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FACTORS AFFECTING KNOWLEDGE TRANSFER BETWEEN YOUNG AND OLD EMPLOYEES AT AN ENGINEERING COMPANY IN CAPE TOWN

by

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DECLARATION

I, Vuyani Mtshikana, declare that the contents of this dissertation/thesis represent my own unaided work, and that the dissertation/thesis has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed **Date**

ABSTRACT

The engineering industry is dealing with an ageing workforce around the world, which has a negative influence on the industry as it loses experienced workers, skills, enormous organisational knowledge and innovation targets as a result of retiring staff. Consequently, firms must engage in business transactions that increase collaborative networks and planned communication in order to accelerate knowledge transfer and sharing to achieve organisational goals. Even as more and more young people enter the engineering sector, several obstacles prevent them from enhancing their knowledge and skills in this field. The vast majority of ageing artisans find it difficult to mentor and pass on knowledge to younger artisans. Academic research has primarily focused on the interactions of these individuals' perceptions of one another, while knowledge transfer systems have been overlooked. As a result, corporations are unable to invest in research and development of new ideas, and young artisans and industry workers are unable to be more innovative. The study of factors influencing knowledge transfer focuses primarily on tacit knowledge transfer and psychological elements to improve information transfer systems as well and serve as a motivating goal to accelerate knowledge transfer.

To gain a deeper understanding of the factors that influence knowledge transfer via tacit knowledge between young and old artisans at an engineering firm, a mixed methods approach was used, while a semi-structured survey questionnaire and (in-depth) interviews were employed to collect data from 71 participants.

The study recommends future research recognise a set of factors affecting knowledge transfer between young and old employees that can be used to create a framework called Knowledge Window Effect Transfer (KWETRA). This study provides useful insights into tacit knowledge that could be strategically aligned with company goals.

Keywords*:* Knowledge transfer, knowledge sharing, industry networks, personality traits, employees

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I am thankful to my mother, **Emma Tilili Mtshikana**, who took care of me from birth till I was old enough, we did it together. The universe, the greatest feeling of all living things. The higher energy, love, and grace she showed me in my life has been a blessing – I am truly humbled.

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To my daughter, **Thuliyani Gxasheka (Mtshikana)** who has been a pillar of my strength. You give me the will to go on in this world. Be wise Nana, be brave, and work hard. The sky is not the limit, there is a universe, and beyond. Have no limits and use your talents. Be brave, never be discouraged, never fall back on anything. Get up and fight every day; it is war. **The challenges of today should never put to doubt your abilities and strength, make sure to handle each challenge with gratitude, calmness, confidence, and reasonable thinking.**

DEDICATION

This dissertation is dedicated to the King and Queen (my grandparents), Mtati Jacob and Sinha Tshikana, who gave birth to my mother. My mother, Tilili Emma Mtshikana, who has been there every step of the way. To my father, Cebo Mrwashu and his family, I will hold the torch to shine for generations. To my brother and my sister, Thandisizwe ‘Zem’ and Vuyiswa Mtshikana, we need to work smarter than anyone else because we are stronger, and we do not give up. I love you with all my heart. To the Tshikana and Stuurman families as well as the nation of Amaqwathi wherever they are. If only you could come together and build wealth as a clan, we could knock out poverty for good.

“Ndingu
Dikela
uNoni
uNtswayiba
ne
uMdwane
uNomatyala
inkonjane ‘bhabhe mafini”

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ABBREVIATIONS AND ACRONYMS

SMEs	Small and Medium-sized Enterprises
KT	Knowledge Transfer
KM	Knowledge Management
PICC	Presidential Infrastructure Co-ordinating Commission
OCEAN (BIG 5)	Openness, Conscientious, Extraversion, Agreeableness and Neuroticism
CSFs	Critical Success Factors
CSC	Construction Supply Chain
OC	Organisational Culture
SACI	South African Construction Industry
TK	Tacit Knowledge
EK	Explicit Knowledge
FET	Further Education And Training
NDP	National Development Plan
IC	Information Culture
KWETRA	Knowledge Window Effect Transfer

GLOSSARY

Term	Explanation
Interprofessional collaboration	Interprofessional collaboration is the most complex form of boundary-crossing collaboration, where expertise and problem solving needs to be socially, relationally and culturally distributed (Edwards *et al.*, 2009).
Knowledge Management (KM)	KM is considered an integral part of the organisation that seeks to acquire and use, its competitive edge in communication and information (Abualoush *et al.*, 2018). KM as "the process of capturing, storing, sharing, and using knowledge" (Lee, 2001). The efficient usage of KM is regarded as an important issue for achieving high academic effectiveness, efficiency, and performance (Arpaci, 2017).
Knowledge Networks	Knowledge networks are knowledge-based structures of interorganizational relationships in dealing with knowledge assimilation and exchanges (Dong & Yang, 2016).
Knowledge Transfer (KT)	KT is "the conveyance of knowledge from one place, person or ownership to another" (Liyanage *et al.*, 2009). More precisely, "Knowledge transfer in organisations is the process through which one unit (e.g., individual, group, department, division) is affected by the experience of another" (Argote & Ingram, 2000).
Organisational Networks (ON)	ON defines the intergenerational relationshipsN between employees, company workshops, mentoring, training. The network levels to be interpersonal, intra-organisational and intra-

	organisational (Phelps, Heidi & Wadhwa, 2012).
Personality Traits (PT)	PT includes individual characteristics, psychological state of individual employees such as Openness, Extraversion, Conscientiousness, Agreeableness, Neurotisism (Rossberger, 2014).
Tacit Knowledge (TK)	TK is internal to an individual in the form of know-how, experience or expertise (Hau, Kim & Lee, 2016).

CHAPTER 1: THE BACKGROUND TO THE PROBLEM

1.1 INTRODUCTION

Organisational knowledge has been seen by many researchers as a very important foundation for industry competitiveness, business strategy and networks, and research for the development of new ideas and innovation. Government departments are opening opportunities to partners within industry to increase knowledge and skills to younger employees to have an understanding of how company processes work, with the assistance of the Presidential Infrastructure Coordinating Commission (PICC). As a result of the aging workforce, fewer young people are entering the industry who have the necessary experience, skills and knowledge to carry the baton to new heights. It has become increasingly important for studies to be taken to unlock the current knowledge management within company bounds and the industry as a whole to find methods to speed up the process of knowledge transfer among employees and company networks.

Williams, Fugar and Adinyira (2018) maintain the transfer of knowledge, as a catalyst factor to discover new business activity development or new technology for innovation. Therefore, in this regard, engineering companies should identify key factors affecting knowledge transfer within bounds of their companies and identify the type of information to address the challenges, which is in this case, knowledge transfer between young and old employees in an engineering company. Based on the relevant literature, knowledge management and transfer agree with the three levels of knowledge; individual, groups and organisational knowledge creation (Saini, Arif & Kulonda, 2018). Tacit knowledge is regarded as a better knowledge concept for knowledge transfer between young and old employees to deal with the nature of the current study to achieve the best results in an engineering environment. This study attempts to link the factors affecting knowledge transfer, with tacit knowledge and personality traits (Big 5) of individuals within company bounds.

In order to achieve this, this study will focus on individual personality traits linked into the critical success factors (CSFs) through tacit knowledge in an engineering firm to precisely find initiators of knowledge flow within bounds of the engineering environment.

1.2 PROBLEM STATEMENT

How the organisation facilitates social platforms determines the effectiveness of knowledge transfer through the willingness of people (Arif *et al.*, 2012). Exploring an engineering company to find if it meets their desired skills development and knowledge transfer between young and old employees, respectively. With major problems encountered with average ageing of old employees, there is a lack of clear framework strategy for knowledge sharing and transfer among employees, therefore a further investigation is imperative for engineering firms to make sure that skills and knowledge remain within their companies.

Based on the research background, the research problem statement for the study relates to: due to a lack of standardisation (Saini *et al.*, 2018), trust and commitment and efficient processes (Alashwal *et al.*, 2011), it makes it difficult for knowledge sharing and transfer between young and old employees within organisations. Obviously, knowledge and skills can be lost without effective channel for knowledge sharing and transfer. This resulted in knowledge loss and ultimately impact on the growth and sustainability of organisations negatively and, moreover, a gap in the previous research is seen and felt by engineering companies. As a call from government institutions, that the problem faced by the industry is the ageing of workers that has vast knowledge, skills and experience in the field are about to leave and retire with all that knowledge. Thus, it has become an urgent need for industry players to work together with companies, institutions of learning, non-profit organisations, government departments and other community organisations in finding an effective way for transfer knowledge.

1.3 RATIONALE AND SIGNIFICANCE OF THE STUDY

For researchers, funders and policy makers, the gap between the knowledge of what will work, and adoption of widespread practices has become a major challenge for engineering organisations. A critical problem regarding the knowledge framework in an organisation is the willingness of employees to transfer knowledge from an employee to other employees. Some employees may be anxious that they might lose power or value by transferring their knowledge therefore a problem arises with the employee him/herself or the culture and the leadership abilities of the organisation. This is why this study is important to try and explain some insights on the behaviour of individual employees within the bounds of the organisation in order to assist organisation's theory, practices, policies and personal learning for the growth of the firm and the industry as

a whole. Most studies in the literature relate to all other aspects of Knowledge Management are focused on other areas of this field with little attention given to transfer knowledge intention between young and old employees in engineering companies. This study intends to add to the existing knowledge management framework and to put into context the framework of knowledge transfer intention and explore employees' behaviour in the process. It might provide some insights into organisations in the engineering sector and assist other industries, non-profit organisations, individuals, institutions of learning and researchers.

1.4 AIMS AND OBJECTIVES OF THE STUDY

The main purpose of the study is to ascertain the extent of knowledge transfer intention between young and old employees and establish a framework context of factors affecting knowledge transfer between them in an engineering and construction organisation in Cape Town.

In order to achieve the primary research aim, the objectives of this study are:

- To explore the barriers of knowledge transfer intention that directly hinders the intention to transfer.
- To ascertain the benefits of identifying suitable personal traits of employee's psychological state.
- To identify the relationship between old and young employees.
- To determine how management encourages knowledge transfer through tacit knowledge within the organisation.

1.5 RESEARCH QUESTIONS

To answer the primary research question, the following questions were addressed:

- What obstacles to knowledge transfer intention that directly hinder the intention to transfer?
- What are the benefits of identifying suitable personal traits of employees' psychological state?
- What is the relationship between young and old employees within the organisation?
- How does management encourage knowledge transfer through tacit Knowledge within the organisation?

1.6 RESEARCH DESIGN

Research design is a plan to be followed with various steps and methods to conduct research. Creswell (2014) explains research design as a plan to conduct the study and its methods as essential steps in designing the research. This study followed a positivist approach aiming to better understand older and younger workers' beliefs and perceptions about aging in the workplace. The formulation and distribution of a questionnaire was a relevant and reliable method of data collection. Data collection via surveys was a great way to gather data on people's perceptions, attitudes, and opinions. Therefore, the positivist approach was a suitable method for this study.

1.6.1 Research design

The data has been collected through a survey questionnaire and semi-structured interviews. All the items from the questionnaire were formulated through relevant literature review in line with the research objectives. Research survey questionnaires collects larger amounts of evidence, such as numeric data or information that has been converted into numbers. A positivistic approach in the form of a questionnaire to obtain data that was directly involved in knowledge transfer between young and old employees at an engineering company.

When the Likert scale was created in 1932, it was to be used as a scientifically accepted and validated method of measuring "attitude" (Joshi, Kale, Chandel & Pal, 2015). Semi-structured interviews, where the researcher has some predefined questions or topics, but then probes further as the participant responds, can produce powerful data that provide insights into participants' experiences, perceptions or opinions (Peters & Halcomb, 2015).

1.7 DELIMITATION OF STUDY

The organisational environment study was conducted from an engineering company in Cape Town, using a manufacturing engineering company; due to the nature of the sample, the results may not be representative of the rest of the South African engineering companies. The respondents in the survey are from the different levels of each department within the company. A close attention has been given to the process of tacit knowledge and individual personality traits. It has also been noted that due to the Covid-19 pandemic lockdowns, that has created a scare within the company, which the general manager decided to stop any communication and this research was also affected that call.

This study focused on the individual intention to transfer knowledge between young and older employees of the organisation.

1.8 RESEARCH METHODOLOGY

This study adopted a mixed method by using both qualitative and quantitative methods. A survey questionnaire was used for the quantitative data. Creswell (2014) points out that the survey design to be used to make generalised interpretation of certain characteristics or attributes of the population from the sample.

1.8.1 Population

This study was conducted from a manufacturing engineering company in Cape Town, South Africa, which was conducted for maximum return rate of the questionnaire. This company has approximately 210 employees in total, made up of 120 young and 90 old. These employees have relevant knowledge and experiences for work purpose. This has identified as the target population for this study. This also had allowed all the elements in the population which, in turn, assisted the researcher to collect data from all units of the population. These units included gender and race, years of experience in the field, age, occupation status, education level, occupational and department status.

1.8.2 Sample method/technique and sample size

This sampling method included each unit that has a certain pre-assigned chance of inclusion. Therefore, it provides a better estimation of parameters than purposive sampling. The sampling frame consist of single individuals, known and non-zero chance of being selected into the sample. It is the ideal and recognised single stage random sampling (Singh & Masuku, 2014).

In this study, these identified samples included all employees in the Department of Engineering and Construction within the company who were surveyed to obtain the data on needs of these employees. The departments consist of supervisors, managers, clerks, artisans, professional technicians and labourers, all of whom were invited in order to collect data for the research and support services were provided to the employees to improve knowledge transfer. A random sampling technique was used to select a group

of participants (n=71) for this study, which counted for 60% of the entire population. Human resource managers sent an invitation to these participants for requesting them to complete the questionnaire. This enabled the researcher to eliminate bias and to ensure the quality of the study was not compromised.

1.8.3 Data collection instruments

Quantitative data were collected through a survey questionnaire, while a semi-structured interview schedule was used to collect qualitative data.

The statements from the survey questionnaire were derived from relevant literature as well as professional opinions from industry. The interview questions were also derived from the relevant literature studies in line with the research objectives. This enabled the researcher to find out what the feeling and perceptions of participants and gain a better understanding of their reactions toward knowledge transformation.

1.8.4 Data collection and fieldwork

Data were collected from the engineering and construction departments, respectively, within a company in Cape Town, South Africa, through a questionnaire. The entire population of the company is about 210 employees. The researcher obtained permission from the Human Resources Department of the company. The survey questionnaires were distributed to both young and old employees.

The invitation was accompanied with a consent form (see Appendix B) and a questionnaire. Questionnaires were collected from the departments selected by the company at stipulated time by the general manager, according to the different unit categories. In addition, semi-structured interviews were focused on the managers (N=7) from various departments within the company. Anonymity and confidentiality will be guaranteed to all participants, as outlined in the distributed invitation and consent form.

1.8.5 Data coding and analysis

It is a descriptive construct coding nature designed by the researcher to capture primary content or the essence of the data (Theron, 2015). The data can generate an incorporation of more cycles, coding process, richer meanings, categories, themes and concepts (Saldaña, 2013:5, 8). A quantitative research method was employed.

Descriptive results of this technique were generated through SPSS Version 25 to help respond to the research questions and objectives. Cronbach'' s Alpha was used in the study. The purpose of this was to determine the internal consistency of the measurements. The Cronbach's Alpha value was, therefore, examined and observed to show data variables and their significance.

1.9 OUTLINE OF THE DISSERTATION

This section outlines the contents of the various chapters of the research study:

Chapter 1 discusses the background of the problem statement, the research objectives, research questions and the purpose of conducting the research. The methodology explained and exploration methods outlined, and information accumulated, and ethical considerations are presented.

Chapter 2 provides a holistic literature review of the research environment presented widely for a clear and comprehensive implementation framework relating to the work of previous researchers regarding knowledge transfer.

Chapter 3 focuses on research methods and clarifies the population, sampling, data collection procedures, instrumentation, general research approach, research philosophies and validity and reliability of the study.

Chapter 4 focuses on data analysis as well as interpretation of the results from the data collected for the study. An analysis of quantitative and qualitative data findings and discussions of the results obtained in the study.

Chapter 5 recaptures the research problem, research objectives, and investigative questions, presents a summary of the findings, draws general conclusions and makes recommendations.

1.10 ETHICAL CONSIDERATIONS

The ethics approach aims to promote the application of the principles of ethics for decision making in the affairs of the corporation (Chandran & Lobo, 2016). In addition, Ogbonna and Ebimobowei (2011) state that ethics and values are reflected in the rules that people use to govern their actions and the personal standards by which people distinguish right from wrong. This study was conducted in a way that would not cause any physical or psychological harm to any participant. The well-being, interest and

identity of the participants were protected, that is, all participants and company information was kept confidential.

All participants were informed about the purpose of the research and sent invitation letters before the data collection began and confidentiality of participants was protected. Participants were informed that their participation was voluntary, and data collected would be treated with strict confidentially. The researcher assured that there will be no harm to the participants who will be involved in this study through anonymous involvements. Participants had the right to withdraw their participation at any stage in the research process. They were assured of anonymity in that their names would not appear in the research findings and the data would be used for research purposes only.

1.11 LIMITATIONS OF THE RESEARCH

The study shows a lot of positive aspect to contribute to the research, it also notes that the study has used a single engineering company in which a broader view scope of the industry has not been reached, which gives room for more research under the same research topic within the industry, especially in South Africa.

The limitations of this study were identified as follows:

- The size of the sample was a limitation to actually have a broader and positive view on the research study due to a single company, which jeopardises the findings of the study which, in turn, will allow generalisation of the research.
- COVID-19 has also contributed to the limitations of the study.
- Time and human resources constraints were responsible for these limitations.

1.12 CONCLUSION

In conclusion, Chapter 1 has shown the current situation of knowledge transfer, knowledge development in South Africa, industry background, and significant contribution of the industry towards the economy. The chapter has also provided an overall structure of the full thesis. The importance of knowledge transfer within the engineering industry requires a careful consideration in establishing a competitive advantage for firms. This chapter provides a guide to the steps and methods to follow to achieve the objectives of the study. The strategy of managing knowledge management processes effectively for engineering firms is addressed as a crucial issue for maintaining development, competitiveness, innovation, and growth.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

The knowledge framework aimed at understanding the production of knowledge on complex system as a complex system itself, namely a perspective with coevolving components within interdependent knowledge domains (Raimbault, 2017). Knowledge is a source of a competitive economy and very significant to companies and their clients. Companies develop a knowledge transfer culture that is embedded in knowledge transfer and business strategy. This includes:

- Understanding of knowledge transfer
- The concept of knowledge management
- The organisational culture within the company
- The human and social networks and
- The Institutionaliation of learning disciplines.

Knowledge sharing is seen as an activity involving risk for the knowledge provider (Sankowska, 2012), as one may lose a competitive advantage over another by divulging valuable knowledge. Both knowledge recipients and knowledge providers face the same risks in terms of competition and information quality, which may be communicated within an organisation with potentially bad intentions.

Older workers must think positively at all times about their counterparts, younger workers in terms of their positives in their attitudes and approach during knowledge transfer networks. A holistic literature review of the research environment presented widely for a clear and comprehensive implementation framework relating to the previous researchers' executed knowledge transfer. While some researchers have classified knowledge as explicit knowledge and tacit knowledge in which later has been used by many others. Knowledge transfer and sharing between co-workers are of high importance for the industry as a whole. Where relevant knowledge lowers costs and spark processes during the open sharing of co-workers within the organisation.

A shortage of skills observed within the South African skills sector and in state-owned enterprises (Mbande, 2010). It has been suggested that since the Further Education and Training (FET) supplies the industry with skills and the system used is not enough to support the needs of the industry as a whole. It is therefore imperative for

government, industry experts, education centres and other stakeholders to find other ways to look at the problem of shortage of skills and development.

This is where the aim of creating an environment where power equals the sharing of knowledge rather than keeping it. As stated in Chapter 1, this study focuses on the factors affecting knowledge transfer between young and old employees at an engineering company.

2.2 UNDERSTANDING OF KNOWLEDGE TRANSFER

Knowledge transfer is a two-way relationship between the source (old employees) and the receiver (young employees) in construction bounds (Williams *et al.*, 2018). The theory of knowledge transfer consists of factors affecting knowledge transfer in an engineering company (Wang, Wang & Liang, 2014). Knowledge transfer is "the conveyance of knowledge from one place, person or ownership to another" (Liyanage *et al.*, 2009). More precisely, "Knowledge transfer in organizations is the process through which one unit (e.g., individual, group, department, division) is affected by the experience of another" (Argote & Ingram, 2000). Therefore, for it to be successful it requires all its elements that assist and hinders the flow of knowledge transfer. This study explores at the concept understanding of knowledge framework, knowledge sharing and transfer and knowledge management and tackle the tacit knowledge concept in relation to the individual personality traits of employee's knowledge transfer intentions to discover the factors affecting young and old employees in an engineering and construction industry.

As knowledge has been widely recognised and accepted by the business world, organisational resource has become valuable (Arif, Mohammed & Gupta, 2015). It is highly important to acknowledge and express the importance of tacit knowledge and explicit knowledge. Furthermore, Raimbault (2017) inductively build a framework that considers knowledge enterprises as perspectives, with co-evolving components within complementary knowledge domains.

2.3 OVERVIEW OF KNOWLEDGE MANAGEMENT

The definition of knowledge management could change from company to company, even from initiative to initiative. Researchers now consider that knowledge is now a management asset within the construction industry while facilitating organisations to improve their competitive advantage (Kant & Singh, 2011; Kasimu *et al.*, 2012). Therefore, knowledge is acquired through experience, reasoning, intuition and

learning. A knowledge organisation is an organisation that optimises the application of knowledge to achieve its operational and strategic goals; it is one where knowledge management has been embedded in the organisational strategy to create a sustainable competitive advantage to encourage innovation (Saini *et al.*, 2017). Thus, the integration of knowledge management into company strategies becomes an important power for the success of the organisation in order to respond to environmental changes (Giampaoli *et al.*, 2017). The five stages of the model of knowledge transfer and innovation decision concept by Williams *et al.* (2018) consist of knowledge, persuasion, decision, implementation and confirmation. Sun and Ren (2014) note that construction companies mostly work on temporary projects that are unique in nature, which causes the gap in knowledge gained and lessons learned/lost at the end of every project. In the case of individual knowledge transfer, some researchers report it as an exchange that can be focused or unfocused (Paulin & Suneson, 2012). Lindner and Wald (2011) also add that organisations lack natural mechanisms of learning, which makes knowledge transfer difficult. In an organisational context, knowledge transfer should be encouraged through organisational systems and strategies and be instilled as an organisational culture, just like lunch breaks are compulsory for employees. The organisational success implementation of knowledge management aspects deeply improves the knowledge transfer framework (Saini *et al.*, 2015). Web-based and intranet technologies have been efficiently and systematically collecting and sharing experience and knowledge processes that aim at knowledge management (Chen & Zhang, 2014).

What all organisations want is to learn and create a learning environment through the Knowledge Management discipline that continuously fosters the creation of useful knowledge for both organisational and personal knowledge to activate and achieve innovation, smart business value, enhance performance and development effectively (Alghail, Yao & Kie, 2017). Furthermore, these authors also define Knowledge Management as a consistent process that focuses on acquiring, storing, diffusing, and implementing, that organisations exploit to achieve business objectives both inside and outside organisational boundaries (Alghail *et al.*, 2017).

Knowledge management has been regarded as a key factor in enhancing organisational performance in organisations across the globe. Its pivotal role is more pronounced in knowledge-intensive organisations such as those involved in research and development. A more vital strategic role played by the clarity and a distinct classification where organisations embark on KM initiatives involving leveraging,

knowledge transformation and resource allocations (Abbas, 2016). In general, knowledge management processes ensure that a firm proceeds with knowledge management that is business-critical and more visible through its activities efficiently (Makore & Eresia-Eke 2014).

Team communication is enhanced through knowledge management within engineering projects in addressing specific designs and simulation tools, while engineers and the National Development Plan process approach is aligned through the effective use of these tools and provide a multi-employee workflow within an organisation (Marion & Fixson, 2021).

The process of creating knowledge originates from socialisation, facilitation and interaction between employees, which initiates the creation and transferring of tacit knowledge in organisational workflows in the context of the impact of knowledge transfer between younger and older employees (Ganguly, Talukdar & Chatterjee, 2019).

Many factors may come into play when different generations find themselves working together and interacting. For example, how each generation perceives the other and how each defines and perceives expertise, experience, productivity, commitment, and so on may differ. How do these factors (amongst others) impact the interactions between younger workers and older workers, particularly in terms of communication? In turn, how does communication influence collaboration between older and younger workers in terms of knowledge transfer?

Effective knowledge management seeks to transform tacit knowledge into explicit knowledge for storage and dissemination across the organisation. as defined by Saini (2015), knowledge management is the process of identifying, transfer and effective knowledge sharing to support other processes within organisations to all places required anytime. This is seen by the researcher to be the driving factor for perception of exchange, since authors argue about tacit knowledge that is perceived as difficult to codify and personalise since it is embedded on ideas, values and emotions that can speed up the process of knowledge transfer (Ganguly *et al.*, 2019).

2.4 IMPACT OF SHARING INTENTION ON KNOWLEDGE TRANSFER

As argued by many researchers, the high levels of selfish behaviour of employees, towards knowledge sharing engagements or knowledge keepers may drive other employees to practice kindness and willingness to share and transfer knowledge

without expecting the same treatment (Koay, Sandhu, Tjiptono & Watabe, 2020). Through daily interactions in the workplace, one individual may develop strong emotional bonds and be comfortable with fellow employees and on the other hand trust amongst one another develops while others do not pose any information about one other it is unclear what is meant (Koay *et al.*, 2020). These researchers have acknowledged that knowledge sharing behaviour and tacit knowledge behaviour have a significant influenced by affective-based trust.

Overall, this research suggests that trust has a significant positive effect on knowledge sharing in which this study makes an argument that with the correlation of tacit knowledge, personality traits and critical factors mentioned in the previous chapter, significant positive transfer and sharing of knowledge can be achieved.

Knowledge sharing between co-workers is essential for organisations. Open sharing of relevant knowledge has the potential to lower costs and optimise processes, whereas a slack of sharing may harm organisations and even render their processes ineffective. Thus, it comes as no surprise that knowledge sharing is studied extensively in the literature.

Accessing the knowledge between co-workers is only possible through the active participation of the people carrying this knowledge. Wah, Zawawi, Yusof, Sambasivan and Karim (2018) found that in order for others to benefit, individual access to knowledge and its use to stimulate innovation should be based on mutual understanding. Motivational factors are important for sharing knowledge.

2.5 TYPES OF KNOWLEDGE TRANSFER

2.5.1 Explicit knowledge

It can be simply transferred by word or writing and is well defined in the literature, Tacit knowledge is much more difficult to grasp (tacit knowledge is bound to the mind of individuals, for example, value systems may rely on rather personal experiences, difficult to formalise and subjected to change).

2.5.2 Implicit knowledge

This is knowledge within people's minds, but that has not been made explicit and can be considered an additional category somewhere between tacit and explicit knowledge. Bennet *et al.* (2015) present an extensive discussion of all three types of knowledge.

The authors recognise that implicit knowledge does not have a unanimous definition, which necessitates a clear definition in scholarly work. Implicit knowledge is defined as knowledge we are not immediately aware of and, therefore, it Is not readily accessible, but can be triggered (it is self-discoverable) and may then partially turn into explicit and tacit knowledge ("The why and how may remain hidden").

From this viewpoint, implicit knowledge is transient, but distinctively different from tacit knowledge. Knowledge sharing is seen as an activity involving risk for the knowledge provider (Sankowska, 2012) as they run the risk of losing competitive advantage over others by revealing valuable knowledge. This means that a co-worker needs to trust the abilities and competencies of a colleague to take the risk and to make use of the knowledge that has been shared.

2.5.3 Tacit knowledge

This type of knowledge cannot be transferred directly by word or writing and requires other means of transfer such as mentoring and shadowing experiences. Tacit knowledge is investigated in this research based on the argument that it is critical for organisations to align organisational policies and strategies to maintain their sustainability and competitive advantage. Many research studies have indicated the need to understand and focus on the importance of tacit knowledge to enhance innovation and organisational performance (Muthuveloo, Shanmugam & Teoh, 2017).

2.6 TACIT KNOWLEDGE TRANSFER

Tacit knowledge is internal to an individual in the form of know-how, experience or expertise (Hau, Kim & Lee, 2016). The challenge inherent in tacit knowledge is figuring out how to recognise, generate, share, and manage knowledge that resides in people's heads. People are not aware of the knowledge they possess or how valuable it may be to others, and tacit knowledge is considered more valuable because it provides context for people, places, ideas, and experiences (Watanuki, 2008).

Effective transfer of tacit knowledge generally requires extensive personal contact and trust (Watanuki, 2008). It is transferred through demonstration and on-the-job training. Tacit knowledge involves knowing how and is by nature difficult to describe. It can be demonstrated, but rarely codified and resides with its holder. A motivated holder of this knowledge is most eager to coach or mentor younger employees willingly because of his expertise and knowledge of the company.

A distinct and on point explanation by the researcher, a series of experience, learning, sensing, analysing, witnessing and observing timeously through thoughts and views of an individual's mind exploring tacit knowledge (Saini, 2015). Arif *et al.* (2015) confirm that tacit knowledge through its relation to the learning process has shown tremendous relevance in the process model of knowledge sharing and transfer within organisations. Tacit knowledge can be compared to the routine work concept. Routines are interdependent and involve multiple individuals, while individuals may require a different approach. The researcher continues to prove the relation of tacit knowledge through the following table of Critical Success Factors (CSFs) (Saini *et al.*, 2017) and the flexibility individual traits within systems and strategies of the organisation. Based on their research recently, organisation within the critical factors has been matched with organisational systems, and personal traits. The personality traits include openness, conscientiousness, extraversion, agreeableness, and neuroticism. Han (2018) further showed relations to knowledge transfer intentions of employees on the five personality traits which are assumed as better suited with tacit knowledge concept framework of which this opens up a new study on the matter.

Some researchers say tacit knowledge is widely accepted and well fit for applying structural organisational knowledge transfer and sharing based on the research done by Saini *et al.* (2018). It should be stated that personality traits are used in the study because their characteristics influence knowledge transfer. Through organisational critical success factors, some elements embedded in organisational environmental processes include honest communication management, organisational culture, organisational leadership capabilities, trust between staff, and information systems.

Table 2.1 below shows the research study through critical success factors (CSFs), organisational processes and personality traits. It is assumed that personality traits are some of the factors affecting knowledge transfer. This study utilised the 10 critical success factors to measure knowledge transfer between young and old employees.

Table 2.1: CSFs, personality traits and organisational environment

Critical success factors	**Personality traits**	**Organisational environment**
Trust between organisations	Openness	Honest Communication
Motivation to share tacit knowledge	Extraversion and agreeableness	Culture trust
Leadership capabilities	Conscientiousness	Leadership capabilities
Business strategies	Conscientiousness	Culture trust
Organisational capabilities	Openness	Honest communication
Employee involvement	Openness and agreeableness	Culture trust
Process improvement	Conscientiousness	Leadership capabilities
Type of knowledge	Openness	Leadership capabilities
Source of knowledge	Conscientiousness	Honest communication
Recipient of knowledge	Extraversion and openness	Leadership capabilities

This study focused on young and old employees through a platform created based on organisational objectives, CSFs and individual positive personality traits to ascertain positive knowledge transfer intentions amongst artisans within a company.

Williams *et al.* (2018) acknowledge and confirm that the field of innovation has opened the concept of knowledge transfer. Knowledge lost from previous skilled employees can be shared with current young employees (Saini *et al.*, 2015).

Five main challenges have been highlighted by Ekambaram *et al.* (2014), namely:

- Lack of incentives for knowledge sharing
- Attitudes
- Low stability or continuity in collaborating knowledge within organisations
- Time pressure
- Inadequate information systems

Timely knowledge transfer is necessary (Sun & Ren, 2014). Therefore, the responsibility lies with the knowledge sharing process within organisations in the construction industry. In this case, the investigation is between young and old

employees, where the source is old employees as information holders and young employees as recipients who are the final destination of knowledge. In a social setting, critical knowledge should be identified to them to make use of knowledge transfer systems to acquire that knowledge needed (Williams *et al.*, 2018). As has been emphasised by most researchers, knowledge transfer involves individuals, networking groups, within social systems and internal and external organisational knowledge that encourage close ties of communication and sharing and transfer of knowledge (Williams *et al.*, 2018).

2.7 ORGANISATIONAL UNDERSTANDING OF TACIT KNOWLEDGE

Tacit knowledge refers to knowledge that cannot be easily described and communicated. It is evident that researchers in this area agree that tacit knowledge refers to on-the-job training (meaning doing), which is inherently focused on individual skills. Knowledge transfer and sharing tacit knowledge remains a challenge due to a lack of awareness and understanding of knowledge management frameworks (Saini *et al.,* 2018).

Tacit knowledge is therefore argued to provide performance benefits to firms by generating a unique competitive advantage that can be sustained through time. A few empirical studies have examined the performance implications of tacit knowledge.

2.7.1 Tacit knowledge at organisational level

Shamsie and Mannor (2013) found that productive and administrative forms of tacit knowledge had a positive impact on organisational performance. More evidence supporting tacit knowledge provides firm-level performance, skills, and benefits. Ganguly *et al.* (2019) argue that tacit knowledge sharing at the organisational level plays a huge role, that social capital plays within and that structural and cognitive social capital have a significant impact in making tacit knowledge sharing a success.

Malamed (2020) provides an in-depth understanding of tacit knowledge transfer to drive skills needed to create quick innovative designs for success organisational development and competitiveness. As noted by many researchers across the world, tacit knowledge has aspects of skills that are highly difficult to articulate or transfer to other people with spoken language. This knowledge, as previously explained, is referred to as implicit or tacit knowledge.

2.7.1 Tacit knowledge at individual level

Malamed (2020) provides essentials of transferring tacit knowledge in individuals, teams or groups and organisations. First, it is critical for organisations to understand what helps experts' intuitive ability to solve problems, innovate and make smarter decisions. Digest tacit and explicit knowledge from subject matter experts, ensuring novices develop quickly and intermediaries build capabilities.

Secondly, an organisation's future success is enhanced by transferring tacit knowledge before the expert leaves the job, thereby ensuring the organisation does not lose critical tacit knowledge by not passing it on. This knowledge gap can be costly and time-consuming or impossible to bridge (Mbuyisa & Leonard, 2017). It is important to collect and disseminate expert tacit knowledge for each organisation's own protection.

Thirdly, an organisation's processes and procedures should ensure that tacit knowledge is embedded to encourage continuous improvement. Without realising it, tacit knowledge can be overwritten and lost. This can be avoided by identifying and raising awareness of an organisation's tacit knowledge store and making it explicit through knowledge management strategies.

Wang and Yang (2015) and Hedlund *et al.* (2003) outline the following characteristics to recognise sources to identify the presence of tacit knowledge in an employee's performance. Tacit knowledge:

- is personal, firmly embedded in an individual's actions, and affected by the ideal, value, or emotion of that employee.
- is acquired on one's own mind, with limited resources and support. Decides what's important and meaningful.
- is procedural - knows how to perform activities in contrast with factual knowledge.
- relies on individual experience and is action oriented.
- demonstrates practical intelligence, rather than abstract, academic intelligence.

Additionally, Malamed (2020) provides us with ways to transfer tacit knowledge and elaborates on the recognition of storytelling, conversation and social interactions to extract tacit knowledge.

Collaboration and social networks

Collaborative communities should be enhanced in order to provide learning opportunities and exposure to new ideas. Three essential factors: leadership, trust and collaboration are the most influential problem seeking and solving among employees within organisations (Saini *et al.*, 2018).

Hinojo-Lucena, Aznar-Díaz, Cáceres-Reche, and Romero-Rodríguez (2020) state that using virtual networks improves learning processes and social networks that favour collaboration.

Show your work

This is a strategy to make an individual's work visible for others to see. With this in mind, the intention of transferring tacit knowledge is embedded in work done. This strategy provides a superficial procedure into the deeper aspects of a person's expertise.

Storytelling

Personal narrative is one of the most powerful forms of communication that exists in narrating a good story (Suzuki, Feliú-Mójer, Hasson, Yehuda & Zarate, 2018). Not surprisingly, organising stories is considered an effective way to acquire and disseminate tacit knowledge. These stories turn information into organisational knowledge. They also provide context that gives meaning to the fact. Through structured interviews, stories can be captured from employees preparing to retire and from SMEs.

Tracking lessons learned

Most organisations officially engage processes for recording *lessons learned* so that others who did not participate can benefit from these experiences. Lessons learned become realistic and relevant case studies and similarly more efficient than storytelling. This is another effective way to spread knowledge gained from experience.

Guided experience

Leonard, Barton and Barton (2013) identify a deep mentoring approach called OPPTY, which stands for *Observation, Practice, Partnering and joint problem solving, and Taking responsibility*). This is a strategy for acquiring tacit knowledge through guided experience. The components of this approach are listed below.

- During the observation, the mentee follows the expert and analyses his or her work. In practice, mentees replicate specific expert behaviours or tasks on

their own, but require some supervision and feedback.

- During the collaborative phase, mentors and trainees work together to analyse and address challenges.

- During the assumption of responsibility phase, the mentee assumes part of the expert role. During this time, individuals are encouraged to reflect on each experience and internalise the knowledge gained.

Reinvention

Willingness of individuals with clear goals requires a great deal of effort to learn by trial and error. Coaches demonstrate as experts and provide an intensive feedback mechanism. Reinvention is slower, but a viable route to attaining a satisfactory level of tacit knowledge in selected fields.

2.8 ORGANISATIONAL CULTURE PRACTICE AND MANAGEMENT

Capelo (2013) defines this as a role in organisations that concerns internal interaction, the feeling of belonging (or not) and commitment regarding the creation of a competitive environment, and development of the social glue that binds the organisation together. Knowledge culture contributes to the organisational knowledge base by considering support, facilitating learning and innovation through encouraging employees to enhance customer value (Intezari, Taskin & Pauleen, 2017).

Intezari, Taskin and Pauleen (2017) emphasise that culture has been defined as a lasting set of assumptions, beliefs, and values that describe organisations and their members. At the deepest level, culture consists of values that are tacit preferences of what the organisation should strive towards and how it should do so. For example, an organisation can promote openness and trust as core values to stimulate innovation. Values are often difficult to articulate and even more difficult to change (Tounkara, 2019). Their impact on knowledge creation, transfer, and application are manifested in behaviours.

While norms are generally derived from values, but they are more observable and easier for employees to identify. Thus, they are more susceptible to change. We can give as an example in an organisation, the social norms governing the way individuals should interact to share knowledge (Tounkara, 2019).

Tounkara (2019) studied the impact of organisational culture on the context for social interaction, which can be observed with the existing norms and practices associated with important core values such as interactivity, collaboration, orientation of collective knowledge (vs. individual knowledge), orientation towards the existing knowledge, and expertise.Organisational behaviour is influenced by organisational culture, patterns of common assumptions, values, beliefs and attitudes (Intezari *et al.*, 2017). Additionally, it has been found that requirements established by governmental agencies for information management such as copyright, freedom of information, play a key role" in information culture.

Wright (2013) investigated information culture in government organisations and concluded that a culture of collaboration and openness resulting in information sharing ensures more informed decision-making. Svard (2014) also found that information culture influences the core management practices.

Most countries generate wealth and improve the quality of life through the critical role played by the construction industry. South Africa is not different when looking at the government's socio-economic policies into social and economic infrastructure development.

Organisational culture is one of the main determinants of the many aspects of an organisation's life such as organisational success, attractiveness, innovation, safety, leadership, productivity, performance and effectiveness.

Employees' attitudes and behaviours in the workplace impact on organisational culture and a critical role played by knowledge culture affects the success or failure of knowledge management and knowledge transfer initiatives (Intezari *et al.*, 2017).

2.9 INFLUENCE OF PERSONALITY ON EMPLOYEES' PSYCHOLOGICAL LEVEL

Bakker, Hetland, Olsen and Espevik (2019) found that in order for individuals to better deal with challenging environments, there are certain strengths of character they should have to facilitate social networks and performance such as creativity, social intelligence and bravery. Personality is defined as "the scientific study of psychological individuality" (McAdams & Olson 2010:518). Individual personalities may refer to relatively enduring personal characteristics in the sense of generalised and basic conduct tendencies within work engagements.

Some people show signs of work engagement, but others exhibit little or no signs of work engagement while working under similar conditions. However, personality plays a role in the engagement process because individuals enter the workplace with their own set of personality characteristics. Previous studies have failed to notice a possibility that strength may not be equally used by all individuals effectively, based solely on character strength and its use. Informed decisions by the human resources management should make sure which personalities are associated with profit and innovation from individual strength use (Bakker *et al.*, 2019).

The five-factor model of personality, often termed the “big five” personality framework by previous researchers, provides one of the most prominent models in contemporary psychology to describe the most salient features of personality. This title “big five” is selected not to reflect their intrinsic greatness, but to emphasise that each of the factors is extremely broad (Zaidi *et al.,* 2012). These big five personality dimensions are categorised under five factors: Extraversion, Agreeableness, Conscientiousness, Openness, and Neuroticism (Zaidi *et al.,* 2012).

2.9.1 Extraversion

Extraversion as an individual’s personality trait is defined as being talkative in nature with high energy levels. This indicates an individual who engages experiences with enthusiasm and other positive emotions with the external world (Ali, 2019). This refers to outgoing tendencies of an individual who possesses assertiveness, is pro-active, and has a highly engaging personality whether it is in large or small groups and gatherings. Additionally, this personality trait is where one finds individuals with high levels of energy, who are highly upbeat, and have high optimism (Agbaria & Mokh, 2021).

2.9.2 Agreeableness

Agreeable individuals are better at balancing opposites and place a high emphasis on social harmony, honesty, collaboration, and trustworthiness. Some researchers have studied the relationship between organisational performance, interpersonal facilitation, and discretionary behaviour (Patnaik, 2020; Van Scotter & Van Scotter, 2021). Furthermore, these are individuals with an optimistic view of life generally. However, other researchers have found agreeableness to influence job performance when collaboration and cooperation among workers are essential (Teh, Yong, Chong & Yew, 2011).

2.9.3 Conscientiousness

Conscientious individuals are regarded as highly purposeful, determined and strong-willed, and associated with occupational achievements and work very hard (Agbaria & Mokh, 2021). These individuals possess the ability to plan the quality of persistence, and are achievement-oriented, as defined by (Ali, 2018).

2.9.4 Openness

This applies to an individual who shows willingness and opens themselves to new experiences of learning, is creative at the same time vulnerable, and shows an ability to try new things (Prakash Pillai, 2020). Individuals who score high on openness to experience tend to be creative, imaginative, cultured, curious, intelligent, and artistically sensitive (Schwaba *et al.*, 2018; Xu *et al.*, 2021).

2.9.5 Neuroticism

Some scholars conclude that neuroticism's positiveness is correlated with perceived stress. Therefore, these individuals are generally more prone to experiencing psychological distress as their subversive emotions interfere with their adaptation process (Agbaria & Mokh, 2021). It is described as the inclination to experience negative emotions and often associated with anxiety, hostility, poor social skills, and depression (Yahaya *et al.*, 2012).

2.10 CONCLUSION

The literature review has revealed essential aspects that hinder knowledge transfer in general as researchers have alluded to. It has been highlighted that key factors that point to engineering problems in terms of transferring knowledge amongst workers are mainly on transfer between younger and older workers within the organisation. Even though there is progress in improving organisational culture to transfer knowledge within an organisation, it is evident that a huge step back for the industry and its development remains a concern.

It is noteworthy that the primary purpose of knowledge transfer is to circulate the flow of KS efficiently within the organisation, while increasing a competitive skills advantage and member's abilities to respond quickly. The following questions and answers concerning knowledge transfer and knowledge sharing between older workers and younger workers are critically important.

- How do these factors (amongst others) impact the interactions between younger workers and older workers, particularly in terms of communication?

Revitalising processes, improving morale enhances more collaborations amongst workers and more social interactions, increases multi-job skills, more departmental cross job interactions, timely and efficient service delivery, individual commitment, and development.

- How does communication influence collaboration between older and younger workers in terms of knowledge transfer?

The influence of communication may be positive or negative.

Positive influence

A good understanding of information flow allows leaders and managers to:

- identify information sharing needs for improvement.
- develop purposely efficient applications and systems that lead to the efficacy of knowledge transfer.
- embed the organisation's cultural policies that assume, beliefs, and values in organisational strategies.

Negative influence

The negative influence of communication on collaboration between older and younger workers in terms of knowledge transfer includes lack of organisational pride and morale; low service delivery to clients; lack of respect and trust in employees' behaviour; lack of innovation, development, and competitiveness within the organisation; deterioration of leadership capabilities; inadequate information systems; and low instability or continuity.

It has been revealed that as long as organisational strategies outline the processes and procedures for continuous improvements of the awareness of transfer of tacit knowledge, employees are more motivated to do so willingly without any incentives. Consequently, it is necessary for organisations to prioritise training workshops, team collaborations and other social engagements within the organisation to effect knowledge transfer at all costs. The importance of tacit knowledge enables individuals to acquire knowledge through action, learned experiences, and mindful thoughts that produce new and innovative designs and skills.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the design and methodological choices regarding the selection of an appropriate strategy for the study. Thus, the chapter focuses on research methods, clarity on the population, sampling, data collection, procedures and instrumentation, general research approach, research philosophies, and validity and reliability of the study.

When the purpose of a project is to acquire knowledge based on individuals' perceptions, attitudes, and opinions, this method is an ideal means of data collection. Questionnaires and interviews are grouped broadly as different forms of surveys in survey design (Creswell & Hirose, 2019).

3.2 RESEARCH DESIGN

Mixed methods, that is, a combination of qualitative and quantitative methods was adopted as the most appropriate research approach for this study. This means both methods were used to achieve the research objectives outlined in Chapter 1.

Leedy and Ormrod (2010:87) point out that in planning the research design it is particularly important for the researcher not only to choose a practical research problem, but also think about the kinds of data required, and logical ways of collecting and interpreting the data when investigating the problem. Each of the tools selected for the study must complement the other for the data generated to be pertinent to the subject of the study and follow in a logical progression (Jonker & Pennink, 2010). For this reason, the method and design adopted for this study is essential and appropriate for the task of the study.

Given that the nature of this study was both qualitative and quantitative, both aspects were used to address the following issues:

- determine firms' commitment to organisational behaviour, organisational culture, and organisational performance management;.
- ensure that the organisation is able to transfer knowledge from old to younger employees and from one unit to another effectively;
- determine factors affecting knowledge transfer within the organisation;

- ensure the organisation understands the importance of tacit knowledge, recognise and capitalise on it; and
- ensure that management focuses on psychological aspects that are embedded in knowledge transfer within the organisation and between employees.

The quantitative approach was used to provide the following understanding:

- generalisation and reliability of various groups or variables;
- focus on the manageability of this reality into smaller pieces; and
- ensure objectivity, confirm and validate findings.

The basis of this primary research approach is outlined in the literature review in Chapter 2, highlighting the framework, themes and concepts, a focus on organisational knowledge management, its culture, and organisational behaviour. It also reviewed the application processes and traceability of these concepts and addressed its framework, standard procedures, and recommended practices.

The mixed methods approach is deemed appropriate for the current study as it involved studying a particular engineering organisation at the level of its manufacturing plant. Thus, a case study approach was used to collect data and critical information in the engineering organisation from the manufacturing departments. The next section presents the research approaches followed in this study.

3.3 RESEARCH APPROACH

This study employed a combination of both qualitative and quantitative approaches. In the study, the approach to using a mixed methods survey is that based on an explanatory sequential design (Creswell & Hirose, 2019). The quantitative and qualitative paradigms offer a basic framework. This study investigates the key factors affecting knowledge transfer between young and old employees at an engineering company in Cape Town. It is imperative to use different type of data (i.e. survey questionnaires and interview schedule) to analyse views of both management and employees through mixed methods. Therefore, the mixed research approach is suitable for this study.

3.3.1 Mixed methods research

The mixed methods approach involves the collection of both qualitative and quantitative data. This approach combines the two methods of data collection by using definite

design approaches that include philosophical hypotheses and theoretical underpinnings. With this approach two sets of data can be collected by the researcher for the study (Rutberg & Bouikidis, 2018).

A significant assumption in a form of a study, both qualitative and quantitative methods provide broader comprehensive understanding of challenges being investigated. In order to conduct a proper study, the investigator not only chose a mixed method approach to guide the investigation process, but also selected a type of study that corresponds with this method. The research design approach involves the types of investigative methods used in qualitative, quantitative, and mixed methods approaches, from which the methodology arises.

Other researchers have acknowledged these strategies of inquiry (Denzin & Lincoln, 2011:12). The following design approaches are associated with the mixed methods approach:

- Descriptive mixed methods,
- Explanatory sequential mixed methods, and
- Exploratory sequential mixed methods.

An exploratory sequential mixed model was deemed appropriate for the study. The researcher started with the qualitative approach partly by exploring the understandings of the population group selected for the investigation. The qualitative part was used to determine a tool that best fits the sample for the inquiry to detect appropriate methods to use in the follow-up quantitative stage, or to determine variables that need to be included in a follow-up quantitative analysis (Creswell, 2014).

3.3.2 Qualitative research

In qualitative research, for emerging theories of the future, exploration of the research topic is done without formulas from the past, with the aim of collecting information and data separately. The researcher uses open-ended questions and interviews subjects in a semi-structured manner; researchers may use open-ended questions and interviews in gathering data (Rutberg & Bouikidis, 2018). Qualitative research has been supported as the data source that can examine a subject study within a specific context (Onwuegbuzie & Collins, 2017).

3.3.3 Quantitative research

Quantitative methodology focuses on quantifying social situations with the aim of collecting and analysing numerical data and establishing links with smaller attributes.. The positivist research approach focuses on group changes using experimental designs to measure effects (Antwi & Hamza, 2015). Qualitative research approach is used to explore and understand individuals or groups that relate to general problems of humanity (Creswell, 2014).

3.3.4 Comparison of quantitative and qualitative research

To determine the research approach, the similarities and differences between the two methods were examined. Table 3.1 shows the differences between qualitative and quantitative research.

Table 3.1: Differences between qualitative and quantitative research

Qualitative	**Quantitative**
Natural and uncontrolled observation	Controlled measurement
Subjective	Objective
Process-oriented	Outcome-oriented (static)
Close to the data: a more inside perspective	Concluded from the data: an outside perspective
Dynamic reality and ungeneralizable	Stable reality and generalizable
Micro Macro Rich, deep data	Hard, reliable data
Theory emergent	Theory testing

Adapted from Blaxter *et al.* (2010).

Quantitative research is a static image of social reality with its emphasis on relationships between variables, whereas qualitative research is interconnected with the actions of participants in social settings. The decision was taken to use a combination of qualitative and quantitative methods as the most appropriate research approach for this study. Researchers suggest that both research approaches explore phenomena (Basias & Pollalis, 2018).

Furthermore, it was considered that a combined research strategy would enable the findings of the research to be informative, while providing support to the reliability and validity of the study. Positivism derives from scientific thinking and is based on the view

that social science procedures should reflect, as much as possible, those of the natural sciences. According to Rahman (2020), mainstream research methods emphasise language testing for researchers to pay attention to the advantages and disadvantages of using qualitative and qualitative research.

3.4 RESEARCH PROCESS

Certain characteristics and properties of the research process qualify it as good research (Tabuena, Hilario & Buenaflor, 2021), namely:

- Ability to Control;
- Rigour;
- Being systematic;
- Validity; and
- Verifiability

In this research, drawing from these characteristics, factors that affect effective knowledge transfer flow and knowledge sharing in an engineering firm were investigated in detail and identified in the literature review with a view to linking the effects with the causes and vice versa. This was done by organising the data in such a way that it can provide the industry with different perspectives.

A rigorous way to find answers to questions is relevant, appropriate, and justified, but the degree varies between physical and social sciences. The most appropriate research methods were identified and justified, while procedures for the investigation followed a certain logical sequence. To allow concluded findings to be corrected and be verified by the researcher to provide hard evidence gathered from data collected from real-life experiences and observations. To explore these experiences a study in an engineering firm was organised. It is crucial to a research inquiry to allow critical scrutiny of the procedures employed in the process for the research to be able to withstand critical scrutiny.

3.5 RESEARCH POPULATION

As the study is about knowledge transfer between young and old employees within the engineering firm, participants were drawn from all sections of the selected company. The population consisted of all individuals likely to be affected by the research. The total population of the company contains 120 members. A target population to be investigated in the study includes managers and the shopfloor employees.

3.5.1 Target group

The size of the target population was derived from the total population. The target population comprised managers, supervisors, clerks, and labourers (young and old). A random sample was taken from the selected engineering company in the Western Cape, South Africa. The participants in the target population consisted of individuals who were selected to complete a questionnaire.

3.6 SAMPLE DESIGN AND METHOD

According to Leedy and Ormrod (2010:87), planning the research design is particularly important for the researcher not only to choose a practical research problem but also to think about the kinds of data that an investigation of the problem will require, as well as logical ways of collecting and interpreting data.

Simple random sampling was used. In the simple random sampling method, each unit included in the sample has an equal chance of inclusion in the sample. This technique provides an unbiased and better estimate of the parameters if the population is homogeneous. This form of sampling was applied in selecting employees who hold significant evidence about the organisational system or strategies within their respective departments. The sample was compared to the population under investigation.

Thus, to collect data, seventy-one (71) employees from the different departments in the selected engineering manufacturing company were selected, including four managers: the general manager of the facility, one from quality management, one from the maintenance department, and one from the welding department. The main interview included all participants selected from the departments mentioned, who responded to the interview questions highlighted in Chapter 5. The methods used to achieve the research objectives mentioned in Chapter 1 are presented in this chapter. This research adopted a mixed method approach by using both qualitative and quantitative methods. The decision was taken to use a combination of qualitative and quantitative methods as the most appropriate research approach for this study. With this in mind, it was considered that a combined research strategy would enable the findings from different stages of the project to inform and refine and also support the reliability and validity of the research.

3.6.1 Sampling procedure

Employees of an engineering company in the manufacturing industry in Cape Town, South Africa, were selected to participate in this study. A sample of 100 employees was selected from the target population. However, owing to tight time schedules at work, 71 out of 100 employees participated in the study.

The departments targeted consisted of operators, managers, clerks, artisans and other employees, who were invited to participate in the study. A semi-structured questionnaire was sent to the general manager of the organisation to distribute to the selected participants. Only the manufacturing employees of the company were included and no experts to ensure that the data gathered focused on the employees' perception and/or perspective. Participation in the study was completely voluntary, and the sampling procedure was, therefore, open and random. Participants were informed of the objective of the study and background of the problem as well as the organisation's permission for the study to be conducted.

3.6.2 Survey research

Surveys can be used in any discipline, although they are the foundation of social science research. Greater insight is provided by mixed methods when both quantitative and qualitative results are combined (Story & Tait, 2019). Surveys are based on probabilistic or non-probabilistic sampling and vary from the use of questionnaires to structured interviews.

3.6.3 Survey questionnaire

The most common research method is the questionnaire survey, which can be used to collect data on any topic from large or small groups of people. Respondents record their answers to a written list of questions.

3.6.4 Interviews

Interviewing is a commonly used method of collecting data from people. Interviews are classified according to the degree of flexibility as structured, semi- structured and unstructured. In qualitative research, the most frequent form of data collection is semi-structured or structured interviews with representative individuals (Hawkins, 2018). To ensure quality, researchers employing semi-structured interviews for data gathering should adopt a relational mindset and evaluate interviewing skills (DeJonckheere &

Vaughn, 2019). A brief comparison of the advantages and disadvantages of using questionnaires and interviews is presented in the following Table 3.2 and Table 3.3, respectively (Bernard, 2000):

Table 3.2: Advantages and disadvantages of using questionnaires

Advantages	**Disadvantages**
Low cost	Having no control over how people react to questions
Same questions to respondents (standard)	Low reliability
Having the chance to ask long questions	Not suitable for illiterate or non-literate populations
Easy to conduct and quick response	Low response rates

Source: Bernard (2000)

Table 3.3: Advantages vs disadvantages of using interviews

Advantages	Disadvantages
Can be used with people who are illiterate, blind, or very old	Costly in both time and money
Having the chance to explain questions	A limited number of respondents
Use different data-collection techniques	Needs experience
Long enough to capture valuable information	Subjective

Source: Bernard (2000)

3.6.5 Data organisation

In this study, the data was organised using two applications: frequency distributions and graphs, in order to draw meaningful conclusions from the data presented. The use of frequency distribution presents information and data in a way that makes their patterns easily distinguishable. The study employs a frequency distribution, which provides associations between all variable values based on their frequencies.

In interpreting a functional relationship between an intervention and the target outcome, decisions of visual analysts are influenced by analysis-altering elements (Peltier *et al.*, 2021). In their natural state, graphs have two coordinate axes: the x-axis (horizontal axis) and the y-axis (vertical axis). In this study, pie-charts, bar graphs and column graphs were used to enhance the visual aspects of the frequency data. The demographic data in the first section of the questionnaire was presented using pie charts.

3.7 DATA COLLECTION

A survey questionnaire and a semi-structured interview schedule were used to collect data. The surveys were provided to both old and young employees in this regard. Quantitative data has allowed us to gain a better understanding of the environment, which primarily concerns five individual personality factors, employee knowledge transfer intentions, and organisational knowledge management in the engineering business. For data gathering in research, paper surveys have long been the preferred method. In cross-sectional research, however, decreased response rates over the last decade have increased the potential of selection bias **(**Ebert, Huibers, Christensen & Christensen, 2018).

The qualitative data were collected through a number of interviews during 2019-2020. Through the use of tacit knowledge and critical success elements, as well as the relationship between the knowledge transfer intentions of young and old employees. The purpose of this study is to gain a new understanding of the elements that influence knowledge transfer between young and old personnel within the confines of an engineering firm. An in-depth analysis to shed light on the current debates surrounding the clarity of the concept, knowledge transfer.

All organisational staff who might be involved will be informed about the questionnaire's research goal. Feedback from selected lecturers who tested the questionnaire resulted in greater clarity and the addition of generic questions about participants. As a result of these refinements, a questionnaire was created and sent to the company's general manager, who had experience with surveys and data analysis in the past. To the best of our knowledge, all required documentation describing the problem, topic and purpose of this research has been correctly produced, and variables have been thoroughly defined so that participants have a full understanding of them.

The respondents have received the completed questionnaire. The sort of research, the population, sampling, data collecting, study dependability, and validity are all covered by the research technique. This study's format is descriptive, which means that data is collected, and theory is developed as a result of data analysis.

3.7.1 Pilot study

According to Intezari *et al.* (2017), when incorporating elements in a text, they should be clearly described so that the pilot study can play a big role prior to the start of the

study, and they should show a high level of completion. Ismail, Kinchin and Edwards (2018) are of the view that both qualitative and quantitative researchers benefit from a well-planned pilot study, which requires a pilot study that is explicit in addressing targets and objectives to ensure the precision of a study in terms of design, data collecting, analysis, and reporting, as well as scientific validity.

The pilot study approach based on interviews and questionnaire was chosen for this study since it is the most appropriate way for collecting in-depth data in many areas of knowledge management. Twenty (20) randomly selected employees from technical and production departments were interviewed to test the validity of the questionnaire. This enabled the researcher to have robust results that could be applied to the engineering and construction industry holistically.

Management highlighted a few concerns with the questions in the questionnaire, which were addressed as follows before the study:

1. Our management considers and **prioritises** knowledge transfer as part of our organisational culture.
2. Our organisation has information systems to **enable me** to transfer knowledge to other employees.
3. I am mindful of details, **good on impulse control**, and plan.
4. I work well with other employees and tend to be **enthusiastic** in social situations.
5. Employees show a willingness to **multi-skill across** jobs/departments.
6. **Management understanding of inter-generated work teams.**
7. Management solves conflict effectively and efficiently within the organisation.
8. Our organisation promotes collaboration and lessons learned.
9. I share personal knowledge that leads to the development of work procedures.
10. Tasks and activities related to **tacit knowledge** are often observed, articulated, and communicated to employees.

The pilot study method for this research aimed to achieve the following objectives:

- To identify knowledge transfer requirements within the organisations.
- To view an understanding of employee relationships and the degree of tacit knowledge awareness within the organisation.

- To determine participants' the level of understanding of psychology.
- To discover ways to develop an innovative knowledge framework to transfer tacit knowledge quicker to a novice.

The necessity to deliver different types of knowledge outcomes at each step of the pilot study was the fundamental reason for designing the study in two categories. The pilot study was divided into two categories: technical-specific studies and operational-level studies.

Step 1: Technical units pilot study

- To gather information on management, supervisors, and individual perceptions, learned experiences, general assumptions about employee relations, and future expectations about tacit knowledge transfer.
- To raise management awareness of critical knowledge management processes and procedures.
- To guarantee that rules are linked with the transmission of tacit knowledge in order to improve the future success of the business.

Step 2: Operational units pilot study

- To collect data on the actual challenges, with an emphasis on knowledge transfer flow, willingness to transmit to others inside the organisation and employee knowledge management engagement.

The main reason for selecting a semi-structured interview method for this study was the need to collect systematic data from the interviewees. Each interview lasted approximately 10-15 minutes. The first step was the technical and operational unit studies, where management and individuals of the firm were identified and randomly selected to participate in the study. Semi-structured interviews were conducted with the technical and operational managers and supervisors to obtain background information about knowledge transfer of tacit knowledge flow issues within the organisation. The participants were presented with a set of key items concerning certain identified key assumptions related to the study from secondary data collected from the literature review.

The interview questions are presented in Appendix E, while information on the interviewees is presented in Table 3.4. During the interviews, information was collected on the following areas:

1. Knowledge selection criteria and employee relationships,
2. Knowledge transfer flow and collaboration issues,
3. Organisational knowledge management framework.
4. Employee's cognitive psychological level of decision making,
5. Organisational culture processes, and
6. Organisation's awareness of tacit knowledge procedure and processes.

Table 3.4: Technical and operational interview participants from manufacturing unit

No. of the interviewee	Role of interviewee	Experience in industry
Participant 1	Technical Manager	+5 years
Participant 2	General Operations Manager	+5 years
Participant 3	Production Manager	+5 years
Participant 4	Management	+5 years

Step 1 consisted of general company challenges to determine general management's understanding of information towards tacit knowledge transfer, the psychological nature, and employees' challenges to awareness of the organisation's knowledge transfer flow. A semi-structured interview was chosen to allow for more discussion with technical and operational managers and supervisors. Following that, managers and supervisors were chosen at random from various departments within the organisation.

The was important as the study looks into how knowledge is created, transferred, stored, and disseminated across the organisation's various departments.

Step 2 involved employees' first-hand experiences and opinions about knowledge management in the organisation were prepared as a semi-structured interview set. A detailed analysis of information transfer flow patterns, psychological nature, tacit knowledge hindrances, and other related concerns was required. Data collected in these interviews was on the following:

- Knowledge management systems and challenges of knowledge transfer in the organisation.
- Individual personality traits and knowledge transfer.

There must be a way for the business to communicate tacit knowledge and give a way for individuals or persons' competence to be recognised and identified.

3.8 DATA COLLECTION METHODS

3.8.1 Semi-structured interviews

Data was collected through interviews because there was a need to interact with senior managers and ensure that relevant data was obtained from key participants in the study. The original plan was to collect data from all of managers, but only four managers from the manufacturing plant agreed to participate. As a result, interviews were used as a qualitative tool to gather more information about the phenomenon under study as well as to draw on the knowledge of key people about factors influencing knowledge transfer between young and old employees within the engineering organisation.

3.8.2 Questionnaire

A questionnaire is an extremely convenient way to collect useful comparable data from a large number of people. Questionnaires are a method of eliciting human opinions, self-reports, and information (Fairclough & Thelwall, 2021). To collect relevant data from a questionnaire, the questions must be straightforward, exact, as well as uniformly asked among all respondents.

3.8.3 Data analysis

To determine descriptive and inferential statistics, quantitative data were analysed using the Statistical Package for Social Science (SPSS) software V24. The qualitative data were analysed shortly after the data was collected. The responses of participants were transcribed and then categorised into themes. The transcribed interviews were then analysed using content analysis.

3.9 QUALITATIVE SAMPLING AND DATA COLLECTION

In this study, a survey questionnaire was used to collect qualitative data, which consisted of closed-ended Likert-scale questions. The SPSS Version 24 was used to analyse the quantitative data, adopting a descriptive statistical method. To offer context to the case study and supplement the quantitative data obtained (Creswell, 2014), a qualitative facet of measurement was necessary. Ten managers from various departments were chosen as the sample.

A list of eight open-ended questions was prepared in an interview schedule (see Appendix E). Interviews would have been conducted face-to-face or telephonically with

the participants, but with work participants' commitment and Covid-19 pandemic protocols this was impossible. Copies of the questionnaire were either sent as hard copies or via email. The total number of respondents was five.

3.10 DATA COLLECTION DESIGN

The next step was to interpret the data and turn it into a detailed survey for data collection using the defined research methodology. Semi-structured interviews and questionnaire surveys were used to collect data. Even with all of its difficult-to-understand complexity and philosophical complexity, positivism takes centre stage when looking at real-life experiences and phenomena (Adhabi & Anozie, 2017). The approach was deemed appropriate as a method for this study.

A questionnaire is a carefully crafted list of questions, chosen after extensive testing in order to elicit reliable responses from a selected sample. One of the objectives was to find out exactly how a selected group of participants behaves or feels. In order to obtain quantitative data, a survey questionnaire was used. A generalised interpretation of certain characteristics or attributes in the sample population was the goal.

Ultimately, this survey was designed to achieve the primary research objectives outlined in Chapter 1, that is, to determine the extent to which young and older employees intend to share knowledge with each other and establish an understanding of factors that influence knowledge transfer in an engineering company. Its primary aims were to:

- explore the barriers of knowledge transfer intention that directly hinder the intention to transfer;
- ascertain the benefits of identifying suitable personality traits of employees' psychological state;
- identify the relationship between old and young employees; and
- determine how management encourages knowledge transfer through tacit knowledge within the organisation.

3.10.1 Classification of questions in the questionnaire

In order to support the main research question, the questionnaire was divided into categories based on key issues, namely: psychological aspects of employees, tacit knowledge, and firm critical success factors. Data collected from the interviews was classified as investigative questions to find out how older employees' tacit knowledge

can be quickly transferred to younger ones, as well and identify personality traits that can be used in order to facilitate quick knowledge transfer within an organisation.

3.11 DATA ANALYSIS

This study was conducted to evaluate how psychological characteristics and tacit knowledge influence the readiness of older workers to pass on their expertise to younger colleagues. Based on the literature review, the data were interpreted in an attempt to validate the need for these framework principles to facilitate fast knowledge transfer between young and old personnel.

Data analysis, according to Mouton (2011), is the process of providing order to the following stages:

- Identifying and selection all your data sources;
- Using existing measuring instruments for validity and reliability;
- Assessments;
- Developing new measuring instruments for design, construction and piloting the data;
- Collecting or gathering all the data;
- Doing fieldwork by using the data documentation;
- Data capturing and data editing; and
- Data analyses and interpretation.

Questionnaires were used to collect feedback data, which was then analysed, coded, and entered into a database created in SPSS for this purpose. Detailed statistics for each of the variables were provided, and only those respondents who completed the entire survey were used in statistical calculations of the data. Using the SPSS statistical tool, data was analysed to produce demographic and descriptive statistical results.

3.11.1 How data collected from the questionnaire was analysed

- The data was cleaned;
- For each distribution of the variable under examination, descriptive statistics were performed in order to find the central and dispersion values;
- In each variable, tests were run to evaluate if there were any significant changes between groups (personality qualities, employee's readiness to transfer,

management's ability to offer channels, and tacit knowledge utilisation);

- Finally, in terms of factors affecting knowledge transfer to see if the variables were significantly connected with one another.

The researcher used both qualitative and quantitative data analysis to analyse the results of the investigation.

3.12 VALIDITY AND RELIABILITY OF THE STUDY

3.12.1 Validity

As a result of this measurement, a study's data validity may be confirmed. Cronbach's Alpha was employed in the study to examine the trustworthiness of data. The quality of the study must be evaluated before it can be put to use in the real world. Concepts such as reliability, validity and generalisability are typically associated with quantitative research and alternative terminology used in relation to their application to qualitative research (Noble & Smith, 2015).

Research should be focused on understanding the meaning that occurrences have for phenomena being researched. Accordingly, Tubey *et al.* (2015) began exploring alternative ways of social science research and eventually established qualitative methodology, which tries to explain why things are the way they are in the social environment and how people respond.

Qualitative research places emphasis on exploring and understanding "… the meaning individuals or groups ascribe to a social or human problem" (Creswell, 2014:4). A flawless phenomenological research may be impossible to achieve (Mitchell, 2021). The norms by which qualitative research should be appraised are not universally agreed upon.

Depending on the measure in question and its intended goal, validity assessment might take many different shapes. Face validity, content validity, construct validity, and criterion-related validity are all distinct means of evaluating the correctness of a given measure (Diamond, 2021). The following brief on validity measures suffice.

- Content validity: questionnaire and interview questions were designed based on the researcher's observation of participants' views and behaviours. A clear and succinct description of the researcher's efforts to consistently produce credible data for this research may be seen in this section.

- Criterion-related validity: The success of measures used for prediction or estimation are reflected in this metric. Any criterion measure must be evaluated in terms of the following four qualities:
- Criterion is relevant: The researcher can judge the appropriate measures of success if the criterion is defined and scored in the terms.
- Freedom from bias: When the criterion allows each respondent to achieve a high score.
- Availability: each of these criteria must be met.
- Construct validity: When attempting to assess construct validity, both the theory and the measuring instrument should be taken into account.

Data validations include the methodology, data collection experience, data validity assessment, and data analysis of the study. As a result, it provides necessary answers to the significance of this study, its goals, and achievements. A fundamental knowledge of the questionnaire and interview questions could be developed because of the researcher's observations of participants' attitudes and behaviours. This provides an accurate and concise view of the researcher's commitment to providing reliable data.

3.12.2 Reliability

Cronbach's Alpha is one of the most widely used measures of reliability in the social and organisational sciences (Bonett & Wright, 2015). It is used to determine a questionnaire's reliability. It is a quick and easy way to see if a score is reliable or not (Shrestha, 2021). Cronbach's α can range from 0.0 to 1.0, and it quantifies the degree to which items on an instrument are correlated with one another (Connelly, 2011).

There are different reports about the acceptable values of alpha, ranging from 0.70 to 0.95 (Bland & Altman, 1997, DeVellis, 2003). A low alpha value of could be due to a low number of questions, poor inter-relatedness between items or heterogeneous constructs (Tavakol & Dennick, 2011). All statements were subjected to a reliability test as part of the measuring instrument.

3.13 ETHICAL CONSIDERATIONS

Given the essence of research ethics, many colleges and universities have developed their own codes of ethical conduct to guide ethical practices in research, which prohibit deception, coercion, plagiarism, falsification of data and results and concealment of findings. As a result of the importance placed on the researcher/respondent

relationship, necessary standards are also in place to ensure the protection of respondents. Investigators need to make sure that participants are protected from harm and unnecessary stress at all times (Cacciattolo, 2015). According to ethical guidelines, participants must be informed in writing of all study details. Any time during the study, respondents can choose to participate in the study, decline participation in the study, or withdraw from the study. This should be communicated to the participants, and informed consent forms are commonly used for this purpose.

Before the study could proceed, ethical approval was obtained from Cape Peninsula University of Technology. Respondents were asked to sign consent forms at the beginning of each interview and questionnaire administration. In the consent forms, the researcher's name, address, phone numbers and name of institution were included. There were also clauses requiring anonymity and confidentiality. As part of the design of this study, these ethical considerations were taken into account.

- **Voluntary participation**

It was not compulsory for anyone to participate and there was no threat or intimidation to participate and no compensation promised in exchange for participation. Participants were encouraged to leave whenever they felt uncomfortable.

- **Informed consent**

In order to take part in the study, the participants signed consent forms.

- **Right to privacy**

It was made clear to participants that all information gathered would be kept strictly confidential, and participants were assured that they would remain anonymous throughout the research study to protect their privacy.

- **Involvement of the research**

Data collected from each participant was strictly used for research purposes, and all participants were treated equally.

- **Ethical clearance**

Before distributing the questionnaires, the researcher sought ethical approval was obtained from the Ethics Committee of the Faculty of Business and Management Sciences.

3.14 CONCLUSION

This chapter focused on the design and methodological aspects of the study. Key topics covered include research methodology; sampling method and sample size; study/target population; data collection methods; data analysis; validity and reliability; ethics; research assumptions and research constraints. Data analysis was briefly discussed and is covered in greater depth in Chapter 4.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 INTRODUCTION

Chapter 3 described the design and methodology employed in studying factors affecting knowledge transfer, with a focus on tacit knowledge and personality traits in a Cape Town-based engineering firm. The relevant data analysis process that assisted in examining and summarising data collected through a questionnaire and interviews to answer the research questions was outlined in detail.

This chapter presents the research results accompanied by a detailed discussion. The results align with the research purpose and objectives as well as the methods used in the study. The goal of the study was to understand factors affecting knowledge transfer between young and old employees in the workplace.

A SPSS programme was used to analyse the data gathered from the completed questionnaire, from which results emanated. Conclusions were drawn from the results, limitations noted, and recommendations made for future research.

In the main, this chapter includes demographic and descriptive statistics, as well as detailed discussions of those statistics. Using personality traits, tacit knowledge, and critical success factors, the study examined factors that affect knowledge transfer between young and old employees within an engineering organisation.

4.2 ANALYSIS AND INTERPRETATION OF QUANTITATIVE RESULTS

4.2.1 Demographic data analysis and interpretation

This research was conducted at a medium-sized manufacturing company in South Africa, encompassing the entire workforce but focusing primarily on the production unit, which includes managers, supervisors, operators, clerks, maintenance, and other personnel. According to the response count for each question, there were 71 responses out of the organisation's 120 permanent employees. These respondents answered all the questions truthfully and to the best of their ability. Demographic statistics include gender, education, and work experience. Demographic characteristics were categorised, analysed, and interpreted on a nominal scale, and visual representations in pie and bar charts were created (Leedy & Ormrod, 2015).

As indicated in Figure 4.1, male participants (n_1=55) were the dominant group in the sample, accounting for 77%, while female participants (n_2=16) accounted for 23%. This reflects the reality of the current situation in the engineering field in South Africa and globally, which is dominated by men. It should be noted that these statistics are based on a single organisation.

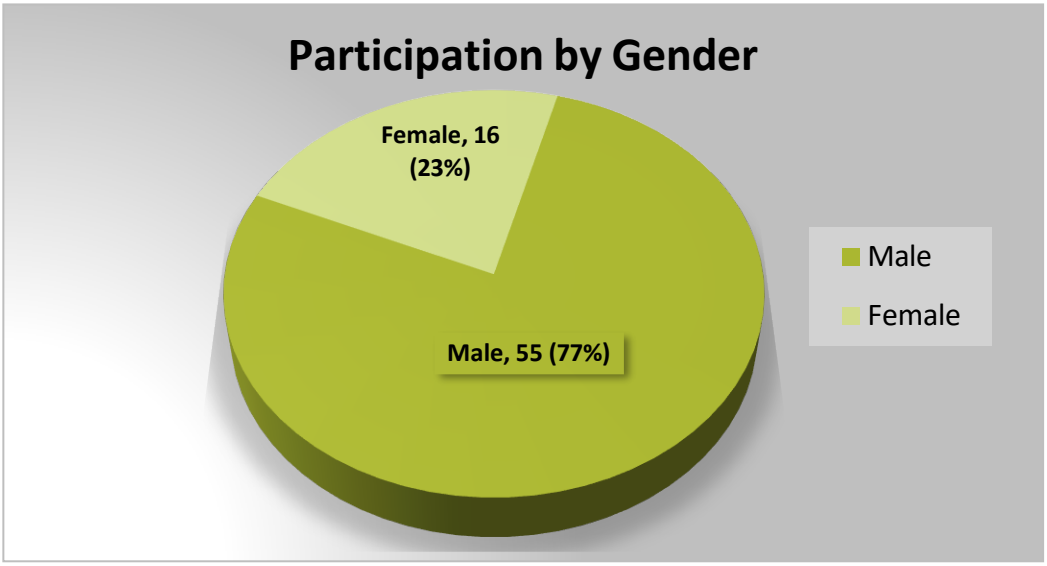

Figure 4.1: Participation by gender

Figure 4.2 shows the difference age groups of participants: 32.4% were between the ages of 25 and 35 years old, 29,6% between 36 and 45 years of age, 28,2% between the ages of 46 and 55 years, and 9.9% above 55 years.

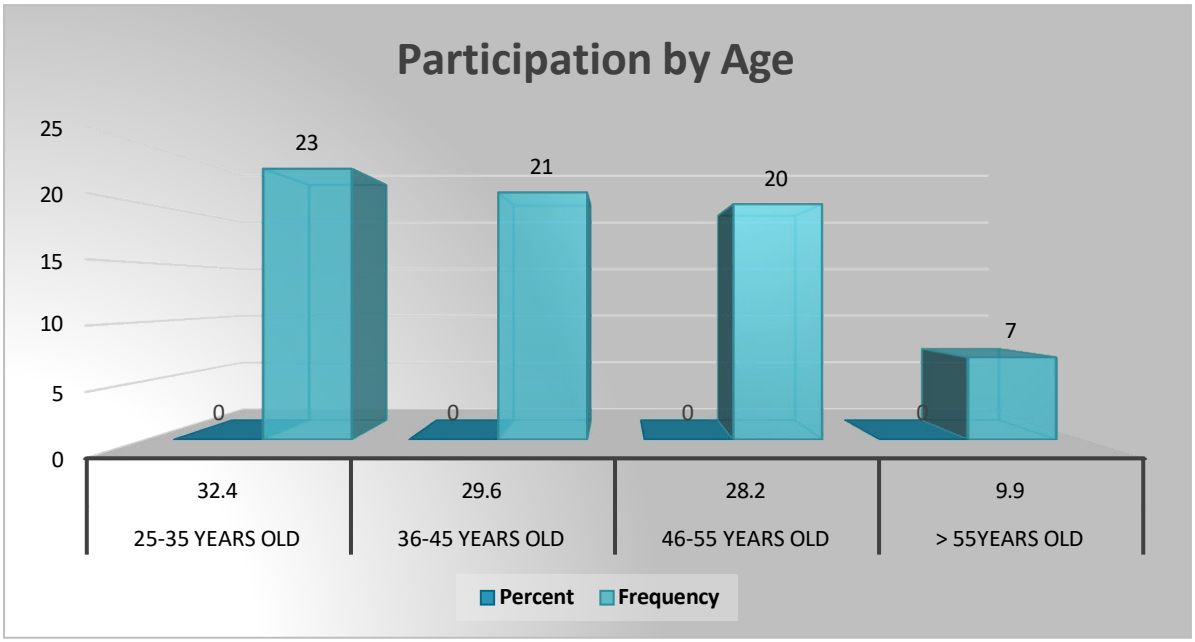

Figure 4.2: Participation by age

A high educational level among participants is shown from Figure 4.3. According to the data, holders of college certificates account for 45,1% of the total, while university graduates account for 9,9%. Almost 41% (40,8%) of the respondents completed high school, while 1,4% and 2,8% completed primary or less and others, respectively.

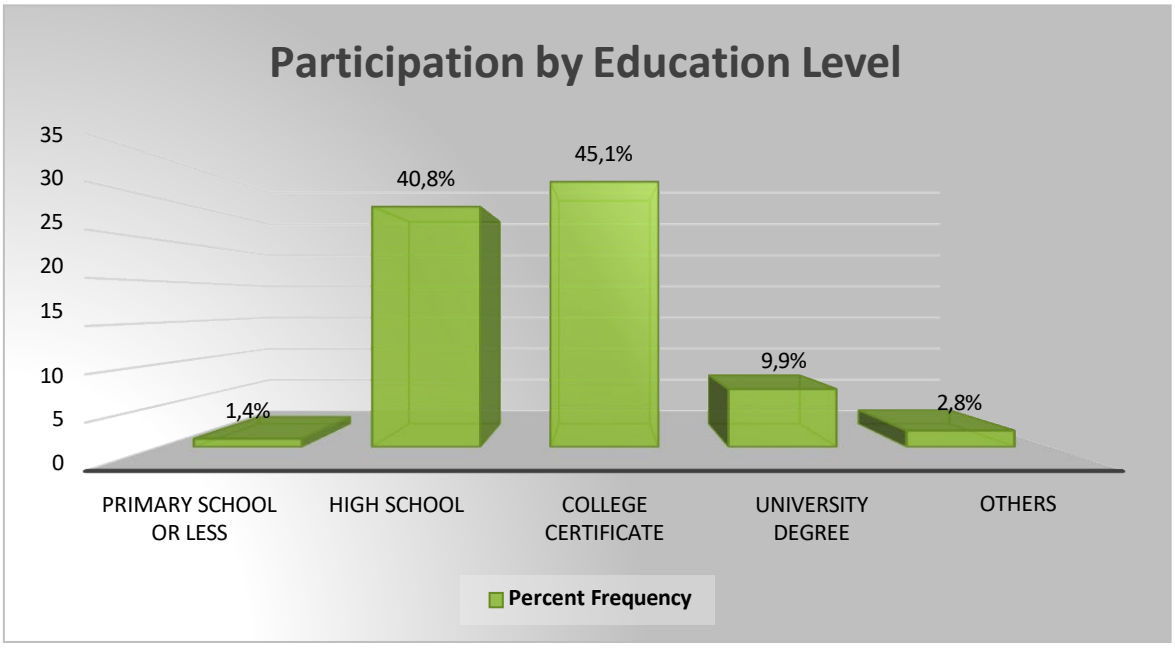

Figure 4.3: Participation by educational level

Figure 4.4 shows the percentage of participants based on field experience. As shown in the pie-chart, 78,9% of employees had more than 5 years field experience, while 21,1% had between 0 and 4 years experience in the field.

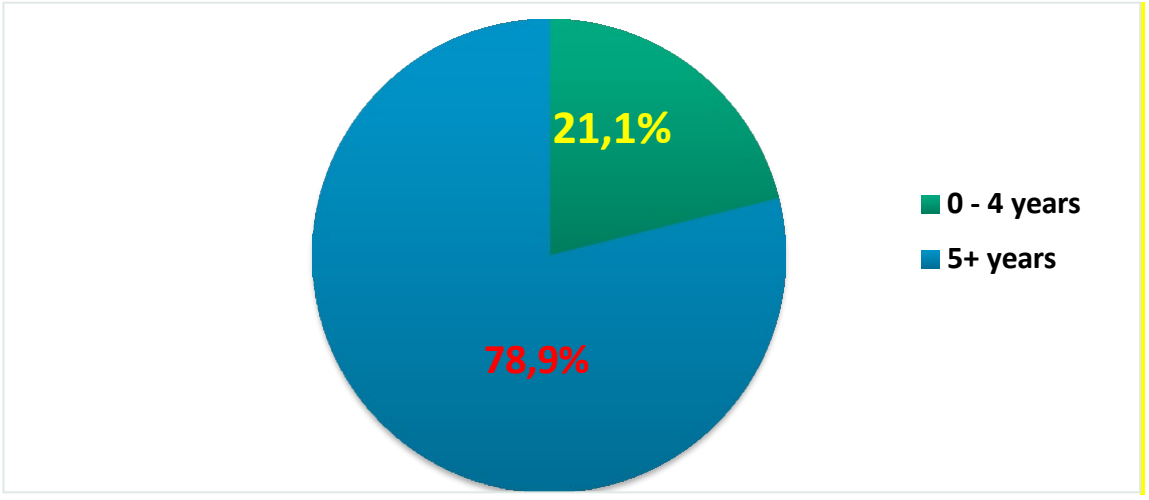

Figure 4.4: Participation by field experience

According to Figure 4.5, which is based on departments that participated in the survey, the count for operators is 52.1%, while supervisors constituted 20% of the sample. Interns/practitioners were 4% of the participants, clerks have a count of 17%, and others 7.0%.

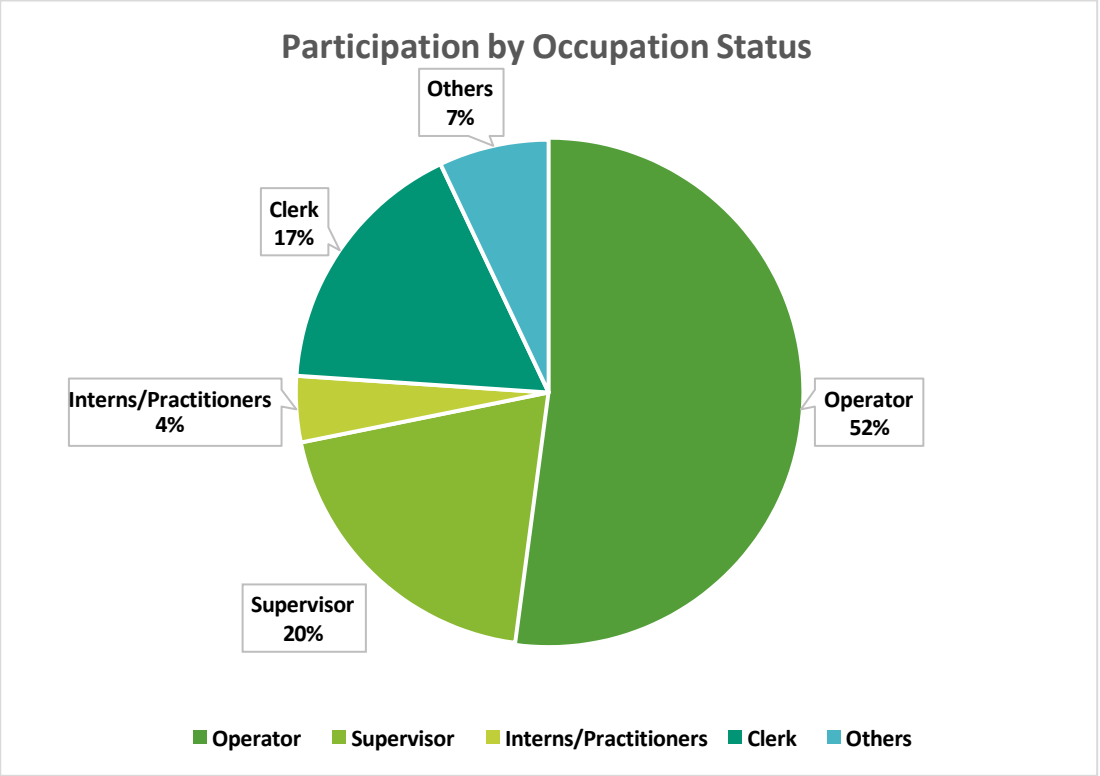

Figure 4.5: Participation by occupational status

Figures 4.1 to 4.5 describe the demographic characteristics of the sample. Participants' ages ranged from 25 to 55, with those in the 46 to 55 age group closest to retirement and should be encouraged to prepare succession interventions and mentorship programmes, upskill younger employees, and offer guidance to the new generation of employees within the organisation.

The participants' educational level demonstrates a high potential for competitiveness and innovation in the industry. A higher percentage of respondents (about 79%) have more than five years' experience with the company. Almost 58% of the participants had college certificates and above, while 42.2% had high school education and below. Significantly, 78,9% of the respondents have been in their current positions for more than five years. The survey also featured occupational status, which clearly identifies 72% of the respondents' as operators and supervisors.

4.2.2 Descriptive statistics

According to Leedy and Ormrod (2015), descriptive statistics describe a set of data, the primary functions of which are:

- Description of what the data look like;
- Indication of where the centre or midpoint is;
- Indication of how broadly the data are spread; and
- How closely two or more variables within the data are inter-correlated.

4.2.3 Interpretation of descriptive statistics

Seventy-one (71) questionnaires were administered to the selected group, all of which were completed and returned. Before allowing respondents to complete the questionnaires, all the requirements and instructions were explained.

On average, the data is evenly distributed at 2.06, with standard deviations ranging from one standard deviation below to one standard deviation above the mean. Variables relating to all demographic and rating scale data were coded for ease of illustration. The rating scale data were given Q-codes and the demographic data also assigned Q-codes. The statements were coded from Q1 to Q28 as shown in Table 4.1.

Four levels of data analysis and interpretation were used, including data reliability testing, data validity testing, data organisation, and statistical interpretation.

The main objective was to measure respondents' perceptions of the statements sent to them. Table 4.1 shows the results of descriptive statistics, which includes mean and standard deviation of biographical data and continuous variables, as well as all variable frequencies and the percentage of the completed questionnaire.

Table 4.1: Descriptive statistics (n=71)

Code	Items	Mean	σ
Q1	I am encouraged by our management to share knowledge with other employees.	3,92	1,011
Q2	I am willing to share knowledge with other employees.	4,46	0,651
Q3	Our management considers and prioritises knowledge transfer as part of our organisational culture.	3,59	1,063
Q4	I trust my co-workers and it makes me willing to transfer my knowledge effectively.	3,86	0,990

Code	Items	Mean	σ
Q5	I have time for sharing and transferring my knowledge to other employees	4,13	0,755
Q6	Our organisation has information systems to enable me to transfer knowledge to other employees	3,35	1,208
Q7	I am always open to new ideas and suggestions from other employees	4,46	0,714
Q8	I am mindful of details, quick on making decisions and plan ahead	4,41	0,599
Q9	I work well with other employees and tend to be enthusiastic in social situations	4,31	0,646
Q10	I tend to be more co-operative and agree with other employees at all times	3,61	1,189
Q11	I always show my emotions and anxiety during stressful times	2,69	1,090
Q12	Employees show support of each other during work projects	3,79	0,925
Q13	Employees transfer knowledge willingly during projects to others	3,76	0,902
Q14	Employees are more prepared to work with each other to finish tasks	3,93	0,961
Q15	Employees show willingness to multi-skill across jobs/departments	3,82	1,004
Q16	Employees respect and trust each other to complete projects	3,73	0,970
Q17	Management provides a positive social organisational culture	3,31	1,260
Q18	Our organisation encourages internal social platforms to improve communication amongst employees	3,37	1,256
Q19	Management employs experienced and knowledgeable leaders with compatible skills	3,25	1,168
Q20	Our organisation treats all employees as equals	2,87	1,341
Q21	Management understanding of self-directed teams	3,44	0,906
Q22	Management solves conflict effectively and efficiently within the organisation	3,45	1,181
Q23	Our organisation promotes collaboration and lessons learned	3,37	0,975
Q24	I develop personal knowledge easily when I am familiar with other employees	4,17	0,717
Q25	I share personal knowledge that leads to the development of work procedures.	4,15	0,730
Q26	Tasks and activities related on-job training are observed, clear and communicated to employees	3,89	0,994
Q27	I am allowed to voice my opinions on issues concerning my work	3,87	1,055
Q28	I always follow instructions and directions without question	3,61	1,201

While a much lower standard error of the mean was recorded than mean itself, the

values in the range of minimal and maximal results always had more standard deviations. It may be concluded, without a doubt, that the results had a very high level of sensitivity of the level of the study. This leads to a conclusion, regarding the results, that the variable shows the number of role players had more positive results (Mean value is greater than 3.0). However, participants whose value was significantly higher than 2.69, which further means that the results of these questionnaires are rather trustworthy by all employees, providing an opportunity to expand the study to more firms. The value of standard deviation (σ) indicates the range from 0.599 to 1.341. Although there were different opinions among respondents, the value of deviation in this case is not significant.

4.2.4 Correlation matrix

Table 4.2 shows the correlation matrix. One star ("*") shows that correlation is significant at the 0.05 level (2-tailed), and two stars ("**") indicate correlation is significant at the 0.01 level (2-tailed).

For instance, beside Q9, Q10, Q12, Q26, Q27, and Q28, the observed correlations show there is a significant correlation between individual management encouragement to share knowledge with other employees (Q1) and other items such as Q2, Q5, Q8, Q15, Q22 (at the 0.05 level (2-tailed); and Q13, Q14, Q16-Q21, while Q23-25 were at the 0.01 level (2-tailed). In addition, Q11 at the 0.05 level (2-tailed) was significantly negatively correlated with Q1.

It is worth noting that there are no significant correlations between Q2 and majority of items. Only Q5, Q14, Q25, and Q28 have significant correlations with Q2 (I am willing to share knowledge with other employees). Further, there are no significant correlations between Q3 (Management considering and prioritising knowledge transfer as part of organisational culture) and items Q5, Q7-Q11, Q24, Q25, and Q28. Finally, there are no significant correlations between Q4 and items Q5, Q9-Q12, and Q25-Q28.

Also, there are no significant correlations between Q5 and the items of Q6, Q11, Q13, and Q16-Q28 and no significant correlations between Q6 and the items of Q7-Q11, Q24, Q25 and Q28. Similarly, there are no significant correlations between Q7 and the items of Q8-Q15, Q18-Q23, and Q25-Q28.

Additionally, there are significant correlations between Q8 and the items of Q9, Q16, and Q24, where other items were not significant. However, there are significant

correlations between Q9 and the items of Q10 and Q24, where all other items are not significant.

Further, there are significant correlations between Q10 and the items of Q24 and Q28, where all other items are not significant, but there are negative significant correlations between Q11and items of Q14 and Q18, and no significant correlations between Q11 and other items. Also, there are significant correlations between Q12and items of Q13-Q18, Q20-Q23, Q26, but no significant correlations between Q11 and all the other items.

Table 4. 2: Inter-item correlation matrix

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27
Q2	.278*																										
Q3	.592**	0.216																									
Q4	.631**	0.059	.406**																								
Q5	.277*	.256*	0.226	0.158																							
Q6	.469**	0.080	.581**	.388**	0.217																						
Q7	.313**	0.113	0.197	.377**	.340**	0.205																					
Q8	.270*	0.129	0.153	.411**	.263*	0.114	0.084																				
Q9	0.106	-0.042	0.021	0.136	.270*	0.206	0.179	.296*																			
Q10	0.079	0.185	0.176	0.037	.311**	0.048	0.202	0.209	.329**																		
Q11	-.296*	-0.217	-0.148	-0.187	0.014	-0.046	-0.143	-0.044	0.017	0.125																	
Q12	0.210	-0.048	.303*	0.170	.285*	.451**	0.129	-0.048	-0.008	0.105	0.076																
Q13	.385**	0.168	.314**	.458**	0.150	.485**	0.087	0.183	0.105	-0.156	-0.018	.572**															
Q14	.509**	.236*	.531**	.380**	.406**	.280*	0.173	0.125	0.128	0.200	-.280*	.449**	.541**														
Q15	.294*	0.110	.370**	.390**	.238*	.289*	0.200	0.150	0.067	0.178	0.000	.435**	.613**	.682**													
Q16	.545**	-0.140	.543**	.525**	0.203	.581**	.285*	.240*	0.043	0.105	0.056	.525**	.464**	.347**	.271*												
Q17	.346**	0.135	.533**	.345**	0.123	.622**	.251*	-0.019	0.144	0.111	-0.168	.364**	.393**	.384**	.407**	.513**											
Q18	.317**	0.208	.424**	.283*	0.191	.497**	0.062	0.064	0.069	0.155	-.271*	.326**	.318**	.495**	.450**	0.210	.640**										
Q19	.503**	0.125	.568**	.414**	0.190	.574**	0.199	0.074	0.216	0.135	-0.117	0.209	.357**	.487**	.430**	.515**	.693**	.520**									
Q20	.414**	0.167	.654**	.460**	0.016	.619**	0.122	0.065	0.046	0.183	0.002	.324**	.329**	.348**	.311**	.468**	.624**	.494**	.678**								
Q21	.462**	0.111	.544**	.308**	-0.019	.471**	0.146	-0.017	-0.015	0.215	-0.092	.350**	.427**	.495**	.466**	.379**	.530**	.560**	.610**	.634**							
Q22	.296*	0.021	.319**	.336**	0.015	.588**	0.172	-0.001	0.114	-0.055	0.032	.285*	.465**	0.217	.384**	.431**	.692**	.407**	.641**	.641**	.508**						
Q23	.380**	-0.182	.408**	.321**	0.130	.556**	0.019	0.058	0.090	-0.071	0.081	.388**	.361**	.272*	.274*	.558**	.651**	.414**	.595**	.561**	.447**	.662**					
Q24	.355**	-0.018	0.148	.296*	0.224	0.112	.291*	.302*	.564**	.297*	0.050	0.141	0.174	0.204	0.182	0.169	0.194	0.168	0.221	0.201	0.105	0.078	0.115				
Q25	.308**	.297*	0.064	0.090	0.197	0.067	0.079	0.049	0.018	-0.011	-0.047	0.113	0.187	0.199	0.156	0.059	0.149	0.062	0.071	0.050	0.199	0.084	.240*	0.058			
Q26	0.147	0.215	.348**	0.172	-0.019	.426**	-0.046	0.078	-0.056	0.143	0.086	.238*	.352**	0.186	.308**	.368**	.530**	.377**	.481**	.547**	.357**	.482**	.427**	0.047	0.103		
Q27	0.137	0.108	.246*	-0.141	-0.069	.249*	-0.034	0.015	0.142	0.096	0.226	0.192	0.223	0.188	0.207	0.050	0.213	.273*	.316**	.352**	.462**	.276*	.254*	0.142	.267*	0.163	
Q28	0.043	.238*	-0.005	0.121	-0.007	0.136	0.017	0.029	0.178	.410**	0.113	0.143	0.136	0.149	.259*	-0.043	.299*	.457**	0.164	.341**	.344**	.238*	0.113	.261*	0.136	0.178	.343**

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

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

4.2.5 Reliability testing

An instrument's ability to produce consistent results when the object being measured has not changed is known as its reliability, which implies that accurate measurement requires consistency (Leedy & Ormrod, 2010). In order for something to be measured with accuracy, the tool used should provide consistency in its measurement.

Reliability is essentially a correlation between the responses from the item on a questionnaire. Crobanch's alpha values are likely to be high when the correlation between the related questionnaire is also high.

Table 4.3 illustrates the case processing summary. It indicates responses from the 71 participants with a 100% validity.

Table 4.3: Case processing summary

Case processing summary			
		N	%
Cases	Valid	71	100,0
	Excluded[a]	0	0,0
	Total	71	100,0

a. Listwise deletion based on all variables in the procedure.

According to Table 4.4, the Cronbach Alpha coefficients for all 28 items in the questionnaire is at 0.904, which is regarded as excellent since it much higher than the acceptable level of 0.70. This indicates that the set of constructs from the questionnaire to be reliable and consistent. This high value implies a high level of consistency amongst the variables and that all the variables are statistically consistent with one another.

Table 4.4: Results of data reliability using Cronbach's Alpha

Reliability statistics		
Cronbach's Alpha	Cronbach's Alpha based on standardised items	No of items
0,904	0,898	28

4.2.6 Decision making session data analysis

Positivists encourage the use of well-supported research theories and methodologies, which are more helpful to their ontology than other methods (Aliyu, Bello, Kasim & Martin, 2014). Each record was assigned a code number and each response was coded according to category in the quantitative data from the second part of the questionnaire. There were no discarded responses. A detailed survey for data collection based on the research methodology was the next step. Data was collected using a survey questionnaire and semi-structured interviews, which, for this study, was deemed appropriate.

In order to obtain reliable data from participants, a questionnaire consists of a carefully crafted list of questions that have been thoroughly tested. As a result of a desire to learn more about what a selected group of participants thinks and/or feels, a survey questionnaire was designed to collect quantitative data and provide a generalised interpretation of certain characteristics or attributes of the participants.

This study sought to determine the level of tacit knowledge transfer intention between young and old employees and to develop a framework of factors that influence knowledge transfer in firms. It focused on engineering firms, but not exclusively. Its goals are outlined in the first chapter of the study. The quantitative data was categorised as follows:

- Knowledge transfer intention
- Identifying suitable personal traits
- The relationship between young and old employees
- Organisational knowledge management encourages

4.2.6.1 Knowledge transfer intention

In section 1.5.2 of Chapter 1, barriers to knowledge transfer are thoroughly discussed. To address these issues, management employs organisational processes and procedures, as stated in Managers' Interview Question No. 3, which depict the interdependence and synergies that exist among employees throughout the company.

4.2.6.2 Identifying suitable personal traits

Question 5 in the managers' interview is based on Section 1.5.2 (Chapter 1). A very important part of cognitive psychology in knowledge transfer of individual analysis with

the organisation is the impact of organisational behaviour and human resource decisions and processes on psychological state of knowledge transfer within organisations.

4.2.6.3 Relationship between young and old employees

This statement was included in the interview questions to allow managers to gauge employees' trust amongst other employees within the company. Effective and efficient management is required to identify employee relationships in order for knowledge to be successfully transmitted between teams, young and old employees, and departments within the firm.

4.2.6.4 Organisational knowledge management

Interview questions 2 and 8 allow management to record tacit knowledge and skills of its older workforce, which is difficult to articulate or transfer to others to receive, reproduce, and record. Employers rely heavily on workers' tacit knowledge as they go about their daily duties and activities (Muthuveloo, Shanmugam & Teoh, 2017). This is further explained in the literature review in Chapter 2.

4.3 QUANTITATIVE DATA ANALYSIS

4.3.1 Benefits to the organisations

The benefits of tacit knowledge include:

- Tacit knowledge approach is quicker and allows collaborations
- Creation of synergies between younger and older employees
- Building of trust amongst employees
- Organisational culture of knowledge transfer and sharing between employees becomes a social aspect.
- Open sharing of relevant knowledge potentially lowers costs, improves processes, renews collaborations, and enhances trust between employees.
- Enhancement of competitiveness and innovation amongst employees
- Improvement of communication and transparency
- Quick solving of problems by management

4.3.2 Impact of factors affecting organisational knowledge transfer

- Ineffective strategic processes and policies to the organisations.
- Lack of social platforms and artisan interventions
- Inability to identify individual characteristics or personality traits
- Information systems to provide collaborations
- No organisational succession plan within departments
- Poor leadership
- Lack of honest communication and transparency

4.3.3 Perception: questionnaire statistics and calculation

Likert scales were used and the ratings indicated in Table 4.5 applied. The ratings were based on the low code 1 to the most code 5, potential positive outcomes. All questions were responded to by the respondents.

Twenty-eight (28) questions were prepared for the study. The questionnaire consisted of a variety of questions. They ranged from individual psychological level questions to gauge respondents' characteristics, attitudes and behaviour, understanding and willingness to transfer knowledge to other employees, relationship status between employees as well as organisational knowledge management to encourage knowledge transfer, to recognising tacit knowledge as the source of providing speedy solutions for employees to learn work quicker.

SPSS's Cronbach Alpha coefficients indicated reliability and consistency of the results. According to the results presented in Chapter 3, the Cronbach Alpha coefficients for all 28 items in the questionnaire was at 0.904, which was more than the acceptable level of 0.70. Thus, the questionnaire was proven to be reliable and consistent. It is noted that the reliability test (Cronbach Alpha Coefficient) was done on all the interview question statements, and was represented as a measuring instrument of this survey in the questionnaire.

Table 4.5 shows the results of scale mean if item deleted, scale variance if item deleted, corrected item-total correlation, squared multiple correlation, and the value of Cronbach's Alpha.

Table 4.5: Item total statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	100,65	201,289	0,580	0,835	0,899
Q2	100,10	214,804	0,194	0,712	0,905
Q3	100,97	198,571	0,642	0,776	0,897
Q4	100,70	203,497	0,512	0,801	0,900
Q5	100,44	211,935	0,293	0,636	0,904
Q6	101,21	194,340	0,687	0,756	0,896
Q7	100,10	212,833	0,269	0,537	0,904
Q8	100,15	214,990	0,204	0,542	0,904
Q9	100,25	214,335	0,221	0,627	0,904
Q10	100,96	209,184	0,242	0,663	0,906
Q11	101,87	220,255	-0,078	0,585	0,912
Q12	100,77	205,206	0,486	0,703	0,901
Q13	100,80	203,361	0,574	0,827	0,899
Q14	100,63	201,950	0,588	0,784	0,899
Q15	100,75	201,335	0,582	0,742	0,899
Q16	100,83	201,400	0,602	0,822	0,898
Q17	101,25	191,878	0,729	0,825	0,895
Q18	101,20	195,961	0,608	0,740	0,898
Q19	101,31	193,617	0,737	0,791	0,895
Q20	101,69	190,074	0,732	0,849	0,895
Q21	101,13	200,569	0,684	0,745	0,897
Q22	101,11	196,673	0,630	0,765	0,897
Q23	101,20	200,989	0,615	0,760	0,898
Q24	100,39	211,357	0,339	0,672	0,903
Q25	100,41	213,845	0,213	0,472	0,905
Q26	100,68	203,651	0,504	0,591	0,900
Q27	100,69	206,960	0,358	0,637	0,903
Q28	100,96	205,555	0,347	0,631	0,904

These results indicate that the overall results of the mean values are positive as none of the values is skewed and they correlate to each other. In addition, all the values of Cronbach's Alpha fall into the range between 0.895 and 0.912 (>0.70), which indicates an excellent situation of high internal consistency. This shows that the dataset is highly reliable.

4.3.4 Likert-scale ratings and categorical items

Likert scales were used and the ratings provided as indicated in Table 4.6 were applied. This measuring tool contains a list of research statements comprising the scale to express a belief, preference, perception, judgment, or opinion. This type of scale contains of a series of statements that explains and determines the content and meaning of the construct to be measured.

The ratings were based on the least (1) to the most strongly positive outcome (5) on the question themes. Some of the questions were edited for clarity and understanding levels. The affected questions are indicated in Table 4.6.

Table 4.6: Likert-scale ratings

Response	Rating
Strongly Disagree	1
Disagree	2
Unknown	3
Agree	4
Strongly Agree	5

Assigning a rating to each response allowed for the use of statistical analysis on all variables responded to in the study. It also allowed for industry checks and balances enabling results by comparing the statistical mean for an understanding of the objectives of the study. Individual questions were grouped into the 28 items in the questionnaire as indicated in Table 4.7.

The results were analysed according to the draft to address the items in the questionnaire and questions were selected categorically to address the following (See Table 4.7):

- Organisational practices and management
- Knowledge transfer practices
- Tacit knowledge transfer
- Employee psychological level of decision making

Table 4.7: Categorical items as indicated above

No.	Items
Q1	I am encouraged by our management to share knowledge with other employees.
Q2	I am willing to share knowledge with other employees.
Q3	Our management considers and prioritises knowledge transfer as part of our organisational culture.
Q4	I trust my co-workers and it makes me willing to transfer my knowledge effectively.
Q5	I have time for sharing and transferring my knowledge to other employees

No.	Items
Q6	Our organisation has information systems to enable me to transfer knowledge to other employees
Q7	I am always open to new ideas and suggestions from other employees
Q8	I am mindful of details, quick on making decisions and plan ahead
Q9	I work well with other employees and tend to be enthusiastic in social situations
Q10	I tend to be more co-operative and agree with other employees at all times
Q11	I always show my emotions and anxiety during stressful times
Q12	Employees show support of each other during work projects
Q13	Employees transfer knowledge willingly during projects to others
Q14	Employees are more prepared to work with each other to finish tasks
Q15	Employees show willingness to multi-skill across jobs/departments
Q16	Employees respect and trust each other to complete projects
Q17	Management provides a positive social organisational culture
Q18	Our organisation encourages internal social platforms to improve communication amongst employees
Q19	Management employs experienced and knowledgeable leaders with compatible skills
Q20	Our organisation treats all employees as equals
Q21	Management understanding of self-directed teams
Q22	Management solves conflict effectively and efficiently within the organisation
Q23	Our organisation promotes collaboration and lessons learned
Q24	I develop personal knowledge easily when I am familiar with other employees
Q25	I share personal knowledge that leads to the development of work procedures.
Q26	Tasks and activities related on-job training are observed, clear and communicated to employees
Q27	I am allowed to voice my opinions on issues concerning my work
Q28	I always follow instructions and directions without question

4.3.5 Organisational practices and management

These results can be compared to those of other studies in order to better understand factors that influence knowledge transfer between young and old employees within organisations.

Table 4.8 indicates the mean result per variable. Business strategies, practices, and procedures should be incorporated into the organisation's policies in order to promote growth and development. Factors affecting knowledge transfer between young and old employees have yet to be determined, with a particular focus on tacit knowledge and individual psychological factors. High and low results of an organisation, relative to its knowledge transfer is essential to have a clear methodology for the identification and capturing of information as well as managing, organising, and sharing of that information (Farabough, 2021). There are four ways to evaluate knowledge management initiatives, namely:

- Cultural integration,
- Organisational integration,
- Procedural integration, and
- Methodological integration.

Organisational culture as identified by Tounkara (2019) involves observation of social interaction with existing norms and practices. The values of organisational culture values are:

- Interactivity
- Collaborations
- Orientation of collective knowledge and
- Expertise (Tounkara, 2019).

Table 4.8: Organisational practices and management statements (n=71)

No.	Items	Mean
Q19	Management employs experienced and knowledgeable leaders with compatible skills	3,25
Q6	Our organisation has information systems to enable me to transfer knowledge to other employees	3,35
Q18	Our organisation encourages internal social platforms to improve communication amongst employees	3,37
Q22	Management solves conflict effectively and efficiently within the organisation	3,45
Q3	Our management considers and prioritises knowledge transfer as part of our organisational culture.	3,59

All variances were used to calculate the mean in Table 4.8. Among general

organisational factors, the mean score ranges from the lowest (3.25) to the highest (3.59), which indicates that organisational culture maturity is perceived as high. This conclusion can be drawn based on respondents' feedback.

Knowledge transfer is seen as a high priority by individuals, with a response of 3.59 on the categorical questions. For example, the company's worst result of 3.25 that it hires the least experienced and knowledgeable leaders with compatible skills. The lesson to learn from this is that management must demonstrate capable leadership by prioritising the recruitment of knowledgeable leaders with an entrepreneurial mindset and an open-minded personality.

Focusing more specifically on the perceived use of knowledge transfer practices, Table 4.9 indicates that best practice, documented processes and on-the-job training are mostly used for knowledge transfer within the organisation. This indicates a positive willingness to participate in the process of transferring knowledge. As Table 4.9 shows, mean results for knowledge transfer range from 2.87 to 3.92 for the 71 respondents for the category on knowledge transfer questions.

Table 4.9: Knowledge transfer practices with the organisation statements

Q20	Our organisation treats all employees as equals	2,87
Q17	Management provides a positive social organisational culture	3,31
Q23	Our organisation promotes collaboration and lessons learned	3,37
Q21	Management understanding of self-directed teams	3,44
Q1	I am encouraged by our management to share knowledge with other employees.	3,92

Knowledge transfer participation willingness has a fairly positive mean, but a disappointing influential component with the low result of 2.87. A positive component embedded to organisational culture and knowledge management has a high score of 3.92.

As a result of the tacit knowledge focus scores (4.46 shown in Table 4.10), employees are willing to share their knowledge with others. Consequently, it is important to include tacit knowledge in the list of factors that positively influence learning and knowledge transfer in order to improve employees’ skills and knowledge.

Table 4.10: Tacit knowledge transfer statements (n = 71)

Q16	Employees respect and trust each other to complete projects	3,73
Q13	Employees transfer knowledge willingly during projects to others	3,76
Q12	Employees show support of each other during work projects	3,79
Q15	Employees show willingness to multi-skill across jobs/departments	3,82
Q4	I trust my co-workers and it makes me willing to transfer my knowledge effectively.	3,86
Q27	I am allowed to voice my opinions on issues concerning my work	3,87
Q26	Tasks and activities related on-job training are observed, clear and communicated to employees	3,89
Q14	Employees are more prepared to work with each other to finish tasks	3,93
Q5	I have time for sharing and transferring my knowledge to other employees	4,13
Q25	I share personal knowledge that leads to the development of work procedures	4,15
Q2	I am willing to share knowledge with other employees	4,46

The table shows employees have a positive on the job learning (tacit knowledge) value perception of 3.89 and also a high sharing experience that leads to innovative procedures of 4.15. There is also a high willingness (4.46) to share knowledge.

Another set of items is based on each respondent's psychology and focuses on their personality traits, which indicate the quality of the organisation's individual characteristics, attitudes or behaviours. Individuals' ability to make decisions against one another is revealed, as well as the relationship between younger and older employees within an organisation, for the purposes of this study.

4.3.6 Employee psychological level of decision-making

Table 4.11 shows that the employees' psychological level of decision-making statements from the 71 respondents. These are explained as follows:

- The lowest result of 2.69 is for **Neuroticism** personalities
- **Agreeableness** is represented by Q10 (3.61) and Q28 (3.61), respectively. Q8 with a rating of 4.41, shows second highest respondents, a positive view of the organisational individual perception.

- Q24 at 4.17 represented the benefits of long-term associations, that seek **Conscientiousness** individuals.
- **Extraversion**: individuals are represented in Q9 with a rating of 4.31, which encourages social collaborations.
- Lastly, **Openness** rate of 4.46, is highest and shows a positive outlook of the calibre of individual respondents that create a pleasant review for HR Practitioners, although it is not a selection tool for new employees, to be part and parcel of the recruitment process.

Table 4.11: Employee psychological level of decision-making statements (n=71)

Q11	I always show my emotions and anxiety during stressful times	2,69
Q10	I tend to be more co-operative and agree with other employees at all times	3,61
Q28	I always follow instructions and directions without question	3,61
Q24	I develop personal knowledge easily when I am familiar with other employees	4,17
Q9	I work well with other employees and tend to be enthusiastic in social situations	4,31
Q8	I am mindful of details, quick on making decisions and plan ahead	4,41
Q7	I am always open to new ideas and suggestions from other employees	4,46

4.3.6 Interventions, improvements and understanding

Management can choose to focus on specific concepts from this study's suggested framework as a starting point after the responses were categorised. There is no doubt that managers need to drive tacit knowledge and organisational management interventions to affect the achievement and success of knowledge transfer. They should also exhaust their resources on mentoring groups, social group meetings and interviews with experts as well as on guided training to drive innovation, entrepreneurialism and employee collaborations. Personnel managers must also pay attention to the kind of people they are bringing into the organisation.

4.4 QUALITATIVE DATA ANALYSIS

Interviews were handled as follows:
The responses of interviewees are summarised in the sections that follow, where

general and in-depth questions were specifically asked. Participants were asked general questions to obtain a general overview of their understanding, while more specific questions were asked in order to better understand their perspectives on the variables in the study.

4.4.1 Managers' approach to general questions

Establishing the understanding of tacit knowledge

The following question was formulated to capture the respondents' understanding of tacit knowledge as a quick way to equip new and young employees on various duties within the organisation, as stipulated in the framework of this study. As a result of the Covid-19 pandemic lockdown, 10 managers were asked to provide feedback by a certain date. We only received feedback from four managers in time.

Table 4.12: Respondents feedback on tacit knowledge

What is your understanding of tacit knowledge process; would you value it as an ideal process for knowledge transfer within the organisation?	
Participant 1	*For me tacit knowledge transfer and **on job training** is one and the same. My mini business unit is doing well when it comes to quality of the product due to the time I spend on the shop floor transferring moulding and casting skills to my team. And it is working and I value it a lot.*
Participant 2	*We are a very labour intensive, specialised manufacturing facility that relies on transference of a skill or art form (tacit) as much as that of textbook knowledge (explicit) in order to produce quality products efficiently.*
Participant 3 and 4	*They both did not answer this question due to understanding of tacit knowledge*.

Table 4.12 indicates that the findings, were a true reflection of participants interviewed, where four participants were interviewed and of the four, 2 answered the question on tacit knowledge, this showed half of the participants confirms the understanding of **tacit knowledge,** which is regarded as an on-the-job training, where employees transfers knowledge, skills right on the floor and they both note that this system works and regard it as the most valuable system to speed up knowledge transfer.

Table 4.13: Responding to personality traits of employees

What are the benefits of identifying suitable personality traits of employees?	
Participant 1	*People are unique, some are not like others, so identifying their strengths and weaknesses helps a lot, and I capitalize on their strengths and train them accordingly. Remember you cannot train for ever production needs to be taken care off at the end of the day.*
Participant 2	*This is crucial at the time of **recruitment to weed out selfish individuals.*** *Identifying the correct traits facilitates the pairing of the correct experienced employees with trainees so that the most effective and least time-consuming transfer of knowledge is enabled.*
Participant 3	*For me personally this is a better option, but doesn't work in the real world. In big companies you need to apply for positions and you are selected on other criteria and not on personality traits. Without being bias I believe one can employ better workers.* *By identifying the positive and negative traits, one can groom and mould a person and his skills to what is needed*
Participant 4	*The organisation requires **Open and honest communication** throughout all its platforms of communication within the organisation, to build trust amongst its employees, partners, stakeholders and it's clients* *Managers should always at all times practice **Transparency** within their departments to enhance collaborations and synergy with their staff* *It is imperative for every manager to encourage the spirit of **Entrepreneurship** amongst employees to enhance innovation*

In summary, Table 4.13, shows there is broad agreement among managers about the importance of identifying employee strengths and weaknesses so that managers can select their employees based on those strengths and weaknesses. Companies can then decide what responsive personality traits they want when evaluating employee capabilities. In addition, **Participant 3** acknowledges that although this approach is not entirely used as sole criteria to select candidates.

Determining positive and negative traits allows for candidates to be groomed to fit the organisation's needs. As a result, this approach is necessary and can be used as an alternative solution for the employer to spend less time on training workshops and instead focus on quality production to transfer tacit knowledge to employees.

Table 4.14 to 4.17 provide the responses of personality traits, organisational culture, managing knowledge transfer, and lessons learned regarding knowledge transfer.

Table 4.14: Responding to how personality traits hinder knowledge transfer

How do the personality traits of individual employees hinder the knowledge transfer?	
Participant 1	*I invite him to my office, have a man to man session, making him to understand that his job is not under threat, remind him that a legacy is something you leave behind so that people can always refer and relate to and that will keep his name live forever.*
Participant 2	*Those that feel their job security is threatened by youth are reluctant to share knowledge. This is particularly prevalent amongst mediocre performers who have a lot more to lose to enthusiastic and quick learning youngsters.* *There are diligent good performers who, out of mere selfish pride, do not want to be shown up by youngsters who work smarter rather than harder.* *Bigotry (racial, gender, religious, generational) is often a stumbling block to knowledge transfer.*
Participant 3	*This seems to be the biggest challenge of late. To find individuals who have the real passion for what he wants to do. For most individuals today it is about survival and finding any type of job, just to have an income. Attitude, discipline and respect has a lot to do with this and it is not improving*
Participant 4	• *Self-improver: Accepts and integrates constructive feedback. Seizes opportunities to develop skills, improve performance and/or gain new experiences.*
	• *Change agent: Challenges the 'status quo', leverages best practice, drives for and implements effective change to improve business performance.* • *Customer driven: Understands customer expectations and needs. Builds and works to maintain lasting relationships with customers, acting as their partner.* • *People developer (mng): Contributes to the development and improvement of their team members (training, feedback, etc).*

Table 4.15: Responding to organisational culture in transferring knowledge

How do you create a culture for knowledge transfer and information sharing within the organisation?	
Participant 1	*Move people around from one workstation to another, encourage young employees to be like sponges, remind the most experienced once about the importance of transferring those skills.*
Participant 2	*I am always encouraging succession planning and have a mantra that I often preach, "Never judge a leader by his performance when he is present but by his performance when he is absent." By this I mean a company, organisation or department should not be individual dependent but rather system or team dependent. One can only have this if there is constant knowledge transfer.*
Participant 3	• *By continuous upgrading of workforce* • *By continuous up skilling and training to improve skills* • *By continuous testing of workforce to ensure that they meet the standard* • *Quarterly Training Meetings to discuss training needs and requirements*
Participant 4	• *Integrity: acts in the job environment with high level of integrity that generates trust from colleagues and clients* • *Openness: able to be challenged and to consider new ideas and ways of working Courage: able to deliver and receive bad news and assume the consequences.*
	• *Responds to challenges and difficulties with confidence. defends own point of view* • *Active listening (mng): listens and responds to others in a way that ensures mutual understanding and gains information and perspective from exchanges.*

Table 4.16: Responding to managing knowledge transfer

How do you manage knowledge transfer and information sharing within your organisation?	
Participant 1	*I had introduced what I call a seedbed **(on job training).** I identify a certain project on most problematic patterns or castings (with continuous defects) and allow everyone to participate, it is always exciting and the results are always positive. I also rotate employees on very crucial position to enable everyone to acquire relevant skills and experience.*
Participant 2	• *We have an apprenticeship programme for boilermakers, welders and fitters. This programme, through formal classroom sessions and **practical training on the shop floor**, facilitates the transfer of knowledge to the young apprentice over a 3-4 year period. Many of the experienced artisans have themselves come through the apprenticeship programme and appreciate the need to transfer knowledge.* • *We occasionally run Section 26(D) training programs in terms of the Skills Development Act that recognise prior learning and experience of mostly older employees, thus allowing them to become formally qualified artisans. This requires transfer of knowledge from qualified artisans to the trainee.* • *Supervisors are obliged and performance managed against their job descriptions, which usually mandate mentorship and knowledge transfer.*
Participant 3	*We have an apprentice training centre where the first line of knowledge/skills are transferred. Once the apprentice is taken into the workshop they are **trained on the job** in a production*
	environment. Other pertinent information is transferred via lectures, training sessions and short courses.
Participant 4	*Exposes team members to challenges that stretch their skills and abilities recruits high calibre people from diverse backgrounds and develops their potential; consistently makes talent available to the group.*

Table 4.17: Responding to lessons learned regarding knowledge transfer

What lessons have you learned from your experiences regarding the knowledge transfer?	
Participant 1	*My mentor during my apprenticeship years used to boast about tacit skill transfer, he used to say I must be like a sponge I must absorb as much information and knowledge from him as I could, which I did. Today I am preaching the same theme to my team members and they are responding positively.*
Participant 2	• *Don't pander to the egos of experienced individuals who are resistant to change by giving them demigod status. Find means of enforcing the transfer of knowledge.* • *Have succession plans in place and make all employees aware of*
Participant 3	*If you don't know, then ask. When seeking knowledge make sure you seek from the correct people. Transfer of knowledge is important but depends upon the individual.*
Participant 4	• *By dividing the maintenance tasks to levels, level 1 and 2 functions can be performed by operators in manufacturing and does not require artisan level intervention* • ***Level four**: Complex interventions involving elaborate dismantling, usually done at the maintenance senior artisans or by experts who need a complete set of sophisticated tools* • ***Level three**: Complex interventions performed with specific tools and spare parts, requiring a simple dismantling. They have to be done by qualified technicians who will have to follow sophisticated procedures* • ***Level two**: Actions requiring no more than simple dismantling with tools and spare parts available at the workstation. They can be done by trained and habilitated*

	• *Operators who just have to follow standard instructions (performance controls, easy and standard parts replacement…)* • ***Level one**: Simple actions performed on safely and easily reachable parts of the machine with tools attached to it. They do not require nor any dismantling either use of spare parts and just require to follow standard instructions (basic inspection, cleaning, oil filling…)*

In the General Manager's own words: *"I am always encouraging succession planning and have a mantra that I often preach, "Never judge a leader by his performance when he is present but by his performance when he is absent." By this I mean a company, organisation or department should not be individually dependent but rather systematic or team dependent. One can only have this if there is constant knowledge transfer".*

4.4.2 Observations based on the interview responses

In accordance with the findings, 100% of the participants interviewed were managers of different departments such as maintenance and welding. Half of respondents had a working knowledge of tacit knowledge. This new knowledge can then be captured by the knowledge agents or shared between them by storing it in databases or embedding it in organisational routines or policies (Shea, Usman, Arivalagan & Parayitam, 2021).

Both firm managers agree that knowledge transfer and knowledge sharing should encourage collaborations, workshops, mentorships by older employees, apprenticeship, and artisan level interventions, which these interventions encourage across team collaborations, to transfer skills and knowledge to new or younger employees. The firm can only encourage and facilitate these in order to create an organisational culture.

4.5 LIMITATIONS

Limitations of any particular study concern potential weaknesses that are usually out of the researcher's control, and are closely associated with the chosen research design, statistical model constraints, funding constraints, or other factors (Theofanidis & Fountouki, 2018). While results of this study raise important points and implications, some limitations must be underlined. As a result of limitations, the researcher has limited control over both the research process and the study's final conclusions. First and

foremost, survey-based research, like all methodologies, has its limitations. Interviews and focus groups, for example, could have yielded more descriptive results on their own, or in conjunction with this study's quantitative methodology, allowing for the analysis of more rich data. Regarding sample size, this study acknowledges that participants were chosen at random due to fact that it was convenient to do so.

It is important to exercise caution when making generalisations about the results of this study. Regarding the complex variable of culture, as noted above, some important information that could have influenced results was not requested from participants. The research design is also subject to delimitations. Delimitations are mainly concerned with the study's theoretical background, objectives, research questions, variables under study and study sample (Theofanidis & Fountouki, 2018). Delimitations are the boundaries set for the study. Moreover, participants' response times and the number of people included in the study were taken into account. As a result of the small sample size and the study's focus on only one organisation, the study's findings may not be generalisable. Time and human resource issues were cited as contributing factors to the low turnout of participants.

It is worth noting that this study was conducted during a pandemic of unprecedented proportions (Covid-19). The interview process had to be pushed back because of Covid-19 in order to include more participants in the study. Covid-19 This led to the closure of companies, which hampered the progress of the study. As a result, it is important to interpret the results with care. Regarding the social interaction that emerged during the study, perhaps using a different methodology would have yielded richer results.

4.6 CONCLUSION

As a result of the collection of data, that has been analyzed and interpreted in this chapter. Graphs and frequencies were used to present descriptive information. In order to determine the data frequencies and descriptions, descriptive statistics were used to make decisions. The data were analysed and interpreted primarily in relation to the research objectives. The findings are highlighted in the next chapter, followed by conclusions and recommendations.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In this chapter, the study's goals are summarised. The research problem, research objectives, and investigative questions will also be elaborated in order to ensure the study's completeness. Also, recommendations for future research are made to the engineering organisation. There will be a focus on the research's key findings, and specific recommendations will be made to not only mitigate the research problem, but also serve as a guide for the target organisation's retention strategies and programs.

5.2 GENERAL CONCLUSIONS

The results of the research are discussed in Chapter 5, and in this chapter, the conclusions drawn from those findings will be highlighted. From the study, a framework for determining factors affecting knowledge transfer between young and old employees has been developed, with tacit knowledge and individual personality traits as the driving concepts. Researchers were able to achieve their goals by examining the positive and negative aspects of knowledge transfer and the practical experiences within an engineering organisation in order to develop an industry framework for factors that influence knowledge transfer. KWETRA, or Knowledge Window Effect Transfer, is the result of previous research (See Table 5.1). A framework for knowledge transfer can be built around these factors in order to better understand how they affect the transfer of information. Assumptions like this will require more research on KWETRA at a larger scale.

To be clear, this study's results cannot entirely be extrapolated or generalised to South Africa because these factors were developed for specific purposes and only tested within a single company. With more companies recognising and implementing the positive effects of the factors identified in this study, an industry strategic framework can be developed.

5.3 CONCLUSION ON ORGANISATION OVERVIEW TO KNOWLEDGE TRANSFER

Despite the fact that tacit knowledge does exist in the workplace, it does not appear to have a direct influence on younger workers' willingness to participate in collaboration

networks. This is due to the size of the study and its focus, however. Results showed that the organisation scored higher on all items in each category as shown in Table 4.17 in Chapter 4. A company's future development and innovation design niche is described below. Relationships between employees and management require effective organisational psychological management (Kim & Hong, 2021). Furthermore, the authors (2021) indicate that in order to achieve this, organisations should ensure effective leadership, create a practical and appropriate organisational culture, and communicate effectively in order to succeed.

5.3.1 Organisational practices and management

There is a positive correlation between tacit knowledge and willingness to collaborate and transfer knowledge among older workers, according to the findings of this study. As indicated by respondents, employees are eager to share their knowledge. A new set of challenges arises from replacing the lost knowledge with experience (Antunes & Pinheiro, 2020). Another finding is that employees are encouraged to share their knowledge with one another by the organisation. Employers' perceptions of using information systems to enhance knowledge transfer among co-workers are negative. However, this study reveals an optimistic view of the extent to which the organisation's culture places a high value on and encourages knowledge transfer amongst its employees (Chapter 4, Q3 of the questionnaire, Table 4.17).

5.3.2 Knowledge transfer practices

For the purpose of this study, the researcher wants to demonstrate the importance of this phenomenon, within organisational structure, in order to achieve global success in the engineering industry. Knowledge management of employees is emphasised as a key business strategy for organisational performance in this study (Muthuveloo, Shanmugam & Teoh, 2017). Researchers have found that a high percentage of respondents believe that it is important for managers to share knowledge with their employees. As a result of their efforts, researchers have developed a variety of governance mechanisms that encourage knowledge sharing within an organisation in order to overcome the obstacles (Kozhakhmet, 2017; Husted *et al.*, 2012).

Table 5.1: Factors affecting the transfer of knowledge within an organisation

FACTORS IMPACT ON KNOWLEDGE TRANSFER		
Christensen's 2007 perspective		Five main challenges have been highlighted by (Ekambaram *et al.*, 2014)
Stickiness on knowledge. Tacit knowledge may be considered stickier than explicit knowledge, hence, requires more effort for an activity		Lack of incentives for knowledge sharing
A lack of an identity. A common identity provides knowledge sharing in an easy way, as people from a same group use a same technical language, use common data and are interesting to reach same aims		Attitudes
The weak relationship between a receiver and a sender of knowledge. A sender and a receiver should have a strong relationship between each other to be able to share knowledge. A receiver and a sender should trust to each other in order to trust knowledge, which he or she obtains;		Low stability or continuity in collaborating knowledge within organisations
A lack of a willingness to share knowledge. Both a sender and a receiver should have a wish to share knowledge;		Time pressure
No knowledge about knowledge. If employees have no knowledge of what knowledge they are going to share, then it would make knowledge sharing impossible.		Inadequate information systems

Table 5.1 depicts a list of factors other researchers have identified as impediments to knowledge transfer across borders. This has paved the way for further research into the factors that influence knowledge transfer between young and old employees.

5.3.3 Tacit knowledge transfer development

We learn from the study that tacit knowledge must be established as a driving force for knowledge transfer when training new workers in an organisation to preserve skills and knowledge. Organisational management should recognise employees who have tacit

knowledge and intervene in this process to achieve organisational success in preserving KT strategies. This should be done by focusing on mentoring groups, social groups, expert interviews, and guided training to fast-track skills development in an organisation. To ensure the company's success, management strategies should be aligned with company policies that provide strategic tacit knowledge methods.

5.3.4 Employees psychological level of decision making

As a result of psychologically motivated employees, the organisation develops a culture understood by both old and new employees, which drives social collaborations and the development of innovative and design-related skills. It is also noted that managers agree that individuals with a selfish mindset will be observed during hr recruitment, as individuals are mostly hired based on their skill set and experience rather than their personality traits. A strategic issue arises when such challenges are observed during recruitment to assist with hiring capable individuals with the right psychological level mindset. Workers' enthusiasm for working together and sharing knowledge may be revealed in the study. To fully understand the respondents' perception of this research, it is important to keep in mind that this research was conducted within a single company.

5.4 RECOMMENDATIONS

Employee-friendly organisations foster collaboration and healthy competition amongst teams in order to foster skills development and innovation growth. For example, if a skilled employee retires, their knowledge can be shared with the current employees. (Saini *et al.*, 2015), based on a section in Chapter 1.

The study results suggest that management should encourage tacit knowledge and provide knowledge management interventions, mentoring groups, facilitated learning, and expert interviews to ensure an effective knowledge transfer within an organisation's culture. It is found that young and old employees have a greater chance of learning from each other. Based on these study results, employees who are open, conscientious, extraverted and agreeable tend to be more willing to transfer knowledge without incentives, while providing management with a clear view of its employees to motivate and encourage employees to mentor, collaborate, train, multi-skill across projects/joints. As an intervention initiative, the outcomes of these interventions should be measured and monitored on a regular basis so that the strategic team can align its policies or organisational objectives accordingly.

Despite the limitations of this study, further research is needed on the following topics:

a) A broader study on the factors affecting transfer of tacit knowledge between young and old employees within organisations
b) A comprehensive evaluation of the influences on the transfer of tacit knowledge

5.5 ACHIEVEMENTS OF THE OBJECTIVES OF THE STUDY

When it comes to knowledge transfer between younger and older employees, the research conducted for this thesis has identified relevant aspects that must be addressed. Table 4.9 of Chapter 4 contains information that, in the author's opinion, can be used to help solve the research problem. A unified framework for factors that affect knowledge transfer between young and old employees has yet to be developed by researchers. The literature review conducted in Chapter 2 as well as the survey results in Chapter 4 provide clear guidelines that provide answers to the research questions posed in Chapter 1. According to Table 5.1, the two scientists had no disagreements about the impact and challenges of knowledge transfer. This prompted the author to answer the research questions:

5.5.1 The barriers of knowledge transfer intention

In Chapter 2, the literature review demonstrates that tacit knowledge is an essential concept for individual skills, experience, and talented people that are considered to be relatively uncovered and unexplored compared to explicit knowledge. The success of knowledge transfer depends largely on the individual attitudes and behaviours of each employee in order to achieve the desired results within the company. Researchers found that reluctance to share knowledge is caused by various factors within an organisation, as indicated in interviews with managers:

- Individual knowledge hoarding for fear of job lose
- The type of knowledge to be shared and who should present such content
- Lack of succession plans
- Organisational culture of knowledge transfer
- Attitudes of employees (personality traits)
- Where organisation stores knowledge management
- Lack of trust amongst employees
- Lack of capable leadership
- No honest communication
- Retirees leave with tacit knowledge

5.5.2 Benefits of identifying suitable personality traits

Researchers found that respondents' opinions on statements in this category were more likely to be extraverted, agreeable, open and conscientious than Neuroticism. It was clear from this analysis that the recruitment departments who interview candidates and operational on-the-job floor/training are the most significant opportunities to identify known and unknown attitudes within the organisation.

According to one manager, although this approach is not used exclusively to select candidates, it is an important factor in determining the calibre of individuals that organisations hire for the success of their businesses. It is crucial to weed out selfish individuals during the recruitment process and identify the correct traits to ensure that the right skills and experienced employees are paired with trainees to ensure the most effective and least time-consuming transfer of knowledge.

Benefits of identifying individual personality traits

Based on Table 4.3, responses to the benefits of identifying personality traits include:

- *Collaboration made easier*
- *Less time spent on training*
- *Open Communication*
- *Transparency amongst groups*
- *Enhances Quality Production improvements*
- *Knowledge transfer made easier*
- *Entrepreneurship spirit*
- *Trust amongst groups and individuals*

5.5.3 The relationship between older and younger employees

According to Chapter 4, respondents had a negative opinion of the organisation's treatment of all of its employees. Employees believe that bias and favouritism pose a serious risk to the organisation because they are counterproductive for any business. The organisation faces a high level of risk of knowledge hoarding amongst employees. A high level of enthusiasm and willingness to work together is evident in the individual responses.

According to the majority of respondents, a high percentage of experience-based knowledge (tacit knowledge) is required to effectively perform their jobs. Thus,

capturing and transmitting tacit knowledge within an organisation is critical. Employees view tacit knowledge as a catalyst for solving knowledge transfer challenges.

Findings regarding employees' perceptions of the importance of knowledge sharing are:

- Employees have a positive on-the-job learning (tacit knowledge) value perception (3.89) and a high sharing experience that leads to innovative procedures (4.15).
- There is a high willingness to share knowledge (4.46)

The study found that employees have a high perception of learning value and a high willingness to share knowledge, which allows the organisation to take advantage of this perceived phenomenon to open up innovative ideas and designs.

5.5.4 Impact of management on knowledge transfer and tacit knowledge

In Chapter 4, it is stated that the on-the-job training focuses primarily on the transfer of tacit knowledge, while others are primarily concerned with explicit learning. As a result, many researchers in this field believe that the background information is accurate and consistent. Many companies use this tactic, knowingly or unknowingly, to help candidates absorb knowledge and processes faster.

This study shows that management views on-the-job training as an effective and efficient method of transferring tacit knowledge gained, skills, and design experiences by workers. The following are some of the engagements that management has undertaken to encourage the transfer of tacit knowledge.

How management encourages transfer of knowledge within the organisation

According to the responses of managers (See Tables 4.5 and 4.6), the following are in place:

- *On-the job training and Time pressure (Tacit)*
- *Seedbed workshops (Tacit)*
- *Encouraging succession plans*
- *Continuous apprenticeship workshops*
- *Quarterly training meetings*
- *Mentorship programmes*
- *Recruitment of diverse groups*

5.6 RECOMMENDATIONS FOR FUTURE RESEARCH

A focus on the progressive maintenance of high self-esteem and self-conceptual individuals within the organisation can be achieved through workplace development and collaborative training practices that allow employees to have favourable and positive views of all social age groups in order to combat unwillingness behavioural advances. If organisational knowledge management is successful, it is likely to create an environment conducive to knowledge sharing.

To achieve management goals, management should promote tacit knowledge by encouraging mentorship, guided learning, and expert interviews. The results of the survey suggest that management should promote tacit knowledge and continue knowledge management interventions.

From these results and a close look at previous studies, the study proposes Figure 5.1*:* **Knowledge Window Effect Transfer** *(KWETRA)* in determining factors affecting knowledge transfer*.*

"Knowledge Window Effect Transfer (KWETRA) is *change-oriented leadership that leverages individual character strengths to drive social exchange and performance within challenging environments, with the goal of co-opting inter-organisational knowledge management to improve the flow of information and improve the quality of business operations, workflow and customer management within an organization."*

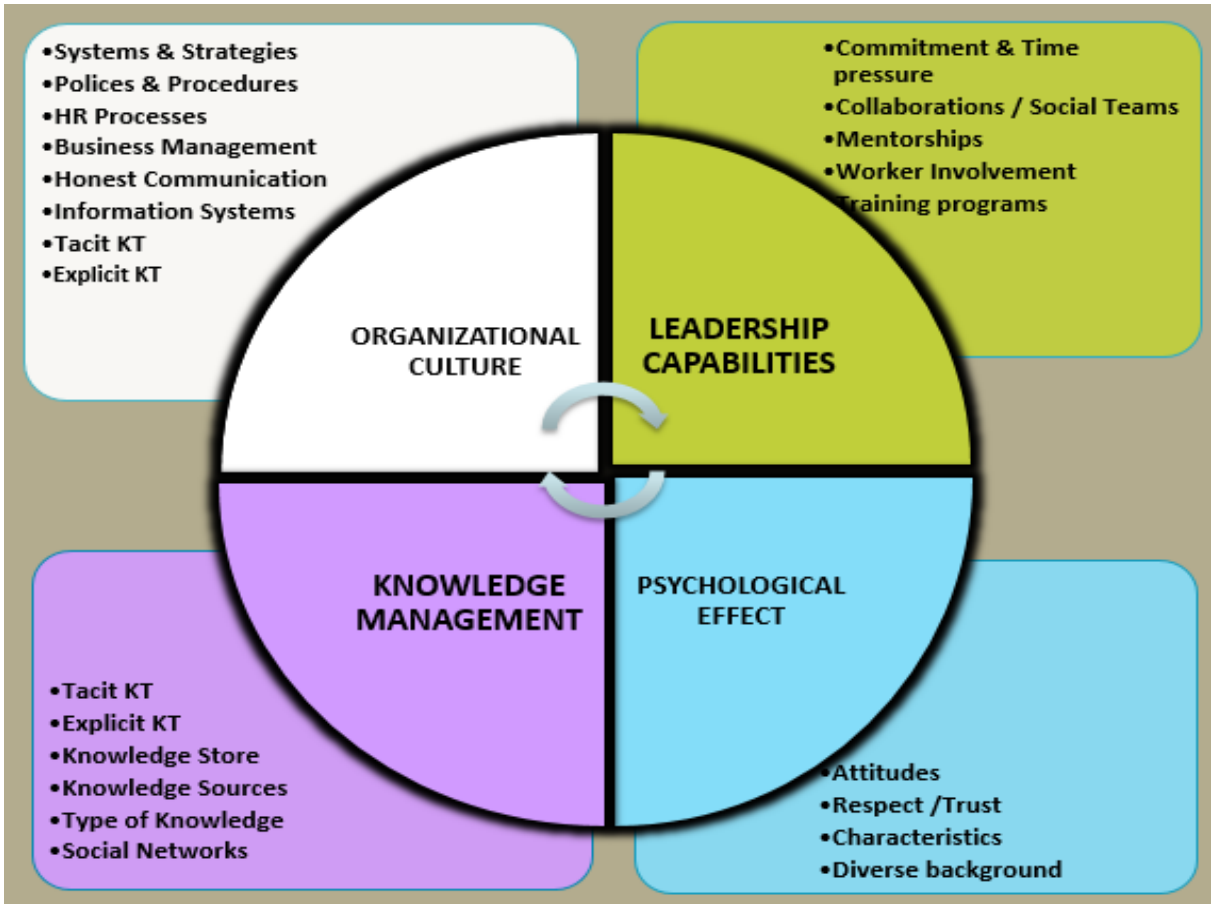

Figure 5.1: Knowledge Window Effect Transfer (abr. KWETRA)

Source: Author's own construct

Changes in younger employees' attitude, knowledge or performance can be seen as evidence of organisational knowledge transfer, which is the ultimate goal of KWETRA. It is recommended that organisations follow the following KWETRA strategies with precision in order to create an effective knowledge transfer:

1. **Knowledge Management strategies:** determine what tools are needed for the activation of effective transfer of tacit knowledge.
2. **Leadership capability strategies:** determine essential needs to enhance workers' collaborations.
3. **Organisational culture strategies:** establish organisational systems as a way of doing business to transfer tacit knowledge.
4. **Psychological effect strategies:** determine human resource tools to establish suitable characteristics of individual workers recruited.

Factors affecting knowledge transfer between young and old employees within organisations may be broken down into business strategies as proposed in this study, which represent a transformational and progressive approach for Organisations: (1)

Organisational culture, (2) Leadership capabilities, (3) Knowledge management, and (4) Psychological effect.

It is vitally important that organisations adopt the assumptions this study suggests and firmly embed them in their strategic policies to stimulate an entrepreneurial spirit, growth, innovation, and skills development.

Based on the assumptions of KWETRA, an organisation's ability to share knowledge can be assessed in terms of several factors. It will be difficult for many companies to retain their knowledgeable workforce during these uncertain times due to the loss of skills and experience. A framework guide embedded in the organisation’s way of doing business, its culture, its vision and mission, its values and norms, as well as business strategies is proposed by the researcher in order to drive knowledge transfer.

KWETRA represents a business strategy to enable development, growth, accelerate knowledge within the organisation, and enhance innovation, skills, and design. Many successful businesses around the world have relied on knowledge management as a way to limit risk and guide employees while also developing skills and enhancing competition. KWETRA has been formulated based on prior knowledge and careful investigation by the founders as well as other researchers from all fields who have contributed in the collecting and disseminating of knowledge management.

In the study, a theoretical framework of KWETRA is proposed as a transformational and a progressive approach for facilitating a quick transfer of knowledge to upskill recruits and young artisans to speed up innovation and quality performance. The study has identified successful tacit knowledge management resulting from the transfer of knowledge between young and old workers as one of the essential requirements for an engineering firms’ innovation capability.

REFERENCES

Abbas, K.D. 2016. Knowledge management strategies and practices in Nigerian agricultural research institutes (Doctoral dissertation).

Abualoush, S.H., Obeidat, A.M., Tarhini, A. and Al-Badi, A., 2018. The role of employees' empowerment as an intermediary variable between knowledge management and information systems on employees' performance. VINE *Journal of Information and Knowledge Management Systems*, 48(2):217-237.

Adhabi, E. & Anozie, C.B. 2017. Literature review for the type of interview in qualitative research. *International Journal of Education*, 9(3):86-97.

Agbaria, Q. & Mokh, A.A. 2022. Coping with stress during the coronavirus outbreak: The contribution of big five personality traits and social support. *International Journal of Mental Health and Addiction*, 20(3):1854-1872.

Alashwal, A.M., Rahman, H.A. & Beksin, A.M. 2011. Knowledge sharing in a fragmented construction industry: on the hindsight", *Construction*, 6(7):1530-1536.

Alghail, A.A., Yao, L. & Kie, C.J. 2017. Importance of project-oriented organizational culture in knowledge management processes. *Global Journal for Research Analysis*, 6(6):400-403.

Ali, I. 2019. Personality traits, individual innovativeness and satisfaction with life. *Journal of Innovation & Knowledge*, 4(1):38-46.

Aliyu, A.A., Bello, M.U., Kasim, R. & Martin, D. 2014. Positivist and non-positivist paradigm in social science research: Conflicting paradigms or perfect partners. *J. Mgmt. & Sustainability*, 4:79-?

Antunes, H.D.J.G. & Pinheiro, P.G. 2020. Linking knowledge management, organizational learning and memory. *Journal of Innovation & Knowledge*, 5(2):140-149.

Antwi, S.K. & Hamza, K., 2015. Qualitative and quantitative research paradigms in business research: A philosophical reflection. *European Journal of Business and Management*, *7*(3):217-225.

Argote, L. & Ingram, P., 2000. Knowledge transfer: a basis for competitive advantage in firms. *Organizational Behavior and Human Decision Processes*, 82(1):150-169.

Arif, M. *et al.* 2012. Assessing knowledge retention in construction consultancies: cases from the UAE. *Australasian Journal of Construction Economics and Building*, 12(2) 55-71.

Arif, M., Mohammed, A. & Gupta, A.D. 2015. Understanding knowledge sharing in the Jordanian construction industry. *Construction Innovation*, 15(.3):33-354.

Arpaci, I. 2017. Antecedents and consequences of cloud computing adoption in education to achieve knowledge management. *Computers in Human Behavior*, 70:382-390.

Bakker, A.B., Hetland, J., Olsen, O.K. & Espevik, R., 2019. Daily strengths use and employee well-being: The moderating role of personality. *Journal of Occupational and Organizational Psychology*, 92(1):144-168.

Basias, N. & Pollalis, Y. 2018. Quantitative and qualitative research in business & technology: Justifying a suitable research methodology. *Review of Integrative Business and Economics Research,* 7:91-105.

Bernard, H.R. 2000. *Social research methods: qualitative and quantitative approaches*. Thousand Oaks, CA: Sage.

Bland, J.M. & Altman, D.G. 1997. Statistics notes: Cronbach's alpha. BMJ, 314(7080): 572.

Blaxter, L., Hughes, C. & Tight, M. 2010. *How to research*. 4th ed. City: Open University Press. McGraw-Hill Education (UK). stopped

Bonett, D.G. & Wright, T.A. 2015. Cronbach's alpha reliability: Interval estimation, hypothesis testing, and sample size planning. *Journal of Organizational Behavior*, 36(1):3-15.

Cacciattolo, M. 2015. Ethical considerations in research. In *The praxis of English Language teaching and learning (PELT*. City: Brill, 55-73).

Capelo, R.A.G.O. 2013. Organizational culture influence on information quality-use of business intelligence systems relationship: Portuguese context. Doctoral dissertation. School of Statistics and Information Management, Lisbon, Universidade Nova de Lisboa.

Chandran, S. & Lobo, A. 2016, May. Ethics and compliance in corporations: values based approach. *2016 IEEE International Symposium on Ethics in Engineering, Science and Technology (ETHICS)*. 1-4). IEEE.

Chen, N. & Zhang, X. 2014. A dynamic observation capability index for quantitatively pre-evaluating diverse optical imaging satellite sensors, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 7(2):515-530.

Connelly, L.M. 2011. Cronbach's alpha. *Medsurg Nursing*, 20(1):45-47.

Creswell, J. 2014. *Research design: qualitative, quantitative and mixed methods approach*. 4th ed. Thousand Oaks, CA: Sage.

Creswell, J.W. & Hirose, M. 2019. Mixed methods and survey research in family medicine and community health. *Family Medicine and Community Health*, 7(2): e000086.

Dart, E.H. & Radley, K.C. 2018. Toward a standard assembly of linear graphs. *School*

Psychology Quarterly, 33(3):350-355. https://doi.org/10.1037/spq0000269.

DeJonckheere, M. & Vaughn, L.M. 2019. Semi-structured interviewing in primary care research: a balance of relationship and rigour. *Family Medicine and Community Health*, 7(2): e000057.

Denzin, N.K. & Lincoln, Y.S. (eds). 2011. *The Sage handbook of qualitative research.* London: Sage.

DeVellis, R. 2003. *Scale development: theory and applications: theory and application*. Thousand Oaks, CA: Sage.

Diamond, B. 2021. Measurement validity. *The encyclopedia of research methods in criminology and criminal justice*, 1:77-80.

Dong, J.Q. & Yang, C.H. 2016. Being central is a double-edged sword: Knowledge network centrality and new product development in US pharmaceutical industry. *Technological Forecasting and Social Change*, *113*, pp.379-385.

Ebert, J.F., Huibers, L., Christensen, B. & Christensen, M.B. 2018. Paper- or web-based questionnaire invitations as a method for data collection: cross-sectional comparative study of differences in response rate, completeness of data, and financial cost. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5801515/. [6 October 2020].

Edwards, A., Daniels, H., Gallagher, T., Leadbetter, J. & Warmington, P. (eds). 2009. *Improving Inter-professional Collaborations: Multi-agency Working for Children's Wellbeing.* City: Routledge.

Ekambaram, A., Johansen, A., Langlo, J. & Rondon, P. 2014. Knowledge transfer – a means to manage the interplay between changes and time-usage in construction projects. Proceedings of the 15th European Conference on Knowledge Management, Academic Conferences Publishing, 288-96.

Fairclough, R. & Thelwall, M. 2021. Questionnaires mentioned in academic research 1996-2019: rapid increase but declining citation impact. Learned Publishing. 10.1002/leap.1417. [date downloaded?]

Farabough, M.C. 2021. Implementation of National and Statewide Transportation Knowledge Management Initiatives: The Role of KM Professionals. SLA 2021 Conference, 3-13 August 2021. www.sla.org.

Ganguly, A., Talukdar, A. & Chatterjee, D. 2019. Evaluating the role of social capital, tacit knowledge sharing, knowledge quality and reciprocity in determining innovation capability of an organization. *Journal of Knowledge Management*, 23(6): 1105-1135. https://doi.org/10.1108/JKM-03-2018-0190. [06 October 2020].

Giampaoli, D., Ciambotti, M. & Bontis, N. 2017. Knowledge management, problem solving and performance in top Italian firms. *Journal of Knowledge Management,* 21(2):355-

375.

Hau, Y.S., Kim, B. & Lee, H. 2016. What drives employees to share their tacit knowledge in practice? *Knowledge Management Research & Practice*, 14(3):295-308.

Hawkins, J.E. 2018. The practical utility and suitability of email interviews in qualitative research. *The Qualitative Report*, 23(2):493-501.

Hedlund, J., Forsythe, G.B., Horvath, J.A., Williams, W.M., Snook, S. and Sternberg, R.J., 2003. Identifying and assessing tacit knowledge: Understanding the practical intelligence of military leaders. *The Leadership Quarterly*, *14*(2):117-140.

Hinojo-Lucena, F.J., Aznar-Díaz, I., Cáceres-Reche, M.P. & Romero-Rodríguez, J.M. 2020. Use of social networks for international collaboration among medical students. *Educación Médica*, 21(2):137-141.

Husted, K., Michailova, S., Minbaeva, D.B. & Pedersen, T. 2012. Knowledge-sharing hostility and governance mechanisms: an empirical test. *Journal of Knowledge Management*, 16-754-773.

Intezari, A., Taskin, N. & Pauleen, D.J. 2017. Looking beyond knowledge sharing: an integrative approach to knowledge management culture. *Journal of Knowledge Management*, 21(2):492-515. https://doi.org/10.1108/JKM-06-2016-0216. [06 October 2020].

Ismail, N., Kinchin, G. & Edwards, J.A., 2018. Pilot study, Does it really matter? Learning lessons from conducting a pilot study for a qualitative PhD thesis. *International Journal of Social Science Research*, 6(1):1-17.

Jonker, J. & Pennink, B.W. 2010. *The essence of research methodology: a concise guide for master and Ph.D students in Management Science*. Heidelberg: Springer Verlag.

Joshi, A., Kale, S., Chandel, S. & Pal, D.K. 2015. Likert scale: explored and explained. *British Journal of Applied Science & Technology*, 7(4):396.

Kant, R. & Singh, M.D. 2011. Knowledge management adoption in supply chain sectional evidence of Indian manufacturing organization. *Journal of Information & Knowledge Management*, 10(1):59-69.

Kasimu, M.A., Roslan, A, & Fadhlin, A. 2012. Knowledge management model in civil Engineering construction firms in Nigeria. *Interdisciplinary Journal of Contemporary Research in Business*, 4(6):936-950.

Kim, S.G. & Hong, S.H. 2021. The impact of organizational management factors on direct employee consultation in distribution channels. *Journal of Distribution Science*, 19(6):21-28.

Koay, K.Y., Sandhu, M.S., Tjiptono, F. & Watabe, M. 2020. Understanding employees'

knowledge hiding behaviour: the moderating role of market culture. *Behaviour & Information Technology*, 1-18.

Kozhakhmet, S. 2017. Fighting knowledge sharing hostility in post-soviet Kazakhstan. *Kuwait Chapter of the Arabian Journal of Business and Management Review*, 6(11):19-30.

Lee, J.N. 2001. The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success. *Information & management*, 38(5): 323-335.

Leedy, P.D. & Ormrod, J.E. 2010. *Practical research.* New Jersey, NJ: Merrill Prentice Hall.

Leedy, P.D. & Ormrod, J.E. 2015. *Practical research: planning and design.* (11th ed.) Essex, England: Pearson Education Limited.

Leonard, D., Barton, G. & Barton, M. 2013. Make yourself an expert. *Harvard Business Review*. https://hbr.org/2013/04/make-yourself-an-expert. [06 October 2020].

Lindner, F. & Wald, A. 2011. Success factors of knowledge management in temporary organizations. *International Journal of Project Management,* 29:877- 888.

Liyanage, C., Elhag, T., Ballal, T. & Li, Q. 2009. Knowledge communication and translation – a knowledge transfer model, *Journal of Knowledge Management*, 13(3):118-131. https://doi.org/10.1108/13673270910962914.

Majid, U. 2018. Research fundamentals: study design, population, and sample size. *Undergraduate Research in Natural and Clinical Science and Technology Journal,* 2:1-7.

Makore, S. & Eresia-Eke, C. 2014, September. The role of knowledge management in organisational performance. In Proceedings of the 15th European Conference on Knowledge Management, 1240-1248.

Malamed, C. 2020. Strategies for tacit knowledge transfer: https://theelearningcoach.com/learning/tacit-knowledge-transfer. [06 October 2020].

Marion, T.J. & Fixson, S.K. 2021. The transformation of the innovation process: how digital tools are changing work, collaboration, and organizations in new product development. *Journal of Product Innovation Management*, 38(1):192-215.

Mbande, C. 2010 July. Overcoming construction constraints through infrastructure delivery. In Proceedings (p. 20).

Mbuyisa, B. & Leonard, A., 2017. The role of ICT use in SMEs towards poverty reduction: A systematic literature review. *Journal of International Development*, 29(2):159-197.

McAdams, D.P. & Olson, B.D. 2010. Personality development: continuity and change over the life course. *Annual Review of Psychology*, 61:517-542.

Mitchell, C.E. 2021. The novice researcher and the phenomenological pilgrimage.

European Journal for Qualitative Research in Psychotherapy, 11:60-71.

Mouton, J. 2011. Doctoral production in South Africa: statistics, challenges and responses. *Perspectives in Education*, 29(3):13-29.

Muthuveloo, R., Shanmugam, N. & Teoh, A.P. 2017. The impact of tacit knowledge management on organizational performance: evidence from Malaysia. *Asia Pacific Management Review*, 22(4)192-201.

Noble, H. & Smith, J. 2015. Issues of validity and reliability in qualitative research. *Evidence-Based Nursing*, 18:34-35.

Ogbonna, G., & Ebimobowei, A. (2011). Ethical compliance by the accountant on the quality of financial reporting and performance of quoted companies in Nigeria. *Asian Journal of Business Management*, 3(3): 152-160.

Onwuegbuzie, A.J. & Collins, K.M. 2017. The role of sampling in mixed methods research. *KZfSS Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, 69(2):133-156.

Patnaik, S., 2020. Operationalizing employee performance: a literature review. *Training & Development Journal*, 11(2):45-56.

Paulin, D. & Suneson, K.A.J. 2012. Knowledge transfer, knowledge sharing and knowledge barriers – three blurry terms in KM. *The Electronic Journal of Knowledge Management*, 10(1)1479-4411.

Peltier, C., Muharib, R., Haas, A. & Dowdy, A. 2021. A decade review of two potential analysis altering variables in graph construction. *Journal of Autism and Developmental Disorders*, 52:714-724.

Peters, K. & Halcomb, E. 2015. Interviews in qualitative research. *Nurse Researcher* (2014+), *22*(4):6

Phelps, C., Heidl, R. & Wadhwa, A., 2012. Knowledge, networks, and knowledge networks: A review and research agenda. Journal of management, 38(4): 1115-1166.

Prakash Pillai, R. 2020. Happiness and personality traits of care professionals: a comparative analysis of nurses in Kerala. *Online Learning*, 21(3):68-86.

Rahman, M.S. 2020. The advantages and disadvantages of using qualitative and quantitative approaches and methods in language “testing and assessment” research: a literature review. Canadian Center of Science and Education. http://dx.doi.org/10.5539/jel.v6n1p102. [25 January 2021].

Raimbault, J. 2017. An applied knowledge framework to study complex systems. arXiv preprint arXiv:1706.09244. [06 October 2020]

Rossberger, R.J. 2014. National personality profiles and innovation: The role of cultural practices. *Creativity and Innovation Management*, 23(3):3313-48.

Rutberg, S. & Bouikidis, C.D. 2018. Focusing on the fundamentals: a simplistic differentiation between qualitative and quantitative research. *Nephrology Nursing Journal*, 45(2):209-213.

Saini, M. 2015. *A framework for transferring and sharing tacit knowledge in construction supply chains within lean and agile processes*. PhD. Thesis, University of Salford, United Kingdom.

Saini, M., Arif, M. & Kulonda, D.J. 2018. Critical factors for transferring and sharing tacit knowledge within lean and agile construction processes. *Construction Innovation,* 18(1):64-89.

Saini, M., Arif, M. & Kulonda, D.J., 2017. Critical factors for transferring and sharing tacit knowledge within lean and agile construction processes. *Construction Innovation*. 18(1):64-89. https://doi.org/10.1108/CI-06-2016-0036.

Saldaña, J. 2013. The coding manual for qualitative researchers. (2nd ed.). London: Sage.

Sankowska A. 2012. Relationships between organizational trust, knowledge transfer, knowledge creation, and firm's innovativeness. *The Learning Organization,* 20(1):85-100.

Schwaba, T., Luhmann, M., Denissen, J.J., Chung, J.M. & Bleidorn, W., 2018. Openness to experience and culture-openness transactions across the lifespan. *Journal of Personality and Social Psychology*, 115(1):118.

Shamsie, J. & Mannor, M.J. 2013. Looking inside the dream team: probing into the contributions of tacit knowledge as an organizational resource. *Organization Science*, 24(2):513-529.

Shea, T., Usman, S.A., Arivalagan, S. & Parayitam, S., 2021. Knowledge management practices as moderator in the relationship between organizational culture and performance in information technology companies in India. *VINE Journal of Information and Knowledge Management Systems*.

Shrestha, N. 2021. Factor analysis as a tool for survey analysis. *American Journal of Applied Mathematics and Statistics*, 9(1)4-11.

Singh, A.S. & Masuku, M.B., 2014. Sampling techniques & determination of sample size in applied statistics research: An overview. *International Journal of economics, commerce and management*, *2*(11):1-22.

Story, D.A. & Tait, A.R. 2019. Survey research. *Anesthesiology*, 130(2):192-202.

Sun, J. & Ren, X. 2014. Research on the knowledge transfer of a construction project network. In *ICCREM 2014: Smart Construction and Management in the Context of New Technology*, 897-903.

Suzuki, W.A., Feliú-Mójer, M.I., Hasson, U., Yehuda, R., J.M. 2018. Dialogues: the science and power of storytelling. *Journal of Neuroscience*, 38(44):9468-9470.

Svard, P. 2014. The impact of information culture on information/records management: a case study of a municipality in Belgium. *Record Management Journal*, 24(1):5-21.

Tabuena, A.C., Hilario, Y.M.C. & Buenaflor, M.P. 2021. Understanding the nature, characteristics, and ethics of inquiry and research for beginning practical research students. *International Journal on Integrated Education*, 4(3):144-152.

Tavakol, M. & Dennick, R. 2011. Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2: 53.

Teh, P.L., Yong, C.C., Chong, C.W. & Yew, S.Y. 2011. Do the big five personality factors affect knowledge sharing behaviour? A study of Malaysian universities. *Malaysian Journal of Library & Information Science*, 16(1):47-62.

Theofanidis, D. & Fountouki, A. 2018. Limitations and delimitations in the research process. *Perioperative Nursing-Quarterly Scientific, online official journal of GORNA*, 7(3):155-163. September-December.

Theron, P.M. 2015. Coding and data analysis during qualitative empirical research in Practical Theology. *In die Skriflig*, 49(3):1-9.

Tounkara T. 2019. A framework to analyze knowledge management system adoption through the lens of organizational culture. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing,* 1-12.

Van Scotter, J.R. and Van Scotter, J.R. 2021. Does autonomy moderate the relationships of task performance and interpersonal facilitation, with overall effectiveness? *The International Journal of Human Resource Management*, *32*(8): 1685-1706.

Wah, N.C., Zawawi, D., Yusof, R.N.R., Sambasivan, M. & Karim, J. 2018. The mediating effect of tacit knowledge sharing in predicting innovative behaviour from trust. *International Journal of Business and Society*, 19(3):937-954.

Wang, J. & Yang, J. 2015. An empirical study of employees' tacit knowledge sharing behaviour. *Journal of Systems Science and Information*, 3(3):264-278. https://doi.org/10.1515/JSSI-2015-0264.

Wang, Z., Wang, N. & Liang, H. 2014. Knowledge sharing, intellectual capital and firm performance. *Management decision*. 52(2): 230-258. https://doi.org/10.1108/MD-02-2013-0064.

Watanuki, K., 2008. Virtual reality based job training and human resource development for foundry skilled workers. *International journal of cast metals research*, 21(1-4): 275-280.

Williams J., Fugar K. & Adinyira, E. 2018. A conceptual framework of knowledge transfer

from the construction company to the host community. 10th CIDB Postgraduate Conference. Towards a Better Route to Enhanced Productivity, Performance, and transformation of Construction, 25-27 February 2018, Port Elizabeth, South Africa.

Wright, T. 2013. Information culture in a government organization: examining records management training and self-perceived competencies in compliance with a records management program. *Record Management Journal*, 23(1):14-36.

Xu, X., Soto, C.J. & Plaks, J.E. 2021. Beyond openness to experience and conscientiousness: testing links between lower-level personality traits and American political orientation. *Journal of Personality*, 00:1-20.

Yahaya, A., Yahaya, N., Bon, A.T., Ismail, S. & Noor, N.M. 2012. The relationship between big five personality with work motivation, competitiveness and job satisfaction. *Elixir Psychology*, 44(a):7454-7461.

APPENDIX A: PERMISSION LETTER

Subject: Require permission to conduct research study

Good day Sir,

My Name is Vuyani Mtshikana, A Masters student at Cape Peninsula University of Technology, Bellville Campus.

Research title: Factors affecting Knowledge Transfer between young and old employees in engineering company in Cape Town.

Data collection type: Questionnaire and interviews

Interview time frames: Are 10-15 minutes

Based on the company information

Employees to **be interview**, these consist of managers, supervisors and employees respectively.

A schedule can be worked out once I identify the sample within the company, to schedule for time so that I don't interfere with their daily work.

Lastly, I need a **consent letter** that allows me to conduct research within the company, for submission to the Ethics Committee for approval.

Thank you in-advance, for allowing a space for me to collect data for my research at your **organisation**. I would like the research to assist the company to improve its growth as a token of my appreciation.

Kind regards
Vuyani
Mtshikana

ACTOM

john thompson

Boiler and Environmental Solutions

2018-05-30

Attention: Vuyani Mtshikana

Cape Peninsula University of Technology
Bellville Campus

Sir

Re: Consent to conduct research study at John Thompson

On behalf of the management of John Thompson (a division of ACTOM (Pty) Ltd) I hereby grant you permission to conduct the research study titled, *"Factors affecting knowledge transfer between young and old employees in an engineering company"* at our Bellville Manufacturing facility.

Yours sincerely,

Suben Govender

General Manager – Manufacturing Business Unit

Sacks Circle, Bellville South, 7530
P.O.Box 129, Bellville, 7535
Tel: +27 (021) 959 8000
Fax: +27 (021) 959 8345
www.johnthompson.co.za

APPENDIX B: LETTER OF CONSENT

Researcher's Name: Vuyani Mtshikana, Phone Number: 061 7291613, E-mail address: mtshikanav@cput.ac.za Supervisor's Name: Dr Bingwen Yan, Phone Number: 021-953 8478, E-mail address: yanb@cput.ac.za

Dear Madam / Sir

I am Mr Vuyani Mtshikana, I am currently busy with my **MTech Degree in Business Administration** at Cape Peninsula University of Technology. As part of the requirements of this qualification, I am required to conduct a research project on the ***"Factors influencing knowledge transfer between young and old employees at an engineering company, Cape Town"***. In order to achieve this goal, I kindly invited you to participate in this exciting research project.

The purpose of this research is to gain insights on the factors influencing knowledge transfer between young and old artisans at a construction company. The findings of this study will contribute various insights to the businesses growth of the industry and community development.

The procedure includes:

There are no risks in the whole process of this research project. Your participation in this study is purely voluntary, and you are under no obligation to participate. By returning the completed surveys implies consent for participating in the study. To maintain anonymity, your name will not be appeared on the research paper. Participants and their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs. All data will be collected by the researcher, and data will only be used for research purpose.

You are free to ask any questions about the study or about being a participant by contacting the contact details above.

You have read this letter and voluntarily consent to participate in this study. You also have the rights to withdraw yourself from the study at any time. In order to confirm your consent to participate on this study, kindly sign below as a participant.

Researcher's signature	**Participant's signature**
Date: _____	Date: _____

APPENDIX C: INFORMED CONSENT TO PARTICIPATION

Faculty of Business and Management Sciences
Research questionnaire Submission Template

28 April 2019

INFORMED CONSENT TO PARTICIPATION

Dear Sir/Madam,

You are invited to participate in a research project that investigates factors affecting knowledge transfer between young and old employees in an engineering company in Cape Town. All employees are encouraged to participate in the study. This research is undertaken for academic purposes by a Masters of Technology Degree student of Business Administration in the Faculty of Business and Management Sciences at Cape Peninsula University of Technology.

You are hereby assured that your participation is voluntary and all the information will be treated confidentially. It is also assured that there will be no harm to you or anybody who is involved in this survey. You have the rights to withdraw your participation in the research process. The findings of this study will be dealt with anonymously. The data will be only used for research purpose.

Please read and answer each question carefully. The survey should take about 15 MINUTES to complete and participants are implored to return them before 30 May 2019. Thank you for your cooperation and assistance. Your inputs would be greatly valued and appreciated.

Yours faithfully

Vuyani Mtshikana
Mobile: 0617291613 / Email: vmtshikana001@gmail.com

Participant surname and Initials:_____ Date:_____

Signature:_____

APPENDIX D: RESEARCH INSTRUMENT-QUESTIONNAIRE

Re: Factors Affecting knowledge transfer between Young and Old employees in an Engineering Company in Cape Town

Please make a "√" on your choice in the shaded block.

SECTION ONE: SOCIAL-ECONOMIC AND DEMOGRAPHIC DATA

1.1 **Gender**

1	Male	
2	Female	

1.2 **Field experience**

1	0 – 4 years	
2	5 + years	

1.3 **Employee age**

1	< 25 years old	
2	25-35 years old	
3	36-45 years old	
4	46-55 years old	
5	> 55years old	

1.4 **Employee occupation status**

1	Operator	
2	Supervisor	
3	Internships/Practioner	
4	Clark/Manager	
5	Others (Please indicate)	

1.5 **Department status**

1	Management	
2	Technical	
3	Maintenance	
4	Clerical	
5	Others (Please indicate)	

1.6 **Education**

1	Primary school or less	
2	High school	
3	College Certificate	
4	University Degree	
5	Others (Please indicate)	

1.7 **Race**

1	African	
2	Colored	
3	Indian	
4	White	

SECTION TWO: DECISION-MAKING

(Please tick where appropriate answer all questions)

Option	Strongly Disagree	Disagree	Unknown	Agree	Strongly Agree
Code	1	2	3	4	5

No.	Items	Strongly Disagree	Disagree	Unknown	Agree	Strongly Agree
1.	I am encouraged by our management to share knowledge with other employees.	1	2	3	4	5
2.	I am willing to share knowledge with other employees.	1	2	3	4	5
3.	Our management considers and prioritises knowledge transfer as part of our organisational culture.	1	2	3	4	5
4.	I trust my co-workers and it makes me willing to transfer my knowledge effectively.	1	2	3	4	5
5.	I have time for sharing and transferring my knowledge to other employees	1	2	3	4	5
6.	Our organisation has information systems to enable me to transfer knowledge to other employees	1	2	3	4	5
7.	I am always open to new ideas and suggestions from other employees	1	2	3	4	5
8.	I am mindful of details, quick on making decisions and plan ahead	1	2	3	4	5
9.	I work well with other employees and tend to be enthusiastic in social situations	1	2	3	4	5
10.	I tend to be more co-operative and agree with other employees at all times	1	2	3	4	5
11.	I always show my emotions and anxiety during stressful times	1	2	3	4	5
12.	Employees show support of each other during work projects	1	2	3	4	5
13.	Employees transfer knowledge willingly during projects to others	1	2	3	4	5
14.	Employees are more prepared to work with each other to finish tasks	1	2	3	4	5
15.	Employees show willingness to multi-skill across jobs/departments	1	2	3	4	5
16.	Employees respect and trust each other to complete projects	1	2	3	4	5
17.	Management provides a positive social organisational culture	1	2	3	4	5

No.	Items	Strongly Disagree	Disagree	Unknown	Agree	Strongly Agree
18.	Our organisation encourages internal social platforms to improve communication amongst employees	1	2	3	4	5
19.	Management employs experienced and knowledgeable leaders with compatible skills	1	2	3	4	5
20.	Our organisation treats all employees as equals	1	2	3	4	5
21.	Management understanding of self-directed teams	1	2	3	4	5
22.	Management solves conflict effectively and efficiently within the organisation	1	2	3	4	5
23.	Our organisation promotes collaboration and lessons learned	1	2	3	4	5
24.	I develop personal knowledge easily when I am familiar with other employees	1	2	3	4	5
25.	I share personal knowledge that leads to the development of work procedures.	1	2	3	4	5
26.	Tasks and activities related on-job training are observed, clear and communicated to employees	1	2	3	4	5
27.	I am allowed to voice my opinions on issues concerning my work	1	2	3	4	5
28.	I always follow instructions and directions without question	1	2	3	4	5

Thank you for participating on this study

APPENDIX E: RESEARCH INSTRUMENT - INTERVIEW QUESTIONS

Semi-structured interview questions

1. How do you **encourage** employees to transfer knowledge and share information?

2. How do you **manage** knowledge transfer and information sharing within your organisation?

3. How the **personality traits of individual employees hinder** the knowledge transfer?

4. What **lessons have you learned** from your experiences regarding the knowledge transfer?

5. What are the **benefits of identifying** suitable personal traits of employees?

6. What is your understanding of **on-job training** (Tacit Knowledge), would you value it as an ideal process for knowledge transfer within the organisation?

7. Currently, **how do you make sure** that older employees share their knowledge with the younger employees?

8. **How do you create** a culture for knowledge transfer and information sharing within the organisation?

Thank you for participating on this study.

APPENDIX F: FREQUENCY TABLE FOR DEMOGRAPHIC DATA

SPSS DATA Frequency Table

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	55	77.5	77.5	77.5
	Female	16	22.5	22.5	100.0
	Total	71	100.0	100.0	

Field Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 – 4 years	15	21.1	21.1	21.1
	5+ years	56	78.9	78.9	100.0
	Total	71	100.0	100.0	

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25-35 years old	23	32.4	32.4	32.4
	36-45 years old	21	29.6	29.6	62.0
	46-55 years old	20	28.2	28.2	90.1
	> 55years old	7	9.9	9.9	100.0
	Total	71	100.0	100.0	

Occupation Status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Operator	37	52.1	52.1	52.1
	Supervisor	14	19.7	19.7	71.8
	Interns/Practitioners	3	4.2	4.2	76.1
	Clerk	12	16.9	16.9	93.0
	Others	5	7.0	7.0	100.0
	Total	71	100.0	100.0	

Department Status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Management	7	9.9	9.9	9.9
	Technical	44	62.0	62.0	71.8
	Maintenance	6	8.5	8.5	80.3
	Clerical	11	15.5	15.5	95.8
	Others	3	4.2	4.2	100.0
	Total	71	100.0	100.0	

Education level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary school or less	1	1.4	1.4	1.4
	High school	29	40.8	40.8	42.3
	College Certificate	32	45.1	45.1	87.3
	University Degree	7	9.9	9.9	97.2
	Others	2	2.8	2.8	100.0
	Total	71	100.0	100.0	

Race					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	African	26	36.6	36.6	36.6
	Colored	44	62.0	62.0	98.6
	White	1	1.4	1.4	100.0
	Total	71	100.0	100.0	

APPENDIX G: FREQUENCY TABLE FOR LIKERT SCALE DATA

Question 1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	4.2	4.2	4.2
	Disagree	5	7.0	7.0	11.3
	Unknown	6	8.5	8.5	19.7
	Agree	38	53.5	53.5	73.2
	Strongly Agree	19	26.8	26.8	100.0
	Total	71	100.0	100.0	

Question 2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.4	1.4	1.4
	Agree	34	47.9	47.9	49.3
	Strongly Agree	36	50.7	50.7	100.0
	Total	71	100.0	100.0	

Question 3					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.8	2.8	2.8
	Disagree	11	15.5	15.5	18.3
	Unknown	15	21.1	21.1	39.4
	Agree	29	40.8	40.8	80.3
	Strongly Agree	14	19.7	19.7	100.0
	Total	71	100.0	100.0	

Question 4					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	4.2	4.2	4.2
	Disagree	4	5.6	5.6	9.9
	Unknown	10	14.1	14.1	23.9
	Agree	37	52.1	52.1	76.1
	Strongly Agree	17	23.9	23.9	100.0
	Total	71	100.0	100.0	

Question 5					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	5.6	5.6	5.6
	Unknown	4	5.6	5.6	11.3
	Agree	42	59.2	59.2	70.4
	Strongly Agree	21	29.6	29.6	100.0
	Total	71	100.0	100.0	

Question 6					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	7.0	7.0	7.0
	Disagree	14	19.7	19.7	26.8
	Unknown	17	23.9	23.9	50.7
	Agree	21	29.6	29.6	80.3
	Strongly Agree	14	19.7	19.7	100.0
	Total	71	100.0	100.0	

Question 7					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.4	1.4	1.4
	Disagree	1	1.4	1.4	2.8
	Agree	31	43.7	43.7	46.5
	Strongly Agree	38	53.5	53.5	100.0
	Total	71	100.0	100.0	

Question 8					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	1.4	1.4	1.4
	Unknown	1	1.4	1.4	2.8
	Agree	37	52.1	52.1	54.9
	Strongly Agree	32	45.1	45.1	100.0
	Total	71	100.0	100.0	

Question 9					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	2	2.8	2.8	2.8
	Unknown	1	1.4	1.4	4.2
	Agree	41	57.7	57.7	62.0
	Strongly Agree	27	38.0	38.0	100.0
	Total	71	100.0	100.0	

Question 10					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.8	2.8	2.8
	Disagree	17	23.9	23.9	26.8
	Unknown	6	8.5	8.5	35.2
	Agree	28	39.4	39.4	74.6
	Strongly Agree	18	25.4	25.4	100.0
	Total	71	100.0	100.0	

Question 11					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	9	12.7	12.7	12.7
	Disagree	27	38.0	38.0	50.7
	Unknown	14	19.7	19.7	70.4
	Agree	19	26.8	26.8	97.2
	Strongly Agree	2	2.8	2.8	100.0
	Total	71	100.0	100.0	

Question 12					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.4	1.4	1.4
	Disagree	8	11.3	11.3	12.7
	Unknown	9	12.7	12.7	25.4
	Agree	40	56.3	56.3	81.7
	Strongly Agree	13	18.3	18.3	100.0
	Total	71	100.0	100.0	

Question 13					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.4	1.4	1.4
	Disagree	6	8.5	8.5	9.9
	Unknown	15	21.1	21.1	31.0
	Agree	36	50.7	50.7	81.7
	Strongly Agree	13	18.3	18.3	100.0
	Total	71	100.0	100.0	

Question 14					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	1.4	1.4	1.4
	Disagree	8	11.3	11.3	12.7
	Unknown	5	7.0	7.0	19.7
	Agree	38	53.5	53.5	73.2
	Strongly Agree	19	26.8	26.8	100.0
	Total	71	100.0	100.0	

Question 15					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.8	2.8	2.8
	Disagree	8	11.3	11.3	14.1
	Unknown	7	9.9	9.9	23.9
	Agree	38	53.5	53.5	77.5
	Strongly Agree	16	22.5	22.5	100.0
	Total	71	100.0	100.0	

Question 16					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.8	2.8	2.8
	Disagree	7	9.9	9.9	12.7
	Unknown	12	16.9	16.9	29.6
	Agree	37	52.1	52.1	81.7
	Strongly Agree	13	18.3	18.3	100.0
	Total	71	100.0	100.0	

Question 17					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	8.5	8.5	8.5
	Disagree	17	23.9	23.9	32.4
	Unknown	10	14.1	14.1	46.5
	Agree	25	35.2	35.2	81.7
	Strongly Agree	13	18.3	18.3	100.0
	Total	71	100.0	100.0	

Question 18					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	9.9	9.9	9.9
	Disagree	12	16.9	16.9	26.8
	Unknown	14	19.7	19.7	46.5
	Agree	24	33.8	33.8	80.3
	Strongly Agree	14	19.7	19.7	100.0
	Total	71	100.0	100.0	

Question 19					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	7.0	7.0	7.0
	Disagree	17	23.9	23.9	31.0
	Unknown	13	18.3	18.3	49.3
	Agree	27	38.0	38.0	87.3
	Strongly Agree	9	12.7	12.7	100.0
	Total	71	100.0	100.0	

Question 20					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	14	19.7	19.7	19.7
	Disagree	18	25.4	25.4	45.1
	Unknown	10	14.1	14.1	59.2
	Agree	21	29.6	29.6	88.7
	Strongly Agree	8	11.3	11.3	100.0
	Total	71	100.0	100.0	

Question 21					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	4.2	4.2	4.2
	Disagree	5	7.0	7.0	11.3
	Unknown	27	38.0	38.0	49.3
	Agree	30	42.3	42.3	91.5
	Strongly Agree	6	8.5	8.5	100.0
	Total	71	100.0	100.0	

Question 22					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	8.5	8.5	8.5
	Disagree	10	14.1	14.1	22.5
	Unknown	13	18.3	18.3	40.8
	Agree	30	42.3	42.3	83.1
	Strongly Agree	12	16.9	16.9	100.0
	Total	71	100.0	100.0	

Question 23					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	4.2	4.2	4.2
	Disagree	11	15.5	15.5	19.7
	Unknown	19	26.8	26.8	46.5
	Agree	33	46.5	46.5	93.0
	Strongly Agree	5	7.0	7.0	100.0
	Total	71	100.0	100.0	

Question 24					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	3	4.2	4.2	4.2
	Unknown	4	5.6	5.6	9.9
	Agree	42	59.2	59.2	69.0
	Strongly Agree	22	31.0	31.0	100.0
	Total	71	100.0	100.0	

Question 25					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	4	5.6	5.6	5.6
	Unknown	2	2.8	2.8	8.5
	Agree	44	62.0	62.0	70.4
	Strongly Agree	21	29.6	29.6	100.0
	Total	71	100.0	100.0	

Question 26					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	2.8	2.8	2.8
	Disagree	6	8.5	8.5	11.3
	Unknown	9	12.7	12.7	23.9
	Agree	35	49.3	49.3	73.2
	Strongly Agree	19	26.8	26.8	100.0
	Total	71	100.0	100.0	

Question 27					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	5	7.0	7.0	7.0
	Disagree	1	1.4	1.4	8.5
	Unknown	11	15.5	15.5	23.9
	Agree	35	49.3	49.3	73.2
	Strongly Agree	19	26.8	26.8	100.0
	Total	71	100.0	100.0	

Question 28					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	8.5	8.5	8.5
	Disagree	10	14.1	14.1	22.5
	Unknown	4	5.6	5.6	28.2
	Agree	37	52.1	52.1	80.3
	Strongly Agree	14	19.7	19.7	100.0
	Total	71	100.0	100.0	