation, are often more powerful drivers of sharing behaviour than monetary incentives in social networks. On the other hand, there are the perceived costs and the disadvantages or ill effects of sharing. One important cost is the knowledge codification effort—the time and effort required to explain and share tacit knowledge, which would otherwise have been devoted to other profitable pursuits (Kankanhalli *et al.* 2005). The most significant issue, however, is individuals' fear of losing their perceived knowledge power, as they worry about losing their competitive advantage and job security if they share their unique skills and knowledge with others (Akhavan *et al.* 2015; Ode & Ayavoo 2020). According to empirical findings from Akhavan *et al.* (2015), the fear of losing unique value is one of the main obstacles to knowledge sharing. As a result, individuals tend to withhold knowledge to preserve their position within the competitive hierarchy. The SET component of the framework offers the vital motivational layer to this argument; it indicates that people will only share knowledge if they believe the potential benefits of the exchange outweigh the perceived costs.

2.9.3 The Integrated Conceptual Framework for This Study

This study proposes an integrated conceptual framework that synthesises key concepts from the literature and the cognitive elements of the TPB with the relational dynamics of SET (see Figure 2.1). The framework captures the process of knowledge sharing within the specific context of South African construction SMMEs. The model proposes that a knowledge sharing decision begins with a set of pre-existing antecedent conditions, both enabling factors (such as trust, leadership, and supportive culture) and hindering factors (such as resource constraints and fear of loss of power). These macro level conditions directly influence the micro level core individual decision-

making process. This core mechanism is represented by a combination of theories: first, an individual's intention to share knowledge is created on the basis of individual attitudes, perceived subjective norms, and perceived behavioural control (TPB). This intention is moderated by an unconscious social exchange calculation, in which the perceived benefits of sharing are weighed against the perceived costs under strong trust influence (SET). When a decision is positive, it is translated into the most important knowledge-sharing behaviour, both explicit and tacit. It is not an end, nor the end in itself, but the catalyst to a chain of positive outcomes.

The conceptual framework shows how effective knowledge sharing is translated into tangible intermediate outcomes in the form of greater organisational learning, greater innovation, greater problem-solving capabilities, and enhanced employee performance. The aggregation of the benefits in the terminal outcomes results in the final and most important dependent variable of the study: long-term SMME growth and the SMME's sustainable competitive advantage in the competitive construction industry.

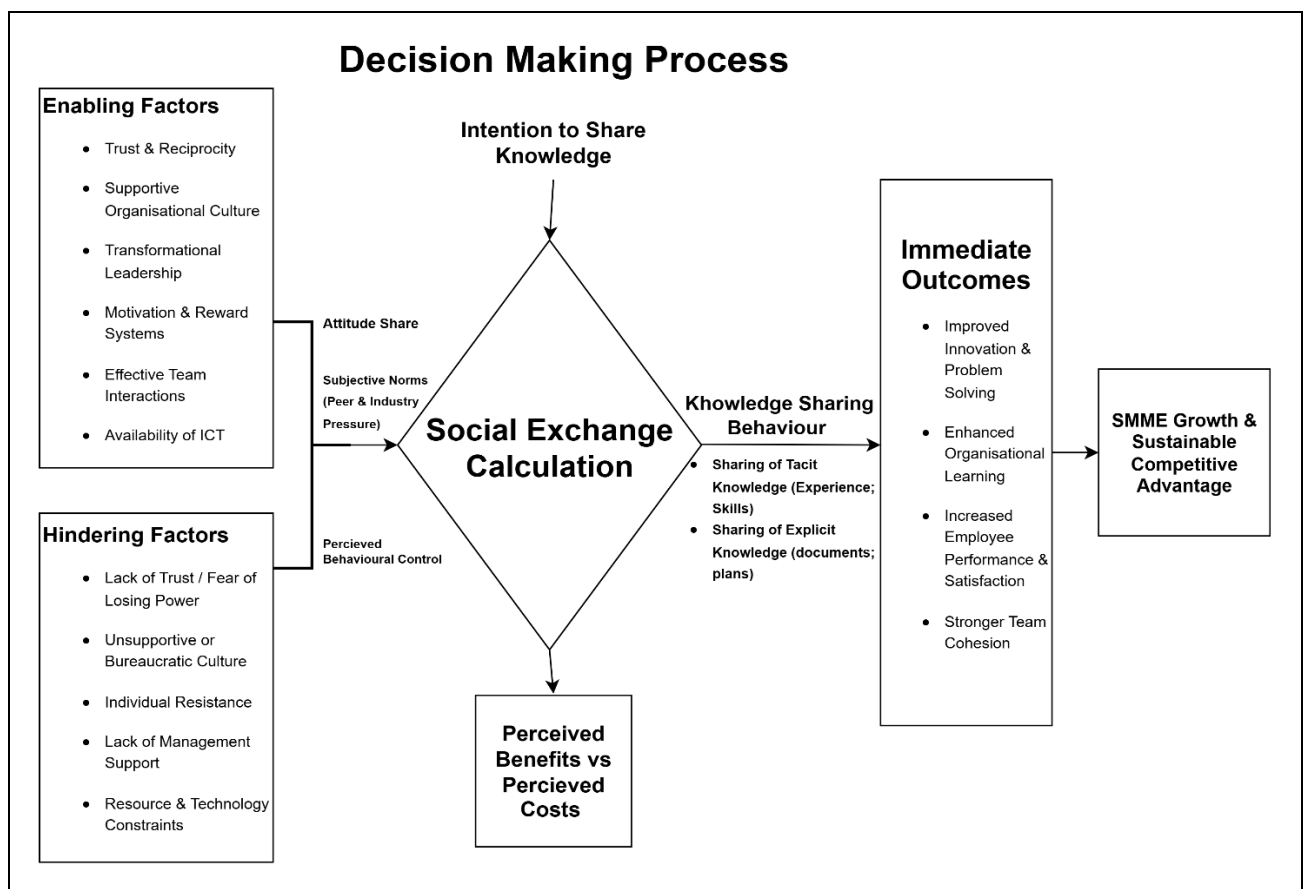


Figure 2.1: An Integrated Framework for Knowledge Sharing in South African Construction SMMEs

Source: Own Illustration

2.10 Chapter Summary

This chapter provided a broad theoretical overview of the central concepts underlying the research. It began with a description of the multifaceted nature of knowledge before it was positioned within the knowledge management context. The general theme of knowledge sharing was then described at length, including definitional, historical, and strategic conceptualisations of how best to advocate for it. The review continued logically to consider the general facilitators of effective knowledge sharing – such as leadership, trust, and organisational culture – and the general barriers to it, such as individual resistance and structural barriers. Having set out this general theoretical framework, the next chapter will now position the principles within context, applying them specifically to the research setting of SMMEs in South African construction.

Chapter 3: Contextual Literature Review: SMMEs in the Construction Industry and the Role of Knowledge Sharing

3.1 Introduction

Building on the theoretical concepts from the previous chapter, this chapter examines knowledge sharing and knowledge management within the high-risk environment of SMMEs operating in South Africa's construction sector. It describes the characteristics of SMMEs and the South African construction industry, and the role these entities play in the country's economy. Furthermore, this chapter offers an overview of how knowledge is shared in this context and evaluates the potential of knowledge sharing to support the development of these businesses. It also identifies how knowledge sharing can address unique challenges faced by the South African construction sector, as well as the documented impacts on firms and sustainable business practices. Furthermore, this chapter presents a contextual literature review of the application of general knowledge-sharing theories to the daily operations of SMMEs in the construction industry.

3.2 Defining SMMEs

The definition of SMMEs is not universal considering that various countries and businesses use their own judgement when defining enterprises (World Bank 2017; Roopchund 2020; Cucculelli & Peruzzi 2020). This variation in definitions is generally based on the value of products, total or net worth, annual turnover, employee number or fixed investment (Zhou 2021). There is a general consensus among scholars that SMMEs or SMEs are the main source of job creation in the world as well as the engines of the world's economies (Wiklund, Nikolaev, & Shir. 2019; Morais & Ferreira. 2020). Virglerova, Khan and Martinkute-Kauliene. (2020) also agreed that SMMEs impact economic growth and progress. As alluded to earlier, the definition of SMMEs varies across countries and scholars; thus, some definitions are based on the number of employees employed by an entity, whereas others consider business financial turnover (Bloese 2018).

According to the United States Small Business Administration (US SBA 2018:1), "an SMME shall be deemed to be one which is independently owned and operated and

which is not dominant in its field of operation.” Blose (2018) goes on to view SMMEs as enterprises that do not operate or experience profits that are at par with large corporations or well-established large businesses in the country. In the literature, the terms “small business”, “small enterprise”, “SME” and “SMME” are generally used interchangeably. The Banking Association of South Africa (2019) and the National Small Business Amendment Act (26 of 2003) classified manufacturing businesses with 200, 50, 20 and 5 employees as medium, small, very small and micro-enterprises, respectively.

The European Commission (EC, 2016:4) had the following view on an SMME, “a microenterprise is a business with up to 10 employees; a micro- or small-sized enterprise has up to 50 employees, and a medium-sized enterprise has fewer than or equal to 250 employees.” Similarly, the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP 2016:4) offered the following definition, “medium-sized enterprises are those having an annual average number of employees not exceeding 99 persons or total assets not exceeding 1 billion kips (Estimated at that time to be R185.10).” The United Nations, quoted by Blose (2018), noted that an SMME should have in its employment 1 to 250 people. Sharma *et al.* (2020) revealed that the SMME environment is divided into three sets of enterprises, the first being survivalist enterprises, which are mainly found in the informal sector; the second being micro-enterprises, which are composed of the owner, family members and four employees at most; and the third being the one found in the formal sector of the economy (South African Small Business Amendment Act No 26 of 2003). For this study, the definition of SMMEs adopted is that set out in the South African Small Business Amendment Act No. 26 of 2003.

In South Africa, the definition of SMMEs is based on firm size, number of employees, and turnover bands. Ayandibu and Houghton (2017), who focus on the Standard Bank of South Africa, classify an SMME as a registered firm with fewer than 250 employees and a turnover of between R150 000 and R5 million. A study by the International Finance Corporation (2019) on the South African SMME sector highlighted the lack of clarity regarding the definition of SMMEs. The Small Enterprise Development Agency (SEDA) adopted a broader definition of SMMEs, including formally registered entities, non-value-added tax (VAT) registered and informal organisations. Therefore, SMMEs can have different ownership structures, ranging from family-owned businesses

employing more than 100 people to informal, self-employed, survivalist enterprises (Zhou 2021). This section contributes to objective one by situating SMMEs within the South African context, highlighting their historical and structural legacy.

3.3 The Construction Industry

The construction industry is a paramount industry worldwide and is generally defined as an important sector of the economy. Watermeyer and Phillips (2020) highlight that the industry has been at the forefront of infrastructure development and job creation within the changing post-apartheid South African economy. Various countries attain economic growth through this sector, although there may also be challenges that affect the goal of the project and the economy's steady growth. The construction industry is a highly hazardous industry that comprises a wide range of activities that involve planning, designing, constructing, altering, maintaining, repairing, building demolishing, civil engineering works, mechanical and electrical engineering and other works of a similar nature (Occupational Safety and Health Administration 2021). Data from the Occupational Safety and Health Administration (2021) indicates that the complexity of these activities directly correlates with higher incident rates, necessitating stringent knowledge sharing protocols regarding safety.

In general, construction is inherently complex, making the industry highly susceptible to disputes, delays, and cost overruns. The construction industry comprises numerous parties and stakeholders, including clients, professional advisers, professional bodies, contractors, suppliers, manufacturers, financial institutions, research and development bodies, and public authorities (Constructing Excellence 2021). In addition, Constructing Excellence (2021) highlights that stakeholder fragmentation creates information silos, which are a primary barrier to project efficiency.

The construction sector contributes significantly to South Africa's economy and development. As Kissi *et al.* (2023) explain, the construction sector is an important driver of the economy, with building and engineering, as well as specialised trades, contributing substantially to GDP. In addition to being an essential part of the economy, it is a major source of employment opportunities. Dithebe *et al.* (2022) report that, although there are job opportunities, the construction sector faces numerous challenges, including very low productivity and a significant shortage of skilled

workers, both of which will affect the long-term sustainability of the construction industry. The construction sector also encourages technology development and exchange, provides numerous opportunities for the construction industry to grow and develop, and shapes the lifestyles of those who use constructed products.

The construction industry is categorised into three terms of work by Procore Technologies (2024): building construction, infrastructure construction and special trade construction. Building construction involves the construction of residential, industrial, farm and commercial buildings. Infrastructure construction is more heavily oriented toward heavy works, including roads and highways, sewers, bridges, railways, irrigation projects, and flood control projects. The final category of special trade construction includes projects such as plumbing, painting, fittings, and electrical work. According to Procore Technologies (2024), special trade construction is particularly reliant on tacit knowledge transfer due to the specialised nature of the skills involved. The construction industry produces a wide range of products, and small or local enterprises account for most of them. Despite globalisation and the international construction industry, local firms typically undertake most construction activities in their respective areas. However, construction enterprises typically outsource the goods and services required for the production process. Specialised services are primarily provided by subcontractors, and labour agents are responsible for providing labour.

In the context of South Africa, in 2022, the construction sector constituted approximately 3% of South African GDP, with a value of approximately US\$9.6 billion (Cowling 2023). Cowling (2023) analysed market reports and found that despite this contribution, the sector's growth is hampered by a lack of digital integration and knowledge-retention strategies. The projected growth rate for the industry was 9.1% in the same year. According to the South Africa Construction Market Report (2022), in 2022 alone, the South African construction sector contributed an estimated 107 billion rand (approximately 5.9 billion United States dollars) towards the country's GDP. This represented a decline compared with the previous year, specifically 2021, when the GDP was approximately 111 billion rands, according to Cowling (2023). The author argues that the decreased performance may, among other factors, be a consequence of inefficient project execution, where better knowledge transfer may have been

achieved. Despite this reduction, it is apparent from the information that a significant role exists in the construction industry with regard to economic sustainability.

3.4 Knowledge Sharing and Its Importance in the Context of SMMEs

Knowledge is currently viewed as the most important resource for an organisation to gain competitive advantage (Bagnoli, Dal Mas, Lombardi, & Nucciarelli. 2020). Bagnoli *et al.* (2020) conducted a case study on business model tensions and found that translating knowledge into actionable strategies allows organisations to resolve the conflict between economic goals and social values. However, there is a need to effectively manage and share this knowledge to successfully derive the advantages embedded in it. Rossignoli *et al.* (2024) noted that knowledge sharing affects the performance and competitiveness of SMMEs, specifically through the strategic management of key knowledge assets, which ensures long-term viability.

The world is rapidly changing, with new problems springing in organisations as well as old problems continuing to pose challenges. Apte, Lele, and Choudhari. (2022) note that issues such as climate change and unpredictable pandemics disadvantage mainly small businesses in their early stages of operation. In their study of an Indian engineering services organisation during the COVID-19 pandemic, these researchers found that knowledge management systems were instrumental in maintaining operational continuity and facilitating remote collaboration. Thus, a SMMEs' readiness and preparedness to cope in such an environment ensures its survival. Knowledge sharing is one of the solutions that enables small entities to share ways to survive in any eventuality striking and be knowledgeable in ways to sail through the challenges that might arise.

Knowledge plays an important role in driving the value of an organisation, especially in the current era of the knowledge-based economy (Ha & Lo 2018). Jeong, Lee, & Park. (2022) examined sustainable growth in South Korean firms and found that knowledge services significantly impact organisational performance when aligned with balanced scorecard metrics. Individuals who possess knowledge that is valuable for achieving and sustaining organisational performance also have a bearing on organisational sustainability. Therefore, organisations that are effective in knowledge

sharing perform well in competitive markets, considering that relevant and competitive information will be shared across departments of the organisation, increasing competitiveness (Ohemeng & Kamga 2020). The analysis of administrative leadership in developing countries by Ohemeng and Kamga (2020) revealed that institutional entrepreneurs who facilitate knowledge sharing are essential for establishing performance management systems.

Li *et al.* (2020) believe that the capacity of knowledge sharing assists in the adoption of new technologies and enhances organisations' dynamic capabilities. They utilised a mediated moderation model to show that knowledge management practices directly influence entrepreneurial performance by enhancing the firm's innovation capacity. SMMEs enable them to preview technologies, helping them remain competitive in twenty-first-century markets and remain flexible in adapting to a changing work environment. Researchers argue that knowledge sharing enhances the dynamic capabilities of both individuals and organisations, leading to the development of new products and enabling entrepreneurs to absorb change while simultaneously demonstrating a willingness to pursue competitive advantage (Li *et al.*, 2020).

Knowledge sharing may result in improved efficiency, better business effectiveness, improved trust, enhanced innovation, reduced costs and better teamwork or performance (Al-Kurdi *et al.* 2020). Their findings in academic settings indicated that a positive organisational climate, characterised by trust, significantly increases the willingness to share knowledge, thereby reducing operational silos. Most SMMEs operate in a profit-maximisation culture to expand, and knowledge sharing enables cost reduction by keeping teams updated on trends, thereby making other organisations, large or small, more profitable. In South Africa, SMMEs in various organisations, their managers and owners have started to become more aware of the power that knowledge sharing possesses towards competitive advantage (Li *et al.* 2020). This followed the realisation that employees accumulate a wealth of knowledge over many years of service at a firm. Upon their departure due to transfer, retirement or death, accumulated knowledge leaves with them (Castellani *et al.* 2021). Although South African firms still lack sound knowledge-sharing initiatives, the few that have effectively practised them ultimately gain a competitive advantage (Adesina & Ocholla 2024).

Rossignoli, Lionzo, Henschel and Boers. (2023) argue that knowledge sharing is key in organisations' strategic development and that this applies to SMMEs as well. This research on family-owned SMEs has shown that Communities of Practice (CoPs) are practical tools that help these firms overcome resource constraints. A key link has been established between knowledge sharing and performance. Knowledge sharing practices in family-owned SMMEs are vital in a resource-constrained setting. Outsourcing information benefits family-owned SMMEs in maintaining their continuity, even when family members are involved. A study by Anand, Muskat, Creed, Zutshi and Csepregi (2021) showed that knowledge sharing enhanced the strategic focus of human resources at individual, group, and organisational levels, encompassing customer relationships, organisational learning, creativity, profitability, and positive effects on processes and decision-making. The authors also explained that antecedents such as organisational structure and organisational culture are significant catalysts of knowledge sharing in organisations. The results of this study also highlighted that knowledge sharing is related to innovation, trust, and improved performance in SMMEs.

The industrial ecosystem has been reshaped by the Fourth Industrial Revolution (4IR), and human capital flexibility has become a key factor in success (Mucha 2021). Mucha (2021) evaluated European investment funds and found that human capital development is essential for adapting to new industrial standards. Therefore, knowledge sharing is key to entrepreneurship and the development of small businesses. Moreover, knowledge sharing in regard to employees is crucial to the expression of entrepreneurial behaviours (Rahman, Mannan, Hossain, Zaman & Hassan 2018). Salamzadeh *et al.* (2021) examined digital startups and found that knowledge-sharing behaviour moderates the relationship between human capital and performance, thereby amplifying the value of employees' skills. Thus, knowledge sharing puts a firm in a position to access specialists who possess novel information at the appropriate time (Salamzadeh, Tajpour, Hosseini & Brahmi. 2021). In addition, knowledge sharing enables firms to think beyond and outside the box, enabling participants to have a glimpse of the global view of the organisational innovation and transformation (Al-Kurdi, El-Haddadeh & Eldabi. 2020).

Sharing knowledge encompasses, among other things, the exchange of experiences and expertise with others. Thus, knowledge sharing aids organisations, including

SMMEs, in maintaining quality within their companies (Habib, Abbas, & Noman. 2019). Castaneda and Ramírez (2021) found that cultural values are significant predictors of knowledge sharing, suggesting that sustainable organisations must cultivate values that align with open exchange. Additionally, knowledge sharing has been identified by Castaneda and Ramirez (2021) as a new development paradigm that helps update and align real-time with market trends, thereby ensuring the continuation of business. Companies that invest in knowledge sharing may achieve long-term operational performance, retain loyal customers, and, most importantly, become more competitive in the marketplace.

Knowledge sharing responds to the future challenges of companies, enabling the acquisition of new skills and approaches that align with the changing context (Johnson, Fletcher, Baker & Charles. 2019, Abbas, Zhang, Hussain, Akram, Afaq & Shad. 2020; Mohiuddin, Matei, Al-Azad & Su. 2022). Abbas *et al.* (2020) used a structural equation model to demonstrate that knowledge management mediates the relationship between innovation and sustainability in SMEs. Mohiuddin *et al.* (2022) additionally found that ICTs are essential for facilitating this sharing, but their effectiveness is contingent upon a supportive organisational culture. Considering that knowledge sharing is accompanied by an increase in creativity, which in turn leads to organisational learning, it has been pivotal for improving both individual and organisational performance (Deng, Duan & Wibowo. 2023). Deng *et al.* (2023) confirmed that digital technology-driven knowledge sharing significantly improves job performance by enabling employees to access relevant information efficiently.

3.5 The Relevance of Knowledge Sharing to the Construction Industry

Knowledge sharing has been shown to offer a plethora of benefits to various organisations and the construction industry among them. Kissi *et al.* (2023) note that the temporary nature of construction projects often leads to "organisational amnesia," in which valuable lessons learned are lost when the project team disbands. Cowling (2023) supports this view, arguing that without systematic capture, errors are repeated across sites. This knowledge becomes scattered in the various documents of construction firms. The same knowledge can be distributed across individual brains without a mechanism to retrieve it and share it among employees. Thus, it is essential

to establish a knowledge-sharing practice or platform from the outset to ensure that knowledge is readily shared and benefits its recipients in the construction sector, before it is diluted or scattered across various documents.

Knowledge sharing across a project is very paramount because it allows the transfer or use of readily proven knowledge to apply to subsequent projects. This allows employees to utilise the existing proven knowledge to solve problems instead of trying to develop new knowledge, which may be time-consuming and expensive (Kasimu & Leje 2019). Cowling (2023) analysed industry efficiency reports and found that the failure to transfer knowledge between projects is a primary cause of stagnating productivity levels in the South African sector. The construction industry is complex, and knowledge sharing prevents the complexity of the industry from delaying production or decision-making, given the availability of proven solutions. An organisation that lacks effective knowledge sharing becomes vulnerable to knowledge leaks. This clearly results in organisational inefficiency, marked by repeated errors, reliance on a few key individuals, duplicated tasks, and slow uptake of new ideas and methods.

Knowledge sharing ensures that, in the construction industry, personnel are not left behind by novel methods introduced through technological advancements, which affect the industry as a whole. Knowledge sharing within construction firms is vital, as it surely leads to knowledge application, innovation, and a competitive advantage for construction firms (Li *et al.* 2019). Li *et al.* (2020) utilised a mediated moderation model to show that knowledge management practices directly influence entrepreneurial performance by enhancing the firm's ability to innovate. However, it is worth noting that most of this knowledge is tacit; that is, it cannot be written down, hence, there is a need to develop methods to capture it in documents to ensure its continued sharing across the organisation.

According to Haq, Khan, Hafeez and Chughtai. (2022), knowledge sharing in the construction firm possesses the maximum value. These findings imply that trust and knowledge sharing between project teams play a crucial role in moderating perceived behavioural control, which in turn influences project performance. Al Kurdi *et al.* (2020) further expand on this concept of trust by demonstrating that, to break silos, it is vital to cultivate a trust-building culture; when this occurs, problem-solving speed increases

significantly. Within construction firms, knowledge sharing is both shared and relayed in ways that efficiently capture the professional experiences and characteristics that elevate data and information into knowledge. The training curve is accelerated to benefit the recipient, increasing their knowledge in the field of construction and, in turn, benefiting the industry (Haq *et al.* 2022). Employees view knowledge as a source of advantage within the organisation. Although there may be cultural barriers to implementing effective knowledge-sharing strategies and learning approaches within construction firms, these barriers are not significant, as employees have come to recognise the need for and value of knowledge sharing.

Professional firms possess distinct creative and management capabilities that benefit construction firms. Through knowledge sharing, the construction industry can access this knowledge and experience and derive the most from them; the industry has developed through such sharing. The project-based nature of the construction industry, as noted by Senaratne, Jin and Perera (2020), has been described as inhibiting knowledge transfer from project to project. This has been supported by Adesina and Ocholla (2024), who argue that, in developing nations, tacit knowledge lost as projects are completed is lost due to a lack of strategies to preserve it. The approaches in knowledge management then advocate that new knowledge created within construction projects should be recorded and passed up to the organisational level for later transfer to future projects. The networks of informal relationships in the construction industry are more likely to dismantle knowledge sharing; however, it is essential to build strong networks to enable wider sharing of project knowledge.

The downfall of the construction industry lies in a lack of knowledge sharing. Among all industries, the construction industry has relatively high accident and fatality rates, second only to the manufacturing industry. The Occupational Safety and Health Administration (2021) reports that high accident rates are often linked to a lack of shared safety information, noting that workers often lack knowledge of the risks associated with new tasks. Watermeyer and Phillips (2020) further highlight that construction firms implementing rigorous knowledge sharing protocols regarding safety hazards saw a measurable reduction in on-site incidents. These can be prevented by sharing knowledge on worker safety and between teams, equipping them with prior knowledge to avert the dangers that affected or cancelled previous

construction workers. Hence, knowledge sharing, as argued above, is highly applicable to the construction industry.

3.6 The Role of Knowledge Sharing in Fostering Growth and Sustainability

This section contributes to objective four by examining how knowledge sharing improves sustainability practices in SMMEs. Batool, Mohammad, Awang and Ahmad. (2023) reported a close relationship between knowledge sharing and personal satisfaction. In their study, Batool *et al.* (2023) found that when employees share knowledge, it enhances their psychological well-being and commitment. Knowledge sharing supports the working of employees together as a team in a variety of collaborations to solve problems or participate in common work duties. This allows intense interaction, idea sharing and the application of knowledge from members (Ahmad & Karim 2019), which foresees the expansion of the enterprise. Sogaxa (2024) further notes that intense interaction and idea sharing are prerequisites for sustainable business performance in the Eastern Cape construction sector.

Research has also identified knowledge sharing as a means by which organisations can expand intellectually (Dodla & Jones 2023). The authors found that knowledge management strategies are essential for systematising this intellectual expansion. Furthermore, Ngo Ndjama and Van der Westhuizen (2024) argue that this intellectual expansion is what allows SMMEs to contribute meaningfully to socioeconomic development. As knowledge sharing is a key component of knowledge management, it impacts both the individual and organisational levels, thus increasing problem-solving and innovation, which may hinder the growth and sustainability of an organisation. The knowledge sharing process involves the exchange of skills, information and expertise among employees, and this exchange of knowledge strengthens their knowledge assets and improves performance (Ahmad & Karim 2019). Meher *et al.* (2022) found that the successful transfer of knowledge enables employee development and competencies. The successful transfer of knowledge to other members of one's organisation and using it productively enables employee development and competencies (Irawan, Bastian & Hanifah. 2019; Meher, Nayak, Mishra & Patel. 2022). Al Zoubi *et al.* (2025) corroborate this, adding that structured on the job training and mentoring are specific mechanisms that facilitate this transfer.

As such, these conditions create a situation in which employees have greater confidence in their abilities and are more satisfied with their jobs (Azeem et al., 2021), two factors associated with high performance and employee commitment to work. These findings are also supported by Yeboah (2023), who reports a positive relationship between knowledge-sharing behaviour and organisational commitment and concludes that motivated employees are key to ensuring firm sustainability. Research has shown that knowledge sharing can lead to both individual and organisational growth and contribute to long-term organisational sustainability by enhancing profitability and by fostering awareness of and responsiveness to current industry trends and changes, thereby creating competitive advantage for an organisation (Ahmad & Karim, 2019). Rossignoli *et al.* (2024) reveal that effective knowledge sharing sustains an organisation, enabling it to generate profits and remain abreast of prevailing trends. Knowledge sharing alluded to earlier impacts on innovation, as it presents new ideas and allows employees to benefit from others' experiences (Muhammed & Zaim 2020). The authors established that peer knowledge sharing significantly improves organisational performance.

Although people may be reluctant to share information in fear of losing power or the only leverage they possess, the effective sharing of knowledge has been found to motivate employees to work toward the organisation's goal and vision. Human resource practices encourage employees to pursue knowledge and to develop innovative products or services. Emere *et al.* (2025) found that human resource practices that create a credible organisational climate influence staff flexibility and their willingness to share ideas. Wentzel *et al.* (2024) investigated corporate social responsibility in South African construction SMMEs and found that a lack of strategic knowledge implementation often compromises financial stability and sustainability.

Additionally, Sogaxa (2024) confirmed a positive relationship between management practices (including knowledge sharing) and sustainable business performance. Huie *et al.* (2020) further argue that knowledge sharing is a vital strategic resource that can yield sustainable competitive advantage. The knowledge of all members within an organisation plays a vital role in shaping competitiveness in a globally connected market. This is due to the influence of group intelligence, which develops from free information exchange, making it easier for members to adapt to various changes in their work environment.

3.7 Knowledge Sharing in SMMEs and Its Role in Overcoming Challenges

This section supports objective three by identifying the barriers and challenges that obstruct effective knowledge sharing in SMMEs. An organisation's growth, especially in business, determines a country's economy (Islam & Abd Wahab 2021). Panda, Pradhan and Singh. (2022) in their research, found evidence of moderated mediation models for SMMEs as an engine for successful economic development, and specifically to drive innovation in underserved markets by utilising their knowledge. Every organisation seeks success and growth, and this can occur only with high levels of performance (Alshurideh, Al-Kurdi, Alzoubi, Ghazal, Said & AlHamad. 2022; Hanaysha & Mehmood 2022). Hanaysha and Mehmood (2022) found that organisational performance is the primary driver of success, while Alshurideh *et al.* (2022) expanded on this by confirming that human resource management practices directly influence supply chain performance. The concept of organisational performance assessment rests on the premise of human, physical and capital (Abubakar *et al.* 2019; Lee *et al.* 2022). Lee *et al.* (2022) conducted an empirical study in the manufacturing industry and confirmed that digital supply chains significantly enhance organisational performance.

A study by Li *et al.* (2020) shows that knowledge sharing mediates the relationship between human capital and organisational output, addressing the challenge of underperformance. On a similar note, authors Ngo Ndjama and Van der Westhuizen (2024) argue that, with increasing globalisation, SMMEs face significant competitiveness challenges, requiring them to leverage innovative entrepreneurship to contribute to economic development. To counter the intense competition from established firms, Rossignoli *et al.* (2023) found that knowledge management solutions, specifically Communities of Practice, allow SMMEs to adapt to rapidly changing market trends. Knowledge sharing affords the privilege of sharing the new technological advancements that will be trending and equipping an organisation with competitive advantages (de Bem Machado, Secinara, Calandra, & Lanza Longa. 2022). Moreover, de Bem Machado *et al.* (2022) conducted a structured literature review. They concluded that knowledge management is vital for a firm's ability to close its technological gap and to facilitate the digital transformation of Industry 4.0. Therefore,

knowledge sharing also provides essential capabilities for innovation, helping overcome the resistance to technology embedded in knowledge management systems. As a result, knowledge sharing will support SMME employees and owners in addressing the challenges posed by technological advancements in the workplace and equip them with the knowledge necessary to operate successfully in the new dynamic work environment.

Organisational knowledge consists of corporate expertise and common understanding, including personal knowledge (Martins, Rampasso, Anholon, Quelhas, & Leal Filho. 2019). Social interaction enables knowledge sharing, which has growth opportunities (Rehman, Poulova, Yasmin, Haider, & Jabeen. 2021). Quick development for SMMEs in an environment dominated by larger enterprises may be a challenge; however, knowledge sharing may reveal the trades of larger organisations, which may reach the desired level (Di Vaio, Palladino, Pezzi & Kalisz. 2021). Di Vaio et al. (2021) conducted a systematic literature review and found that digital innovation in knowledge management systems is a key driver for reaching desired organisational levels. Anand and Walsh (2020) found that fostering teamwork through knowledge sharing reduces individualism and aligns employees with the organisation's development goals. The sharing of knowledge fosters teamwork, which compacts individualism and competition among employees. Hence, the goal will be to foresee the development of an SMME or organisation and the fulfilment of its vision or mission.

Workers are more likely to engage in information sharing if they see the benefit in it. Haider, Zubair, Tehseen, Iqbal and Sohail. (2023) studied project-based construction companies and found that ambidextrous leadership promotes innovation through the mediating role of knowledge sharing. The sharing of expertise creates an empowered workforce and solves the problems of high employee turnover and a lack of professional advancement (Nguyen 2020). Nguyen (2020) went on to propose a four-dimensional model and found that online organisational knowledge sharing significantly mitigates the lack of professional advancement. This is crucial because, as Ojasalo *et al.* (2023) observed, personal interaction facilitates Communities of Practice, which support communication between individuals and management. Teamwork is forged, and personal interaction also supports communication between individuals and management, a common picture that is scarce in SMMEs. This existing

collaboration supports problem solving, task coordination, information exchange and conflict resolution (Harb, Zahrawi, Shehabat & Zhang. 2021). Thus, conflicts will be at a minimum, which tends to impact the efficient operation of an SMME.

SMMEs are important since they contribute to the economy and create jobs. Despite this importance to many economies, SMMEs are often associated with poor productivity and limited growth opportunities. Among the many causes of SMMEs failure are resource mismanagement, ineffective procedures in supply chains, poor forecasting and planning systems, poor performance delivery, long cycle times, high inventories, limited awareness of global market trends, ignorance of modern technologies, and financial instability (Mishra 2019). Mhlongo and Daya (2023) identified strategic management issues and found that entrepreneurial leadership is an essential tool for overcoming these failures in Gauteng SMMEs. Zulu *et al.* (2023) further evaluated factors impacting sustainability and confirmed that financial instability remains a primary barrier. Knowledge management can impact the operating performance of SMMEs. By using effective knowledge management channels and processes, SMMEs can overcome these challenges and ultimately develop sustainable businesses. Although knowledge sharing can be slow and difficult, as it requires a certain level of trust, it remains a vital element in tackling the issues faced by SMMEs.

3.8 Impact of Knowledge Sharing Among SMMEs

SMMEs dominate most of the construction industry in most developing economies. These construction enterprises need a competitive business environment to thrive. However, the majority of SMMEs face numerous barriers that hinder their growth and survival. Various case studies on the impact of knowledge sharing on the establishment of SMMEs have been conducted. A study by Ametepey, Frempong Jnr and Cobbina (2022) sought to evaluate the critical barriers that affected the growth of small and medium-scale construction enterprises (SMSCEs) in the Ghanaian construction industry. The authors found that knowledge management barriers, alongside financial constraints, were the most critical impediments to growth. Supporting this, Adesina and Ocholla (2024) found that in the South African context, the lack of tacit knowledge management strategies similarly stifles the survival and growth of small enterprises. In this context, the management and sharing of knowledge

were deemed paramount if Ghana's construction industry was to expand and remain sustainable. Consequently, the authors recommended a framework that prioritises knowledge management initiatives to foster industry growth.

The research by Li *et al.* (2019) examined the relationship between intellectual capital and the innovation performance of construction enterprises, with knowledge sharing serving as an intermediary. They found the same results as another research study conducted by Arsawan *et al.* (2022), who confirmed that SMEs utilise a knowledge-sharing culture for creating a sustainable competitive advantage. This study was carried out in the context of China and considering that the construction industry is viewed as the pillar of the economy, construction enterprises had to strengthen their investments in intellectual capital and attain market competitiveness, which could only be possible if enterprises shared knowledge with other members of their networks. The data for the study were collected via a questionnaire survey and analysed using SPSS and a structural equation model. The findings indicate that intellectual capital has a direct positive influence on the innovation performance of construction enterprises and, in turn, positively affects it through knowledge sharing. Thus, these findings confirm that knowledge sharing has a measurable impact on the innovation and sustainability of the construction industry.

Seriki (2020) conducted a study in Nigeria investigating the key barriers to the implementation of knowledge sharing by foreign construction firms in Africa and the future direction of sustainable knowledge transfer on the continent. The study also sought to explain why many years of foreign direct investment (FDI) in construction by international construction companies operating in Africa have not yielded sustainable knowledge transfer to the largely unskilled construction workforce in their communities. The Chinese International Construction Companies (CICCs), which are viewed as currently occupying a significant share of the African construction sector market, were examined, with an emphasis on knowledge sharing or transfer initiatives and perceptions. The findings revealed that knowledge sharing and transfer are realised only when they are integrated into a set of policies and aligned with stakeholders' perceptions. This can help drive growth in the construction industry, including small-scale companies. Kissi *et al.* (2023) highlight that, for the South African construction industry to move beyond current issues, stakeholder cooperation is essential.

Knowledge sharing has positive implications for business performance, innovation and competitiveness. SMMEs are hampered in their growth and performance by various factors, including a lack of construction project management skills, improper contract documentation, inadequate facilities and equipment, poor working relationships, cultural communication barriers, unreliable cash flow, and inadequate financial management skills. Most of these challenges can be solved through a culture of knowledge sharing, which allows SMMEs to be knowledgeable in most matters pertaining to the business, be it in construction or any other sector (Tayeh, Alaloul & Muhaisen. 2019). SMMEs are equipped to acquire the necessary documentation and support, thereby gaining a competitive advantage.

3.9 Chapter Summary

This chapter provided a contextual overview of knowledge sharing among construction SMMEs. It started by defining SMMEs and the construction industry and emphasised their economic importance. The discussion then shifted to a review of knowledge sharing in construction SMMEs and established that, globally and locally, knowledge sharing is essential for growth, for organisations to address systemic challenges such as resource constraints and intense competition, and for firm sustainability. Through specific case studies and their analyses, this chapter has established that knowledge sharing is not merely a peripheral necessity but a core strategic imperative for SMMEs in South Africa. The literature review provided valuable context and rationale for the main research project, which, in general, links theory and industry practice. The following chapter unpacks the research methodology adopted in this study.

Chapter 4: Research Design and Methodology

4.1. Introduction

This chapter discusses the methodological approach used in the research to identify factors contributing to knowledge sharing in SMMEs in the South African construction industry. This chapter explains how a specific research approach was used to identify factors influencing knowledge sharing. This research is underpinned by pragmatism, which advocates for the practical application of theories and the convergence of diverse views (Kaushik & Walsh 2019). The chapter begins by aligning the problem statement, research objectives, and research questions with the chosen methodologies to establish a coherent connection between the research purpose and its implementation. The chapter further moves on to discuss the research philosophy, followed by a discussion on research approaches and research design. Next, this chapter describes the target population, the sampling techniques employed, and the data collection tools. Finally, it discusses data integration methods, data analysis, and validation procedures used to establish the research's validity.

4.2. Problem Statement and Methodological Alignment

This section revisits the problem statement and study objectives to provide a detailed reorientation of these elements in light of the study's adopted methodology. The main aim is to demonstrate how the study problem and its objectives were directly addressed at every step of the study. Hence, the section presents these critical steps in a more focused and concise manner, providing a clear direction for how the study was conducted and how each component was addressed.

4.2.1. Revisiting the Problem Statement

The challenges faced by SMMEs in South Africa, especially in the construction industry, are alarming. A lack of information dissemination and poor project management and planning can affect the growth and viability of South African SMMEs, particularly in the construction industry (Sogaxa 2024). Research indicates that SMMEs in South Africa have some of the lowest sustainability rates worldwide, highlighting a crucial need to tackle these challenges (Masama & Bruwer 2018; Mbomvu *et al.* 2021; Farisani 2022; Zulu *et al.* 2023; Mhlongo & Day 2023). Given that

the construction industry is pivotal to the South African economy, with SMMEs contributing to growth, development, and job creation, it continues to face numerous challenges, including limited resources and underdeveloped knowledge management systems (Ramsuraj 2023; Ndjama & Van der Westhuizen 2024). SMMEs in the construction industry face constraints such as limited finances, a lack of skilled labour, and insufficient technological expertise, all of which hinder knowledge transfer and adversely affect overall performance (Madondo *et al.* 2024; Sogaxa 2024; Sheik 2023). Knowledge sharing, as an integral aspect of knowledge management, can help SMMEs in the construction sector overcome many of these challenges. Consequently, it has become imperative to explore and analyse how successful knowledge sharing approaches and enablers can be developed to promote the sustainable growth and development of SMMEs in South Africa.

4.2.2. Justification of the Methodology

Given this detailed problem, selecting an appropriate methodology was essential to generate insights that would help identify the relevant solutions. Such as creating platforms and opportunities committed to knowledge exchange, providing training and support in knowledge-sharing practices, and providing a culture of knowledge sharing among enterprises. Understanding that the problem of knowledge sharing is not merely numerical but involves complex human behaviours, attitudes, and contextual barriers that a single research approach would fail to capture fully, a mixed-methods research approach was adopted. The use of a mixed-methods strategy was considered imperative, as it allows for a more complete understanding of the research topic than is possible with either quantitative or qualitative approaches individually (Creswell & Creswell 2023). Specifically, the explanatory sequential design was chosen to first explore the phenomenon through quantitative surveys, followed by measuring the prevalence of these themes through qualitative interviews (Saunders *et al.* 2023). This design enabled the identification of existing practices and the underlying reasons or mechanisms associated with these SMMEs. It should be noted that the research methodology employed here aligns with a pragmatic school of philosophy, which advocates combining various methods and theories to identify the most useful and appropriate responses to the issue at hand, namely, knowledge sharing within construction. According to Ngulube (2020), among others, there are three primary research philosophies.

4.2.3. Methodological Alignment with the Research Objectives

Table 4.1 presents the study's research objectives and identifies the methodological technique and source of data employed to respond to each. The details illustrate the logical relationship between the research objectives and the selection of procedures for the explanatory sequential mixed-methods design employed in this study.

Table 4.1: Research Objectives and Methodological Alignment

Objective	Research Objective	Methodological Approach & Data Source
i	Objective: To assess the historical legacy of Knowledge Sharing in SMMEs within the Construction Industry in South Africa.	Qualitative Approach: This was achieved through in-depth interviews, to explore long-term experiences, perceptions and narratives that were inherited within the established firms.
ii	Objective: To explore the strategies of Knowledge Sharing in SMMEs within the Construction Industry in South Africa.	Mixed-Methods Approach: The quantitative surveys were used to identify the extent of strategy use, while interview data provided nuanced, contextualised pictures of how and why these strategies are used.
iii	Objective: To identify factors enabling or hindering Knowledge Sharing in SMMEs within the Construction Industry in South Africa.	Mixed-Methods Approach: While the quantitative survey assessed the importance of prior determinants over the entire sample, the qualitative interviews delved into complex and situational drivers and barriers.
iv	Objective: To determine the impact of Knowledge Sharing in SMMEs within the Construction Industry in South Africa.	Mixed-Methods Approach: The statistical relationship between knowledge sharing practices and perceived business outcomes was established through the quantitative survey. The qualitative interviews investigated personal experiences and specific instances of this effect.
v	Objective: To propose a framework for enhancing Knowledge Sharing in SMMEs within the Construction Industry in South Africa.	Synthesis of Findings: The framework is established through synthesising and interpreting the merged results of the quantitative and qualitative components of the research.

4.3. Pragmatic Research Philosophy

A research philosophy constitutes the system of beliefs and assumptions that guide the entire process of inquiry and knowledge creation (Saunders, Lewis & Thornhill 2023). The present study is intentionally grounded within a pragmatic research philosophy. Pragmatism is characterised by a concern with the problem situation itself, which is given precedence to theoretical concerns, and value in practice rather than the holding of one fixed view of reality (what works). This feature makes pragmatism an appropriate philosophical foundation for mixed-methods research because it provides the intellectual flexibility to choose and combine the most appropriate methods for attaining the best response to the research questions (Ngulube 2022).

The use of pragmatism was a deliberate response to the character of the research problem in focus. Complexity in knowledge sharing in construction SMMEs involves multifaceted elements, both quantifiable, objective measures (for example, how frequently certain practices are practised) and crucial, subjective human experiences (for example, the subjective perceptions of trust and organisational culture). In this case, exclusive reliance on a single philosophical perspective would not have been sufficient, as a strictly positivistic approach would overlook subjective realities that influence behaviour, whereas a completely interpretivist stance would disregard broader, generalisable patterns. Pragmatism transcends this dichotomy. Its core principles – the value of actionable knowledge, the synergy between experience and practice, and viewing inquiry as an experiential process – are therefore exceptionally well suited to this study's aims (Kelly & Cordeiro 2020). This orientation allowed the research to not only investigate existing practices but also work towards its ultimate objective of proposing a practical, contextually relevant framework.

On the other hand, the pragmatic view allowed for the flexibility needed to advance beyond methodological disputes and apply the sequential explanatory mixed-methods design strategically, as employed in this study. By incorporating both qualitative and quantitative evidence, this approach facilitated a more comprehensive, reliable, and practical understanding of the barriers and triggers for knowledge sharing. This allows research to address the real-world complexities inherent in the South African construction sector effectively, ultimately enhancing the relevance and applicability of the findings (Kelly & Cordeiro 2020; Maarouf 2019).

4.4. Research Approach

This study employed a mixed-methods research approach to provide a comprehensive and synergistic investigation of the research problem. A mixed-methods approach strategically blends qualitative and quantitative techniques, with the primary purpose of combining their respective strengths to develop a more complete understanding than a single approach could achieve (Creswell & Creswell 2023). Foundational typologies identify a range of mixed-methods designs, including parallel, conversion, and fully integrated designs (Fetters & Molina-Azorin 2020); however, the study employed a sequential explanatory design. This two-phased approach, congruent with the pragmatic nature of this study, was to first read and analyse the numerical data and then use the qualitative data to illuminate or explain the numerical evidence (Creswell & Creswell 2023).

The research process unfolded in two distinct, chronological phases. The initial phase was quantitative; a survey aimed at collecting numerical data from SMMEs in construction business operations. Surveys are vital in informing research design through efficient data collection from a larger sample (Creswell & Creswell 2023), which is why the present study was carefully prepared to measure the depth of knowledge sharing practices, individual characteristics and decision procedures. The quantitative data collected were analysed via descriptive and inferential statistics to identify salient patterns, trends and relationships with respect to knowledge sharing.

Following the statistical analysis, the study proceeded to its second phase: a qualitative inquiry designed to explain the initial quantitative findings. The approach adopted was based on the precept that qualitative research is geared toward providing rich insights into the distinctive experiences and perceptions of the participants involved (Creswell & Creswell 2023). To ensure in-depth contextual understanding, semi-structured interviews with open-ended questions were used (Taherdoost 2022). These interviews explored participants' attitudes, the challenges and facilitators they encountered, and their perceptions of the relevance and effectiveness of knowledge sharing. These qualitative data were then analysed thematically, with the explicit goal of identifying patterns and narratives that could add depth, meaning, and explanation to the trends observed in the survey data. By systematically integrating the two datasets in this manner, the study achieved a thorough, robust, and nuanced

understanding of the knowledge-sharing dynamics within the South African construction sector.

4.5. Research Design: Explanatory Sequential Design

This research employed an explanatory sequential mixed-methods research design. This type of design employs a two-phase approach: the first phase involves collecting and analysing quantitative data to explore the topic (phenomenon) in depth (Bell, Harley & Bryman. 2022). In Phase II, qualitative data are collected and analysed to provide evidence supporting the results obtained from the quantitative data collected and analysed in Phase I. The two-stage approach enables a deeper understanding of the context in which knowledge sharing occurs in SMMEs, including the relationships and interrelationships among the factors believed to be associated with knowledge sharing (Saunders *et al.* 2023). The goal is not only on quantifying the prevalences of knowledge sharing enablers but also to understand the complex human behaviours and legacy issues that drive them.

The research process unfolded in two distinct, chronological phases:

Phase 1 (Quantitative): This investigation began with a quantitative inquiry to measure the depth of knowledge-sharing practices and decision procedures in SMMEs within the construction industry. A survey is essential for developing research proposals, as it facilitates efficient data collection from a larger sample (Hair, Page & Brunsveld 2019). The quantitative data were analysed using descriptive and inferential statistics to identify trends and relationships regarding knowledge sharing.

Phase 2 (Qualitative): Based on the themes derived from Phase 1, a qualitative research method was conducted on SMMEs within the construction industry. Semi-structured interviews employing open-ended questions were conducted to develop a comprehensive contextual understanding of the problem under investigation. These interviews explored participants' attitudes, the challenges and facilitators they encountered, and their perceptions of the relevance and effectiveness of knowledge sharing. These qualitative data were analysed thematically to identify salient patterns and variables (Braun & Clarke 2021).

This sequential design was selected because quantitative patterns provide a foundational baseline for understanding knowledge sharing enablers among black-owned construction SMMEs in South Africa. By quantifying first, the researcher could statistically identify core trends, using the subsequent qualitative phase to explain how historical legacy and culture drove these industry results.

4.5.1. Weighting of the Research Strands

In the present study, the quantitative approach was prioritised first, followed by the collection of qualitative data (QUAN → qual), in accordance with the explanatory sequential design (Creswell & Creswell 2023). The focus was on the survey to identify the statistically significant enablers within the industry. The qualitative component was only used to support the study by providing the depth needed to understand the identified trends. Therefore, the quantitative results form the basis of the study, while the interviews aim to explore the underlying human complexities.

4.6. Population, Sampling & Sample Size

4.6.1. Population Size

Saunders *et al.* (2023) refer to the population as the entire group of individuals who the researcher intends to study. Consequently, the population for this study comprised all black-owned small-to-medium contractors and construction organisations currently registered with the Construction Industry Development Board (CIDB) in South Africa. Using the CIDB register provided a verified list of active enterprises, ensuring that the study focused on legitimate business entities contributing to the formal economy. This specific population definition enabled the research to isolate the unique dynamics, cultural elements, and business practices that characterise black-owned enterprises, which often face distinct historical and structural challenges relative to their white-owned counterparts.

4.6.2. Sampling Procedure

There are systematic, evidence-based procedures for developing samples in qualitative research. Compared with quantitative research, qualitative research relies on theoretical and deliberate sampling methods. Unlike some methods in quantitative research, qualitative research does not depend on probability theory. The goal of locating information-rich participants—those with characteristics such as in-depth

knowledge or first-hand experiences related to the subject being studied (Saldaña, 2023), is to obtain a representative sample of participants. A common approach to achieving this is to use extreme or negative-case examples in judgmental or purposive sampling. The use of these extreme or atypical case examples aims to provide an overview of the range of cases within a particular population and may include all possible examples (Creswell & Creswell 2023). In addition to being smaller than those in quantitative research, qualitative samples are examined in detail; however, the number of participants selected will depend on the scope and complexity of the investigation.

The study employs purposive (judgemental) non-probability sampling (Saunders et al., 2023). The researcher chose this sampling technique because it enabled them to intentionally select participants deemed most suitable to address the research questions. These individuals were selected for their specialised knowledge, experience, or position within the construction industry, making them highly valuable for gaining insights into the phenomena under study. According to Saunders *et al.* (2023), although this approach ensures the inclusion of relevant and knowledgeable participants, it also introduces bias because the sample does not represent the entire population. The study acknowledges this limitation and recognises that the findings will be highly specific and relevant only to the group of participants included in the sample. Consequently, the findings are interpreted within the particular context of the sample and may have limited generalisability to the broader, diverse construction sector (Andrade 2021).

The research design employed a mixed-methods approach, integrating quantitative and qualitative phases. A purposive sampling technique was used in both phases. During the quantitative phase, data were collected from project managers, quantitative surveyors, constructors, engineers, and other relevant stakeholders who were familiar with and experienced in the construction industry. These data were analysed using statistical methods to identify patterns and trends in knowledge-sharing practices. Afterwards, during the qualitative phase, in-depth interviews were conducted with construction managers, quantity surveyors, and business owners in the construction industry. These interviews provided more detailed and nuanced insights into their experiences with and perceptions of knowledge sharing. This approach combines the benefits of quantitative and qualitative research, enabling the researcher to better

understand the knowledge-sharing dynamics of black-owned SMMEs in the South African construction sector.

4.6.3. Sample Size

Sampling involves selecting a specific group from a larger population (Obilor 2023). To address the research questions effectively, adopting a tailored approach to sample selection in the construction industry is crucial. This is because knowledge sharing in this industry is quite complex; hence, the mixed-methods sample we utilised.

4.6.3.1. Quantitative Sample Size

This study sought to explore and analyse the factors and approaches that facilitate knowledge sharing among SMMEs in the construction industry of South Africa. It is challenging to accurately determine the population size of SMMEs in South Africa (Noruuzian 2020). Therefore, an estimated population size of respondents to be sampled from SMMEs in knowledge-sharing activities was calculated using a Raosoft online calculator to establish a suitable sample size (Fatima *et al.* 2023; Salman *et al.* 2023). An estimated population of 8000 construction SMMEs registered under the construction board serves as the population, with a margin of error of 5% and a confidence level of 95%. The expected standard deviation is 50%. To gather reliable data, the researcher distributed approximately 400 survey questionnaires. Although the goal was to reach an estimated sample size of 367, the response rate was very low at 29%; hence, only 116 surveys were conducted over a period of 6 months. While this is lower than the initial target, a sample size of 116 is statistically sufficient for performing Factor Analysis and regression modelling, as confirmed by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy reported in Chapter 6, which exceeded the recommended threshold of 0.5 (Hair *et al.* 2019).

4.6.3.2. Qualitative Sample Size

The study's qualitative component examined in greater detail the experiences and perceptions of knowledge sharing in the construction industry. When conducting qualitative research, it is common to use smaller sample sizes. This is because qualitative analysis involves in-depth exploration of the data (Creswell & Creswell, 2023). This approach provides a thorough understanding of the benefits and obstacles of knowledge sharing in SMMEs. According to Ngulube (2022), a sample size of 15-30 participants is generally considered adequate. Additionally, the study followed the

saturation principle, as recommended by Braun and Clarke (2022). This means that interviews were conducted until no new information was gathered. Although saturation was reached at 15 interviews, 5 additional interviews were conducted to ensure that no new insights were omitted. Thus, 20 in-depth interviews were conducted to thoroughly investigate the enablers, strategies, advantages, and challenges of knowledge sharing involving SMMEs in the construction industry (see Table 4.2).

Table 4.2: Interview Participants

Participant	Job Title	Designation	Geographic Area	Area Type
1	Carpenter	Owner	Gauteng	Township
2	Property Development	Owner	Gauteng	Urban
3	Builder	Owner	Gauteng	Rural
4	Project Manager	Owner	Western Cape	Urban
5	Project Manager	Owner	Western Cape	Township
6	Project Manager	Owner	Western Cape	Township
7	Project Manager	Owner/Founder	KwaZulu-Natal	Urban
8	Civil Engineer	Director	KwaZulu-Natal	Urban
9	Project Manager	Director	Eastern Cape	Rural
10	Builder	Business Owner	Eastern Cape	Urban
11	Facility Manager	Managing Director	Free State	Urban
12	Project Manager	Director	Free State	Urban
13	Builder	Director	Limpopo	Urban
14	Quantity Surveyor	Owner	Limpopo	Rural
15	Civil Engineer / Plumbing	Director	Mpumalanga	Township
16	Facilities Management	Director	Mpumalanga	Township

17	Building Consultant, maintenance, and renovations	Director	North West	Urban
18	Civil Engineer	Director /Business Owner	North West	Urban
19	Project Manager	Director	Northern Cape	Rural
20	Project Manager / Property Developer	Owner	Northern Cape	Urban

4.7. Data Collection Procedure

The study used primary and secondary data sources to collect comprehensive information on knowledge sharing in the construction sector's SMMEs. This approach allowed a thorough investigation of the factors that facilitated a broader understanding of the methods employed, the benefits gained, and the obstacles faced when sharing knowledge in the context of SMMEs in the construction industry.

4.7.1. Primary Data Sources

Primary data refer to information that is collected directly from the source or individuals who are central to the study (Saunders *et al.* 2023). Having these data was extremely important because it allowed one to gain direct insights and a deeper understanding of the subject matter. This research collected primary data using two main methods: survey questionnaires and in-depth interviews. The researcher distributed survey questionnaires to a carefully chosen group of SMMEs operators in the construction industry. The goal was to gather quantitative data on different aspects of knowledge sharing. Afterwards, the researcher conducted in-depth interviews with a selected group of participants to gather qualitative insights. The interviews explored personal experiences, perceptions, and in-depth understanding of knowledge-sharing processes. This provided a deeper and more nuanced understanding of the subject.

4.7.2. Secondary Data Sources

Secondary data refer to information that has been collected by someone else for their own purposes but is still relevant to the researcher's study (Trinh 2018). This study conducted a thorough literature review to gather secondary data. The researcher conducted a thorough analysis by examining various sources, such as books, peer-reviewed journal articles, reports from construction industry organisations and government bodies and relevant online resources. The secondary data provided a better understanding of the background and theories related to the study. This helped place the primary data in a broader academic and practical context. Additionally, it helped validate and enhance the findings obtained from primary sources.

4.8. Data Collection Instruments

According to Jovancic (2019), data collection is the methodical process of obtaining and assessing information on relevant factors to formulate research questions, test hypotheses and assess results. This research methodology combined survey questionnaires and in-depth interviews to thoroughly understand knowledge sharing among SMMEs in South Africa's construction industry. The aim was to obtain first-hand information in its naturalistic setting; hence the use of surveys. The survey was also cost-effective and able to gather vast amounts of data (McCombes 2019).

4.8.1. Survey Questionnaires

The study used structured survey questionnaires to gather quantitative data, as recommended by Saunders *et al.* (2023). Questionnaires play a crucial role in quantitative research, as they are carefully crafted to collect specific information in a standardised and consistent manner. The survey questions in this study aimed to understand the patterns, strategies and challenges of knowledge sharing among SMMEs in the construction sector. The researcher distributed the questionnaires to a sample of SMME operators in the targeted regions using a multi-mode approach, which included both manual delivery and online Google Surveys, to increase convenience and practical engagement with participants (Creswell & Creswell 2023; Saunders *et al.* 2023). Each survey was expected to take approximately 5–10 minutes to complete. The questionnaire was divided into three sections. Section A collected the demographic data of the respondents; Section B focused on assessing the enablers of knowledge sharing in SMMEs; and Section C explored the participants'

knowledge of the impact of knowledge sharing in SMMEs. The responses were systematically recorded and coded numerically on an Excel spreadsheet for easy analysis with relevant statistical tools.

4.8.2. Interview Schedule

For qualitative data collection, a primary method was the use of in-depth interviews, often referred to as semi-structured or unstructured interviews in academic settings (Saunders *et al.*, 2023). Interviews play a crucial role in qualitative research, as they enable the gathering of rich and nuanced information using open-ended questions. The interview guide consisted of a series of questions designed to investigate the factors that facilitate, the approaches used, the benefits gained, and the obstacles faced in sharing knowledge among SMMEs in the construction industry.

The researcher conducted interviews with various individuals with valuable insights and expertise in the construction sector. SMME operators, industry experts, and other relevant stakeholders were involved in the research. During the first part of the interview, the researcher collected basic information about the participants, including their age, gender, and professional background. The qualitative study helped better understand and interpret their responses in the context of their personal and professional experiences. Using unstructured guiding questions in interviews helped maintain consistency while allowing flexibility to explore deeper into the context on the basis of the participants' responses.

The interviews were conducted for an average of 30–60 minutes. The exact length depended on the extent to which participants were willing to share and on the depth of their knowledge and experience. The interviews were recorded using a voice recorder to ensure accurate transcription and interpretation of the information shared.

4.8.3 Pilot Study

The pilot study evaluated the validity and reliability of the research instruments before the initial data collection. Ten participants completed surveys, while two conducted interviews, all chosen from the intended sample of construction SMME owners in Gauteng. The aim of the pilot was to assess the clarity, relevance, and timing of the instruments. Pilot testing revealed significant issues with the original draft of the questionnaire. First, participants noted that the term "Communities of Practice," used in Section B, was too academic and hard to understand in the context of the informal

construction industry. To address this, the term was briefly defined in the final instrument. Second, the length of the initial interview schedules exceeded 60 minutes, causing fatigue. Consequently, unnecessary demographic components were eliminated, and focus was directed towards the most prominent knowledge-sharing methods. The adjustments made during the pilot phase significantly enhanced the tools' usability, simplifying data collection from the sample and increasing efficiency.

4.9. Data Analysis

This study used qualitative and quantitative data analysis methods to process and interpret the collected data effectively. Furthermore, quantitative data analysis for this study was conducted using the Statistical Package for Social Sciences (SPSS) version 29.0. Thematic analysis was a helpful tool in qualitative research that helped researchers identify and understand patterns in their data.

4.9.1. Statistical Analysis

This study used IBM SPSS version 29.0 for quantitative data analysis. SPSS is widely recognised for its effectiveness in analysing survey data, particularly in social science research (Field 2022). This study utilised survey questionnaires as the main method for collecting data. The questionnaires were designed to collect large amounts of quantitative data. The responses from the questionnaires were carefully organised into an Excel spreadsheet. This spreadsheet was imported into SPSS for in-depth analysis. Using SPSS was crucial for accurately processing numerical data and ensuring the validity of conclusions drawn from quantitative analysis (Saunders *et al.* 2023). This tool allowed the researcher to analyse knowledge-sharing practices among SMMEs in the construction sector. It quantitatively assesses patterns, trends, and correlations in these practices.

4.9.2. Qualitative Thematic Analysis

The gathered qualitative data were analysed using thematic analysis, specifically with the help of Atlas.ti, a software tool designed for coding and processing qualitative data (Saldaña 2023). Thematic analysis is a flexible and accessible method for identifying, analysing, and reporting patterns or themes within qualitative data (Braun & Clarke 2022). The study carefully recorded and transcribed data from in-depth interviews. These data were then analysed using thematic analysis. This method helped organise and analyse interview data to identify common themes. This clearly explained how

knowledge sharing works in SMMEs in the construction industry. The researcher first became familiar with the data and generated initial codes for thematic analysis. Braun and Clarke's (2019) guidelines allowed for a thorough and organised exploration of qualitative data.

4.10. Mixed Methods Data Integration

A critical component of mixed-methods research is the integration of quantitative and qualitative data to draw comprehensive conclusions. In this explanatory sequential design, integration occurred at two distinct points: the *connection* phase and the *interpretation* phase (Vinevala, Halcro & Acharyya. 2024). The connection phase involved using the initial quantitative survey results to purposefully select participants and refine the interview schedule for the subsequent qualitative inquiry. Furthermore, integration was achieved during the "interpretation" phase, where the findings from both strands were merged to provide a comprehensive answer to the research questions. This sequential integration ensured that the qualitative narratives directly addressed the patterns identified in the quantitative phase. In other words, the survey results established the statistical prevalence of knowledge-sharing practices; however, the qualitative nature of the interviews allowed the researcher to understand why specific trends existed, such as the impact of legacy issues and organisational culture. Overall, the use of multiple data-collection methods increased the reliability of the findings and supported the study's conclusions, grounded in either statistical evidence or lived experience (Susanto, Arini, Marlita, Yuntina & Saribanon. 2024).

4.11. Validity, Reliability and Trustworthiness

Validity in research refers to the extent to which the study's findings are accurate and credible. According to Morrow (2020), building trustworthiness requires maintaining data integrity, balancing reflexivity and subjectivity and effectively communicating findings.

This study provided a clear and detailed description of the methodologies used to maintain data integrity. This enhanced their replicability in future research. The study aimed to explain key concepts in a clear and accessible way. To ensure consistent data collection, the study used a standardised survey questionnaire and collected

data from 116 respondents. Additionally, the researcher used a consistent interview guide during in-depth interviews with key informants.

This study enhanced reliability by conducting a pilot study to assess the quality of the research instruments. To complete this task, the researcher distributed 10 survey questionnaires and conducted two pilot interviews. Conducting a pilot study helped refine the research tools and methodology prior to initiating the main study.

The study used peer-reviewed journal articles, relevant books, and credible online sources on knowledge sharing in the construction industry to ensure that the research findings were reliable and applicable. This approach ensured a fair interpretation of participants' perspectives and reduced bias. The researcher used surveys, recorded interviews, and follow-up inquiries to ensure the reliability of the collected information. The findings were effectively communicated to the academic audience through careful editing to ensure clarity and appropriate language usage.

The study employed triangulation to validate the data, using both qualitative and quantitative methods. By adopting this approach, the study enhanced its credibility and ensured that its findings were strong, dependable, and relevant to the specific circumstances of SMMEs in the construction sector of South Africa.

4.11.1 Validity

Validity was confirmed through content validity and construct validity. Content validity was established as the research questions and answers aligned with the literature review and findings from previous research phases. To assess construct validity, factor analysis was performed in Chapter 6.

4.11.2 Reliability

This study enhanced reliability by conducting a pilot study to assess the quality of the research instruments. To complete this task, the researcher distributed 10 survey questionnaires and conducted two pilot interviews. A pilot study was carried out prior to the main research to refine the research tools and methods. Additionally, the internal consistency reliability of the survey instrument was assessed using Cronbach's alpha statistics. As shown in Table 4.3, the Knowledge Sharing (KS) scale comprises five items and demonstrated excellent reliability ($\alpha = .952$). The Collaborative Organisation Ecosystem (COS) scale, containing six items, showed excellent reliability ($\alpha = .977$).

Similarly, the Factors Influencing Knowledge Sharing (FKS) scale, with five items, indicated excellent reliability ($\alpha = .984$). The Factors Hindering Information Sharing (FHIS) scale, with seven items, had excellent reliability (Cronbach's $\alpha = .962$). The C scale with seven items, that is Challenges Faced by SMMEs, also had an excellent reliability value with Cronbach's alpha at $\alpha = .963$. The IMS scale with eight items showed an exceptional value for Cronbach's alpha at $\alpha = .979$. These values confirm that the instrument used was highly reliable.

Table 4.3: Cronbach's alpha values

Numbers	Construct	Scales	Number of items	Cronbach's alpha score
1	Knowledge sharing	KS1-KS5	5	0.952
2	Collaborative organisation ecosystem	COS1-COS6	6	0.977
3	Factors influencing knowledge sharing	FKS1-FKS5	5	0.984
4	Factors hindering Information sharing	FHIS1-FHIS7	7	0.962
5	Challenges face by SMME	C1-C7	7	0.963
6	Impact of knowledge sharing	IMS1-IMS8	8	0.979

4.12. Ethical Considerations

The study adhered to various ethical principles in accordance with UNISA standards. This guaranteed the participants' protection from inhumane treatment and safeguarded their privacy and rights as research participants. Prior to the research study's data-gathering phase, higher education institutions mandate researchers to

obtain ethical clearance. This setup is present in all universities and/or research organisations.

Research Planning

Research planning involves the systematic identification of ethical risks and the implementation of safeguards to protect the rights and welfare of participants before data collection commences (Kolstoe & Pugh 2024). In this study, ethical clearance was applied for and granted before the start of the research to ensure compliance with institutional standards. This phase was crucial for specifying ethical protocols, including privacy, legitimacy, and data stability. Additionally, to ensure academic integrity, Turnitin was utilised to detect plagiarism at different stages of the study, ensuring the originality of the work.

4.12.1. Honesty (Research Integrity)

According to UKRIO (2023), research integrity can be described as diligent adherence to research ethics and standards, as reflected by honest reporting and avoidance of data fabrication, falsification, and misrepresentation. The research followed research ethics standards and carefully adhered to research guidelines outlined within the UNISA Research Ethics Policy. Research integrity was reflected by clearly reporting all research ethics as well as properly citing sources. Furthermore, there was transparency reflected by disclosing all sources of conflict of interest.

4.12.2. Gatekeeper Permission

Gatekeepers are individuals or organisations that control access to potential research participants, possessing the power to grant or deny entry to the research site (Brodeur, Schwartz & McDonald. 2025). For this study, SMME owners and industry bodies acted as gatekeepers. They provided the researcher with permission letters, granting formal access to interview their employees. This formal endorsement reassured participants that the research was legitimate and that their organisation supported their involvement.

4.12.3. Voluntary Participation

Voluntary participation is a key ethical principle that supports individuals' free choice to take part in research studies without external pressure, influence, or fear of retaliation (Findley, Ghosn & Lowe. 2024). Each participant was aware that their involvement was entirely optional. Participants were fully informed that they could

withdraw from the research at any given time without consequences. There were no monetary rewards for participation, nor were there any forms of coercion to encourage participation.

4.12.4. Informed Consent

The informed consent process involves participants confirming their voluntary involvement in a research study after being informed of all aspects that could influence their decision to take part (Holtz, Mitchell, Adams, Grier & Wright. 2025). The researcher provided each participant with a comprehensive explanation of the research before collecting data. All participants were also given sufficient time to ask any questions about the study before signing a consent form indicating their agreement to participate and their understanding of what the study involved.

4.12.5. Anonymity and Confidentiality

Confidentiality refers to the protection of participant data from unauthorised disclosure, whereas anonymity ensures that data cannot be linked to a participant's identity, even by the researcher (Godfrey-Faussett 2022). Since the researcher conducted face-to-face interviews, full anonymity was not possible during data collection; therefore, strict confidentiality was maintained. To ensure confidentiality, specific measures were taken:

Pseudonyms

The researcher employed a highly strict "no-name" method so that none of the participants could be identified by their names in the data. Additionally, participants were referred to by pseudonyms rather than their actual job titles. For example, instead of "Senior Marketing Manager at XYZ Corporation," it might simply be "Marketing Executive." This way ensured that no one could pinpoint the individual based on specific job functions or the organisational hierarchy.

Exclusion of Company Names and Locations

Any references to specific companies or the places where participants worked were omitted entirely. This measure ensured that no one could trace individuals back to their employers or workplaces.

Informed Consent and Confidentiality Assurance

Participants were assured that all information about their identities was fully anonymised and that no identifying information could be derived from the data provided for analysis and reporting.

Secure Data Handling with Encryption

All data (that is, recordings and/or transcriptions) were stored and backed up in a secure environment on a computer with encryption to ensure data security and compliance with the requirements of UNISA's Higher Degree Committee.

Restricted Data Access

Access to the interview recordings and transcripts was limited to the researcher alone. The transcripts were also anonymised through coding. The recorded interviews and transcripts were accessible only to the researcher; the transcribed material was coded. All participants were interviewed with their discretion preserved and courtesy maintained. The interviewer (researcher) was the sole individual with access to the audio recordings of the interviews and the interview transcripts; a code was used for the transcribed information. All participants were assured that their signed consent documents would be securely shredded 10 years after they were stored in the University's secure vaults.

Private Interview Settings

Every research participant had their interview conducted in a discreet location and was treated courteously. The interviews were conducted in private to ensure confidentiality and prevent inadvertent identification.

Exclusion of Sensitive Details

At no stage in the research process was any sensitive or personally identifiable information about the participants published.

4.12.6. Non-maleficence (No Harm)

Non-maleficence is the ethical obligation to do no harm, requiring researchers to minimise risks and prevent physical, psychological, or emotional harm to participants (Hasim *et al.* 2025). This principle was upheld by conducting interviews in safe, private environments chosen by the participants. Furthermore, the pilot study served as a safety check to ensure that the interview questions were not insensitive or

professionally damaging. No questions were found to be harmful, although minor wording changes were made to ensure clarity and comfort.

4.12.7. Ethical Approval

Before data collection began, the researcher received ethical clearance from the UNISA Ethics Committee. This clearance confirmed that the study design adhered to all necessary ethical standards.

4.13. Chapter Summary

In summary, this chapter has demonstrated a methodological procedure that utilised an explanatory sequential mixed-methods research design. In addition to utilising both qualitative and quantitative methodologies simultaneously (and collectively) for the analysis of knowledge-sharing processes among SMMEs in the construction industry, the quantitative data were analysed using SPSS. In contrast, the qualitative interview data were analysed using ATLAS.ti software. A pilot study was also undertaken to evaluate the validity and reliability of the methodology and the quality of the data collection tool(s); additionally, all relevant ethical principles were maintained at the highest level of professionalism, emphasising honesty, transparency, and confidentiality. The subsequent chapter will outline the results and findings from the qualitative aspect of the research.

Chapter 5: Presentation of Findings

5.1 Introduction

This chapter presents the data collected on the enablers and impact of knowledge sharing in the construction industry. In this study, the questionnaire was the instrument used for data collection and was distributed to 116 SMME respondents. The collected data were analysed and presented using both descriptive and inferential statistics. All analyses were performed with SPSS version 29.0 at a confidence level of 0.05. Consistent with the requirements for an explanatory sequential design, this quantitative component represents the primary level of the study and is intended to examine the prevalence and impact of knowledge-sharing factors in a large sample. The statistical patterns identified in this chapter provide the underlying foundation for the subsequent qualitative component in Chapter 6, in which in-depth interviews are utilised to uncover underlying bases for the quantitative patterns.

5.2 Research Hypotheses

To validate these inter-relations involving enablers, barriers, and the influence of knowledge sharing, five research hypotheses have been formulated. These hypotheses are based on the conceptual framework developed within this research, which includes themes derived from the findings of earlier research phases, that is, Chapter 5. The hypotheses are tested through regression analysis in Section 6.9.

- H1: Knowledge sharing strategies (KS) have a significant positive impact on the benefits of information sharing (IMS) in SMMEs.
- H2: A collaborative organisation ecosystem (COS) has a significant positive impact on the benefits of information sharing (IMS) in SMMEs.
- H3: Factors influencing knowledge sharing (FKS) have a significant positive impact on the benefits of information sharing (IMS) in SMMEs.
- H4: Factors hindering information sharing (FHIS) have a significant relationship with the perceived impact of knowledge sharing (IMS) in SMMEs.
- H5: The challenges faced by SMMEs (C) have a significant relationship with the perceived impact of knowledge sharing (IMS) in SMMEs.

5.3 Response Rate

A total of 120 copies of the questionnaire were distributed and all were returned, which constituted a response rate of 96.6%. Of the 120 copies distributed, 116 were fully completed and valid for analysis.

5.4 Socio-demographic Variables

5.4.1 Gender

Table 5.1 shows the gender of the respondents. The data indicate that males make up a larger proportion of the sample, accounting for just over half (58.6%) of the total participants, whereas females represent a smaller portion, at 41.4%.

Table 5.1: Gender of the respondents

		Frequency	Percent
Gender	Male	68	58,6
	Female	48	41,4
	Total	116	100,0

The demographics show a population mainly composed of males (58.6%), aligning with the historical gender makeup of the construction sector. However, a significant female contribution (41.4%) shows a shift in the industry as more inclusive gender distribution in SMME ownership. This observation aligns with those of Wentzel *et al.* (2024), who respectively note that, although the sector remains male-dominated, government transformation initiatives are effectively encouraging female participation in construction SMMES.

5.4.2 Age

Table 5.2 shows the statistics of the respondents' ages. The average age of the respondents is 44.77 years, indicating that the typical respondents are in their mid-40s. The median age is 45 years, meaning that half of the respondents are younger than 45 years and that the other half are older. The standard deviation is 8.55, indicating that the ages of the respondents vary by approximately 8.55 years from the mean. This suggests a moderate spread in the ages of the participants. The youngest

participant was 30 years old, which could be an outlier. The oldest participant was 60 years old.

Overall, the data show that most participants were between 39 and 50 years of age, with an average age close to 45 years and a reasonably moderate age distribution across the group.

Table 5.2: Statistics of respondents' age

Age		
N	Valid	114
	Missing	2
Mean		44,7719
Median		45,0000
Std. Deviation		8,54663
Minimum		30,00
Maximum		60,00
Percentiles	25	39,0000
	50	45,0000
	75	50,0000

Statistics

A3. What is your estimated average sales turnover per year? R_____

N	Valid	108
	Missing	8
Mean		17336486,67
Median		2000000,00
Std. Deviation		64061636,485
Minimum		15000
Maximum		500000000

Percentiles	25	700000,00
	50	2000000,00
	75	7000000,00

The age structure, with a mean age of 44.7 years, indicates a mature cohort of SMME owners or managers. The mature age profile is consistent with the view that the respondents are highly experienced, which is essential for the transfer of tacit knowledge. The findings are consistent with the consensus of Anand and Walsh (2020), as supported by Kissi *et al.* (2023), who state that experienced senior staff members are the primary carriers of tacit knowledge in the trade. The lack of respondents under the age of 30 is consistent with Kissi *et al.* (2023), who are concerned with the aging workforce in the trade and the challenges faced by youth in the technical construction trade.

5.4.3 Average Annual Income

Table 5.3 shows the distribution of the average annual income. The largest proportion of respondents (43.5% of valid responses) indicate that their company earns 1 million or less annually. A significant portion (38.9%) reported earning 4 million or more annually, making this the second most common income category.

There is a relatively small proportion of respondents (7.4%) whose companies earn between 1 and 2 million, and 10.2% earn between 2 and 4 million annually.

Overall, the data show a clear income distribution where the majority of participants earn either 1 million or less, or 4 million and above, with fewer participants in the middle-income brackets. Notably, 8 responses were missing (6.9% of the total sample).

Table 5.3: Company average annual income

		Frequency	Percent	Valid Percent
Average annual income	1 million and less	47	40,5	43,5
	1000001-2million	8	6,9	7,4
	2000002-4million	11	9,5	10,2
	4000004 million and above	42	36,2	38,9

	Total	108	93,1	100,0
Missing	System	8	6,9	
Total		116	100,0	

The income distribution reveals a bifurcation in the sample: a significant cluster of micro-enterprises earning less than R1 million (43.5%) and a substantial group of established small-to-medium enterprises earning above R4 million (38.9%). This polarisation reflects the Department of Small Business Development's (2023) distinction between survivalist micro-enterprises and growth-oriented small businesses. Furthermore, this finding corroborates Msomi and Olarewaju (2021) and Zulu *et al.* (2023), who collectively argue that financial constraints and "missing middle" financing are the most significant barriers preventing micro-enterprises from graduating to higher turnover bands.

5.4.4 Highest Level of Education

Table 5.4 shows the highest level of education attained by the respondents. The majority of respondents (67.2%) have a tertiary education, indicating that a significant portion of the sample is well educated. A smaller portion of participants (25.0%) had a high school education, whereas a minimal number (7.8%) had only a primary education.

The above data show that most respondents in this sample have higher levels of education, with over two-thirds having completed tertiary education.

Table 5.4: Respondents' highest level of education

		Frequency	Percent
What is your highest level of education?	Primary	9	7,8
	High school	29	25,0
	Tertiary	78	67,2
	Total	116	100,0

The results indicate a highly educated population, with 67.2% of the population attaining tertiary education. This aligns with findings from Adesina and Ocholla (2024), who assert that a rising educational level within the knowledge economy is required

for business survival, thereby refuting the notion that the sector is entirely unskilled. This high level of educational attainment acts as a vital enabler for knowledge management; as Li et al. (2020) state that education is linked to 'absorptive capacity', the ability to recognise, assimilate, and apply new knowledge effectively.

5.4.5 Position Within the Organisation

The respondents' position within the organisation is given in Table 5.5. This distribution shows that the majority of participants (59.5%) are business owners, whereas the remaining respondents are distributed among managers (8.6%), executives (14.7%) and salaried employees (17.2%).

Table 5.5: Respondents' position in the organisation

		Frequency	Percent
What is your position in the organisation?	Manager	10	8,6
	Owner of business	69	59,5
	Executive	17	14,7
	Salaried Employee	20	17,2
	Total	116	100,0

A high proportion of business owners (59.5% of respondents) in the study indicate that decision-making in South African construction SMMEs is highly centralised. The Sogaxa (2024) findings suggest that this is attributable to owner-managers being the key drivers of management practices within the SMME sector. The implications of these findings for introducing knowledge sharing into an organisation are that it must originate with the owner-managers, as suggested by Kock (2020). This would indicate that the organisational culture of a small firm is directly linked to the values of its owner and their level of commitment

5.4.6 Number of Years in Business

Table 5.6 shows the number of years the business has been in operation. The data indicate that the majority of businesses (40.5%) have been operating for 1-10 years, indicating a relatively young business population, whereas 32.8% of businesses have been operating for 11-20 years, suggesting a fairly stable group of middle-aged businesses. Only a small proportion (6.0%) have been in operation for 31-40 years,

and an even smaller portion (1.7%) have operated for 41 years or more, indicating that long-standing businesses are rare in this sample. Overall, most businesses in the sample population have been in operation for less than 20 years, with fewer businesses having longer operational histories.

Table 5.6: Number of years in business operation

		Frequency	Percent
How many years has the business been in operation	1-10	47	40,5
	11-20	38	32,8
	21-30	22	19,0
	31-40	7	6,0
	41 and above	2	1,7
	Total	116	100,0

Data on the operational lifespan shows that 73.3% of the surveyed SMMEs were in operation for 20 years or less. The majority of this group (40.5%) are very young businesses, aged 1–10 years. This is consistent with the findings of Zulu *et al.* (2023) and Maduku and Kaseeram (2021) regarding the high number of South African SMME failures and the tendency of these firms to be "survivalist." Maduku and Kaseeram (2021) state that many such businesses struggle to transition from a survival-focused to a growth-focused model, which may explain the significant decline observed at the 20-year mark.

5.4.7 Number of Employees

Table 5.7 presents the data regarding the number of employees in the organisation. Most businesses (81.9%) are relatively small, employing 1-20 employees, suggesting that most businesses in this sample are likely small-scale operations. Only 9.5% of businesses employ 21-50 employees, and even fewer (2.6%) employ 51-100 employees. A small group of businesses (6.0%) employs over 100 employees, indicating that a minority of larger businesses exist in this sample. Overall, these data show that most businesses in the sample are small enterprises with fewer than 20 employees, whereas only a small fraction are larger businesses with over 50 employees.

Table 5.7: Number of employees in the organisation

		Frequency	Percent
What is the total number of employees you currently have?	1-20	95	81,9
	21-50	11	9,5
	51-100	3	2,6
	Above 100	7	6,0
	Total	116	100,0

The majority of businesses (81.9%) have fewer than 20 employees, thereby classifying them as "Small" or "Micro" businesses according to the classification used by the Department of Small Business Development (2023). This organisational trait has several implications for KM. Smaller teams, as described by Anand and Walsh (2020), enable interactions that facilitate informal knowledge transfer but are often understaffed, which can hinder the implementation of a comprehensive knowledge management system that requires significant human resources. This organisational characteristic aligns with the findings in Chapter 5, which utilises a WhatsApp system.

5.4.8 Formal Knowledge Sharing Process or Systems

Table 5.8 highlights the responses to the statement regarding formal knowledge-sharing processes or systems in place within SMMEs. The data suggest that nearly half (49.1%) of the businesses do not have formal knowledge-sharing processes or systems in place, which suggests that many SMMEs may lack structured approaches to sharing knowledge. Only 34.5% of businesses have formal knowledge-sharing processes, indicating that a significant portion has recognised the importance of structured knowledge sharing, while 16.4% of respondents are uncertain, which may reflect a lack of awareness or clarity regarding internal processes within their organisations.

Overall, the data show that a substantial number of SMMEs lack formal systems for knowledge sharing, potentially limiting their ability to systematically capture and distribute knowledge within the organisation.

Table 5.8: Responses to formal knowledge-sharing processes or systems in place within SMMEs

	Frequency	Percent
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Are there formal knowledge-sharing processes or systems in place within your SMME?	Yes	40	34,5
	No	57	49,1
	Not sure	19	16,4
	Total	116	100,0

The research findings show that around 49.1% of respondents do not use knowledge-sharing systems. The results support Emere & Oguntona (2025) and Cerchione et al. (2015), who argue that, due to resource constraints, small business organisations use informal systems for knowledge sharing. In addition, Emere & Oguntona (2025) suggested that although tacit knowledge is shared informally among employees, small business organisations remain at high risk of losing knowledge because they lack formal knowledge management systems. The “Not Sure” rate of 16.4% also indicates a lack of understanding of knowledge management processes within the organisations.

5.4.9 Effectiveness of Current Knowledge-sharing Practices in SMMEs

Table 5.9 highlights the responses regarding the data concerning the effectiveness of current knowledge-sharing practices in SMMEs. The data show that a significant portion of the respondents (53.5%) believe that their SMMEs’ knowledge-sharing practices are ineffective or very ineffective, indicating room for improvement. A smaller group (31.1%) viewed these practices as effective or very effective, reflecting some level of satisfaction with knowledge-sharing efforts in certain businesses.

Table 5.9: Responses to the effectiveness of current knowledge-sharing practices in SMMEs

		Frequency	Percent
How would you rate the effectiveness of current knowledge-sharing practices in your SMME?	Very Effective	11	9,5
	Effective	25	21,6
	Neutral	18	15,5
	Ineffective	32	27,6
	Very Ineffective	30	25,9
	Total	116	100,0

The majority of respondents (53.5%) perceive their current knowledge-sharing practices as ineffective. This critical self-assessment supports the observations of Sogaxa (2024) and Adesina and Ocholla (2024), who highlight that the construction SMME sector suffers from fragmentation and "organisational amnesia." Adesina and Ocholla (2024) attribute this ineffectiveness to the lack of formal strategies identified in the previous section, creating a cycle where informal sharing is sufficient for daily tasks but insufficient for long-term strategic growth. This dissatisfaction underscores the urgent need for the tailored framework proposed in this study.

5.4.10 Main Source of Information Sharing

The bar chart in Figure 5.1 depicts the main sources of information sharing in the respective sampled organisations. Networking with peers is the most frequently cited source, with 62.1% of respondents indicating that they rely on this method for information. This suggests that interpersonal connections and peer interactions are highly valued for knowledge sharing in this context. Online portals and industry websites are next, with 32.8% of the respondents using these sources, indicating that digital platforms are an essential way to access industry information.

Industry conferences and seminars are also significant, with 31% of respondents attending these events for information, indicating that face-to-face professional gatherings remain valuable. Professional associations are used by 29.3% of the respondents, highlighting the role of industry-specific organisations in disseminating information.

Training and Certification Programmes and Government Agencies are both used by 27.6%, suggesting that structured learning programmes and official government channels are equally valued sources. Online forums and communities were used by 30.2% of the participants, reflecting the importance of informal online spaces for exchanging knowledge.

Industry Reports and Publications and Local and International Construction Exhibitions are utilised by 24.1% and 20.7% of the respondents, respectively, indicating that formal publications and specialised exhibitions play smaller yet notable roles in information sourcing.

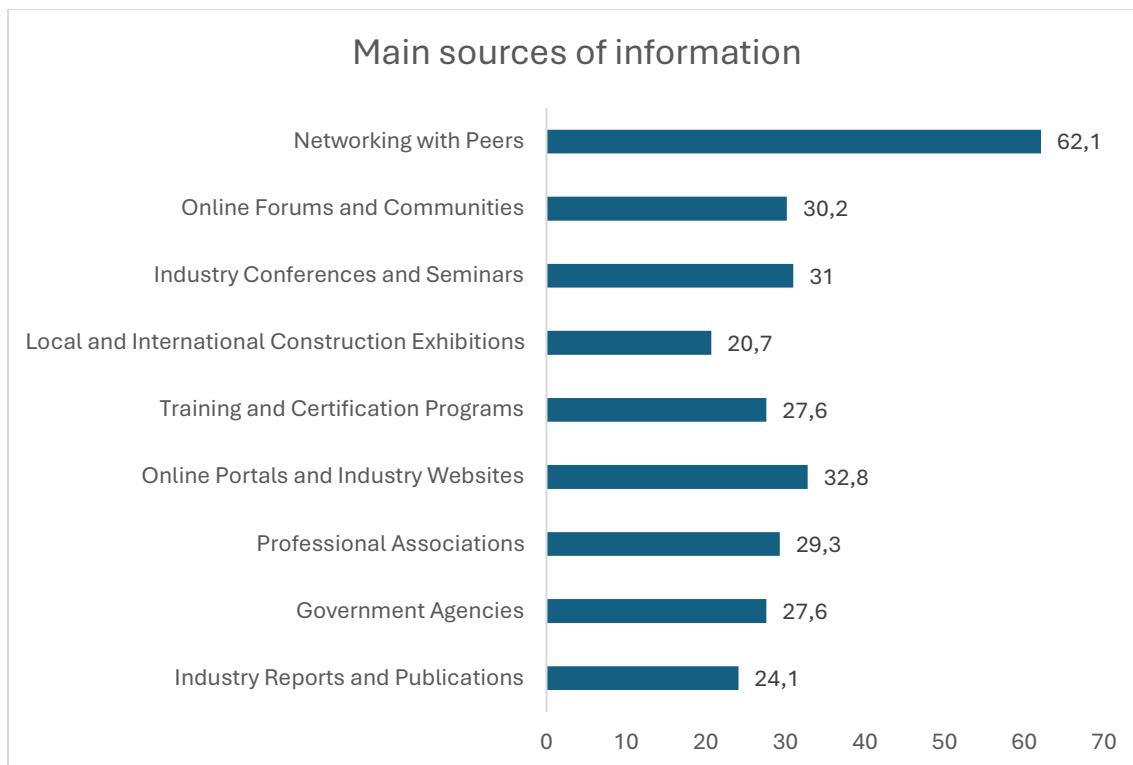


Figure 5.1: Responses to the main source of information sharing

The overwhelming reliance on peer networking (62.1%) corroborates Nwachukwu *et al.* (2021) and Anand and Walsh (2020), who collectively emphasise that social interaction is the primary vehicle for knowledge exchange in the construction industry. Nwachukwu *et al.* (2021) note that industry bodies serve as critical platforms for stakeholders to interact, while Anand and Walsh (2020) argue that in SMMEs, "interactive learning" through socialisation is more effective than passive learning. Furthermore, the moderate usage of online portals (32.8%) supports Phaladi *et al.* (2022), who highlight the growing potential of technology to enhance information access, although it has yet to surpass traditional face-to-face networking.

5.4.11 Culture of Knowledge Sharing

Table 5.10 presents the data concerning the extent to which SMMEs encourage a culture of knowledge sharing among employees. The data suggest that a small minority (2.6%) of respondents feel that knowledge sharing is actively discouraged, which suggests that overt resistance to sharing knowledge is rare in these organisations. The largest group, at nearly 49.1%, falls into the neutral category. This

indicates that a significant portion of respondents may not be aware of or engaged with the culture of knowledge sharing in their SMME.

A combined total of 48.3% (37.1% + 11.2%) of the respondents believed that knowledge sharing is at least strongly encouraged or very strongly encouraged within their organisations. This reflects a positive attitude towards promoting a culture of sharing among employees. Overall, while there is a notable emphasis on encouraging knowledge sharing in many SMMEs, the large neutral group suggests opportunities to more actively foster this culture or to increase employees' awareness of its importance.

Table 5.10: Responses to the extent to which SMMEs encourage a culture of knowledge sharing among employees

		Frequency	Percent
To what extent does your SMME encourage a culture of knowledge sharing among employees?	Discouraged	3	2,6
	Neutral	57	49,1
	Strongly encouraged	43	37,1
	Very strongly encouraged	13	11,2
	Total	116	100,0

The findings reveal a split culture: while nearly half (48.3%) of firms actively encourage sharing, a nearly equal proportion (49.1%) remains neutral. This neutrality is critical; as Yeboah (2023) and Imam and Zaheer (2021) argue, a passive culture is insufficient for effective knowledge management. Yeboah (2023) posits that leadership must actively establish a "climate of trust and openness," while Imam and Zaheer (2021) found that trust is a significant enabler that must be cultivated, not just assumed. The high neutrality suggests a lack of intentional leadership in driving this culture, leaving employees unsure of the organisation's stance on knowledge exchange.

5.5 Aggregated View of the Construct Items Measuring Enablers of Knowledge Sharing in SMMES

This section addresses the scoring patterns of the respondents with respect to 14 identified factors influencing the adoption of remote working as a strategy for

construction. The respondents were asked to share their thoughts on each of the items listed under each factor. The questions were asked using a 5-point Likert scale with the options “strongly agree, agree, neither agree nor disagree, disagree and strongly disagree”. This section presents the frequency distribution of the responses. The responses used a stacked bar graph.

5.5.1 Strategies to Promote Knowledge Sharing

Table 5.11 summarises the perceptions of respondents regarding various strategies to promote knowledge sharing in SMMEs.

Forming Communities of Practice (CoPs) (KS1): A significant majority of respondents (83.6%) either strongly agree or agree that forming CoPs is an effective way to promote knowledge sharing. The low percentage of disagreement (2.6%) indicates a strong consensus on the value of CoPs in facilitating knowledge exchange.

Implementing knowledge management systems (KMS) (KS2): Similarly, 82.8% of the respondents supported the implementation of KMS to enhance knowledge sharing. The relatively greater degree of disagreement (4.3%) with the previous strategy suggests that there may be some scepticism or concern regarding the effectiveness or practicality of KMS in certain contexts.

Promoting Learning and Development Programmes (KS3): Again, a strong majority (82.8%) believe that learning and development programmes are crucial for fostering knowledge sharing. The agreement is evenly split between strong agreement and general agreement, indicating a robust endorsement of this strategy.

Facilitating Open Communication Channels (KS4): This strategy also receives strong support, with 81.9% of the respondents agreeing that open communication channels are vital for knowledge sharing. The absence of strong disagreement (0.9%) suggests that facilitating communication is widely accepted as beneficial.

Providing Training and Awareness Programmes (KS5): Most respondents (81.9%) agreed that training and awareness programmes are essential for promoting knowledge sharing. The results are similar to those of previous strategies, reflecting a general consensus on the importance of training in enhancing knowledge exchange.

Across all the strategies, a high percentage of the respondents expressed agreement regarding the importance of these initiatives for promoting knowledge sharing among

SMMEs, with most strategies receiving over 80% support. The low percentages of disagreement indicate a strong belief in the effectiveness of these approaches, suggesting that SMMEs could benefit significantly from implementing these strategies. The consistent support for forming CoPs, implementing KMS, promoting learning and development, facilitating open communication and providing training programmes highlights a collective understanding of the key components necessary for fostering a knowledge-sharing culture within organisations.

Table 5.11: Perceptions of respondents regarding various strategies to promote knowledge sharing in SMMEs.

Knowledge sharing in SMMEs can be promoted by:	Code	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Forming CoPs.	KS1	41,4	42,2	13,8	2,6	
Implementing knowledge management systems (KMS).	KS2	38,8	44	12,9	4,3	
Promoting learning and development programmes.	KS3	41,4	41,4	12,9	3,4	
Facilitating Open Communication Channels	KS4	37,9	44	12,9	4,3	0,9
Provide Training and Awareness Programmes.	KS5	41,4	40,5	13,8	3,4	0,9

The high support rates for CoPs (83.6%) and training programmes (82.8%) as strategies clearly endorse the position of Al-Zoubi *et al.* (2025) and Sogaxa (2024), who argue that structured social interactions are vital for facilitating knowledge transfer. Al-Zoubi *et al.* (2025) emphasise that formalised mentorship and training are vital for transferring tacit knowledge, a view reinforced by respondents' strong agreement on learning programmes (KS3). Moreover, support for CoPs aligns with Sogaxa (2024), who reported that intensive interactions within professional communities are crucial for long-term business success in the South African construction industry.

5.5.2 Factors Contributing to a Collaborative Organisation Ecosystem

Table 5.12 summarises respondents' views on various factors contributing to a collaborative organisation ecosystem that supports knowledge sharing.

Leadership support is essential for the success of knowledge-sharing efforts in businesses (COS1): A significant majority (83.6%) agree that leadership support is crucial for effective knowledge sharing. The minimal disagreement (3.5%) suggests a strong consensus on the role of leadership in fostering an environment conducive to knowledge exchange.

A culture of trust and openness creates successful information sharing (COS2): With 82.7% of the respondents in agreement, this statement emphasises the importance of trust and openness in facilitating information sharing. The low percentage of disagreement supports the view that a supportive culture is vital for successful collaboration.

Technology can play an essential role in enabling information sharing (COS3): A total of 81.9% of respondents believe that technology is key to enhancing information sharing. This finding highlights the importance of technological tools in creating effective knowledge-sharing platforms, with little opposition to this view.

CoPs encourage knowledge exchange by providing a welcoming environment for learning and sharing (COS4): Approximately 81% of respondents support the idea that Communities of Practice (CoPs) facilitate knowledge exchange. The results indicate that these communities foster a collaborative atmosphere, although there is a slightly greater neutral response than previous statements do.

Enablers can help employees create a supportive learning and knowledge-sharing environment (COS5): Here, 79.3% of the respondents agreed that various enablers contribute to a supportive knowledge-sharing environment. However, the relatively higher neutral and disagreement responses suggest that there may be some variation in opinions regarding what constitutes effective enablers.

A corporate culture that encourages learning and innovation supports knowledge sharing (COS6): Approximately 81.1% of respondents believe that a culture promoting learning and innovation positively impacts knowledge sharing. Low disagreement

indicates a shared understanding of the importance of fostering a culture that values continuous learning.

Across all statements, a high percentage of respondents (approximately 79% to 83%) agreed that various factors contribute significantly to creating a collaborative organisation ecosystem that supports knowledge sharing. The strong support for leadership, trust, technology and a culture of learning underscores the collective belief that these elements are essential for effective information sharing in businesses. The slightly higher neutral responses for some statements (especially COS4 and COS5) may indicate that while many respondents recognise the importance of these factors, there may be a lack of clarity or direct experience regarding their implementation in practice.

Table 5.12: Respondents' views on various factors contributing to a collaborative organisation ecosystem

Collaborative organisation ecosystem	Code	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Leadership support is essential for the success of knowledge-sharing efforts in businesses.	COS1	44,8	38,8	12,9	2,6	0,9
A culture of trust and openness creates successful information sharing.	COS2	40,5	42,2	13,8	3,4	
Technology can play an essential role in enabling information sharing.	COS3	41,4	40,5	14,7	3,4	
Communities of practice encourage knowledge exchange by providing a welcoming environment for learning and sharing.	COS4	38,8	42,2	15,5	3,4	
Enablers can help employees create a	COS5	37,1	42,2	16,4	4,3	

supportive learning and knowledge-sharing environment.						
A corporate culture that encourages learning and innovation supports knowledge-sharing	COS6	39,7	41,4	14,7	3,4	0,9

The results highlight the crucial role of leadership (83.6% agreement) and trust (82.7% agreement) in fostering a collaborative ecosystem. This finding validates the integrated framework of Alo *et al.* (2025) and Yeboah (2023). Alo *et al.* (2025) identify top management support as the critical driver of information-sharing attitude, while Yeboah (2023) argues that without a "climate of trust and openness," technical enablers are ineffective. The data confirms that SMME respondents view the human elements of the ecosystem, leadership and trust, as equal to, if not more critical than, the technological tools (COS3).

5.5.3 Factors Influencing Knowledge Sharing Among SMMEs

Table 5.13 summarises respondents' perspectives on various factors that influence knowledge sharing within SMMEs.

Leadership support (FKS1)- A substantial majority (82.8%) of the respondents agreed that leadership support is crucial for knowledge sharing. The very low percentage of disagreement (4.3%) suggests that respondents largely recognise the role of leaders in creating an environment that facilitates information exchange.

A culture of trust and openness (FKS2)- Approximately 80.2% of the respondents believe that a culture of trust and openness enhances knowledge sharing. This indicates a shared understanding that such a culture is essential for encouraging open communication and collaboration, with minimal disagreement.

Information Technology (FKS3)- With 82.7% of the respondents in agreement, there is a strong belief that information technology plays a significant role in facilitating knowledge sharing. This emphasises the importance of technological tools in enhancing communication and information exchange among employees.

Networking and Collaboration (FKS4)- Approximately 82.7% of the respondents recognise the importance of networking and collaboration in promoting knowledge sharing. This indicates that respondents see value in building relationships and working together to exchange ideas and best practices.

Regular Training and Feedback (FKS5)- Approximately 81.9% of the respondents agreed that regular training and feedback contribute to effective knowledge sharing. This suggests a recognition of the need for continuous learning and development opportunities to enhance employees' skills and facilitate information exchange.

Across all factors, the above data suggest that there is a consistently high level of agreement (approximately 81% to 83%) among respondents regarding the significance of leadership support, trust culture, technology, networking and training in promoting knowledge sharing among SMMEs. The strong consensus emphasises that effective knowledge sharing is influenced by multiple interconnected factors, highlighting the importance of leadership, a positive organisational culture and the role of technology.

Table 5.13: Respondents' perspectives on various factors that influence knowledge sharing among SMMEs

Factors influencing knowledge sharing	Code	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Leadership support	FKS1	38,8	44,0	12,9	3,4	0,9
A culture of trust and openness	FKS2	38,8	41,4	15,5	2,6	1,7
Information Technology	FKS3	40,5	42,2	12,9	4,3	
Networking and Collaboration	FKS4	37,9	44,8	12,9	3,4	0,9
Regular Training and Feedback	FKS5	38,8	43,1	13,8	3,4	0,9

The results above are consistent with the importance of both social and technical enablers, as discussed by Khalil *et al.* (2022) and Al-Kurdi *et al.* (2020). Considering the very high level of consensus regarding Information Technology (IT) (82.7%), this strongly supports Khalil *et al.* (2022) that IT is an essential element in creating knowledge management systems. Similarly, with regard to the emphasis of SMMEs

on networking (82.7%), this reinforces Al-Kurdi *et al.* (2020) finding that communication enablers facilitate the face-to-face interactions required for sharing tacit knowledge. Therefore, the data indicate that SMMEs perceive these factors as influencing their capacity to share knowledge collectively rather than individually.

Table 5.14 presents the effectiveness ratings based on respondents' perceptions of various factors that influence knowledge sharing within SMMEs. The data suggest that many respondents, 51.7%, rated the effectiveness as "Medium". This suggests that while a significant portion of respondents acknowledge some level of effectiveness, they may not consider it strong or sufficient. A substantial 43.1% of the respondents rated the subject as "Very effective." This indicates that a significant portion of the respondents recognise the initiative as achieving its goals and producing beneficial outcomes. Only 5.2% of the respondents rated the subject as "Not effective." This low percentage indicates that very few participants perceive the initiative as failing to achieve its intended outcomes. Overall, 94.9% of the respondents rated the effectiveness as either "Medium" or "Very effective," highlighting a generally positive perception of various factors that influence knowledge sharing within SMMEs.

Table 5.14: Rating of the effectiveness of various factors influencing knowledge sharing among SMMEs

		Frequency	Percent
Rating	Not effective	6	5,2
	Medium	60	51,7
	Very effective	50	43,1
	Total	116	100,0

5.5.4 Factors Hindering Information Sharing Among SMMEs

Table 5.15 summarises respondents' perspectives on various factors that hinder information sharing among SMMEs.

Lack of Formal Knowledge Management Systems (FHIS1)- The result suggests that a total of 81.9% of the respondents agreed that the absence of formal knowledge management systems significantly hinders information sharing. This suggests a strong

recognition of the need for structured systems to facilitate the effective exchange of information within the organisation while only 3.4% disagreed and 14.7% were neutral.

In terms of limited Resources (FHIS2), the data suggest that approximately 81.9% of respondents indicate that limited resources are a significant barrier to information sharing. This highlights the challenges faced by SMMEs in terms of personnel, time and financial resources, which can affect their ability to share information effectively.

With respect to inadequate IT infrastructure (FHIS3), approximately 78.4% of the respondents agreed that inadequate IT infrastructure impedes information sharing, 17.2% were neutral, and 4.3% disagreed. This suggests that the lack of reliable and effective technological support can create obstacles to the flow of information among employees. Similarly, approximately 78.4% of the respondents recognise that high turnover rates and skills gaps (FHIS4) negatively affect information sharing. Frequent staff changes can disrupt continuity and knowledge transfer, leading to difficulties in maintaining effective communication.

With respect to resistance to change (FHIS5) as a barrier hindering information sharing, a total of 79.3% of the respondents believed that resistance to change hinders information sharing, whereas 18.1% were neutral and 2.6% disagreed. This finding indicates that employees may be reluctant to adopt new practices or technologies that facilitate information exchange, impacting overall knowledge sharing.

In terms of the perception of the absence of knowledge-sharing culture (FHIS6) as a barrier hindering information sharing, approximately 78.5% of the respondents agreed that the lack of knowledge-sharing culture was a barrier to effective information exchange, whereas 19% were neutral and 2.6% disagreed. This suggests that fostering a culture that values and encourages the sharing of knowledge is essential for enhancing information flow within the organisation.

A lack of trust among employees (FHIS7) was viewed by approximately 80.2% of the respondents as a barrier hindering information sharing. Trust is vital for open communication and collaboration; without it, employees may be hesitant to share information.

The above data suggest that across all factors, there is consistent recognition of the challenges to effective information sharing among SMMEs, with agreement levels

ranging from approximately 78% to 82%. The high percentage of respondents identifying these barriers highlights the critical issues that need to be addressed to improve knowledge-sharing practices.

Table 5.15: Respondents' perspectives on various factors hindering information sharing among SMMEs

Factors hindering information sharing	Code	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Lack of Formal Knowledge Management Systems	FHIS1	31,9	50	14,7	3,4	
Limited Resources	FHIS2	36,2	45,7	14,7	3,4	
Inadequate IT Infrastructure	FHIS3	31	47,4	17,2	4,3	
High Turnover and Skill Gaps	FHIS4	29,3	49,1	18,1	3,4	
Resistance to Change	FHIS5	34,5	44,8	18,1	2,6	
Absence of Knowledge-Sharing Culture	FHIS6	32,8	45,7	19,0	2,6	
Lack of Trust	FHIS7	31,9	48,3	17,2	2,6	

The respondents' high agreement on barriers such as the lack of formal systems (81.9%) and limited resources (81.9%) corroborates the findings of Lartey *et al.* (2022) and Koko (2020). Lartey *et al.* (2022) argue that fear of data breaches and resource constraints lead SMMEs to restrict access to digital platforms, directly creating the "inadequate IT infrastructure" barrier identified here. Furthermore, the impact of "Lack of Trust" (80.2%) validates Koko (2020), who found that an organisational culture of distrust acts as a primary obstacle, causing employees to view knowledge sharing as a risk rather than a responsibility.

5.5.5 Challenges Faced by SMMEs in the Construction Industry

Table 5.16 presents the challenges faced by SMMEs in the construction industry, as indicated by respondents' views on various statements. These are detailed below:

Regarding poor access to resources as a challenge (C1), the data suggest that a total of 81.9% of respondents agree that poor access to resources is a significant challenge for SMMEs in the construction industry. This highlights the difficulty these businesses

face in obtaining the necessary materials, equipment and labour, which can impede their operations and project delivery.

In terms of limited knowledge-sharing practices (C2), approximately 82.7% of the respondents indicated that limited knowledge-sharing practices hinder SMMEs in the construction sector. This suggests that a lack of effective communication and collaboration among employees and stakeholders can negatively impact project outcomes and innovation.

With respect to poor project management and planning (C3), approximately 81% of the respondents agreed that poor project management and planning is a challenge faced by SMMEs. Effective project management is crucial for timely and successful project completion; the recognition of this issue indicates a need for better training and practices in this area.

Furthermore, approximately 83.6% of respondents believe that limited access to funding (C4) is a significant challenge, with only 15.5% being neutral and less than 1% disagreeing. This suggests that financial constraints can restrict the ability of SMMEs to invest in projects, hire skilled labour and acquire necessary resources. Similarly, a total of 82.8% of the respondents recognise high competition as a challenge (C5). In a competitive market, SMMEs may struggle to differentiate themselves and secure contracts, which can impact their growth and sustainability.

In terms of skills shortage (C6), the data suggest that approximately 80.2% of respondents indicate that a skills shortage is a barrier for SMMEs. The construction industry often requires specific technical skills; a lack of qualified personnel can affect project quality and completion timelines. Approximately 79.3% of the respondents agreed that low levels of innovation pose a challenge (C7). The construction industry must adapt to new technologies and methods to improve efficiency and competitiveness; a lack of innovation can lead to stagnation.

In summary, across all challenges, the data reveal that there is a consistent acknowledgement of significant issues faced by SMMEs in the construction industry, with agreement levels ranging from approximately 79% to 83%. The high percentages of respondents identifying these challenges emphasise the critical obstacles that SMMEs must navigate to thrive in a competitive and resource-constrained

environment. Key challenges include access to resources and funding, knowledge-sharing practices, project management and a shortage of skills and innovation.

Table 5.16: Respondents' perspectives challenges faced by SMMEs

Challenges faced by SMMEs in the construction industry	Code	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Poor access to resources	C1	31,0	50,9	15,5	2,6	
Limited knowledge-sharing practices	C2	33,6	49,1	16,4	0,9	
Poor project management and planning	C3	37,9	43,1	17,2	1,7	
Limited Access to Funding	C4	36,2	47,4	15,5	0,9	
High Competition	C5	37,1	45,7	15,5	1,7	
Skills Shortage	C6	32,8	47,4	15,5	4,3	
Low levels of innovation	C7	31,9	47,4	18,1	2,6	

These results support the findings of Zulu *et al.* (2023) and Mishra (2019), who thoroughly mapped the challenges faced by SMMEs. Zulu *et al.* (2023) identified financial instability as a key obstacle, which is directly reflected in the participants' highest-rated challenge: "Limited Access to Funding" (83.6%). Additionally, the strong agreement on "Skills Shortage" (80.2%) validates Mishra (2019), who listed the lack of technical management skills as a key cause of SMME failure. The data confirm that these external challenges exacerbate the internal difficulties of sharing knowledge.

5.5.6 Impact of Knowledge Sharing in SMMEs

Table 5.17 presents the impact of knowledge sharing in SMMEs, as indicated by respondents' views on various statements. The responses for each statement are detailed below.

Enhanced Competitiveness of SMMEs (IMS1)- A total of 81.9% of the respondents believed that knowledge sharing enhances the competitiveness of SMMEs. This suggests that sharing knowledge can help these businesses differentiate themselves in the market, leading to improved strategies and practices.

Improved Organisational Performance (IMS2)- Approximately 85.4% of the respondents agreed that knowledge sharing improved organisational performance. This finding indicates that effective communication and the sharing of expertise contribute to better outcomes, efficiency and productivity within the organisation.

Enhanced Organisational Learning and Innovative Attitudes in the Workplace (IMS3)- Approximately 81.9% of the respondents felt that knowledge sharing fostered organisational learning and encouraged innovation. This emphasises the importance of creating a culture where learning is valued and innovative ideas are encouraged.

Enhanced Problem Solving (IMS4)- Approximately 81.9% of the respondents believe that knowledge sharing enhances problem-solving capabilities. This suggests that collaborative efforts and shared insights lead to more effective solutions to the challenges faced by SMMEs.

Improved Project Efficiency (IMS5)- Approximately 84.5% of the respondents agreed that knowledge sharing leads to improved project efficiency. This finding indicates that sharing best practices and lessons learned can streamline processes and reduce project completion times.

Innovation and Adaptability (IMS6)- Approximately 84.5% of the respondents believe that knowledge sharing enhances innovation and adaptability. This highlights the role of shared knowledge in enabling SMMEs to respond effectively to market changes and adopt new technologies.

Enhanced Decision-Making (IMS7)- A total of 83.7% of the respondents agreed that knowledge sharing enhances decision-making. This suggests that having access to diverse insights and experiences leads to more informed and effective decisions within the organisation.

Customer Satisfaction (IMS8)- Approximately 83.7% of the respondents believe that knowledge sharing positively impacts customer satisfaction. This finding indicates that sharing knowledge can lead to a better understanding of customer needs and preferences, ultimately enhancing service quality and client relationships.

Across all the impacts, there is a strong consensus on the positive effects of knowledge sharing among SMMEs, with agreement levels ranging from 81.9% to 85.4%. The high percentages of respondents recognising these impacts emphasise

the critical role that knowledge sharing plays in enhancing the overall effectiveness and sustainability of SMMEs. The key benefits identified include increased competitiveness, improved performance, enhanced learning and innovation, effective problem solving, greater project efficiency, adaptability, better decision-making and heightened customer satisfaction.

Table 5.17: Respondents' perspectives on the benefits of sharing knowledge

Impact of knowledge sharing in SMMEs	Code	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Enhanced competitiveness of SMMEs	IMS1	34,5	47,4	14,7	3,4	
Improved organisational performance	IMS2	34,5	50,9	12,9	1,7	
Enhanced organisational learning and innovative attitudes in the workplace	IMS3	29,3	52,6	16,4	1,7	
Enhanced Problem Solving	IMS4	30,2	51,7	16,4	1,7	
Improved Project Efficiency	IMS5	31,9	52,6	14,7	0,9	
Innovation and Adaptability	IMS6	31,9	52,6	14,7	0,9	
Enhanced Decision-Making	IMS7	32,8	50,9	14,7	1,7	
Customer satisfaction	IMS8	32,8	50,9	14,7	1,7	

The overwhelming agreement on the positive impacts of knowledge sharing validates the theoretical propositions of Li *et al.* (2020) and Arsawan *et al.* (2022). Li *et al.* (2020) demonstrated that knowledge management practices directly enhance entrepreneurial performance and innovation capacity, a finding mirrored by the 85.4% agreement on "Improved organisational performance" (IMS2). Furthermore, the results corroborate Arsawan *et al.* (2022), who argue that leveraging a knowledge-sharing culture creates a sustainable competitive advantage. The participants' recognition that sharing enhances "Innovation and Adaptability" (84.5%) confirms that knowledge exchange is a critical mechanism for SMMEs to survive in dynamic markets.

5.6 One-sample T-test for the Constructs

A series of one-sample t-tests were conducted to determine whether the mean scores of various constructs related to the enablers and impacts of knowledge sharing in SMMEs were significantly different from the neutral midpoint of 3.00 on a five-point Likert scale. The results indicated that all the constructs were rated significantly lower than the midpoint, suggesting that the respondents tended to agree with the items.

As shown in Table 5.18, knowledge sharing (KS) (Mean = 1.82, SD = 0.79) was significantly lower than the neutral point, indicating that the respondents viewed knowledge sharing positively. The significant t-value and p-value ($t(115) = 24.874$, $p < 0.001$) show that this finding is statistically significant. The Cohen's coefficient ($d = 0.79$) suggests a large effect size, meaning that knowledge sharing has a strong effect on SMMEs.

The responses to collaborative organisation ecosystem (COS) show a favourable view of the collaborative organisational ecosystem (Mean = 1.82, Std. Deviation = 0.78). The significant t-value and p-value indicate that the result is significant ($t(115) = 25.010$, $P\text{-value} = < 0.001$), and Cohen's d of 0.78 suggests a large effect size, implying that a collaborative ecosystem plays a strong role in fostering knowledge sharing and overall organisational performance.

The factors influencing knowledge sharing (FIKS) are positive. The mean (Mean = 1.84, SD = 0.82) and statistically significant t-value ($t(115) = 24.087$, $p < 0.001$) reflect a relatively positive influence of various factors on knowledge sharing, with a large effect, emphasising the strong influence of leadership, trust, technology and collaboration on knowledge-sharing practices (Cohen's $d = 0.80$).

The mean value measured for FHIS suggests that respondents lean slightly toward acknowledging factors that hinder information sharing and that their views are statistically significant (Mean = 1.91, SD = 0.71, $t(115) = 28.966$, $p < 0.001$). A Cohen's d of 0.71 indicates a large effect, indicating that these barriers (such as lack of resources or resistance to change) strongly influence the flow of information within SMMEs.

The challenges faced by SMME (C) are rated positively. The mean value measures (Mean = 1.86, SD = 0.69) indicate that the respondents recognise substantial

challenges faced by SMMEs, such as limited access to resources and funding. The significant result ($t(115) = 29.220$, $p < 0.001$) and large effect size (Cohen's $d = 0.69$) suggest that these challenges have a profound effect on SMME operations and growth.

The mean value measured for "Impact of knowledge sharing (IMS)" reflects a positive perception of the impact of knowledge sharing, such as improved competitiveness and organisational performance (Mean = 1.86, SD = 0.68). The significant t-value ($t(115) = 29.667$, $p < 0.001$) and Cohen's d of 0.68 indicate a large effect size, underscoring the strong influence that knowledge sharing has on enhancing the effectiveness of SMMEs.

Overall, and across all the constructs, the p values are consistently less than 0.001, meaning that the differences are statistically significant. The means across the constructs are consistent, ranging between 1.82 and 1.91, indicating that respondents generally have positive but not overwhelmingly strong agreement with the various constructs. The Cohen's d values, ranging between 0.68 and 0.80, indicate large effect sizes, suggesting that each of these factors (knowledge sharing, organisational ecosystems, challenges, etc.) has a significant and meaningful impact on SMMEs in the study.

Table 5.18: One-sample Aggregate Statistics for enablers and impact of knowledge sharing

	N	Mean	Std. Deviation	t-value	Df	P-value	Cohen's d
Knowledge sharing	116	1,82	,79	24,874	115	<,001	,79
Collaborative organisation ecosystem	116	1,82	,78	25,010	115	<,001	,78
Factors influencing	116	1,84	,82	24,087	115	<,001	,80

knowledge sharing							
Factors hindering Information sharing	116	1,91	,71	28,966	115	<,001	,71
Challenges faced by SMME	116	1,86	,69	29,220	115	<,001	,69
Impact of knowledge sharing	116	1,86	,68	29,667	115	<,001	,68

The one-sample t-test results confirm that the respondents' agreement with the constructs is not due to chance but reflects a genuine consensus within the SMME sector. This statistical validation supports Li et al. (2020), who argue that the influence of knowledge management on performance is measurable and significant. Furthermore, the strong effect sizes (Cohen's $d > 0.68$) for "Challenges faced by SMMEs" reinforce Zulu et al. (2023), confirming that barriers such as funding and resources have a profound and consistent impact on the operational reality of these firms.

5.7 Factor Analysis and Validation of the Research Constructs

Factor analysis was performed to validate the constructs (knowledge sharing, collaborative organisation ecosystem, factors influencing knowledge sharing, FHIS, challenges faced by SMMEs and the impact of knowledge sharing). Watkins (2018) states that factor analysis can help identify common factors that explain the order and structure among measured variables. EFA analysis was performed via the principal component analysis (PCA) extraction method, and varimax rotation was set as the measuring parameters. Factors with eigenvalues greater than 1 were retained. As explained by Shrestha (2021), the condition for EFA is that the Kaiser–Meyer (KMO) value should exceed 0.5 and that Bartlett's test of sphericity must be statistically significant. The data in Table 6.19 show that the Kaiser–Meyer value for all the

constructs exceeded the recommended values, whereas Bartlett's test of sphericity was statistically significant for the constructs. This, therefore, supports the suitability of the correlation matrix and is appropriate for conducting further multivariate analyses, such as factor analysis, to explore underlying structures or patterns in the data.

Table 5.19: KMO and Bartlett's tests for the constructs

Section	Caption	Kaiser–Meyer– Olkin Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
			Approx. Chi-Square	df	Sig.
1	Knowledge sharing	0.869	794.445	10	0.001
2	Collaborative organisation ecosystem	0.920	1078.780	15	0.001
3	Factors influencing knowledge sharing	0.870	1063.771	10	0.001
4	Factors hindering Information sharing	0.887	1059.249	21	0.001
5	Challenges face by SMME	0.881	973.797	21	0.001
6	Impact of knowledge sharing	0.891	1537.707	28	0.001

The KMO measures are very high, ranging from 0.869 to 0.920, thus ensuring good sampling adequacy. This validates the suitability of the data in being amenable to structure identification and hence reinforces the construct validity of the used instrument. As noted by Hair *et al.* (2019), higher KMO values indicate shared variance, implying good measurement of the theoretical constructs in the research using the questionnaire. This means that the research findings presented in the previous sections have a level of statistical validity.

5.7.1 Assessing Factor Coefficients for Knowledge-sharing Constructs

The total variance explained in Table 5.20 provides insights into the proportion of variance accounted for by each component in a principal component analysis (PCA). Component 1 has an eigenvalue of 4.425, which explains 88.51% of the total variance. This indicates that the first component is dominant and accounts for much of the variance in the data. The remaining components (2, 3, 4 and 5) have eigenvalues far below 1, contributing very little to the total variance.

Table 5.20: Total variance explained for the knowledge sharing construct

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,425	88,510	88,510	4,425	88,510	88,510
2	,315	6,301	94,811			
3	,104	2,086	96,897			
4	,089	1,772	98,669			
5	,067	1,331	100,000			
Extraction Method: Principal Component Analysis.						

The component matrix in Table 5.21 further shows the factor loadings (correlation coefficients) of each variable with the extracted component. All five variables (KS1 through KS5) have very high loadings on Component 1, ranging from 0.899 to 0.961. KS4 (with a loading of 0.961) has the highest correlation with the first component, followed closely by KS2 (0.956) and KS5 (0.945). These high factor loadings suggest that all five variables (likely representing aspects of knowledge sharing) are strongly related to the underlying latent construct (Component 1), which explains most of the variance in the data.

In summary, the PCA results indicate that Component 1 is the dominant factor, explaining 88.51% of the total variance. This suggests that the five variables (KS1–KS5) are highly correlated and can be reduced to a single component without losing much information. The high factor loadings on Component 1 indicate that all the variables are strongly related to this component, implying that they represent a common underlying factor related to knowledge sharing in SMMES. Thus, the analysis reveals that knowledge sharing can be effectively explained by a single component, as most of the variance in the data is captured by Component 1.

Table 5.21: Component matrix loading for the knowledge sharing construct

Component Matrix^a

	Component
	1
KS1	,899
KS2	,956
KS3	,942
KS4	,961
KS5	,945
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

5.7.2 Collaborative Organisation Ecosystem

Table 5.22 shows the total variance explained for six items measuring the collaborative organisation system. Component 1 has an eigenvalue of 5.380, which explains a very high percentage of the variance, 89.675%. This finding indicates that the first component captures most of the data's variability, making it the dominant factor. The remaining components contribute minimal variance (less than 2% each), and their influence is negligible.

Table 5.22: Total variance explained for the collaborative organisation system construct

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,380	89,675	89,675	5,380	89,675	89,675
2	,273	4,543	94,218			
3	,135	2,250	96,467			
4	,089	1,479	97,947			
5	,064	1,072	99,019			
6	,059	,981	100,000			
Extraction Method: Principal Component Analysis.						

The component matrix in Table 5.23 displays the factor loadings of each variable on the extracted component. All six variables (COS1 through COS6) have very high loadings on Component 1, ranging from 0.891 to 0.967. COS6 has the highest loading of 0.967, indicating a very strong correlation with the first component. COS3 (0.959) and COS2 (0.955) also have very strong loadings. The remaining variables, COS4, COS5 and COS1, have slightly lower but still very strong loadings, all above 0.891. These high loadings indicate that the variables are highly correlated with the underlying component, which suggests that they are all closely related to a common factor, likely representing the collaborative organisation ecosystem.

In summary, the analysis revealed that Component 1 was the dominant factor, explaining 89.675% of the total variance. This indicates that the six variables (COS1–COS6) are highly related and can be effectively reduced to one primary component without significant loss of information. The high factor loadings on Component 1 suggest that all six variables are strongly correlated with this component. These variables likely represent aspects of a collaborative organisation ecosystem, and the single component effectively captures the essence of this concept.

This means that the collaborative organisation ecosystem can be summarised by one dominant factor, and the strong loadings suggest that the variables measure closely related aspects of this ecosystem, making the analysis more efficient and interpretable.

Table 5.23: Component matrix loading for the collaborative organisation ecosystem

Component Matrix^a	
	Component
	1
COS1	,891
COS2	,955
COS3	,959
COS4	,954
COS5	,953
COS6	,967

Extraction Method: Principal Component Analysis.
a. 1 components extracted.

5.7.3 Factors Influencing Knowledge Sharing

Table 6.24 highlights the total variance for the five items measuring factors influencing knowledge sharing in SMMEs. Component 1 has an eigenvalue of 4.698, explaining 93.956% of the variance. This finding indicates that the first component captures most of the data's variability, making it the primary factor influencing the dataset. The subsequent components have minimal eigenvalues.

Table 5.24: Total variance explained for factors influencing knowledge sharing

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,698	93,956	93,956	4,698	93,956	93,956
2	,137	2,737	96,693			
3	,084	1,687	98,379			
4	,055	1,092	99,471			
5	,026	,529	100,000			
Extraction Method: Principal Component Analysis.						

The component matrix in Table 6.25 shows the factor loadings of each variable on the extracted component. All five variables (FKS1 through FKS5) have very high loadings on Component 1, ranging from 0.963 to 0.983. FKS5 has the highest loading of 0.983, indicating a very strong correlation with the first component. The other variables, FKS1, FKS2, FKS3 and FKS4, all have similarly strong loadings (above 0.963). These strong loadings suggest that all variables are closely related to the underlying component, likely representing factors influencing knowledge sharing.

In summary, the results show that the variables related to factors influencing knowledge sharing can be summarised by one primary component, which accounts for nearly all the variance in the data. This efficient reduction allows for a clearer

understanding of how these factors are interrelated and contribute to knowledge sharing.

Table 5.25: Component matrix loading for factors influencing knowledge sharing

Component Matrix^a	
	Component
	1
FKS1	,963
FKS2	,965
FKS3	,968
FKS4	,968
FKS5	,983
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

5.7.4 Factors Hindering Information Sharing

Table 5.26 presents the PCA analysis for the seven items measuring FHIS in SMMEs. Component 1 has an eigenvalue of 5.707, which explains a substantial 81.526% of the total variance. This suggests that most of the variability in the dataset can be captured by this single component. The remaining components contribute relatively little to the explanation of variance

Table 5.26: Total variances explain factors hindering information sharing

Total Variance Explained						
Compo nent	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,707	81,526	81,526	5,707	81,526	81,526
2	,602	8,604	90,130			
3	,280	4,005	94,136			
4	,155	2,210	96,345			

5	,126	1,793	98,138			
6	,077	1,094	99,232			
7	,054	,768	100,000			
Extraction Method: Principal Component Analysis.						

The component matrix in Table 5.27 displays the factor loadings of each variable on the extracted component. All seven variables (FHIS1 through FHIS7) load highly on Component 1, with values ranging from 0.838 to 0.931. FHIS4 has the highest loading of 0.931, suggesting a strong correlation with Component 1. The other variables, FHIS1, FHIS2, FHIS3, FHIS5, FHIS6 and FHIS7, also have very high loadings (above 0.838), indicating that they are all closely related to the underlying component. These high loadings indicate that all the variables are measuring aspects of a single underlying factor, likely related to FHIS.

In summary, the data regarding FHIS can be effectively summarised by one primary component, which captures over 80% of the variance. This suggests that the factors are highly interrelated and can be reduced to a single underlying factor for more efficient interpretation.

Table 5.27: Component matrix loading for the factors hindering information sharing

Component Matrix ^a	
	Component
	1
FHIS1	,875
FHIS2	,919
FHIS3	,838
FHIS4	,931
FHIS5	,918
FHIS6	,917
FHIS7	,919
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

5.7.5 Challenges Faced by SMMEs in the Construction Industry

Table 5.28 presents the PCA analysis for the seven items measuring challenges faced by SMMEs in the construction industry. The data suggest that Component 1 has an eigenvalue of 5.760, explaining a significant 82.288% of the total variance. This finding indicates that most of the variability in the data can be attributed to this single component. The remaining components contribute very little to the explanation of variance.

Table 5.28: Total variances explain for challenges faced by SMMEs

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,760	82,288	82,288	5,760	82,288	82,288
2	,363	5,179	87,467			
3	,294	4,204	91,671			
4	,228	3,253	94,924			
5	,184	2,623	97,547			
6	,116	1,664	99,211			
7	,055	,789	100,000			
Extraction Method: Principal Component Analysis.						

The component matrix in Table 5.29 shows the factor loadings for each variable on the extracted component. All seven variables (C1 through C7) load highly on Component 1, with values ranging from 0.875 to 0.948. C2 has the highest loading at 0.948, indicating a very strong relationship with the component. The other variables, C1, C3, C4, C5, C6 and C7, also have high loadings, all above 0.875, indicating that they are strongly correlated with the same underlying factor. These high loadings suggest that all the variables measure a single, unified concept or factor.

In summary, the analysis shows that the data regarding this set of variables can be effectively reduced to one primary component, which captures more than 82% of the total variance. This component represents the shared underlying factor among the

variables, indicating that they are highly interrelated and can be grouped into one dominant construct.

Table 5.29: Component matrix loading for challenges faced by SMMEs

Component Matrix^a	
	Component
	1
C1	,934
C2	,948
C3	,898
C4	,903
C5	,903
C6	,886
C7	,875
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

5.7.6 Factor Coefficient for the Impact of Knowledge Sharing

Table 5.30 shows the PCA analysis for the eight items measuring the impact of knowledge sharing. Component 1 has a high eigenvalue of 6.988, explaining 87.353% of the total variance. This means that most of the variability in the data is captured by this single component. The remaining components explain very little of the variance.

Table 5.30: Total variance for impact of knowledge sharing

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6,988	87,353	87,353	6,988	87,353	87,353
2	,326	4,079	91,431			
3	,215	2,691	94,122			
4	,166	2,075	96,198			
5	,137	1,717	97,915			

6	,086	1,079	98,994			
7	,064	,799	99,793			
8	,017	,207	100,000			
Extraction Method: Principal Component Analysis.						

The component matrix in Table 5.31 provides the factor loadings of each variable on the extracted component. All eight items (IMS1 to IMS8) load highly on Component 1, with values ranging from 0.897 to 0.968. IMS5 has the highest loading at 0.968, indicating a very strong relationship with the component. The remaining items also load strongly on Component 1, with factor loadings all above 0.897, showing that they are all closely related to the same underlying construct.

In summary, this analysis reveals that the data can be reduced to one primary component that captures over 87% of the variance. The high factor loadings across all the items suggest that these variables are strongly interrelated and that the data structure can be effectively represented by a single component.

Table 5.31: Factor component matrix loading for the impact of sharing knowledge

Component Matrix ^a	
	Component
	1
IMS1	,897
IMS2	,923
IMS3	,933
IMS4	,910
IMS5	,968
IMS6	,963
IMS7	,938
IMS8	,943
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

The factor analysis in each instance consistently revealed a single dominant factor for each construct, accounting for between 81.5% and 93.9% of total variance. This high variance explanation indicates that the research instrument possessed excellent construct validity. Specifically, the fact that "Factors Influencing Knowledge Sharing" loaded onto a single component (93.9% variance) supports the integrated theoretical framework proposed in Chapter 2, suggesting that leadership, technology, and culture are viewed by respondents not as separate entities, but as an interconnected ecosystem. This confirms the findings of Yeboah (2023) and Alo *et al.* (2025), who argue that enablers of knowledge management must be treated as a holistic system rather than isolated variables.

5.8 Association Between the Knowledge Sharing Constructs

Pearson correlation was performed to test the association between each of the constructs. The Pearson correlation (r) measures the strength and direction of the linear relationship between two variables. A value of +1 indicates a perfect positive relationship, a value of -1 indicates a perfect negative relationship, and 0 indicates no linear relationship. The Sig. (2-tailed) values represent the p values. If the p -value is less than 0.01 (at the 0.01 level), the correlation is considered statistically significant. Table 5.32 provides the Pearson correlation coefficients between six variables: Knowledge Sharing, Collaborative Organisational Ecosystem, Factors Influencing Knowledge Sharing, Factors Hindering Information Sharing, Challenges and Impact of Knowledge Sharing.

Knowledge sharing is most strongly correlated with a Collaborative Organisation Ecosystem ($r = 0.945$, $p < 0.001$) and Factors Influencing Knowledge Sharing ($r = 0.886$, $p < 0.001$). This suggests that both the organisational environment and specific influencing factors play major roles in determining knowledge-sharing behaviour. The FHIS are highly correlated with challenges ($r = 0.849$, $p < 0.001$) and the impact of knowledge sharing ($r = 0.879$, $p < 0.001$), indicating that hindrances to information sharing can lead to greater organisational challenges and affect the broader impact of knowledge sharing.

Factors Hindering Information Sharing: Moderate to strong positive correlation ($r = 0.683$, $p < 0.001$). Knowledge sharing may be hindered by certain factors, but the positive correlation suggests some connection between knowledge sharing and how hindrances are perceived. The knowledge of sharing information positively correlates with the challenges faced by SMMEs ($r = 0.644$, $p < 0.001$), meaning that challenges are somewhat associated with knowledge sharing. There was a strong positive correlation between knowledge of sharing information and the impact of knowledge sharing ($r = 0.756$, $p < 0.001$). The impact of knowledge sharing on other outcomes is positively linked to the degree of knowledge sharing.

There was a very strong positive correlation between collaborative organisation ecosystem and factors influencing knowledge sharing ($r = 0.939$, $p < 0.001$). Organisations with a collaborative ecosystem also strongly align with factors that influence knowledge sharing. A moderate to strong positive correlation was observed between a collaborative organisation ecosystem and FHIS ($r = 0.735$, $p < 0.001$). A collaborative ecosystem may also be linked to how information sharing is hindered. A moderate positive correlation exists between a collaborative organisation system and the challenges faced by SMMEs ($r = 0.684$, $p < 0.001$). The challenges faced by an organisation may relate to how collaborative its ecosystem is. There was a strong positive correlation between a collaborative organisation system and the impact of knowledge sharing ($r = 0.799$, $p < 0.001$). The impact of knowledge sharing is closely linked to a collaborative ecosystem.

Overall, and across all the variables, the correlations are statistically significant ($p < 0.001$), indicating that the relationships observed are highly unlikely to have occurred by chance. This analysis highlights the interconnectedness between various factors influencing knowledge sharing, hindrances, challenges and their impacts on SMMEs.

Table 5.32: Pearson correlation between the constructs

Correlations						
	Knowl edge sharin g	Collab rative _orga nisati	Factor s_infl uenci ng_kn	Factor s_hin dering _infor	Cha llen ges	Impac t_of_k nowle

			onal_ ecosy stem	owled ge_sh aring	matio n_sha ring		dge_s haring
Knowledge_ sharing	Pearson Correlati on	1	,945**	,886**	,683**	,644**	,756**
	Sig. (2- tailed)		<,001	<,001	<,001	<,001	<,001
	N	116	116	116	116	116	116
Collabrative _organisatio nal_ecosyst em	Pearson Correlati on	,945**	1	,939**	,735**	,684**	,799**
	Sig. (2- tailed)	<,001		<,001	<,001	<,001	<,001
	N	116	116	116	116	116	116
Factors_influ encing_kno wledge_shar ing	Pearson Correlati on	,886**	,939**	1	,693**	,622**	,788**
	Sig. (2- tailed)	<,001	<,001		<,001	<,001	<,001
	N	116	116	116	116	116	116
Factors_hin dering_infor mation_shari ng	Pearson Correlati on	,683**	,735**	,693**	1	,849**	,879**
	Sig. (2- tailed)	<,001	<,001	<,001		<,001	<,001
	N	116	116	116	116	116	116
Challenges	Pearson Correlati on	,644**	,684**	,622**	,849**	1	,856**
	Sig. (2- tailed)	<,001	<,001	<,001	<,001		<,001
	N	116	116	116	116	116	116

Impact_of_knowledge_sharing	Pearson Correlation	,756**	,799**	,788**	,879**	,856**	1
	Sig. (2-tailed)	<,001	<,001	<,001	<,001	<,001	
	N	116	116	116	116	116	116
**. Correlation is significant at the 0.01 level (2-tailed).							

A strong positive relationship was found between Knowledge Sharing (KS) and the Collaborative Organisation Ecosystem (COS), with a correlation coefficient of $r = 0.945$. Supporting this, the correlation confirms that knowledge sharing is a collaborative activity, not purely an individual one. The relationship confirms the claims made by Yeboah (2023) and Anand *et al.* (2021) regarding the need for a trusted and effectively led environment to facilitate collective participation. Additionally, a positive relationship is established between Challenges (C) and Factors Hindering Information Sharing (FHIS) with a correlation coefficient of $r = 0.849$. The two variables align with Zulu *et al.* (2023), who found that financial constraints hinder information sharing in the facility.

5.9 Regression Analysis

Regression analysis was performed to establish the impacts of knowledge sharing on SMMEs. The independent variable measures were knowledge of information sharing, factors influencing information sharing, FHIS and challenges faced by SMMEs, whereas the single dependent variable was the impact of information sharing. Linear regression was applied for each of the independent variables against the dependent variable. Before analysis, the normality of the data was assessed through descriptive analysis. The resulting skewness values fell within the acceptable range of +1 to -1, as per Al-Qeisi (2009), indicating that no data transformation was necessary. Additionally, residual analysis was performed using a normal P-P plot to examine the regression standardised residuals (Pallant 2016). The P-P plot in Figure 5.2 demonstrated sufficient normality, with standardised predicted values and standardised residuals aligning in a straight line, suggesting no significant deviations from normality. Linearity and homoscedasticity were evaluated by inspecting the

residual scatter plot. The plot showed a linear distribution, indicating a linear relationship between the dependent variable and the independent variables, thus confirming the assumption of linearity (Saunders *et al.* 2016). Furthermore, the consistent pattern in the residuals verified the assumption of homoscedasticity, meaning that the variances between the independent and dependent variables remained constant (Everitt & Skrondal 2010).

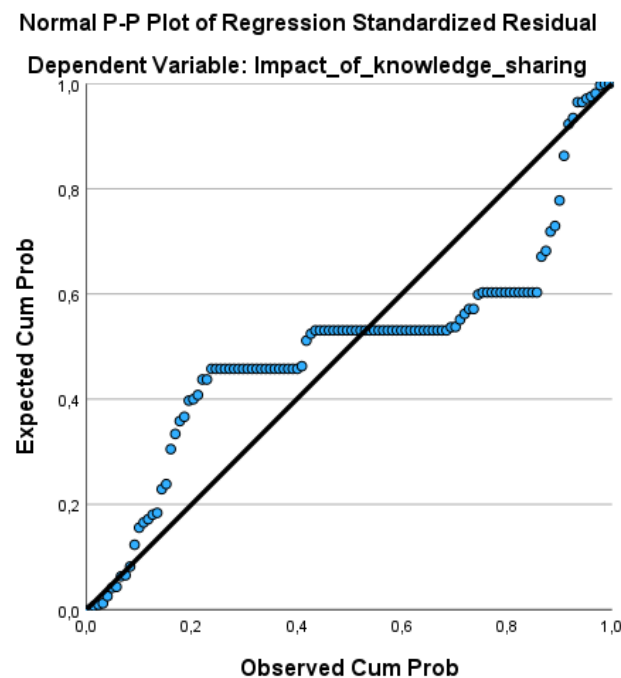


Figure 5.2: Normal P-P Plot of Regression Standardised Residual

The final assumption of collinearity or multicollinearity, which requires that no significant correlations exist between two or more independent variables, was examined. As Saunders *et al.* (2016) noted, a general guideline suggests that high correlations, typically 0.90 or greater, indicate the presence of collinearity. Upon checking the correlations, no bivariate relationships displayed such high values. According to Pallant (2016) and Saunders *et al.* (2016), collinearity can also be identified by reviewing tolerance coefficients and variance inflation factor (VIF) values. The rule of thumb is that a tolerance coefficient below 0.10 signals collinearity, whereas a VIF value above 10.0 points to multicollinearity. Table 6.33 presents the collinearity statistics for the sample. The results in Table 5.33 show that all tolerance coefficients exceeded the 0.10 threshold and that all the VIF values were below 10.0.

Consequently, none of the independent variables violated the multicollinearity assumption, allowing them to be retained in the regression model.

Table 5.33: Tolerance and VIF Distribution of Independent Variables

	Collinearity Statistics ^a	
	Tolerance	VIF
(Constant)		
Knowledge sharing	1,00	1,00
Collaborative organisation ecosystem	1,00	1,00
Factors influencing knowledge sharing	1,00	1,00
Factors hindering Information sharing	1,00	1,00
Challenges face by SMME	1,00	1,00
a. Dependent Variable: Impact of information sharing		

5.9.1 Knowledge That Information Sharing Positively Impacts Information Sharing

Hypothesis 1 was stated as follows:

H_0 : *KS has no impact on IMS.*

H_1 : *KS has a significant impact on IMS.*

As shown in Table 5.34, KS accounts for 57.2% ($R^2 = .572$) of the variance in the IMS, $F(1, 115) = 12.349$, $p < .001$. The data also show that KS is a significant predictor of IMS and that the relationship is positive ($\beta = .756$, $p < .001$). This means that as KS increases (agreement on the knowledge of information sharing), IMS (agreement on the benefits of information sharing in SMMEs) increases. Therefore H_1 is supported.

Table 5.34: The effect of KS on the benefits of information sharing in SMMEs

Hypothesis	DV	IV	R	R ²	F	df1 ; df2	p-value	B (regression coefficient)	T	p-value
H1	IMS	KS	0.756	.572	152.495	1; 115	.001	.756	12.349	.001

This study's regression analysis confirmed that knowledge-sharing strategy implementation is accountable for 57.2% of the variability in perceived benefits. The quantitative support of this finding verifies the qualitative data collected from Chapter 5 participants' perceptions that mentorship, and informal tools were primarily responsible for their personal and professional growth. Furthermore, the research findings align with those of Li *et al.* (2020) and Arsawan *et al.* (2022), who showed that knowledge-sharing strategies are important predictors of organisational performance and competitive advantage.

5.9.2 Collaborative Organisation Ecosystems Positively Impact Information Sharing

Hypothesis 2 was stated as follows:

H₀: COS has no impact on IMS.

H₁: COS has a significant impact on IMS.

As shown in Table 5.35, the COS accounts for 63.8% ($R^2 = .638$) of the variance in the IMS, $F(1, 115) = 14.170$, $p < .001$. The data also show that COS is a significant predictor of IMS and that the relationship is positive ($\beta = .799$, $p < .001$). This means that as the COS increases (agreement on a collaborative organisational ecosystem with the SMMEs), the IMS (agreement benefits of information sharing) increases. Therefore H_1 is supported.

Table 5.35: Effect of the COS on the benefits of information sharing in SMMEs

Hypothesis	DV	IV	R	R ²	F	df1; df2	p-value	B (regression coefficient)	T	p-value
H2	IMS	COS	0.799	.638	200.791	1; 115	.001	.799	14.170	.001

5.9.3 Factors Influencing Knowledge Sharing Positively Impact Information Sharing

Hypothesis 3 was stated as follows:

H₀: FKS has no impact on the IMS.

H₁: FKS has a significant impact on the IMS.

As shown in Table 5.36, FKS accounts for 62.1% ($R^2 = .621$) of the variance in the IMS, $F(1, 115) = 13.671$, $p < .001$. The data also show that FKS is a significant predictor of IMS and that the relationship is positive ($\beta = .788$, $p < .001$). This means that as FKS increases (agreement on factors influencing information sharing), IMS (agreement on the benefits of information sharing) increases. Therefore H_1 is supported.

Table 5.36: The effect of FKS on the benefits of information sharing in SMMEs

Hypothesis	DV	IV	R	R ²	F	df1; df2	p-value	B (regression coefficient)	T	p-value
H3	IMS	FKS	0.788	.621	186.890	1; 115	.001	.788	13.671	.001

5.9.4 Factors Hindering Information Sharing Positively Impact Information Sharing

Hypothesis 4 was stated as follows:

H_0 : The FHIS has no impact on the IMS.

H_1 : The FHIS has a significant impact on the IMS.

As shown in Table 5.37, FHIS accounts for 77.3% ($R^2 = .773$) of the variance in IMS, $F(1, 115) = 19.688$, $p < .001$. The data also show that FHIS is a significant predictor of IMS and that the relationship is positive ($\beta = .879$, $p < .001$). This means that as FHIS increases (agreement on the factors hindering information sharing), IMS (agreement on the benefits of information sharing) increases. Therefore H_1 is supported.

Table 5.37: The effect of the FHIS on the benefits of information sharing in SMMEs

Hypothesis	DV	IV	R	R^2	F	df1; df2	p-value	B (regression coefficient)	T	p-value
H4	IMS	FHIS	0.879	.773	387.622	1; 115	.001	.879	19.688	.001

5.9.5 Challenges Faced by SMMEs Positively Impact Information Sharing

Hypothesis 5 was stated as follows:

H_0 : C has no impact on the IMS.

H_1 : C has a significant impact on the IMS.

As shown in Table 5.38, C accounts for 73.3% ($R^2 = .733$) of the variance in the IMS, $F(1, 115) = 17.700$, $p < .001$. The data also show that C is a significant predictor of IMS and that the relationship is positive ($\beta = .856$, $p < .001$). This means that as C increases (agreement on the challenges), the IMS (agreement that information sharing benefits) increases. Therefore H_1 is supported.

Table 5.38: The effect of Challenges faced by SMMEs on benefits of information sharing in SMMEs

Hypothesis	DV	IV	R	R^2	F	df1; df2	p-value	B (regression coefficient)	T	p-value
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H5	IMS	C	0.856	.733	313.277	1; 115	.001	.856	17.700	.001
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5.10 Chapter Summary

This chapter presented on the quantitative findings of the research, based on a survey of 116 SMMES in the construction sector. A demographic analysis indicated that the majority of employees in this sector were male, had significant experience, and held high levels of education; however, they had limited access to financial resources and therefore exhibited characteristics of a survivalist industry. In addition, the descriptive analysis revealed that, while there existed high agreement on the benefits of knowledge sharing, this is somewhat at odds with respondents' extensive reliance on informal methods of knowledge sharing.

Inferential statistics confirmed the reliability and construct validity of the research instrument. Correlation analysis revealed strong, significant relationships between all constructs, particularly between a collaborative ecosystem and knowledge-sharing behaviour. Lastly, regression analysis resulted in the rejection of all five null hypotheses (H_0) in favour of the alternative hypotheses (H_1), demonstrating that knowledge-sharing strategies, collaborative ecosystems, and even the recognition of barriers are significant predictors of perceived benefits in information sharing. The quantitative results provide the statistical basis for the study, which Chapter 6 utilises to present qualitative data and explain the socio-cultural and historical influences behind the observed trends..

CHAPTER 6: Data presentation, Analysis and Discussion

6.1 Introduction

Building on the statistical baseline established in Chapter 5, this chapter presents the study's qualitative findings, in particular the themes and patterns that have emerged from the research data on enablers, barriers, and strategies related to knowledge sharing in South African construction industry SMMEs. This phase was conducted to provide a deeper understanding of the "why" behind the quantitative trends identified in the previous phase. Using Braun and Clarke's (2019) thematic analysis, this study examines the legacy issues, informal practices, and leadership dynamics that shape how knowledge is shared within these businesses. The insights gained from these findings are critical for understanding how SMMEs manage, share and retain knowledge, as well as the impact of these practices on their competitive advantage and growth. This chapter discusses the research questions and themes and provides a critical analysis of each theme based on participant responses. The objective is to explain the statistical correlations established in Phase 1 and provide a thorough understanding of the information-sharing procedures currently implemented in SMMEs and to identify areas for development to improve knowledge management in this industry.

6.2 Presentation of Findings

The three themes that emerge address informal structures that govern knowledge sharing, barriers to formalisation driven by legacy issues and leadership and incentivisation of knowledge sharing. All three identified themes highlight both the challenges and opportunities faced by SMMEs in developing effective knowledge management systems. The following sections delve into these themes, presenting insights from participant data and supporting them with relevant data.

Table 6.1: Research question, the key themes and the description of the themes.

Research Question	Theme
1. How does the historical legacy of knowledge sharing affect the SMMEs?	Informality in Knowledge-Sharing Structures

	Barriers to Formalising Knowledge Sharing Due to Legacy Issues
	Knowledge Sharing as a Tool for Trust and Team Empowerment
2. What are the strategies of knowledge sharing in SMMEs within the Construction Industry?	Reliance on Informal Knowledge Sharing Tools and Methods
	Employee Empowerment Through Practical Training and Mentorship
	Knowledge Sharing as a Motivational Tool Through Incentives
3. What factors enable or hinder knowledge sharing in SMMEs within the Construction Industry?	Technology as an Enabler and Barrier to Knowledge Sharing
	Organisational Culture and Leadership as Key Enablers
	Knowledge Sharing Incentives and Recognition
4. What impact does knowledge sharing have on SMMEs within the Construction Industry?	Knowledge Sharing as a Catalyst for Innovation and Growth
	Team Empowerment and Organisational Learning
	Enhanced Competitive Advantage and Business Continuity
	Increased Trust and Team Collaboration
5. What framework can be recommended for enhancing knowledge sharing in SMMEs?	Lack of Formal Knowledge Sharing Systems
	Leadership-Driven Knowledge Sharing
	Technological Enablers and Barriers
	Incentives in Knowledge Sharing

6.2.1 The Effects of the Historical Legacy of Knowledge Sharing on SMMEs Within the Construction Industry in South Africa.

The thematic analysis identified three recurring themes related to the historical legacy of knowledge sharing in South African SMMEs from the construction sector. These identified shared experiences and participant perspectives on how the past informs the present in knowledge sharing help explain how organisational knowledge

management today is shaped by the relentless presence of traditional problems, unofficial systems and relationship building.

6.2.1.1 Informality in Knowledge-Sharing Structures

The informality within the process of sharing knowledge is vital to SMMEs and has been changing throughout history only with respect to organisational practice. Most businesses within this sector have not yet reached formal systems of documentation, transmission and storage of knowledge. This is also evident from discussions in which participants mentioned time and again that knowledge flows through loose conversations, WhatsApp messages and onsite discussions. This approach shows how small firms may tend towards a survivalist attitude, whereby there is an assumption that knowledge practices are shared almost subconsciously rather than being designed in a structured knowledge-sharing mechanism. One of the participants, who is a managing director, noted,

"We do not have personal site meetings; we do chat up, not formalised. People are free to speak" (Participant 11)

The participant underlined that informal conversations rather than structured meetings are used, which again shows that there is a lack of formal processes for sharing knowledge. Furthermore, the use of informal business conversation is also noted by the participants, as some of them reported that there is an instance of informal control and functionality in the construction industry. This is highlighted by another director participant who noted,

"I don't have people on my team permanently; I hire them per project, so knowledge sharing is mostly informal. " (Participant 12)

The participant indicates the use of temporary employment within the construction industry, and he uses employees based on projects only, which justifies and reinforces the reliance on informal knowledge sharing. Moreover, the participants indicated that presence represents deep-seated challenges where knowledge exists in the heads of business leaders and is not transferred in a systematic manner or documented for reuse in the business's future. This is highlighted by a participant, who is a director focused on the building areas in construction by noting,

"I don't know how to transfer the knowledge I have... It's all in my head, and no one ever told me how to share it. " (Participant 13)

The presence of reliance on informal means of knowledge sharing is reflected by the participants' historical practices, where formal structures were unavailable and even impractical for small businesses. These businesses have developed over time, without the appropriate resources being put in place within formal knowledge-management systems. The applicability of historic practices has proven flexible for business owners. This informal approach restricts scalability, limits business continuity and sometimes leads to critical loss when employees or key leaders leave an organisation. In participants' responses, there was no formal knowledge management system due to very scarce resources, and the survival concept was prioritised over the growth concept.

This finding supports Anand and Walsh (2020), who argue that, in SMMEs, a lack of knowledge sharing within the business occurs when there is no culture, motivation or trust. The authors add that, owing to their size and human resources, SMMEs generally rely on informal systems for knowledge diffusion. This assertion is also supported by Centobelli *et al.* (2019), who find that SMMEs commonly use KM practices that are useful for task implementation, but, due to limited resources, these practices are generally informal. Formal structures impede scalability, and when knowledgeable staff leave the organisation, there is a serious loss of knowledge. Consistent with previous literature, the participants confirmed that the informality of information sharing arises from past practices where formal structures were either unfeasible or too costly. This lack of formality promotes flexible and rapid communication; however, it hampers the growth and stability of the organisation. The knowledge is tacit, private, and informal, making it vulnerable to loss and not easily shared within the organisation.

6.2.1.2 Barriers to Formalising Knowledge Sharing Due to Legacy Issues

The results revealed barriers to the formalisation of knowledge sharing, which are typically rooted in historical obstacles, including insufficient funding, inadequate resources, and highly entrenched hierarchical structures. The participants noted that their respective companies have difficulty transitioning from informal to formal knowledge-sharing systems. These are barriers to legacy issues that have, over time,

been part of the construction industry, in which there is the persistence of traditional ways of operating, usually informally passed down, while financial constraints prevent companies from investing in formal knowledge management infrastructure. One of the participants, who is an owner, noted,

"There is no practice in place; knowledge sharing happens through discussions, but nothing formalised." (Participant 2)

This participant indicates the historical legacy of ad hoc knowledge sharing that persists because the appropriate structures are not put into place. Additionally, another participant a director noted,

"We call it skills transfer, not knowledge sharing... It is very informal, and the older generation tends to hold onto their knowledge." (Participant 9)

This underscores the deeply rooted habits and the age gap preventing the formalisation of knowledge exchange within SMMEs. This further highlights how the older generation within this industry may be unwilling or unable to pass on their expertise to the next generation in a structured manner. However, a participant who is an owner noted,

"Knowledge sharing has been happening, but it is not formalised. It is expensive to hire professionals to manage knowledge, and there is no recognition of its importance. " (Participant 14)

This participant identifies the presence of knowledge sharing, however, in an informal practice, additionally identifying both financial and practical difficulties in formalising knowledge-sharing practices, as many SMMEs cannot afford to employ full- or part-time knowledge managers.

Formalising knowledge sharing is deeply linked to the legacy of under-resourced and economically strained operations within SMMEs. Most businesses, according to the research, have historically prioritised survival over expansion. This highlights that procedures such as knowledge sharing have not been implemented or prioritised. The participant highlights cultural resistance to formalising knowledge sharing, particularly among the older generation, who have traditionally passed down knowledge informally. Barriers of this nature limit SMMEs' potential to innovate or achieve

organisational improvement due to the retention or loss of key knowledge when employees leave.

These findings support the assertions made by Dithebe *et al.* (2022), who discuss the challenge faced in the South African construction industry, stating "a mismatch between available and required skills" and "critical issues in procurement for sustainable empowerment." This literature highlights the challenges arising from historical inequalities coupled with resource limitations. Nevertheless, the findings also support the research by Anand and Walsh (2020), who found that SMMEs face knowledge sharing difficulties that hinder the retention of qualified personnel. This confirms a lack of commitment to formalising knowledge-sharing practices, often due to financial constraints and a focus on short-term survival rather than on knowledge management. Additionally, the findings support Saka *et al.* (2022), who argued that organisational factors such as culture, technology, structure, or strategy that might influence knowledge transfer are generally underdeveloped due to legacy issues in the SMMEs sector. There is a consensus that the main obstacles preventing many SMMEs from establishing structured, formalised knowledge-sharing practices can largely be attributed to historical factors; in particular, their focus on survival rather than strategic development, along with financial constraints and cultural barriers to adopting new methods of operation, which lead to a lack of formal knowledge sharing in organisations, resulting in valuable organisational knowledge being absent or lost when employees leave.

6.2.1.3 Knowledge Sharing as a Tool for Trust and Team Empowerment

The data highlighted the absence of formalised systems. However, the participant data reflect the recurring theme of a strong reliance on trust and interpersonal relationships to facilitate knowledge sharing. The participants noted that knowledge sharing promotes team loyalty, trust, and empowerment in the absence of formal structures. This theme indicates that, according to the data, SMMEs attach greater importance to the role of knowledge sharing in building strong and cohesive teams. Knowledge sharing is often based on trust, which forms a highly innovative and collaborative environment where employees feel free to contribute all their ideas and expertise. The participant, who is a managing director, noted,

"Knowledge sharing builds trust and loyalty... Even if you are not with me anymore, it builds you as a person." (Participant 11)

This emphasises the interpersonal and relational nature of knowledge sharing, which benefits an employee's personal development and empowerment in addition to its business purpose. Another participant who is an owner further emphasises the value of information sharing by stating,

"Sharing knowledge with ease gives the company a competitive edge and strengthens the team to be high performing. " (Participant 14)

The participant emphasised how information sharing fosters collaboration and improves an organisation's overall performance, demonstrating the clear link between information sharing and commercial success. Furthermore, when the elements of trust and team empowerment are referenced, another participant stresses the significance of information sharing in employee empowerment. As the participant noted,

"I have taught three people to do tender buying, and they became creators. Sharing makes them loyal and trustworthy. " (Participant 13)

This demonstrated how employee enablement encourages loyalty and innovation in the workplace depends heavily on knowledge sharing.

Trust-based knowledge sharing, as identified by the data, becomes critical in settings where there is an absence of formal systems. It allows the organisation to function properly and provides an environment in which employees feel valued and empowered. In informal industries, knowledge sharing works as a tool for empowering teams in which employees obtain new skills, innovate and even take on leadership roles. However, while trust-based knowledge sharing is important, the data show that it cannot replace the role of formalised systems, which are necessary to ascertain that the knowledge becomes available to all employees and does not become siloed.

This finding validates Yeboah (2023), who argue that "trust plays a constructive role" in knowledge exchange, and organisations that share more knowledge perform "in a better way." It also corroborates Hall's (2019) research, which found that "sharing knowledge helps business owners manage complexity and uncertainty," and it "contributes to enhancing the organisation's performance." Trust-based knowledge sharing fosters team cohesion and a productive environment. Furthermore, this aligns

with Anand *et al.* (2021), who observed that SMMEs rely mostly on "the process of knowledge sharing mainly emphasises systems, technology and people," and further, the literature explains that "it is linked with limited employees, and their main focus is on creating social relationships." Similarly, the data and the literature indicate that, in the absence of formal systems, trust and interpersonal relationships form the basis for knowledge sharing in these SMMEs. This approach to trust indeed empowers employees, engenders loyalty and enhances team performance. However, it cannot be fully used as a substitute for the importance of formalised systems needed to scale and sustain an organisation.

6.2.2 Strategies for Knowledge Sharing Among the SMMEs of the Construction Industry in South Africa

The results of the thematic analysis revealed three recurrent themes concerning the knowledge-sharing tactics used by SMMEs in the South African construction sector. These themes emerged from the perspectives of participants on information-sharing practices within their companies, with a particular focus on the strategies, obstacles and innovative approaches used to improve knowledge sharing in this industry.

6.2.2.1 Reliance on Informal Knowledge-Sharing Tools and Methods

One key strategy that emerged from the data is the informal nature of knowledge sharing: the majority of SMMEs rely on valid, inexpensive methods such as WhatsApp, email, and direct discussions to convey information, as identified in the interviews. This approach is strongly related to the restricted resources and financial limitations that SMMEs have, as they are frequently unable to invest in formal knowledge management systems. The participants emphasised that although these informal approaches are rapid and adaptable, they rarely prove effective for organisational learning and long-term knowledge preservation. One participant noted,

"We use WhatsApp to communicate and share knowledge on projects. I would want my team to attend the same training I do, but I don't hire people on my team permanently. " (Participant 12)

The participant highlighted the reliance on WhatsApp as a primary communication tool. However, this communication tool is practical and effective for the use of communication with employees, yet it is limited and is not an appropriate tool for

structured knowledge management in a business. Additionally, another participant noted,

"Emails, WhatsApp, SMS... We record things informally, but it's more of a personal effort than a company policy." (Participant 11)

The participant asserted the presence of informal, technology-driven approaches in businesses, which are dependent on an individual's initiative and have limited institutionalised processes. Another participant noted the limited presence of formal information knowledge-sharing tools in the construction industry. However, the organisation is still heavily reliant on informal communication in day-to-day business management. The participant noted,

"We use shared drives on OneDrive to save our documents and institutional knowledge, but a lot of communication happens on WhatsApp." (Participant 14)

The participant illustrated how the business makes use of both cloud-based systems for storing documents and informal means of communication, such as WhatsApp, which are used side by side for day-to-day knowledge sharing.

The study's data revealed that methods have remained informal, reflecting the pragmatic approach that most SMMEs have adopted in managing knowledge sharing within the bounds of their operational budgets. The SMMEs data show the presence reliance of quick communication tools such as WhatsApp, email and SMS, which enable real-time information flows. The data, however, revealed the lack of formal structures and the limited use of formal communication tools as a means used on a day-to-day basis by construction companies, which suggests that some knowledge might be lost or, worse still, inaccessible to future employees. According to this research, the construction industry's approach is effective for meeting immediate needs but presents difficulties for long-term knowledge growth and retention.

This finding aligns with the observations of Adesina and Ocholla (2024), who note that while informal tools offer flexibility and immediate communication, they present significant disadvantages for long-term knowledge retention and the transfer of tacit knowledge. This confirms the significant challenge facing the construction industry, where project-based work necessitates consistent knowledge transfer across teams over time. Furthermore, this result corroborates Anand and Walsh (2020), who indicate

that most SMMEs in resource-poor environments utilise low-cost communication tools for speed but lack the capacity to establish formal knowledge management systems. Similarly, these findings support Centobelli *et al.* (2019), who observed that SMMEs are inclined towards "pragmatic and cost-effective" solutions, exploiting informal channels like WhatsApp due to a lack of infrastructure. Informal methods are a practical strategy for real-time knowledge exchange in resource-constrained environments such as the construction industry. However, the data indicate that these informal methods pose serious challenges to knowledge preservation and organisational learning due to a lack of formal systems intended to ensure that knowledge is captured and retained for future use.

6.2.2.2 Employee Empowerment Through Practical Training and Mentorship

The findings indicated that the knowledge-sharing strategies cited most by the SMMEs in the construction industry included mentorship and on-the-job training. The significance of mentorship and experiential learning in the transfer of knowledge from more experienced employees or managers to less experienced team members was emphasised by the participants. This method fits the needs of the construction industry since learning is often work-based and practical, requiring hands-on experience. In mentoring, there is ample scope for this, as knowledge is passed on little by little to attain perfection in projects executed by a small team in most cases. A participant who is a director noted,

"I've taught three people how to do tender buying, and they became creators. Knowledge sharing is essential to building loyalty and growing skills"
(Participant 13)

This participant highlights how mentorship and on-the-job training help workers develop more skills, which additionally adds value to them as employees and fosters loyalty to the organisation. Additionally, another participant noted,

"We create a psychologically safe environment that allows everyone to contribute knowledge, and we recognise each other's input in every project."
(Participant 14)

The participant stated that in a safe setting, people feel at ease, are free to contribute whatever expertise they possess and take part in project decision-making. These data demonstrated how crucial it is to create a positive work environment where employees

are encouraged to actively share their expertise and take part in choices about projects that would benefit the business. Furthermore, one participant highlighted the strategic use of mentoring within the construction industry. The participant noted,

"For a leader to make their life simple, they have to share with the junior staff. Give them the leverage to make decisions when I am not around, so they learn from their mistakes. " (Participant 9)

The participant highlights the strategic use of effective mentorship application. The junior staff in the business are empowered to take on decision-making roles, making knowledge transfer practical.

The data analysis identified two crucial methods for knowledge exchange in SMMEs in the construction sector: mentoring and hands-on, practical training. These methods facilitate skill development and ensure that knowledge is transferred in a manner appropriate to the company's specific requirements. Employee growth and contribution to a company's success are encouraged in this culture of shared responsibility, which is fostered by this empowerment-focused approach. However, the lack of official training programmes and the limited availability of experienced mentors may pose barriers to this approach.

In the same vein, Al-Zoubi et al. (2025) argued that mentorship facilitated the transfer of tacit knowledge, a vital element for practical tasks in the construction industry. Furthermore, the results support Anand *et al.* (2021), who state that "knowledge sharing in SMMEs often revolves around people and interpersonal relationships," with mentorship playing a crucial role in skill development. These findings also support the foundational work of Nonaka and Takeuchi (1995), affirming that information is effectively shared through socialisation processes where experienced team members mentor newcomers, an especially vital process in fields where expertise is grounded in real-world activities. The findings highlight how mentorship helps employees build confidence and transfer practical knowledge. Mentorship-driven knowledge sharing creates a supportive work environment where employees can learn from their mistakes and take on new tasks, ultimately developing more competent and committed staff.

6.2.2.3 **Knowledge Sharing as a Motivational Tool through Incentives**

Several participants discussed using incentives to promote information sharing, acknowledging that both material and nonmaterial rewards are effective. Organisations can cultivate a culture of cooperation and ongoing learning by encouraging staff members to share their knowledge. Within this framework, incentives encompass not only monetary compensation but also the acknowledgement of individual contributions, team-building exercises, and other non-monetary forms of motivation. This approach recognises that when workers feel that their efforts are respected and appreciated, they are more inclined to share their knowledge. The participant in the data noted,

"For most people, money incentivises... If we beat a target, I give them more based on the success of the project. " (Participant 11)

This participant provides evidential data that highlight that financial incentives are linked with business project success and can contribute to motivating employees toward knowledge sharing and play a role in overall team success. Another participant noted,

"We recognise contributions with vouchers or small rewards, but we also use intangible rewards like praise and acknowledgement during meetings." (Participant 14)

This participant highlights that financial incentives linked to business project success can motivate employees toward knowledge sharing, while intangible rewards reinforce a collaborative culture. Another participant noted,

"It cannot always be monetary incentives. You need to connect with them personally and give them a platform to share their knowledge." (Participant 9)

In addition to monetary rewards, the participant emphasised the value of personal recognition and the necessity for employers to foster an atmosphere in which workers feel comfortable to share expertise.

Research indicates that employees are more likely to share their expertise when their efforts are recognised, consistent with an incentive-based approach to knowledge sharing. Although the data suggest that financial incentives have proven effective, many participants also mentioned using intangible rewards, such as team-building

activities and recognition, to foster a sense of community and cooperation. A combination of monetary and non-monetary rewards would, therefore, enable companies to create a collaborative environment where sharing information becomes part of the corporate culture.

Consistent with the findings, Nsubuga-Mugoa *et al.* (2021) notes that organisations can foster a culture of knowledge sharing through both intrinsic and extrinsic rewards. The finding that financial incentives encourage sharing while non-monetary benefits foster community directly mirrors Baldacchino's distinction between performance benchmarks and professional growth opportunities. Furthermore, this study builds on the work of Anand and Walsh (2020), who found that non-financial incentives such as public recognition are often used in SMMEs with limited resources. Finally, this aligns with Aggarwal and Kapoor (2020), who argued that recognising contributions is vital for creating a collaborative environment where staff members feel appreciated. The data highlight the significance of both monetary and non-monetary incentives in fostering a culture of information sharing. SMMEs can encourage staff to share information and contribute to a company's success by combining tangible benefits, like bonuses, with intangible incentives, such as praise and recognition.

6.2.3 Factors That Enable and Hinder Knowledge Sharing Among SMMEs in the Construction Industry in South Africa

The data analysis using Braun and Clarke's (2019) thematic analysis generated three major themes that highlight the crucial enablers of and barriers to sharing knowledge. The roles of technology, leadership, organisational culture, rewards and recognition represent a few of these subjects. By analysing these issues, we can determine how SMMEs address the challenges of knowledge exchange and how they might enhance their procedures to enhance long-term viability.

6.2.3.1 Technology As an Enabler and Barrier to Knowledge Sharing

The data revealed that communication tools such as WhatsApp, emails and shared drives are among the most common technologies that enable knowledge sharing, not only through real-time communication but also through document storage. However, the data revealed that the lack of access to sophisticated technologies and financial constraints impeded the formalisation of knowledge-sharing practices. There are enabler technologies tools identified by the participants, an owner participant noted,

"We use shared drives on OneDrive to save or documents and institutional knowledge. " (Participant 14)

According to the participant, cloud-based technologies such as OneDrive facilitate the saving and retrieval of shared knowledge. According to this research, businesses have experienced more effective teamwork and simpler lines of communication. Furthermore, data from another participant also stated,

"We keep records of the knowledge shared. Emails, WhatsApp, SMS... Teams with clients." (Participant 11)

The participant underlined how the company they work for combines informal tools such as WhatsApp and emails to document knowledge or share it during meetings with clients or internal discussions.

However, the data also indicate the current barriers of financial constraints and limited access to advanced technology. The participant noted that,

"In my mind WhatsApp. " (Participant 13)

The participant indicated that knowledge is not formally kept but rather exists informally in people's brains or on WhatsApp. Formalising knowledge-sharing procedures is significantly hampered by the absence of an appropriate knowledge management system. Additionally, another barrier noted by participant is,

"High costs related to software and hardware are one of our greatest challenges in ensuring effective knowledge sharing." (Participant 14)

The participant noted that a major obstacle preventing SMMEs from moving from unstructured communication channels to more formal knowledge-sharing platforms is the high cost of implementing sophisticated technologies.

In the construction industry, simple technical solutions such as shared drives, emails and WhatsApp allow small teams to share information and communicate informally and rapidly. However, many SMMEs still face significant obstacles in adopting modern technology, which restricts their capacity to codify knowledge-sharing procedures. Consequently, businesses turn to unofficial methods of knowledge transmission and storage, which may ultimately lead to information loss or inefficiency.

In line with these findings, Deng *et al.* (2023) also established that digital technology-driven knowledge sharing significantly enhances job performance by enabling employees to access relevant information efficiently. Furthermore, this aligns with Anand and Walsh (2020), who observed that while digital tools enable connectivity, SMMEs often struggle with the high costs associated with implementing advanced knowledge management platforms. The importance of cost-effective solutions, such as using WhatsApp, is highlighted, demonstrating that limited funds are a key factor that encourages SMMEs to rely on available, albeit informal, technological solutions. Conversely, the absence of a formalised system poses potential risks to knowledge retention, which supports the findings of Lartey *et al.* (2022), who note that in most cases, SMME owners feel compelled to limit knowledge sharing due to financial constraints.

6.2.3.2 Organisational Culture and Leadership as Key Enablers of Knowledge Sharing

The leadership and organisational culture of a company play important roles in successful knowledge-sharing practices. The participants noted that supportive leadership creates trust, which encourages people to share knowledge, whereas a lack of trust or fear of job loss discourages them from sharing it. Supportive leadership and team empowerment enable an organisational culture for knowledge sharing. The participant noted,

"For a leader to make their life simple, you have to share with the junior. Make your life easier. Give them the leverage to make decisions when I am not around, by so doing, they are learning from their mistakes. " (Participant 9)

The participant emphasised the importance of empowering junior employees by granting them decision-making authority, encouraging experiential learning, and fostering an environment in which information is openly exchanged. Additionally, organisational culture and leadership are noted by another participant, who stated,

"EME turn over 10 million a year, being small, being a man show, I lead by example, I am available hands-on, I am diligent; that is my strategy for my team to grow. " (Participant 11)

According to this participant, setting an example by being approachable, involved and hardworking. These are the key components highlighted by the data, which foster a

culture of information exchange in which the team feels encouraged and empowered to develop. Moreover, another participant noted,

"We create a psychologically safe environment that allows knowledge to be shared by everyone. Recognising contributions of everyone and acknowledging them. "(Participant 14)

In organisational culture and leadership, establishing an atmosphere that is psychologically safe ensures that employees may freely exchange ideas without worrying about backlash, which encourages teamwork and that creativity effectively enables knowledge sharing.

In organisational culture and leadership, there are barriers, such as a lack of trust and fear of job security.

"Disadvantage: When you are a team leader, people don't want to share because they think the assistant will be better than them. "(Participant 8)

The abovementioned participant highlighted the focus on an issue prevalent in many organisations of employees' fear of being replaced, which prevents them from sharing expertise, especially among team leaders, who could feel threatened by the development of their subordinates. Another participant noted,

"No opportunity yet to survive; people come and go it takes time. "(Participant 13)

The participant highlighted that trust takes time to develop within teams and that information is lost when people depart. There is a lack of continuity and significant personnel turnover, which hinders efficient knowledge sharing in the organisational culture.

The data underscored that knowledge sharing thrives in an environment where supportive leadership is cultivated through empowerment and trust. Knowledge can freely flow throughout an organisation when leaders foster employee responsibility and provide a safe environment for idea exchange. However, mistrust and anxiety over job instability serve as major obstacles, causing workers to conceal information to preserve their jobs, which restricts organisational creativity and expansion.

These results echo the findings of Alo *et al.* (2025), who argued that in organisations, the support of the top management is influential in moulding attitudes of information sharing. The participants' findings confirm that senior management's involvement in empowering junior staff is essential to foster a positive environment for knowledge sharing. Furthermore, this study supports Yeboah (2023), who argues that leadership is vital for building a climate of trust and openness, which are necessary conditions for knowledge sharing within project teams. Conversely, findings on fear of job loss align with those of Yao *et al.* (2020), who discovered that job insecurity is negatively related to knowledge sharing, concluding that when individuals perceive their jobs as threatened, they are less likely to share knowledge. This supports the idea that even though leaders can facilitate knowledge sharing practices, the fear of being replaced remains a major hindrance.

6.2.3.3 Knowledge-sharing Incentives and Recognition As Catalysts

The data analysis underscored that incentives, both tangible, such as financial rewards, and intangible, such as recognition, are necessary to motivate employees in knowledge sharing. Some participants indicated that the recognition of employee contributions and small rewards creates a helpful culture of sharing; conversely, the lack of formal reward systems for collaboration discourages employees. The data analysis does not indicate that incentives and recognition are enabled, which the participant noted:

"For most people, money incentivises me in many ways. If we beat this target, I give them more based on the success of the project. " (Participant 11)

The participant highlighted that employees are encouraged to share information and collaborate toward the company's objectives by offering financial incentives linked to project success. Additionally, the participant also asserted,

"By recognising their contributions celebrating successes and big and small milestones. Creating enabling environment creating systems and processes. "(Participant 14)

The participant indicated how acknowledging contributions and commemorating accomplishments, no matter how minor, empowered team members and promoted information exchange. However, the participant data also noted that there are barriers, such as the lack of reward systems, a participant noted,

"I don't motivate them. "(Participant 12)

The participants highlighted that there is no motivation present in the workspace, which indicates that there is less information sharing when there are no formal incentive programmes or prizes, as employees are not motivated to go above and beyond their job duties. Similarly, a participant noted,

"It cannot be monetary incentives." (Participant 13)

The participant indicated that although monetary rewards might be useful, non-monetary rewards such as establishing a platform for knowledge sharing and receiving personal acknowledgement are just as significant but sometimes disregarded in organisations. These are identified by the data as barriers to knowledge sharing.

The data indicate that one of the effective strategies for encouraging knowledge sharing in businesses is the use of rewards and recognition. While intangible benefits such as recognition and team-building exercises foster a collaborative atmosphere in which knowledge is valued, monetary rewards linked to performance milestones encourage employees to actively engage in knowledge sharing. In addition, the analysis indicated that the absence of official incentive programmes leads to disengagement and reduces employees' motivation to share information, particularly in project-based businesses, where individual efforts may go unappreciated.

These findings support Nsubuga-Mugoa *et al.* (2021), who found that reward systems, both financial and non-financial, are essential for shaping knowledge-sharing behaviour in SMMEs. The study confirms their assertion that employees are more likely to share knowledge when they perceive a direct benefit, whether through monetary bonuses or job security. Furthermore, the results corroborate Javed *et al.* (2019), who distinguish between the impact of financial rewards and non-monetary incentives like recognition. The participants' focus on "celebrating successes" supports Javed *et al.*'s (2019) conclusion that proper compensation and recognition reflect the value of an employee's contribution to the team. The data shows that the lack of such systems results in disengagement, confirming the view that without clear motivation, knowledge sharing is often deprioritised in favour of individual tasks.

6.2.4 The Impact of Knowledge Sharing on SMMEs in the Construction Industry in South Africa

In applying Braun and Clarke's (2019) thematic analysis to the data, the main themes that emerged reveal how knowledge sharing affects innovation, team empowerment, organisational learning, and competitive advantage, thereby informing understanding of its impact on SMMEs within the South African construction industry.

6.2.4.1 Knowledge Sharing as a Catalyst for Innovation and Growth

The data analysis revealed that employees at SMMEs are empowered to think creatively and develop novel solutions to problems in the construction sector through knowledge exchange. Employees who share their knowledge, perspectives and abilities help the company expand overall and become more competitive in a changing market. The participant noted,

"In life in general, everything is fluid; I learn a lot from everyone; they share how things that I don't know do, which enhances innovation. "(Participant 11)

This participant highlighted the way in which information sharing promotes fluid learning, in which staff members share ideas and expertise to inspire creative solutions inside the company. The participant added that,

"Knowledge is power. You share what you think and what you know. If the environment is enabling, the team will be forced to think in order to share information and knowledge. Technology will be enhanced to allow innovation. "(Participant 14)

According to the participant, information sharing stimulates critical thinking and idea exchange among staff members, which promotes creativity, particularly in settings where technology fosters innovative problem solving.

The data revealed that in SMMEs, knowledge sharing fosters an innovative and continuous improvement culture. The data indicate that employees are more inclined to test innovative concepts and take measured risks when they are encouraged to share their knowledge, which strengthens their competitive advantage in the market. This constant flow of knowledge also guarantees the organisation's ability to adjust to new problems and technological breakthroughs.

The findings align with the results obtained by Li *et al.* (2019), who suggested that a direct positive relationship exists between intellectual capital and innovation performance in construction organisations. The respondents' support for fluid learning again aligns with Li *et al.* (2019), who concluded that construction companies need to increase their inputs in intellectual capital to enhance their competitiveness within the marketplace. Supporting the current research, Arsawan *et al.* (2022) found that the construction sector depends on a knowledge-sharing approach to maintain a competitive advantage. The respondents' inclination to engage in creative thinking "outside the box" further corroborates the findings of Arsawan *et al.* (2022).

6.2.4.2 Team Empowerment and Organisational Learning

Increased organisational learning and employee empowerment are two other important effects of information sharing. If knowledge sharing is successful, employees feel more confident and are more motivated to take on responsibilities or contribute to initiatives or projects. This leads to a more cohesive team and a better, stronger workforce. The participant stated,

"For a leader to make their life simple, you have to share with the junior. Make your life easier. Give them the leverage to make decisions when I am not around By so doing they are learning from their mistakes. "(Participant 9)

The participant revealed that through knowledge sharing, employees are given a chance to be made responsible, which allows them to take part in making decisions to learn through experiences and by making mistakes. Another participant director further noted,

"I have taught three people to do tender buying, and they became creators. If you continue to grow them, they will be loyal, trust you and be dependable. "(Participant 13)

The participant emphasises that knowledge sharing develops employees' skills and fosters loyalty and trust, which are critical to increasing workforce dependability.

The data revealed that empowering staff members to take responsibility for their work and to share knowledge greatly enhances organisational learning and team empowerment. In addition, the data indicate that employees who feel empowered are appreciated and trusted, which increases their engagement and productivity.

Furthermore, the data revealed that knowledge sharing improves the organisation's overall capacity to manage challenging tasks, fostering cooperation and ongoing improvement.

This finding validates Ahmad and Karim (2019), who argue that the exchange of skills and expertise strengthens knowledge assets and improves individual performance. The participants' view that sharing creates "creators" and "dependable" staff supports Ahmad and Karim's (2019) conclusion that knowledge sharing leads to both individual and organisational growth. Additionally, this corroborates Nguyen (2020), who found that sharing expertise creates an empowered workforce and solves problems related to a lack of professional advancement. The study confirms Nguyen's (2020) observation that online and offline organisational knowledge sharing significantly mitigates professional stagnation by empowering employees to take ownership of their roles.

6.2.4.3 Enhanced Competitive Advantage and Business Continuity

SMMEs can better maintain their competitiveness in the construction sector by sharing knowledge. By ensuring that vital information and skills are distributed throughout the organisation, knowledge sharing helps to avoid knowledge silos or loss due to staff turnover. This establishes business continuity, allowing them to continue operations and hold onto its competitive edge despite staff turnover or market difficulties. The participant's data assert this as a participant owner noted,

"Sharing what you know with ease gives the company a competitive edge, strengthens the team to be a high-performing team and keeps both management and employees accountable. " (Participant 14)

The participant emphasises that by keeping management and staff aware of and responsible for their responsibilities, efficient knowledge sharing helps the business maintain a competitive advantage. Another participant stated,

"Learning, giving another person a perspective learn every day; we don't know everything, so it is important to share with someone else. I had to teach them because I am qualified. Sharing is caring. "(Participant 8)

The participant emphasises the value of ongoing education and information exchange in developing staff who can develop and adapt, guaranteeing the long-term viability of the business.

The approach to effective knowledge sharing enhances the competitive advantage of a company by ensuring that the knowledge will not remain concentrated in the head of an individual but will be shared within teams for business sustainability. This strategy ensures a company's resilience in a competitive market and reduces the danger of knowledge loss when employees depart. Additionally, knowledge sharing encourages accountability in teams since informed and involved individuals are more likely to comprehend and support the organisation's larger objectives.

The results validate the integrated views proposed by Sogaxa (2024) and Li *et al.* (2020), who argue that knowledge management practices are a precondition for achieving sustainable business performance and competitive advantage. In this regard, Sogaxa (2024) highlights that intensive interactions and idea-sharing are essential to business continuity in the construction industry in the Eastern Cape, while Li *et al.* (2020) validate that knowledge-sharing directly improves entrepreneurial performance by enhancing dynamic capabilities. The respondents' particular orientation toward ensuring business continuity through knowledge sharing is also consistent with this scholarly consensus, indicating that knowledge sharing mitigates potential operating silos in a volatile business environment.

6.2.4.4 Increased Trust and Team Collaboration

Building trust among team members is a vital aspect of knowledge sharing, and trust is essential for productive collaboration. The data analysis revealed that in an organisation with trust and team collaboration, employees freely share their knowledge and experience to build a sense of belonging and respect for one another, which improves teamwork and collaboration at all organisational levels. The data clearly reveal increased trust and collaboration, as the participant stated:

"Knowledge sharing builds trust and loyalty... Even if you are not with me anymore, it builds you as a person. " (Participant 11)

The participant shows the impact of knowledge sharing in building trust and loyalty among employees. The research findings indicate that knowledge sharing in the

construction industry serves to make a team stronger and more collaborative. Another participant stated,

"Everyone start becoming innovative as they are trained to think outside the box. This also assists in keeping each team member accountable."(Participant 14)

The participant accents that through knowledge sharing, accountability in teams is increased to make everyone responsible for helping the team be successful and innovative.

The findings affirm that knowledge sharing strengthens interpersonal relationships because team members build up trust and loyalty with others. The data further indicated that the created trust could further reassure employees to be open to others and express their ideas without the fear of negative judgement. The data also highlight the role of the use of trust, which allows teams to be united and coordinated, solve problems in groups more concisely and help the organisational culture of mutual respect and accountability grow.

These views are supported by Yeboah (2023), who asserts that trust is a pre-condition for encouraging people to contribute. This implication is reinforced by a study conducted by Haq *et al.* (2022), which specifically identified that in construction project teams, team trust plays a significant role in the relationship between knowledge-sharing practices and project performance. The respondents' views on how to foster a sense of loyalty within SMMEs through shared contributions are corroborated by Anand & Walsh (2020), who demonstrated that a cohesive network leads to increased organisational-level interaction, which is vital within SMMEs.

6.2.5 The Framework Recommended for Enhancing Knowledge Sharing in SMMEs Within the Construction Industry in South Africa

The analysis identified key data-related recurring themes throughout the findings of the framework recommended for improving knowledge sharing in the SMMEs of the South African construction industry.

6.2.5.1 Lack of Formal Knowledge-Sharing Systems

The lack of established knowledge-sharing mechanisms appears frequently in the analysed data. Many participants indicated that informal channels, including email, WhatsApp and discussions, are used in their workplaces to share knowledge. However, this method frequently lacks the coordination and consistency required to guarantee that knowledge is retained and available to the entire business. For instance, a participant stated,

"Emails, WhatsApp, SMS... Teams with clients. We use them to communicate, but there is no formal system in place. " (Participant 11)

The participant statement highlights the dependence on informal communication methods within construction businesses. The present informal communication channels evidently work well for exchanging information; however, this was an indicator of the lack of organisation required for long-term memory in SMMEs. To further assert the dependence on informal communication, a participant noted,

"Knowledge management practices exist, but no formal knowledge management system exists to manage knowledge produced. As a result, we use MS365 to collaborate WhatsApp app outlook in-person and virtual meetings CEO's address morning safety scrum sessions." (Participant 10)

The participant statement depicted how the inability to manage and preserve organisational information systematically is hampered by the absence of a formal knowledge management system, even in the face of efforts at cooperative knowledge exchange.

This theme emphasises the need for the formation of formalised knowledge-sharing systems in SMMEs, as such channels might work out practically but do indeed carry a greater risk of losing valuable information with time. The data analysis highlighted that construction businesses lack a formalised system for knowledge sharing, which is necessary to preserve information within this industry. Therefore, the development of a formal system would ensure the capture, storage and availability of knowledge for all employees within the organisation for long-term learning.

These findings corroborate the work of Centobelli *et al.* (2019) and Anand and Walsh (2020), who collectively argue that while informal methods are practical for short-term

survival, they severely diminish long-term organisational learning. Centobelli *et al.* (2019) highlight that resource constraints drive the use of informal tools but warn that this leads to "inefficiencies and loss of expertise." This is supported by Anand & Walsh (2020), who drive the point that a centralised system is crucial for maintaining knowledge over time. Therefore, the data indicate that the absence of formal systems poses a significant risk to South Africa's SMME construction companies, as it hinders their ability to develop institutional memory.

6.2.5.2 Leadership-Driven Knowledge Sharing

A recurring theme within the data concerns the role of leadership in driving knowledge sharing within the organisations of the participants. In the data, most participants stressed that leaders and senior employees are especially important conduits in the knowledge transfer process through mentoring and hands-on training. The data indicated that, in many cases within SMMEs, knowledge remains with leadership and teams and is not disseminated throughout the organisation. The participant, for instance, stated,

"I have taught three people to do tender buying, and they became creators. If you continue to grow them, they will be loyal, trust you and be dependable. "
(Participant 13)

The participant highlights the role of leadership in the informal channel of knowledge sharing that is passed down through mentorship. However, the participant statement also indicated that knowledge is not shared across the board. It is done within the team's leadership work. Another participant also noted the role of leadership within the teams by stating,

"As a leader, I give the juniors leverage to make decisions when I'm not around. By so doing, they are learning from their mistakes."(Participant 9)

The participant emphasises the essential role of leadership in empowering employees by giving them responsibilities that enhance learning through experience. This finding highlights the importance of leadership in driving knowledge sharing in SMMEs.

The theme emphasises the role of leadership in sharing knowledge. The data highlighted that leaders must not only mentor juniors within their ranks but also establish an organisational culture that allows the sharing of knowledge without much

hindrance, which is ongoing and open throughout businesses. The data proves that the purpose of formalising practices such as opening formal knowledge sharing from leadership and ensuring that they are part of the company's structure are the needed steps that should be extended to take knowledge beyond particular persons or teams in the SMME sectors.

These results align with Yeboah (2023) and Anand *et al.* (2021), who posit that leadership is the primary driver of knowledge-sharing culture in small enterprises. Yeboah (2023) asserts that leaders must create an "enabling environment" where sharing is nurtured through empowerment, a view supported by the participants' emphasis on giving juniors "leverage to make decisions." Furthermore, Anand *et al.* (2021) argue that for knowledge sharing to be effective, it must not be confined to ad-hoc mentorship but must be systematic. The findings confirm that while leadership-driven mentorship is currently active, it requires formalisation to ensure knowledge reaches the wider organisation.

6.2.5.3 Technological Enablers and Barriers

Another key emerging theme from the data is the use of technology. The participants noted the dual nature of technology in the construction sector, as it enables and inhibits knowledge sharing among participants. The data showed that most SMMEs utilise WhatsApp, MS365 and Zoom. However, the data indicate the need for more advanced and formal technological systems for the effective capture and storage of knowledge, which remains lacking. The participants mentioned that stronger tools were needed to enable systematic information sharing and storage. For instance, a participant stated,

"We use Zoom for meetings and Teams for collaboration, but it would be helpful to have a better way to store and retrieve documents after projects are done. "
(Participant 7)

This participant's statement proved the utilisation of digital tools, yet also pointed to the deficiencies in storing and retrieving project-related knowledge effectively. Another participant asserted this and stated,

"We don't have a specific place to store information... Everything is working in isolation. "(Participant 9)

The participant's statement reflected the fragmentation of knowledge within the organisation he works for. The statement indicated the need for integrated systems within SMMEs and the vital role they play.

The technological enablers and barriers theme indicates the relevance of SMMEs adopting technology to enhance knowledge-sharing processes. The participant noted the basic technology tools such as Zoom and MS365, which are widely used. However, the integrated knowledge management system that captures, stores, and retrieves valuable information is missing within the participants' organisations. There is a need for a more comprehensive system that would allow for smoother collaboration and the preservation of knowledge for reuse.

The results support the dual nature of technology that has been argued by Phaladi et al. (2022), and Ode and Ayavoo (2020). On one hand, while Phaladi et al. (2022) indicate that the use of digital technologies such as Zoom and Teams can enhance collaborative efforts, Ode and Ayavoo (2020) argue that technology is an ineffective means of providing knowledge when it lacks an appropriate knowledge application process, which was evident in the study data. The participants' frustration with accessing scattered information provides evidence supporting Cerchione et al (2015)'s assertion that simple communication tools will not be sufficient for long-term knowledge acquisition. Therefore, this study indicates that SMMEs require integrated platforms that enable them to move beyond mere communication to effectively manage their knowledge.

6.2.5.4 The Role of Incentives in Knowledge Sharing

This theme highlights the use of incentives to encourage knowledge-sharing practices. Several of the participants mentioned that without formal incentives, employees may not be motivated enough to share knowledge. The data indicated that incentives – both monetary and non-monetary were major factors that drove employees to continuously exchange knowledge. A participant noted,

"For most people, money incentivises. If we beat this target, I give them more based on the success of the project. "(Participant 11)

This participant statement indicated that monetary benefits are a motivational tool for employees to participate in the knowledge-sharing process. In addition, another participant owner noted

"We give bonuses when a project is successful and knowledge sharing plays a part in ensuring that we are all on the same page. "(Participant 6)

The participant stated that bonuses linked to project success highlight how tangible rewards can be effective drivers for the sharing of knowledge by employees. In addition, this indicated that the use of monetary incentives can drive the culture of knowledge sharing among SMMEs.

The theme of the role of incentives in knowledge sharing showed that the use of monetary and non-monetary benefits helps motivate a knowledge-sharing culture. The data analysis indicated that people tend to be keener in knowledge sharing when they feel that what they contribute is valued and recognised. Formal incentive programmes may be instituted in SMMEs to promote the use of incentives for the adoption of knowledge sharing.

These results support the integrated view of rewards proposed by Nsubuga-Mugoa *et al.* (2021) and Javed *et al.* (2019). The data confirms Nsubuga-Mugoa *et al.* (2021)'s finding that while monetary bonuses linked to project success are powerful drivers, they must be part of a broader system that signals value to employees. This is further supported by Javed *et al.* (2019), who argue that reward systems are essential for demonstrating that an employee's contribution is valued by the organisation. The reliance of the participants on beating targets as a means of triggering rewards validates the link between performance outcomes and knowledge-sharing motivation established in the literature.

6.3 Recommended Framework for Enhancing Knowledge Sharing in SMMEs

A thorough framework for improving knowledge sharing among SMMEs within the South African construction industry can be suggested on the basis of the identified themes. With the objective of formalising and facilitating knowledge-sharing methods, this framework addresses the important issues of informality, leadership, technology and incentives.

1. Establish a Formal Knowledge Management System

A centralised knowledge management system such as SharePoint, Microsoft Office 365 and cloud-based platforms that enables the methodical recording, archiving and retrieval of knowledge should be put in place by SMMEs. This ensures that information is preserved and available throughout the company, addressing the participants' observation of a lack of formal systems.

2. Leadership-Led Knowledge Initiatives

Create leadership-driven knowledge-sharing initiatives where top staff members guide junior employees and have frequent meetings to ensure that perspectives are communicated at all levels. Formalising these procedures can help spread information more widely across teams and prevent the retention of isolated knowledge, which is mostly the responsibility of leaders.

3. Technological Integration

Integrated digital technologies, such as knowledge repositories, cloud-based document storage systems and virtual collaboration platforms should be adopted for information sharing. Although many businesses utilise simple applications such as Zoom or WhatsApp, a more complete technology infrastructure must be installed to ensure that knowledge is organised and readily available.

4. Incentivising Knowledge Sharing

A programme with two incentives should be established to encourage staff members to actively engage in knowledge sharing. Both monetary rewards (such as bonuses) and non-monetary recognition (such as praise in team meetings or opportunities for career progression) could be included in this category. Because rewards allow staff members to know that their efforts are appreciated, incentives are a strong motivator for information sharing. A structured system of rewards would promote more active participation in knowledge-sharing initiatives.

6.4 Chapter Summary

The thematic analysis of knowledge-sharing practices in South African SMMEs within the construction sector revealed how informal approaches, practical training and trust-based systems have developed as adaptive responses to historical and economic constraints. These enterprises utilise inexpensive and freely available tools, such as

WhatsApp and mentorship-oriented learning, for knowledge circulation that can provide them with a collaborative and empowered workforce. However, this dependence on informal channels has constraints, as these mechanisms are evidently difficult to sustain without the presence of formal mechanisms. More significantly, the key barriers impeding the process are the high costs of technology tools, the lack of well-structured reward systems and issues of organisational culture related to suspicions of job loss, further influencing the attempt to establish formal knowledge-sharing mechanisms. The data analysis indicated that leadership plays a central role in knowledge sharing, as supportive leaders encourage knowledge flow, whereas environments of high employee turnover and a lack of job security suppress it, hindering broader organisational learning.

The findings underscore that formalised knowledge-sharing practices provide the means for SMMEs to access better innovation team empowerment and continuous competitive advantage in markets of turbulence. Knowledge sharing can be an active driver of resilience because it empowers employees and creates trust, collaboration and further learning. This, in turn, can help leadership-supported, technology-availability and incentive-driven formalised systems shift SMMEs from fragmented and less formalised practices to cohesive knowledge-based activities. The ability to retain knowledge within and adapt will, therefore, enhance their long-term sustainability and competitiveness in the South African construction industry. The next chapter presents the quantitative data presentation and analysis.

Chapter 7: Main Findings, Conclusions and Recommendations

7.1 Introduction

The study investigated the factors that mediate the historical legacies, strategies, enablers, barriers and impacts of knowledge-sharing practices among South African construction SMMEs. Using a mixed-methods approach, the study integrated both qualitative insights derived from in-depth interviews and quantitative data analysis and balanced methodological rigour while offering a comprehensive perspective on the phenomenon. This research provided findings on knowledge dynamics in construction SMMEs and how knowledge sharing stimulates innovation, organisational learning and business resilience.

This study provides nuanced insights into the challenges and opportunities of knowledge sharing in construction SMMEs by integrating quantitative and qualitative data with literature and theoretical frameworks. This final chapter presents a critical discussion of the integrated findings, summarises the key findings, comments on the research process, acknowledges its limitations, and outlines practical recommendations for practice, policy and continued research. The study's findings are further contextualised to highlight their impact on advancing the knowledge-sharing framework in small enterprises, both in the construction industry and elsewhere.

7.2 Discussion of Integrated Findings

To address the research aim of understanding the enablers and strategies of knowledge sharing, this section combines qualitative themes and quantitative statistical results. By triangulating these datasets, this discussion shows where the findings align to offer a comprehensive understanding of the SMME construction environment.

7.2.1 Integration of Research Question 1: Historical Legacy and Informality

The qualitative findings in Chapter 5 showed that knowledge sharing in South African construction SMMEs is mainly based on informal methods, such as "chatting up" and

spontaneous site discussions. This dependence on informality was linked to past resource shortages and a survivalist attitude. The quantitative data in Chapter 6 statistically confirm this "survivalist" profile, revealing that 43.5% of the firms earn less than R1 million annually and 81.9% employ fewer than 20 people. Furthermore, the survey found that 49.1% of respondents lack formal knowledge-sharing systems.

These integrated findings support Anand and Walsh (2020) and Cerchione *et al.* (2015), who contend that in resource-limited environments, informality functions as an adaptive strategy rather than a failure of management. The alignment of the qualitative narrative on "legacy issues" with the quantitative demographic data confirms that the absence of formal systems is not merely a choice but a structural necessity dictated by the sector's financial realities.

7.2.2 Integration of Research Question 2: Strategies for Knowledge Sharing

Regarding strategies, the qualitative phase emphasised "mentorship" and "practical training" as the main methods for knowledge transfer. Participants emphasised that "teaching" juniors to become "creators" was essential for business continuity. This qualitative theme is strongly supported by the quantitative results, where 82.8% of survey respondents agreed that "Promoting Learning and Development Programmes" is a key strategy, and 83.6% endorsed the formation of "Communities of Practice" (CoPs).

This convergence of data validates the work of Al-Zoubi *et al.* (2025) and Sogaxa (2024), who posit that structured social interaction is the most effective strategy for transferring tacit knowledge in the construction trades. The high statistical agreement on CoPs (83.6%) provides empirical weight to the qualitative insight that knowledge sharing in this sector is inherently social and relational, rather than purely document-based.

7.2.3 Integration of Research Question 3: Enablers and Barriers

The qualitative analysis identified "Leadership" and "Trust" as the key enablers of knowledge sharing, with participants noting that "supportive leadership creates trust." This qualitative finding is statistically validated by the Pearson correlation analysis in

Chapter 6, which revealed an exceptionally strong positive correlation ($r = 0.945$, $p < 0.001$) between a "Collaborative Organisation Ecosystem" (defined by trust and leadership) and "Knowledge Sharing" behaviour.

Conversely, the qualitative phase identified "financial constraints" and "fear of job loss" as major barriers. This is evident in the quantitative results, where 81.9% of respondents identified "Limited Resources" and 83.6% identified "Limited Access to Funding" as major challenges. This aligns with the theoretical framework of Social Exchange Theory (SET) used in this research, as discussed in Chapter 2 by Yeboah (2023). The data collectively show that while leadership (the enabler) can promote intention, the absence of resources (the barrier) significantly hampers the actual behavioural control needed to implement formal systems.

7.2.4 Integration of Research Question 4: Impact on Innovation and Competitiveness

Lastly, the qualitative participants held the view that knowledge sharing confers a competitive advantage on an organisation, thereby facilitating innovation. Later, this impact would be empirically tested through regression analysis. The findings showed that Knowledge Sharing Strategies (KS) were a strong predictor for Impact (IMS) with a total variance explained of 57.2% ($R^2 = .572$). Furthermore, 85.4% of survey respondents agreed that knowledge sharing leads to "Improved Organisational Performance."

This triangulation supports the findings of Li *et al.* (2020) and Arsawan *et al.* (2022), who demonstrated that knowledge sharing is a direct antecedent of entrepreneurial performance. The statistical significance of the regression model proves that the qualitative perceptions of "empowerment" are not anecdotal but represent a measurable, generalisable trend across the South African construction SMME sector.

7.3 Summary of Key Findings and Contributions

This study set out to answer five core research questions, each linked to specific dimensions of knowledge sharing. The findings collectively provide an all-encompassing view of knowledge-sharing practices in construction SMMEs and their implications for organisational sustainability and growth.

Research Question One: How does the historical legacy of knowledge sharing affect SMMEs within the construction industry in South Africa?

The first research question probed the historical legacy of knowledge sharing in South African construction SMMEs. The results indicated that such practices are grounded in informal mechanisms that, although allowing flexibility and timeliness, hinder scalability and systematic knowledge preservation. This widespread usage of informal mechanisms becomes critical to easing the transition to more formalised, responsive systems focused on smaller businesses. This view underlines the flexibility of the situation in resource-scarce environments. Through the relation of these findings with those of previous studies, this research confirms that past inequalities and informal norms have long-lasting effects on the evolution of knowledge-sharing practices.

Research Question Two: What are the strategies of knowledge sharing in SMMEs within the construction industry in South Africa?

The second research question addressed the knowledge-sharing strategies of SMMEs. Mentorship, informal tools, training programmes and incentives were pivotal mechanisms for facilitating knowledge exchange. These findings demonstrate that while informal tools excel in solving present-day problems, formal systems are a key component of supporting future-oriented organisational learning and innovation. This duality emphasises the need to integrate formalised systems with the prevailing informal practices to find a balance between operational flexibility and strategic development. Moreover, this study provides a new perspective by explaining how integrated strategies could enhance knowledge transfer in resource-constrained environments.

Research Question Three: What factors enable or hinder knowledge sharing in SMMEs within the construction industry in South Africa?

The third research question addressed the facilitators of and obstacles to knowledge dissemination. The study identified leadership-oriented and trust-oriented organisational cultures as key facilitators of a setting that allows and supports collaboration and learning. On the other hand, cultural resistance, financial constraints and technological deficiencies have been found to be strong obstacles to the successful realisation of knowledge-sharing efforts. The investigation emphasised the need for leadership-oriented strategies and inclusive organisational cultures, where digital resources are readily available to overcome these challenges. One of the large

parts of the research will be investigating the relationships among the factors, hence providing a holistic perspective into what constitutes the creation of good practices in knowledge sharing.

Research Question Four: What impact does knowledge sharing have on SMMEs within the construction industry in South Africa?

The fourth research question addressed the impact of knowledge sharing on construction SMMEs. The results show that knowledge sharing drives innovation, enhances team collaboration and ensures business continuity. Thus, while informal exchanges support immediate creativity and problem solving, formal systems are needed to institutionalise and scale innovations. This dual role of knowledge sharing as both an operational resource and a strategic asset highlights its transformative potential for SMMEs. Furthermore, the research emphasises the necessity of tailoring knowledge-sharing methodologies to the distinct characteristics of the construction industry, especially in promoting innovation and enhancing resilience among smaller firms.

Research Question Five: What framework can be recommended for enhancing knowledge sharing in SMMEs within the construction industry in South Africa?

The last research question resulted in a more holistic framework for promoting knowledge sharing. The framework covers leadership-driven initiatives, adaptive knowledge management systems, collaborative environments and an integrated approach to both informal and formal strategies. The set of actionable strategies presented here for practitioners and policymakers gives the framework a practical way of improving knowledge-sharing practices within the construction industry. Its focus on contextual relevance and scalability ensures its suitability in various organisational contexts.

7.3.1 Broader Implications of the Study

These findings have important implications for theory, practice and policy. This study provides a comprehensive framework for improving knowledge sharing and offers a roadmap for SMMEs in their journey from informal to formal practices, hence building their resilience and competitiveness. The study contributes to the broader discourse on organisational learning, especially in resource-constrained settings; thus, it offers actionable insights for policymakers looking to support small enterprises. At the

societal level, this research highlights knowledge sharing as a means of promoting innovation, economic sustainability, and social cohesion. This study, which addresses the unique challenges of construction SMMEs, underscores the role that small enterprises can play in driving inclusive growth and contributing meaningfully to national development objectives.

7.3.2 Contributions

The research advances theoretical perspectives of knowledge creation and organisational learning by situating them within resource-constrained contexts. The research specifically questioned the universal applicability of the dominant, often Western-centric, theories that assume resource-abundant conditions. With a focus on the distinct socio-economic conditions of developing nations, the study undertakes a judicious reappraisal and re-conceptualisation of these theories against the conditions of SMEs in these countries. It involves the development of theoretical constructs to accommodate informal forms of learning, the role of verbal modes of knowledge transmission, and the impact of stringent financial and technological constraints on the creation, documentation, and dissemination of knowledge.

From a methodological perspective, the study employs an inclusive mixed-methods design, that combines qualitative and quantitative approaches, and this allows detailed documentation of lived experiences while also identifying statistically significant trends. The integration of these two methods or designs offered a comprehensive understanding of the complexities surrounding knowledge sharing, enabling more nuanced analyses of the interactions between enablers, barriers, and outcomes. For example, the qualitative data explained the underlying motivations behind the existence of given barriers, such as a lack of trust or cultural norms. In contrast, the quantitative data measured the extent to which these barriers lead to project success on a larger, more inclusive sample.

From a practical perspective, the framework proposed fulfils the link between practice and theory. It provides a strategic and diagnostic tool with a low-cost action menu that can be tailored to the unique environment of construction SMMEs. This moves beyond a 'one-size-fits-all' solution, empowering owners and managers to select and adapt

knowledge-sharing strategies that align with their available resources, organisational culture, and specific project needs.

Finally, by systematically identifying and analysing the limitations of current practices, this study has laid the foundation for sustainable knowledge sharing. This creates a clear roadmap for future research and practical interventions aimed at building absorptive capacity and institutional memory. Ultimately, developing these skills will provide construction SMMEs the tools for sustained growth and resilience, helping them better handle economic volatility and succeed in a competitive market.

7.4 Reflection on the Research Process

The nature of the research was very rigorous and rewarding; it entailed extensive data collection, analysis and synthesis. A mixed-method approach helped to achieve an in-depth level of understanding of the phenomenon by harmonising statistical insights with qualitative richness. The use of mixed-methods helped ensure that numerical trends and individual experiences were captured, hence an all-encompassing understanding of the topic under investigation. The findings were strengthened by including multiple perspectives from business owners, construction managers, civil engineers and senior employees, hence providing evidence of their applicability in real-world settings. The original plan of the researcher was to obtain responses from 400 survey participants to enhance the statistical reliability of the results.

This objective was established in response to the requirement for a myriad of perspectives within the construction SMME sector. However, owing to issues related to participant availability and willingness to participate, only 116 surveys were completed in six months. This limitation reduced the scope for a comprehensive statistical analysis; therefore, careful triangulation with qualitative data was pursued to arrive at plausible results. However, owing to participant availability and willingness to participate, only 116 surveys were completed in six months. This is one of the challenges of conducting research in time-constrained environments and demonstrates the importance of adaptive strategies in managing expectations. Surmounting these challenges required the use of digital tools for outreach and trust-building with participants to encourage their involvement. The research process also consisted of 20 in-depth interviews with construction SMME industry experts. These

interviews yielded rich descriptive insights into the barriers to and facilitators of knowledge sharing, and these qualitative insights deepened the quantitative findings. By capturing the lived experiences and professional insights of industry experts, the qualitative data enriched the study with nuanced perspectives, which complemented the statistical trends and broadened the general understanding of the phenomenon being studied. The qualitative part of this study provides wide insight into the practical challenges and opportunities surrounding knowledge sharing, hence complementing the quantitative findings. Methodological decisions, such as the use of the saturation principle in qualitative data collection, supported the reliability and completeness of the findings. In summary, the research process emphasised the importance of adaptability, critical reflection and contextual awareness when addressing complex organisational issues.

7.5 Limitations of the Study

Although the study offers important insights, it has its own limitations that should be addressed. The geographical emphasis on South African construction SMMEs potentially limits the generalisability of the findings to other industries or geographies. While the study had a strong qualitative component with 20 participants, it might not encompass the diversity of views in the different SMMEs sectors. The quantitative data gathered had a limited response rate. However, the mixed-methods element of the study helped to triangulate the findings, producing rich and complementary insights. Moreover, owing to time and resource constraints, the possibility of conducting longitudinal observations that could address changes in practice and how knowledge sharing practices evolve over time will be essential for further studies. This does not diminish the key insights drawn from the study findings, just suggesting caution in their interpretation and the need for additional studies.

7.6 Recommendations

The following recommendations were identified; if implemented to promote practical and policy changes, they would be effective in improving knowledge-sharing practices among construction SMMEs in South Africa.

7.6.1 Recommendations for SMME Owners and Practitioners

- **Formalise Informal Practices:** Owners should seek to document the informal knowledge shared during site meetings or via WhatsApp. Implementing simple, low-cost tools like shared cloud drives (for example, Google Drive, OneDrive) can help capture this information without disrupting the workflow.
- **Prioritise Mentorship:** SMMEs should establish mentoring environments because most knowledge is tacit. Creating such environments entails pairing the junior staff with the experienced mentors. Also, setting specific learning goals to support the transfer of essential skills and competencies goes a long way towards supporting knowledge sharing.
- **Create a Culture of Trust:** Leaders must proactively promote a climate of psychological safety so that employees have the confidence to share their ideas. Activities such as regular team-building exercises and open communication opportunities provide a platform for establishing an atmosphere of trust that fosters knowledge exchange.
- **Incentivise Sharing:** Organisations must be better positioned to have in place a proper reward system that offers both financial incentives, such as bonuses, and non-financial recognition, like employee recognition schemes and employee of the month awards, as these can motivate expected to the participation of the employees in knowledge sharing programmes.

7.6.2 Recommendations for Policymakers and Industry Bodies

- **Support Digital Adoption:** The government and professional bodies, such as the CIDB, among others, must provide financial support to aid SMMEs in acquiring essential digital tools and knowledge management software.
- **Training and Development:** The government must both facilitate and provide training opportunities that are closely related not only to construction skills but also incorporate other soft skills such as communication, leadership, and knowledge management.
- **Promote Networking:** Industry associations should expand networking forums, communities of practice (CoPs), and events that enable SMME owners to share best practices and collaborate.

7.6.3 Recommendations for Future Research

- **Longitudinal Studies:** Future studies need to include longitudinal studies to examine the impact of knowledge-sharing interventions over time and gain a better understanding of the benefits associated with causal relationships.
- **Comparative Studies:** Comparative studies focusing on SMMEs in construction in South Africa and other industries, such as production and information technology, may shed light on industry-specific issues and standard best practices.
- **Impact of Specific Technologies:** Further studies are necessary to examine, among other aspects, the influence of new technologies such as Artificial Intelligence and Building Information Modelling on knowledge sharing within the South African SMME environment.

5.7 Conclusion

The results provided a clear understanding of how knowledge sharing operates in the South African Construction SMME industry. By identifying the roles of legacy and contemporary strategy, and the barriers or enablers of knowledge sharing, the results clearly show that the success of knowledge sharing is related to an SMME's ability to remain competitive in its field. Clearly, leadership and trust are key to enabling successful knowledge sharing; however, the primary barrier to successful knowledge sharing is the limited resources and the lack of formally established knowledge management practices.

By combining qualitative data collection techniques with quantitative data analysis, the study has confirmed that SMMEs that prioritise knowledge sharing, regardless of the method or cost involved, experience improvements in innovation, team morale and empowerment, and ultimately in their organisational performance. The proposed framework provides a practical approach for these SMMEs to transition from informal information sharing to a structured knowledge management practice. In conclusion, creating a culture of knowledge sharing is essential to both the survival and future growth of SMMEs in the challenging South African construction market.

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APPENDICES

Appendix A: Ethics Certificate



COLLEGE OF HUMAN SCIENCES RESEARCH ETHICS REVIEW COMMITTEE

06 June 2024

Dear Ms Boitumelo Christina Seshabela

NHREC Registration # :

Rec-240816-052

CREC Reference # :

34337105_CRECHHS_2024

Decision:

**Ethics Approval from 06 June 2024
to 05 June 2025**

Researcher(s): Name: Ms. B. C. Seshabela

Contact details: 34337105@mylife.unisa.ac.za

Supervisor(s): Name: Prof. I. Schellnack-Kelly

Contact details: schelis@unisa.ac.za

**Title: Deciphering the Enablers and Strategies of Knowledge Sharing for SMMEs:
A Case on the Construction Industry in South Africa**

Degree Purpose: PhD

Thank you for the application for research ethics clearance by the Unisa College of Human Science Ethics Committee. Ethics approval is granted for one year.

The **low-risk application** was reviewed by College of Human Sciences Research Ethics Committee, in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment.

The proposed research may now commence with the provisions that:

1. The researcher(s) will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.
2. Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study should be communicated in writing to the College Ethics Review Committee.
3. The researcher(s) will conduct the study according to the methods and procedures set out in the approved application.
4. Any changes that can affect the study-related risks for the research participants, particularly in terms of assurances made with regards to the protection of participants' privacy and the



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confidentiality of the data, should be reported to the Committee in writing, accompanied by a progress report.

5. The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study. Adherence to the following South African legislation is important, if applicable: Protection of Personal Information Act, no 4 of 2013; Children's act no 38 of 2005 and the National Health Act, no 61 of 2003.
6. Only de-identified research data may be used for secondary research purposes in future on condition that the research objectives are similar to those of the original research. Secondary use of identifiable human research data require additional ethics clearance.
7. No fieldwork activities may continue after the expiry date **(05 June 2025)**. Submission of a completed research ethics progress report will constitute an application for renewal of Ethics Research Committee approval.

Note:

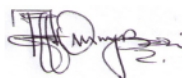
*The reference number **34337105_CREC_CHS_2024** should be clearly indicated on all forms of communication with the intended research participants, as well as with the Committee.*

Yours sincerely,

Signature:



Prof. KB Khan
CHS Research Ethics Committee Chairperson
Email: khankb@unisa.ac.za
Tel: (012) 429 8210



Signature: PP

Prof ZZ Nkosi
Executive Dean: CHS
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Appendix B: Turnitin

Appendix C: Participation Information Sheet

PARTICIPANT INFORMATION SHEET

July 2024

Title: Enablers and Strategies of Knowledge Sharing: A Case of the Construction Industry in South Africa.

Dear Prospective Participant,

My name is Boitumelo C. Boya, and I am doing research under the supervision of Professor I. Schellnack-Kelly (Supervisor), a Professor of the Department of Information Science, towards a Doctor of Philosophy (Ph.D.) in Knowledge Management at the University of South Africa (UNISA). I obtained funding from the Public Investment Corporation (PIC) to assist in conducting this research. I invite you to participate in a study entitled "Enablers and Strategies of Knowledge Sharing: A Case of the Construction Industry in South Africa."

Introduction

You are being asked to participate in a study that seeks to decipher the enablers and strategies of knowledge sharing in SMMEs in the South African Construction Industry. To ensure you are informed about the study, I request that you read and sign this consent form. Please ask me to explain anything you do not understand.

What is the aim/purpose of this study?

This study is being conducted to gather information on deciphering the enablers and strategies of knowledge-sharing in SMMEs, with particular reference to the South African Construction Industry.

Why are you being invited to participate in the study?

Your organisation was selected to participate in this study as it is an SMME in South Africa's construction industry that receives development support from the Construction Industry Development Board (CIDB). You were selected to participate in this study due to your role within your organisation. Fifteen (15) organisations/participants will participate in the overall research in South Africa.

Your part in the study

If you agree to participate in the study, you will be interviewed. The interview will take approximately one (1) hour and will be audiotaped to allow the researcher to capture the entirety of the discussion and for quality purposes. Taking part in this study is voluntary, and you are under no obligation to consent to participate. If you decide to participate, you will be

given this information sheet to keep and asked to sign a written consent form. You are free to withdraw at any time and without giving a reason.

If you decide not to participate in the study

Your participation in the study is voluntary, and you are under no obligation to consent to participate. If you decide to participate, you will be given this information sheet to keep and asked to sign a written consent form. You are free to withdraw at any time and without giving a reason. There is no penalty for refusing to take part.

Benefits

You will receive no financial compensation or other personal benefit from participating in the study. However, your responses may provide insights into developing a model that SMMEs with a particular reference to the South African Construction Industry could use to improve their strategic management and sustainability.

Risks or discomfort

No known risks may result from your participation in the study. If you experience any personal discomfort, you may, as stated above, stop at any time or refuse to answer any questions.

Confidentiality

The information you provide will be kept confidential. Your responses will be recorded anonymously, and your organisation will be de-identified. If the study results are published, your name and that of your organisation will not be published. The only people with access to this information will be the researcher and a co-coder/statistician. The co-coder/statistician have both signed confidentiality agreements.

Your answers may be reviewed by those people who are responsible for making sure that the research is conducted correctly, namely the Supervisors of the study and members of the Research Ethics Review Committee, Department of Information Science, UNISA. Otherwise, records that identify you will be available only to those people working on the study unless you give permission for other people to see the records.

Data storage and disposal

Copies of your answers will be stored by the researcher for a period of five years in a locked safe at the researcher's residence for future research or academic purposes, and electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to an additional research ethics review and approval if applicable. Once the period of five years has lapsed, the researcher will delete all electronic files and all paper-based records will be shredded.

Ethical approval

The study fulfills all requirements set out in the UNISA Policy on Research Ethics and has received written approval from the Research Ethics Review Committee of the Department of Information Science, UNISA. A copy of the approval letter can be obtained from the researcher upon request.

Communication of results

If you would like to be informed of the final research findings, please contact the researcher. The findings will be available from December 2025.

Contact persons for questions

If you have any questions about the study in general or your rights as a participant in this study, or have any problems with the study, you may contact Ms. Boitumelo Boya at the following telephone number: 083 779 7318 or email: boitumelo.seshabela@pic.gov.za

Should you have concerns about the way in which the research has been conducted, you may contact Prof Isabel Schellnack-Kelly (Supervisor), at +27 84 417 2576 or schelis@unisa.ac.za.

Thank you for taking the time to read this information sheet and for participating in this study.

Boitumelo Boya

The Researcher

Appendix D: Interview Schedule

Introduction

Thank you for making time to be interviewed today. I am a PhD student at the University of South Africa (UNISA), undertaking a study examining the enablers and strategies of knowledge sharing in SMMEs with special reference to the construction industry of South Africa. I would like to gain an understanding of the factors taken into consideration when knowledge is shared in your organisation. The interview should take approximately 1 to 1.5 hours.

Your organisation was selected to participate in this study as it is an SMME in South Africa's construction industry that receives funding from the Public Investment Corporation (PIC). You were personally selected to participate in this study due to your role within the organisation. Thirteen organisations will take part in this study in South Africa. Your participation will assist in gathering information on how knowledge is shared and applied to ensure the sustainability of black-owned SMMEs in South Africa, and to develop a model that SMMEs could use to tailor their knowledge management for sustainability processes.

[HAVE EACH PERSON READ CONSENT FORM AND SIGN]

I will now ask you some questions. Please let me know if anything is unclear or confusing.

Section A: Introductory and demographic questions

The following questions concern your position and other information regarding the organisation. Completion of this information is voluntary and confidentiality is assured. No individual data will be reported.

1. Please introduce yourself. Please expand on your nationality, age, highest academic qualifications and professional background.
2. How long have you worked for this organisation, and what is your current position within the organisation?
3. Please elaborate on the background of your organisation, such as the main donors, period of funding, affiliation to other organisations, and how long the organisation has been operational in SA.
4. How many employees are currently employed at the organisation? Has this number remained stable for the last few years? Explain.
5. What are the greatest challenges faced by your organisation?

Section B: Historical Legacy of Knowledge Sharing

6. What is your understanding of the term “Knowledge Sharing” and how would you describe the importance thereof as it relates to your organisation?
7. What are the most important aspects, characteristics or determinants of organisational knowledge sharing?
8. How are the knowledge sharing practices addressed at a top management level in the organisation?

Section C: Enablers of knowledge sharing

9. What does the term “enablers” in the knowledge management” mean to you? What kind of enablers are developed and implemented in your organisation?
10. How is knowledge transmitted, stored, search and retrieved in your organisation?
11. What are the methods and the processes of communication used in your organisation. How do you think they can be improved?

Section D: Strategies of Knowledge Sharing

12. What could be the better strategies for sharing knowledge in your organisation?
13. How does your organisation motivate employees for sharing knowledge?
14. What are the strategies and initiatives that must be undertaken to motivate employees to participate in knowledge sharing procedures? Please describe.
15. How do you think management can encourage employees to share knowledge? Do you think intangible or tangible rewards can enhance the motivation of employees?

Section E: Impact of Knowledge Sharing

16. How do you think knowledge sharing assist in facilitating intellectual capital, organisational learning, innovative attitudes at the workplace?
17. How does knowledge plays a vital role in enhancing workplace innovation? Explain.
18. How important is it to maintain communication with individuals outside your team?
19. Researchers stress that information-sharing allows for the creation of a knowledge synergy effect, speedier problem-solving, and keeps employees informed on current and future issues.

If yes:

- a. Motivate the advantages of knowledge sharing

If no:

- b. Motivate challenges employees could face to hinder knowledge sharing

Section F: Barriers of knowledge sharing

20. What are the challenges pertinent to knowledge sharing in your organisation?
21. Is there a lack of understanding regarding which sort of techniques should be considered when establishing knowledge sharing in your organisation?
22. Why is there a lack of a good grasp of information sharing and or the sluggish implementation of formal knowledge-sharing practices?
23. What are the major obstacles to knowledge sharing within your organisation?

Conclusion

This concludes our interview. Do you have any final remarks or questions for me to consider?

Thank you for your valuable time and participation in this interview. Please be assured that the information you provided will remain confidential and your responses will be anonymised.

Appendix E: Questionnaire

The information to be captured in the questionnaire is strictly confidential and will be used for research purposes by the student working on a project *‘Deciphering the enablers and strategies of knowledge sharing for SMMEs: A case on the construction industry in South Africa’*. There is no right or wrong answer to these questions. You are free to be part or not part of this survey and you can withdraw from the survey at any time you feel like doing so.

Name of SMME	Date

SECTION A: DEMOGRAPHICS (TICK APPROPRIATE)

Let's begin by recording a few facts about you and your business	
A1. How old are you? _____	A2. Gender 1= Male 2=Female
A3. What is your average sales turnover per year? R _____	
A4. What is your highest level of education? 1= No formal 2=Primary 3=High school 4= Tertiary 5= Tertiary	
A5. What is your position in the organisation? 1= Manager 2= Owner of business 3= Entrepreneur	
A6. How many years has the business been in operation? _____	
A7. What is the total number of employees you currently have? _____	
A8. Are there formal knowledge-sharing processes or systems in place within your SMME? 1= Yes 2= No 3= Not Sure	
A9. How would you rate the effectiveness of current knowledge-sharing practices in your SMME? 1= Very Effective 2= Effective 3=Neutral 4= Ineffective 5=Very Ineffective	

A10. What are your main sources of information?	YES	NO
a. Industry Reports and Publications		
b. Government Agencies		
c. Professional Associations		
d. Online Portals and Industry Websites		
e. Training and Certification Programmes		

f. Local and International Construction Exhibitions		
g. Industry Conferences and Seminars		
h. Online Forums and Communities		
i. Networking with Peers		

A11. To what extent does your SMME encourage a culture of knowledge sharing among employees?

1=Strongly discouraged	2=Discouraged	3=Neutral	4=Strongly encouraged	5=Very strongly encouraged
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SECTION B: ENABLERS OF KNOWLEDGE SHARING IN SMMEs

B1. Knowledge sharing in SMMEs can be promoted by:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Forming Communities of Practice (CoPs).					
b. Implementing knowledge management systems (KMS).					
c. Promoting learning and development programmes.					
d. Facilitating Open Communication Channels					
e. Provide Training and Awareness Programmes.					

B2. Show your level of agreement with the following statements

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Leadership support is essential for the success of knowledge-sharing efforts in businesses.					
b. A culture of trust and openness creates successful information sharing.					
c. Technology can play an essential role in enabling information sharing.					
d. Communities of practice encourage knowledge exchange by providing a welcoming environment for learning and sharing.					

e. Enablers can help employees create a supportive learning and knowledge-sharing environment.					
f. A corporate culture that encourages learning and innovation supports knowledge-sharing					

B3. Knowledge sharing may be facilitated by factors like:					
(Enablers)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Leadership support					
b. A culture of trust and openness					
c. Information Technology					
d. Networking and Collaboration					
e. Regular Training and Feedback					

B4. Using a scale from 1 to 10, where 1 means ‘not effective’ and 10 means “very effective”, how effective are the above factors in sharing information?									
Not effective			Medium				Very		
1	2	3	4	5	6	7	8	9	10

B5. Information sharing can be hindered by:					
(Hinders)	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Lack of Formal Knowledge Management Systems					
b. Limited Resources					
c. Inadequate IT Infrastructure					
d. High Turnover and Skill Gaps					
e. Resistance to Change					
f. Absence of Knowledge-Sharing Culture					
g. Lack of Trust					

B6. SMMEs in the construction industry face numerous challenges, including:					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Poor access to resources					
b. Limited knowledge-sharing practices					
c. Poor project management, and planning					

d. Limited Access to Funding					
e. High Competition					
f. Skills Shortage					
g. Low levels of innovation					

SECTION C: IMPACT OF KNOWLEDGE SHARING IN SMMEs

C1. Knowledge sharing in SMMEs results in:					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. Enhanced competitiveness of SMMEs					
b. Improved organisational performance					
c. Enhanced organisational learning and innovative attitudes in the workplace					
d. Enhanced Problem Solving					
e. Improved Project Efficiency					
f. Innovation and Adaptability					
g. Enhanced Decision-Making					
h. Customer satisfaction					

Appendix F: Permission to Contact Research

PERMISSION TO CONDUCT RESEARCH

Research Title: DECIPHERING THE ENABLERS AND STRATEGIES OF KNOWLEDGE SHARING FOR SMMEs: A CASE ON THE CONSTRUCTION INDUSTRY IN SOUTH AFRICA.

Dear Sir,

Trusting that you are well.

My name is Boitumelo Christina Seshabela, PhD student and a member of the employees at the University of South Africa. I will conduct an academic study to decipher the enablers and strategies of knowledge sharing employed by SMMEs in South Africa. These SMMEs should only be black-owned in South Africa. Your permission and/or endorsement to interview SMME leaders within the construction industry will be highly appreciated.

Please note the following:

- An hour-long, one-on-one interview will be conducted.
- At least 15 SMMEs need to participate in this study (this number may slightly increase given the information provided- if this happens, you will be informed).
- All responses will be kept confidential. This means that the report will not identify participants.
- The participation in the study is essential; however, participants may end the interview at any time, as this is voluntary.
- Please take note that there is no financial reward or obligation; however, once the findings of the study, which are set to be finalized in two about two years, may be made available to any participant upon request.
- There are no anticipated physical or psychological risks involved in participating in this Study

Please contact my study Supervisor, Prof Isabel Schellnack-Kelly (Supervisor), at +27 84 417 2576/012 429 6936 or schelis@unisa.ac.za if you have any questions, concerns, or comments regarding this study.

Please also sign the form and send it back to us to indicate that you understand the information given above and that you give your permission to allow SMME leaders to participate in the study voluntarily.



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Boitumelo Seshabela

Date: 2023/11/28

Contact No: (012) 763-2379 / 083 779 7318
Boitumelo.seshabela@pic.gov.za

Isabel Schellnack-Kelly

Date: 2023/11/28

Contact No: (012) 429-6936 / 084 417 2576

Mr. Deon Calitz (WBHO Official)

Date: 29-11-2023

Contact No: 082 567 4859

Appendix G: Research Acknowledgement

THE COLLEGE OF HUMAN SCIENCES

RESEARCHER ACKNOWLEDGEMENT

Research title: Deciphering the Enablers and Strategies of Knowledge Sharing for SMMEs: A Case on the Construction Industry in South Africa

Researcher: Boitumelo C. Seshabela

Hereby, I Boitumelo Christina Seshabela, ID number 7602210400087, in my personal capacity as a researcher, acknowledge that I am aware of and familiar with the stipulations and contents of the

- Unisa Research Policy
- Unisa Ethics Policy
- Unisa IP Policy
- SOPs on ethical clearance risk assessment

And that I shall conform to and abide by these policy requirements.

SIGNED:  _____

Date: 29 November 2023

Appendix H: Co-Coder/Statistician Confidentiality Agreement

CO-CODER / STATISTICIAN CONFIDENTIALITY AGREEMENT

This is to certify that I, -----, the co-coder and statistician of the research project *Enablers And Strategies Of Knowledge Sharing For SMMEs: A Case Of The Construction Industry In South Africa* agree to the responsibilities of the co-coding and analysis of data obtained from participants (and additional tasks the researcher (s) may require in my capacity as a statistician).

1. I acknowledge that the research project is/is being conducted by Boitumelo C. Boya of the Department of Information Science, University of South Africa.
2. I understand that any information (written, verbal, or any other form) obtained during the performance of my duties must remain confidential and in line with the UNISA Policy on Research Ethics.
3. This includes all information about participants, their employees / their employers / their organisation, as well as any other information.
4. I understand that any authorised release or carelessness in the handling of this confidential information is considered a breach of the duty to remain confidential.
5. I further understand that any breach of the duty to remain confidential could be grounds for immediate dismissal and / or possible liability in any legal action arising from such breach.

Full Name of Statistician / Co-Coder: _____

SIGNED: _____

Date: _____

Appendix I: Consent to Participate in this Study

CONSENT TO PARTICIPATE IN THIS STUDY

Research title: Enablers and Strategies of Knowledge Sharing for SMMEs: A Case of the Construction Industry in South Africa

Researcher: Boitumelo Christina Boya

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet.

I have had sufficient opportunity to ask questions and am prepared to participate in the study.

I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable).

I am aware that the findings of this study will be processed into a research report, journal publications and/or conference proceedings, but that my participation will be kept confidential unless otherwise specified.

I agree to the recording of the interview session.

I have received a signed copy of the informed consent agreement.

Participant Name & Surname..... (please print)

Participant Signature.....Date.....

Researcher's Name & Surname: Boitumelo Christina Boya

Researcher's signature.....Date: 29 November 2023

Appendix J: Language Editing Certificate

