



**TECHNOLOGY ADOPTION AND ITS INFLUENCE ON SALESPEOPLE'S
PERFORMANCE IN THE PHARMACEUTICAL INDUSTRY IN SOUTH AFRICA**

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DECLARATION

I, '**Makibi Mafitoe**, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted as a full requirement for the award of Master of Management in the field of Strategic Marketing in the University of the Witwatersrand, Johannesburg. It has never been presented for any degree or examination in this or any other university.

Signed at ...**CENTURION**.....

On the ...**16TH**..... day of ...**FEBRUARY**..... 2021.

DEDICATION

This research report is dedicated to my Mother 'Manthabeleng Mafitoe and my late Father Tumisang Mafitoe, who used to tell us that ***'Education is the inheritance that they are giving to us that no one will ever take away from us.'*** To my Sisters and Brother, Thank you for your words of encouragement and for being Step parents to my kids during this journey. To my kids thank you for understanding that during those times you had to step up and make things happen for yourself. My Workplace – Thank you so much for taking care of me financially during this journey. I knew that I had a second Family. To my supervisor Dr Fanie Sarucherra – deepest gratitude for your supervision and guidance, which has raised the quality of my work. My Editor Dr Elsie Naude, your dedication and hard work has made my work to shine, I am deeply grateful. To my friends who also became my other family, thank you for making sure that ***"The most beautiful discovery true friends make is that they can grow separately without growing apart."*** — Elisabeth Foley

Above All I give Thanks to you Father for blessing me.

ABSTRACT

This study sought to examine technology adoption and its influence on the performance of salespeople in the pharmaceutical industry in South Africa. There has been some reluctance in the adoption of technology by pharmaceutical companies in South Africa. As a result of this failure to adopt new technologies, pharmaceuticals sales representatives have been left behind in the highly digitised economy. This has resulted in them either failing to meet their sales targets or failing to adequately market new products to the right prospective markets. The study objectives were to determine factors influencing technology adoption by salespeople in the Pharmaceutical industry in South Africa, to establish the influence of technology adoption on the performance of salespeople in the pharmaceutical industry in South Africa, and to establish the antecedents to the factors influencing sales representatives' intention to adopt technology usage in the pharmaceuticals sector in South Africa. The theoretical framework was underpinned by the Theory of Reasoned Action (TRA), Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology Acceptance Model (TAM). The methodology adopted for the study involved a positivist research philosophy and an explanatory research design. The study population comprised 500 participants who were sales representatives and the sample size was 217. The study employed the Cronbach Alpha to test for reliability, which was confirmed across all 13 constructs of the study. The study employed the use of factor analysis as a descriptive tool. A multicollinearity test established that there was no variable construct which was above 0.9. The study results accepted the hypothesis that competition, innovation, communication, and the size of the organisation influenced technology adoption, whereas the hypothesis which tested

demographics and change dynamics against influence on technology adoption was rejected using t-values and the p-values to accept and reject the hypothesis. The study established that there is a positive relationship between technology adoption and salespeople's performance within the pharmaceutical industry in South Africa as evidenced by a positive correlation of 0.820 and p-value which was significant ($p < 0.05$). The goodness of fit of the model was 67.2% ($R^2 = 0.672$). Perceived usefulness, perceived convenience, and perceived ease of use were supported by positive Pearson coefficients and supported statistically by values less than 0.005. As antecedents to technology usage. The study recommended that the sector be receptive to change in management as well as embrace fully the adoption of technology. If need be, incentives can be provided to overcome resistance.

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CHAPTER ONE: INTRODUCTION

1.0 Introduction

Computers and information technologies have a widespread presence in present-day organisations and have considerably expanded in scope and application. Since the 1980s about 50 percent of all new capital investment in organisations has been in information technology (Westland & Clark, 2000). In order for that investment to lead to improved productivity, these technologies must be accepted and used by employees in organisations. Understanding the factors that influence or inhibit technology adoption has consequently received considerable attention from researchers and has become one of the established research areas of contemporary information systems. Technology adoption can be defined as the acceptance, integration, and use of new technology in society (Walkme, 2020). Esmailzadeh, Sambasivan, Kumar and Nezakhati (2011) define technology acceptance as the willingness of the users to use technology which is designed to support tasks.

One of the most important determinants of successful technology adoption in the pharmaceutical industry is the degree to which technology systems are accepted by sales representatives. Many organisations invest in technology systems in order to cut costs, as well as to improve the quality of products or services (Esmailzadeh et al., 2011). Hooley (2012) points out that technology is constantly developing at a rapid pace, which affects not only high tech industries but all other industries as well. Pharmaceutical companies are also keeping pace with changes brought about by technology. As a result of widespread technology development, technology adoption is receiving increasing attention as the number of technology implementations is witnessed to be on the rise globally. This study intends to examine technology adoption and its influence on salespeople's performance in the pharmaceutical industry in South Africa.

1.1 Background to the study

In most advanced and emerging economies, technology adoption and innovation have become priorities for governments and companies alike as a source of value creation, productivity growth, and improved living standards. Technology has also been perceived to improve access to basic services, working conditions, and health outcomes as well as economic security (Schwab, 2019). Improving human performance in organisations is a primary goal for organisations in order to increase competitiveness (Marshall, Byrd, Gardiner & Rainer Jr, 2000). Organisations spend significant amounts of money on technology implementation and expect to get increased productivity and performance from their investments (Marshall et al., 2000). However, this has proven to be challenging in the pharmaceuticals industry, as the industry is among the most heavily regulated and highly competitive industries in the world. As a result, when compared to other consumer focused industries, the healthcare and pharmaceutical markets are traditionally slow to adopt emerging technologies. This is largely due to safety concerns, regulatory constraints, and intellectual property issues (Mulinari, 2016).

Additionally, the increasing quest for efficiency and agility in vertical relationships is sparking the convergence of perspectives particularly for technology related activities (Roco & Bainbridge, 2013). For that reason, innovation is now a complex, multi-organisational as well as multi-disciplinary activity that demands collaboration and interactions right across the various entities within the entire pharmaceutical chain. A substantial segment of the innovation process and the resulting outcomes occur at the level of buyer-seller interface. Pharmaceutical manufacturers face challenges in forecasting the right market demand, tackling fluctuating costs, and handling the manufacturing pipeline (Munyasi, 2016). Firms find that the volumes of their finished products tend to fluctuate widely. Furthermore, inconsistent product orders, in-bound logistics, and transport challenges all impact manufacturer's ability to stock enough raw materials. This forces them to occasionally stop production (Cook, 2016). Munyasi (2016) stated that adoption of information technology could lead to improved efficiencies, a significant reduction in operational costs, improved or better customer service, and greater satisfaction among members of the distribution channel.

Many countries in Africa maintain a combination of national and regional wholesalers who distribute pharmaceuticals to retail pharmacies, shop fronts, and hospitals. In principle, national wholesalers provide the full range of medicines and regional wholesalers provide either an entire or partial range of medicines. Far fewer countries, on the other hand, run single channel systems with a wholesaler having exclusive rights to distribute pharmaceuticals on behalf of a manufacturer. A single-channel system comprises a few wholesalers who hold strong control over the market compared to wholesalers in multi-channel systems.

Most pharmaceutical companies in Africa source their active and inactive pharmaceutical ingredients for manufacturing from India, China, the United States, and European countries. They buy these raw materials and equipment (APIs, manufacturing machinery, blister packages, paper cartons and glass bottles) with the help of a procurement agent as opposed to buying directly from source (manufacturers). It is noteworthy that procurement agents have access to prices from many suppliers in various countries and may source through brokers if quantities are too small. Since many African manufacturers have limited access to credit facilities, they pay upfront for their orders. As this is difficult, many intermediary agents control the payment terms (credit period and credit amount).

South Africa's pharmaceutical sector is worth approximately R20 billion annually. The pharmaceutical sector is made up of more than 200 pharmaceutical firms in the country. Large companies such as Aspen Pharmacare (34%) and Adcock Ingram (25%) dominate the field. These two companies are key players in the South African Pharmaceutical industry, followed by Sanofi, Pharmaplan, and Cipla Medpro (Global African Network, 2020). The pharmaceutical industry in South Africa has consistently registered a double digit growth in recent past years. However, adoption of technology has occurred at different rates, affecting the cost of distribution and service delivery and thereby impacting drug accessibility and overall industry growth. To gain in-depth understanding, this study will examine the impact of technology adoption and its influence on salespersonnel's performance in the pharmaceutical industry in South Africa.

Within a rapidly evolving and turbulent environment, pharmaceutical marketers have been under pressure to deliver higher returns within the constraints of a limited promotional budget. Studies have long established that e-detailing channel technology can help in improving the pharmaceuticals sales efforts (Gönül & Carter, 2012; Rod, Ashill & Carruthers, 2007). While the e-detailer channel appears to be dominating especially within Europe, the channel has been exposed to intense scrutiny and acceptance in the developing world has come with mixed reactions based on the strict rules governing pharmaceuticals marketing. Nevertheless, the calls to digitize pharmaceutical companies' marketing effort have been increasing (Jawaid & Ahmed, 2018; Lad, Muragundi & Ligade, 2017) even though the medical sales representatives' intention to adopt and embrace such digitization remains unclear (Kwak & Chang, 2016).

1.2 Problem Statement and Research Gap

Despite the documented impact of technology and the increasing calls to digitize the pharmaceutical company selling efforts (Jawaid & Ahmed, 2018; Lad et al., 2017), there has been some reluctance among pharmaceutical companies in South Africa to embrace technology. As a result of this failure to adopt new technologies, pharmaceutical sales representatives have been excluded from a highly digitised energy field of marketing. This has resulted in them either failing to meet their sales targets or failing to adequately market new products to the right prospective markets.

The South African pharmaceutical industry in 2017, had the output value estimated at 48.6 billion rand for providing medicines to the public and private sectors, of which 69% was absorbed by the private sector and 31% was absorbed by the public sector (Department of Trade and Industry, 2017).

The industry has been undergoing rapid transformation spurred on by the changing economic climate, shifting government policy, and an evolving local existing customer

base. The supply and distribution of pharmaceutical products are often highly centralized and characterised by poor storage facilities, inaccurate demand planning processes, insufficient human resource management capabilities, high stock pilferage, and inadequate financing, resulting in frequent stock-outs. African pharmaceutical manufacturers face considerable challenges in setting up good demand planning processes, such as raw material cost fluctuations due to instability in foreign exchange rates and poor control of manufacturing pipeline. This affects the manufacturing firms' output. The situation is exacerbated by irregular customer orders, transport and logistic challenges, and credit inaccessibility. Technology has changed many industries around the globe, and the changes have brought about cultural changes at these organisations including the members of the pharmaceutical industry. The changes that have been felt in the pharma include the use of artificial intelligence, automation, Blockchain (Schöner et al., 2017) and other technologies driving digital transformation which fundamentally reshape how drug makers operate, from portfolio planning to drug development, direct-to-consumer marketing, finance administration and other administrative functions. Lai (2017) also indicated that consistent innovative changes at the same time makes dangers to set up business models, while additionally offering openings for novel assistance contributions in the industry.

A study carried out by Baines, Jindal and Kathan (2015) indicated that digital platform ability is undervalued in the entire pharmaceutical industry and tools such as mobile phones, email, and social media are under deployed. This is despite the fact that research (Grackin, 2010) has shown that embracing digital technology to label goods, move them, and facilitate invoicing and distribution have an impact on a firm's overall performance. These studies highlight the knowledge gap with regard to the impact of technology adaption and its influence on performance in the pharmaceutical industry in South Africa. There are evidently not many studies of this nature in the context of a developing and emerging economy where there has been no extensive application of technology at the distribution channel level. It is with this in mind that the identified research gap became the basis for this study with the title "Technology adoption and its influence on salespeople's performance in the pharmaceutical industry in South Africa". In order to

adopt technology fully, the pharmaceutical industry will need to seamlessly integrate people and machines, while simultaneously harnessing the technological disruption into a competitive advantage. This integration will create a great deal of upheaval in organisations, a circumstance that will lead to difficult questions about how people will adopt new technology in the workplace (Lakshmi & Rao, 2018).

1.3 Research Objectives

The study sought to examine technology adoption and its influence on salespeople's effectiveness in the pharmaceutical industry in South Africa. The specific objectives of this particular study were to:

- Determine factors influencing technology adoption by salespeople in the pharmaceutical industry in South Africa
- Establish the influence of technology adoption on the performance of salespeople in the pharmaceutical industry in South Africa
- Establish the antecedents to the factors influencing sales representatives' intention to adopt technology usage in the pharmaceuticals sector in South Africa.

1.4 Research Questions

The following questions were answered by the study:

- Which factors influence technology adoption by salespeople in the pharmaceutical industry in South Africa?
- What influence does technology adoption have on sales representatives in the pharmaceutical industry in South Africa?
- What are the antecedents to the factors influencing sales representatives' intention to adopt technology usage in the pharmaceuticals sector in South Africa?

1.5 Significance of the Study

The industry stakeholders will be able to make use of the study findings to improve the industry performance standards. Firstly, the study will be of value to the pharmaceutical

manufacturers, wholesalers, and the retailers by offering a guide on improved business performance associated with the adoption of new technologies in their businesses with regard to operational efficiency, improved profitability, and increased turnover.

Secondly, the study sought to add value to the industry's regulatory board. Government agencies such as South African Pharmacy council as well as the Health Professions Council of South Africa can use the study findings to formulate policies that will lead to better and faster accessibility to medication by the population. They would also be able to know how to link with the other stakeholders to enhance efficiency in the industry.

Finally, the study will be useful to scholars and academicians and also provide relevant literature for other studies related to it. The study sought to increase the general knowledge on the subject and also provide a useful reference for future studies. While there have been studies on technology acceptance and usage in different industries, this study provides a basis upon which technology adoption in the pharmaceuticals industry can be built. The study borrows theories developed for other areas and utilises them as the basis to address the objectives of the study.

1.6 Delimitations of the Study

The study sought to evaluate the impact of technology adoption and its influence on sales personnel's performance in the pharmaceutical industry of South Africa. It was confined to pharmaceutical sales representatives in the Gauteng province of South Africa where most of the pharmaceutical companies have either their head-quarters or offices.

1.7 Limitations of the study

The study was impacted by the COVID-19 pandemic and this minimised the physical movement and interaction of the researcher. The researcher was, however, able to make use of online platforms. The potential respondents were sceptical about giving data for fear of victimisation from the employer as well as because of the sensitivity of the topic. The researcher was able to provide assurance through the letter of consent from the

university that their input would be used for academic purposes only. The respondents were not coerced to participate neither were they required to unmask their identity in any way.

1.8 Definition of Key Terms

PSR: Pharmaceutical Sales Representatives - these are salespeople who are employed by the pharmaceutical companies to sell companies' products.

TAM: Technology acceptance Model - A model that was developed by Davis, Bagozzi and Warshaw (1989) in order to establish the relationships between the level of technology acceptance and users factors which include perceived usefulness, perceived ease of use, attitude toward using, and actual usage behaviour.

IDT: Innovative Diffusion Theory - The diffusion of innovation is a model that looks at how new products, services, and ideas spread. The cumulative adoption of innovation (of any type) over time generally follows an S-shaped curve as the product moves through its life.

1.9 Chapter Summary

This chapter provided an introduction to the study as well as the background which underpinned the study. The chapter previewed the statement of the problem as well as the three research instruments. The research objectives sought to establish the factor which influenced technology adoption, the antecedents, and the benefits. The chapter includes the research questions, the significance of the study, the limitations, definition of terms as well as the delimitations of the study. The next chapter provides a literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The only constant factor in business life is change. It follows therefore that organisations that fail to embrace change will eventually fail to survive. Organisations today are battling to embrace the use of technology, acknowledging that failure to do so will lead to their demise (Qasim & Abu-Shanab, 2016). The adoption of technology has become a source of competitive advantage and it is the new way of conducting business (Philips, 2017). This chapter will review existing literature on the subject of technology adoption and its influence on salespeople's performance within the pharmaceutical industry. The literature will be examined in sections, starting with the overview of technology adoption within the pharmaceutical industry, followed by the role of sales representatives, and finally the theoretical framework. The literature study will preview the theories which underpin this study, giving an empirical review of studies and scholarly work relating to this subject. The study will identify the research gaps within the existing body of knowledge. The research objectives will guide the empirical review. Lastly, a chapter summary will be given.

2.2 Technology Overview

Kushnir (2015) defines technology as the application of scientific knowledge for the sole purpose of practicability within the industry and wherever appropriate. Anderson (2015) defines technology within a broader context as an infrastructure that is intangible created out of scientific knowledge for application to achieve results from any geographical point of the world by its intended users. The term technology is also used to refer to machines, tools that are capable of solving problems for humans. According to Rahayu and Day (2015), many businesses have adopted technology in the form of E-commerce. E-commerce is defined as the buying and selling of services and products online. It is this context that this study seeks to investigate the adoption of technology by salespeople within the pharmaceutical industry.

2.2.1 Technology adoption in the pharmaceutical industry

According to Dong and Yang (2015), the pharmaceutical industry has now been overtaken by the adoption of technology. Reinhardt (2020) observed that the pharmaceutical industry experiences more severe administrative pathways in adopting technology to ensure patients safety. The landscape of business has changed even more since the outbreak of the Covid-19 pandemic, and the sector has been left with no option but to change itself despite the challenges and costs associated with the use of technology.

Buonomenna and Bae (2015) contend that the pharmaceutical sector is central to saving lives. They note that the coming of technology has made operations and transactions more user friendly for the healthcare practitioners as well as the businesses although challenges have been inevitable. The coming of technology has shifted stakeholders' way of transacting business, as well as consumers' behaviours, their daily lifestyle, the manner in which they conduct their activities, and their ways of consuming and using information. According to Schwab (2019), in the most advanced as well as emerging economies, technology adoption and innovation have become top priorities for governments and companies alike as a means of value creation, job creation, stimulating economic activity, productivity growth, and improved living standards.

2.3 Technology adoption and its influence on sales representatives

The pharmaceutical industry in South Africa has consistently registered double-digit growth in recent years. However, adoption of technology has taken place at different rates, affecting the cost of distribution and service delivery and thereby impacting drug accessibility as well as overall industry growth. Sales representatives have been forced to accept change and have been left with no option but to embrace the use of technology (Buonomenna & Bae, 2015). The adoption of technology has opened new ways of conducting business. Internal Marketing is an element of holistic marketing where the company's employees are the most important marketing tool. According to Kim, Song,

and Lee (2016), employees are identified as important marketing tools because of their role of being in the front lines, adapting a company's marketing strategies to the needs of each customer they serve.

Lakshim and Rao (2018) posit that the utilisation of technology and tools by organisations can increase productivity, boost sales, and help organisations to make better, informed decisions. This has not always been the case as organisations are faced with the challenge of getting every employee on board, which is often difficult. In their discussion of technology adoption strategy in the competitive environment, Kim et al. (2016) point out that the success of an internal marketing strategy depends on the effectiveness of the sales force, constant strategic development, and maintaining customer relationships. According to Grackin (2010), integration is a key objective of the use of IT in the pharmaceutical industry, because of the many positive effects that integration brings, such as comprehensive information sharing that is more accurate and faster. Firms are also able to get better demand forecasts that are based on precise information.

2.4 Theoretical Framework

To study the factors influencing the acceptance of information technology in organisations and the usage behaviour of individuals adopting the information technology, three theories were identified to serve as framework for this study. These theories are the Theory of Reasoned Action, The Unified Theory of Acceptance and Use of Technology, and the Technology Acceptance Model.

2.4.1 Theory of Reasoned Action (TRA)

According to Nasri and Charfeddine (2012), the Theory of Reasoned Action was developed in 1975 by Fishbein and Ajzein. According to this theory, the intentions of users of a particular system to commit to a particular behaviour can be explained by their attitude towards the behaviour (their positive or negative feelings about performing the behaviour) and by the subjective norm (their perception of whether significant people think they should perform the behaviour). Alsughayir and Albarq (2013) define attitude as an individual's negative and positive target behaviour, while the subjective norm is defined

as a personal perception arising from the individual's opinion or feeling of being right or wrong. According to Nasri and Charfeddine (2012), the theory of reasoned action explains as well as predicts the behaviour of the users of a system. The theory of reasoned action posits that an intention to engage in behaviour of some sort is considered the best predictor of whether or not someone will engage in the behaviour. According to Alsughayir and Albarq (2013), the more positively an individual values a certain action or behaviour, the more likely they are to engage in that type of behaviour. They will be even more likely to engage in a behaviour if their close associates, friends, and family approve of that behaviour. In the context of this study, the theory predicts how salespeople would behave when they are requested or instructed to make use of technology.

Frishman (2008) adopted this theory in a study that sought to look at the attitudes and norms which people had regarding food irradiation, given that it is a controversial issue. Pokhrel and Lohar (2018) adopted the theory in their quest to establish factors that influenced attitudes and norms around mobile retailing. The theory predicts the behaviour patterns and intentions of individuals as well as their attitude towards the adoption of technology within their line of work or specialty. The theory has been widely used to make inferences regarding users' behaviour and has led to the development of the Theory of Planned Behaviours, the Theory of Technology Acceptance, and the Unified Theory of Acceptance and Use of Technology. In the context of this study, this theory allows prediction of how salespeople will behave with regard to the adoption of technology, possibly after establishing how their counterparts in other sectors have experienced the adoption of technology. The behaviour of their stakeholders will also generate either positive or negative behaviour which they can embrace or exhibit in their tasks. The theory is envisaged to highlight the behavioural pattern as well as the attitudes which salespeople are likely to adopt as a result of the use of technology within the pharmaceutical industry.

2.4.2 Unified Theory of Acceptance and Use of Technology

According to Venkatesh and Zhang (2010), the Unified Theory of Acceptance and Use of Technology is recognized as a unified model. It was developed by Venkatesh, Morris, Davis and Davis (2003), who based the model on the social cognitive theory. These scholars combined eight prominent information technologies, or information technology acceptance research models. They examined the ultimate predictive validity of eight specific models in determining behavioural intention as well as usage, to permit fair comparison of the selected models. According to Venkatesh and Zhang (2010), since the inception of the Unified Theory of Acceptance and Use of Technology there have been many predictions regarding system usage and decision making regarding technology. Sumak and Sorgo (2016) highlight that the model provides a cognitive framework or architecture that elucidates the actual use of systems and technologies.

Okonkwo (2012) adopted the use of this theory in a study that examined internet banking and sought to ascertain how clients perceived the use of banking online. Moreover, Al-Qeisi (2009) adopted the use of this theory to try to explain online banking behaviour. The two authors adopted the theory to explore whether clients accepted the use of banking technology or not. The model has been used over a wide spectrum to integrate the usage and acceptance of technology. According to Venkatesh and Zhang (2010), the theory relates to the variables of trust, self-efficacy, habits, perceived risk, and satisfaction. The Unified Theory of Acceptance and Use of Technology highlights that, for any particular individual, the actual use of an information system is directly influenced by the facilitating conditions. However, this use is indirectly influenced by various factors that include performance expectancy, social conditions, and effort expectancy. UTAUT model integrates the issues into four main core determinants. In the context of this study, the theory facilitates learning to the sales representative and creates awareness regarding the adoption of technology. In relation to this study of the adoption of technology by salespeople, the theory plays a vital role in ensuring that salespeople embrace the use of technology within the pharmaceutical framework. The study envisages the acceptance of the use of technology by salespeople to perform their tasks within the pharmaceutical sector in South Africa.

2.4.3 Technology Acceptance Model

Davis et al. (1989) proposed the Technology Acceptance Model (TAM). In the field of information systems, this model has been used to predict and explain user acceptance of various information technologies. According to Davis et al. (1989), the goal of TAM is to provide a description of the determinants of computer acceptance that is capable of explaining user behaviour across broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified. The model by Davis et al. (1989) was designed to predict the acceptability of a tool and also to identify which modifications should be made to a system to make it readily acceptable to users. The model proposes that the perceived usefulness and to a lesser extent perceived ease of use determine the acceptability of an information system (Davis et al., 1989). Perceived usefulness is, at the outset, defined as the level to which a person is convinced or believes that the expected use of that particular system will improve his/her performance. Perceived ease of use, on its part, denotes the degree to which the person believes that his or her use of the system will be effortless.

Strudwick (2015) adopted this theory within the health sector amongst nurses after the introduction of healthcare technologies in order to access the benefits of accepting the use of this technology. Several factorial analyses illustrate that the concepts of perceived usefulness and perceived ease of use may well be considered two very different dimensions. Davis et al. (1989) assert that an individual's approach is not the only factor that fully determines the use of a system. The use of a system is also based on the likely impact on his or her performance. In the context of this study, the theory will show how both staff and consumers can accept, implement, and adopt the new system which in itself is based on Information Technology. This theory is envisaged to help the salespeople accept the adoption of technology within the pharmaceutical industry given the benefits of its adoption, the more so in light of the Covid-19 pandemic.

2.5 Empirical Review

2.5.1 Factors influencing technology adoption by salespeople

According to Macher, Miller and Osborne (2017, p. 3), competition is a factor influencing technological adoption by salespeople. They point out that in the fight for survival, competition has prompted organisations to adopt technology. Macher et al. (2017) employed quantitative data to make inferences about the determinants of technology adoption. The study revealed that competition is a vital factor which influences technology adoption by salespeople. They posited that the use of technology offers a competitive advantage over competitors. Although the study by Macher et al. (2017) was carried out within the cement industry, it may have implications for other industries or industry sectors such as the retail sector as well as the pharmaceutical industry. However, the study made use of quantitative data only, neglecting qualitative information. The current study seeks to employ a mixed approach research design. While the Macher et al. (2017) study made use of an impracticable time frame (1973 up to 2013), the study in hand seeks to carry out a similar study making use of a five year time frame.

In Norway, Moen, Tvedten and Wold (2018) also explored the influence of competition on the adoption of technology. The results of the study indicated that competition has a large impact and correlates positively with technology. The researchers concluded that competition is a factor that influences technology adoption in Norway. The study only focused on small to medium enterprises, however, neglecting other sectors which may have given a different set of results regarding how competition influences technology adoption by salespeople. The current study seeks to extend the study by Moen et al. (2018) to the pharmaceutical sector to determine whether competition influences the adoption of technology.

Talukder (2012) investigated the factors influencing the adoption of technology by salespeople within the context of organisations in Australia. He posited that understanding potential adopters and the factors influencing their adoption decision is of paramount importance for any firm to be highly successful in bringing innovation to its workplace, and that wanting to be innovative influences the adoption of technology. This

study made use of the technology acceptance model as well as the theory of reasoned action as its theoretical framework base. The study employed survey questionnaires to collect data from Australian organisations. In brief, Talukder's (2012) findings indicated that perceived usefulness and support from management influences are the two main factors influencing adoption of technology. Survey questionnaires were used to collect data from an Australian organization. The findings indicate that perceived usefulness and managerial support are the two dominant variables in explaining adoption. The results show that individual adoption of innovation is also influenced by two social factors – peers and social network. The results also indicate that innovation is influenced by demographic factors.

The study also found that individual adoption of innovation is driven by demographic factors in the various organisations. The study concluded that innovation correlates with the adoption of technology. The study by Talukder (2012) only made use of survey questionnaires to the exclusion of other instruments such as interviews. The current study seeks to employ a mixed methods research design and to make use of both qualitative and quantitative data collection instruments.

Matthews, McNeil, Brilliant, Tax, Maillet, McCulloch and Glogauer (2016) explored factors which influenced the adoption of technology by salespeople within the Canadian dentistry field. The study made use of Roger's diffusion of innovation theory as a framework for organizing codes and subcodes in its deductive approach. The study findings indicated that perceived relative advantage which came as a result of innovation influenced technology adoption. The study also found that contextual factors influence the adoption of technology by salespeople in dental practice. The study by Matthews et al. (2016) only made use of NVivo 10 to analyse qualitative data, while other qualitative analysis tools such as thematic analysis could have given a different set of more detailed results. Furthermore, the study did not employ quantitative data which may have provided details of the degree to which innovation influences the adoption of technology by the salespeople. This study seeks to employ both quantitative and qualitative data. The study by Matthews et al. (2016) was also undertaken in Canada, a developed country, hence

its findings cannot be generalized to South Africa which is a developing country. These shortcomings apply to various other studies that are discussed in this literature review.

According to Borhani (2016) his study, which was undertaken in the construction industry, underscored the importance of technology in getting work done. Borhani (2016) investigated the factors and barriers which influence the adoption of technology. The study employed a web-based survey as well as informant interviews to gather data. The study found that enhanced communication influences the adoption of technology by salespeople in the construction industry. The study population of the study was 164 contacts in the construction sector, and 31 of the contacts responded, giving a response rate of 31%. Borhani (2016) concluded that communication is key more than ever before in the sector, for marketing purposes or for planning, coordination, and interaction amongst the employees themselves as well as with their clients. Since the study by Borhani (2016) was qualitative in nature and did not use quantitative tools to obtain data, it could not ascertain the impact that communication had on the adoption of technology in the sector. Furthermore, it is questionable whether the response rate of 31% of the study could deliver credible results as it is not representative of the total population which was under study. This prompts further study in the pharmaceutical industry to ascertain the factors which influence the adoption of technology by the salespeople making sure of a higher response rate which is representative of the population under study.

Aguila-Obra and Melendez (2006) as cited in Palacios-Marqués, Soto and Merigo (2015) explored the factors that influence technology adoption. The study argued that size of the organisation influenced the adoption of technology by salespeople. Palacios-Marqués et al. (2015) employed a questionnaire to collect data from a total of 280 organisations. Aguila-Obra and Melendez (2006) as cited in Palacios-Marqués et al. (2015) found that the size of the organisation influences the adoption of technology, since small organizations have fewer bureaucratic processes, which facilitates the adoption of technology; but size does not impact how the technology will be used by the salespeople. The study was cross-sectional. A longitudinal study could determine whether the size of

the organisation influences the adoption of technology in the long term or not. The cross-sectional study weakness was that it looked at data at one particular point, which may have given misleading data. The current study seeks to take a longitudinal view, collecting data over a period of months

Ramsey, Ibbotson, and McCole (2008) as cited in Fujimoto, Ferdous, Sekiguchi and Sugianto (2016) explored factors influencing technological adoption within the small to medium enterprise sector in Ireland. The study performed confirmatory factor analysis on seven factors which related to the external environment. The study found that willingness to change is a significant external factor that influences the adoption of technology. Ramsey et al. (2008), cited in Fujimoto et al. (2016), conducted t-tests to analyse data, but other quantitative techniques such as chi-square tests could have investigated the relationship between willingness to change and technology adoption in more detail.

Dhraief, Bedhief, Dhehibi, Oueslati, Jebali and Ben (2019) examined the factors which affect the adoption of technology by livestock holders in the arid area of Tunisia. The study aimed to shed light on the potential factors which influence technology adoption in Tunisia. The study found that economic, institutional, and human factors influence the adoption of technology by salespeople in agriculture. Dhraief et al. (2019) employed a quantitative approach using a cross sectional design for the purpose of data gathering. The study found that demographic factors were statistically significant and had a positive influence on the adoption of technology. The findings seemed to suggest the vital role of institutional factors. Furthermore, the study concluded that young salespeople in a farming environment should be educated on the role that technology plays in the agricultural sector. They should be training regarding the role of technology.

In a similar study within the same sector and also in Africa, Kinyangi (2014) examined factors that influenced the adoption of technology in agriculture within Kenya. The key objectives of the study by Kinyangi (2014) were to examine how demographics and capital influenced the adoption of technology, to establish how training influenced the

adoption of technology, and to establish how the demographic characteristics of the farmers influenced the adoption of technology. The study employed an exploratory research design with a targeted population of 750 farmers comprising both smallholder farmers and producer group officials.

The study employed interviews and questionnaires to elicit data from the respondents. . Quantitative data was collected from the questionnaires as well as qualitative data. The results revealed that size of the business (capital) influenced the adoption of technology whilst demographics had a positive and significant association with the adoption of technology. Melesse (2018) conducted a similar study to review the factors which influence the adoption of technology by sales personnel in agriculture within Ethiopia. The variables found to affect the adoption of agricultural new technologies by farmers in Ethiopia are the demographics of age, education level, family size, farm size, extension service provision and credit access. Demographics appear to play a significant role in various sectors of commerce in Africa, in particular agricultural commerce.

According to Albar and Hoque (2019), there are a number of factors that influence the adoption of technology in small to medium enterprises. They posited that the adoption of technology by salespeople within the small to medium business sector has empowered the small to medium enterprises to make their presence felt in the international markets. Albar and Hoque (2019) examined the factors that influence the adoption of technology in small to medium enterprises in Saudi Arabian rural areas. They found that culture, innovativeness, competitive environment, and the regulatory environment influenced the adoption of technology by salespeople within the small to medium enterprises. The study employed a sample size of 100 participants and the study employed structural equation modelling as its tool for data analysis. The study was quantitative in nature and a cross sectional survey was employed to collect data for the study. The study used closed ended questionnaire for the sole purposes of utility. Qualitative data was not collected. The sample size of 100 participants may be unrealistic given the number of SMEs in Saudi Arabia. Furthermore, the study only made use of a cross-sectional survey, which confined it to one period of data collection whilst the adoption of technology is a process. The factors which influence the adoption of technology tend to form a trend and hence a cross-

sectional approach was inappropriate. The study might better have employed a longitudinal survey. In addition, the study was conducted within the context of the small to medium enterprises, and the findings cannot be generalized to other sectors or to other countries. The results of the current study might be generalised to some other countries Africa given that South Africa is the second largest economy after Nigeria.

Young (2015) explored the factors which influence the adoption of technology by salespeople within government call centres. The study was exploratory and employed a mixed methods research design. The study drew its framework from the Diffusion of Innovation theory, and employed inductive analysis using qualitative methods to obtain an understanding of the factors which influence the adoption of technology. Deductive analysis was used to analyse the quantitative data which was gathered by the study. The sample size of the government call centres was 25 000 participants, a number which was unrealistic. The findings were that managerial leadership and organisational responsiveness, which is inclusive of customer's expectations, were factors which influenced the adopting of technology. The study in hand seeks to employ a sizeable study population, but nothing near the range of 2500 that Young (2005) attempted.

Kyobe (2011) as cited in Luthra, Mangla, Chan and Venkatesh (2018), investigated the factors that influenced the adoption of technology by salespeople in South Africa. The purpose of the study was to investigate the influence on information and communication technology (ICT) adoption of three factors: capacity to adopt and use ICT, exposure to international environment, and state policies in South Africa. The study covered the period 2000-2009 and employed secondary data obtained from the World Bank databases as well as other sources. A logarithmic transformation and a regression analysis were performed to determine the significance of the influence which each factor had on the adoption of technology. The study found that the capacity to adopt (change of culture) had the most significant influence on technology adoption by salespeople in South Africa, awhile the international environment also had an effect.

In contrast to other studies, the study by Kyobe (2011) as cited by Luthra et al. (2018) found that the regulatory environment does not influence the adoption of technology in South Africa. The results also indicated that human, social, political, economic, and other factors had some influence on the adoption of technology by salespeople in South Africa. These findings cannot be regarded as convincing, however, given that the data employed was only collected from secondary sources. The study did not use primary data which could have given first-hand information. The researcher did, however, put in place stringent measures to minimize the limitations to which the use of secondary data is susceptible but it is not clear whether they were adequate. This prompts further study to cover the existing gap created by the study of Kyobe (2011) as cited in Luthra et al. (2018).

Kavandi and Jaana (2020) examined the factors that influence the adoption of technology by salespeople in the health sector, mostly in Europe and the US. The researchers carried out a systematic review in the period December 2017 to February 2018, attempting to critically appraise as well as synthesize the available data with regard to the factors which influence the adoption of technology. The study reviewed a total of 41 studies which were mostly published between 2014 and 2017. The study by Kavandi and Jaana (2020) found that cost/price as well as demographic variables influenced the adoption of technology. The study relied upon secondary data and did not use primary data. Secondary data may be subject errors and omissions and its interpretation is subjective. The study in hand seeks to make use of both primary and secondary data.

Shatat (2017) explored the factors which influenced the adoption of technology on the usage of online services in Oman. The study by Shatat (2017) employed a survey questionnaire as the data collection instrument to explore the impact which various factors have on the adoption of technology. The study population comprised of 270 participants who were drawn from the Al-Batinah region. Ease of use, culture of the organisation, the issues of privacy and security, and social issues influenced the adoption of technology. The findings by Shatat (2017) revealed that a significant relationship existed between the culture of the organisation, ease of use, social issues, and the adoption of technology.

Kerava (2017) explored the factors affecting the adoption of technology by salespeople in the retail sector in Finland. At the time of the study, retailing was seen to be facing some tough times due to the advances and changes in the environment. External factors were influencing the adoption of technology, and the change process was at full throttle. The study applied an organisation-centric perspective approach in trying to establish the factors which influenced the adoption of technology by salespeople in the retail sector. The study made use of primary data which was collected through nine qualitative semi-structured thematic interviews conducted in 6 Finnish retail firms.

The study used content analysis to analyse the collected qualitative data obtained through the interviews. As part of its methodology, the study also made use of secondary data which comprised articles, public documents, and press releases regarding retailers. Kerava (2017) used the secondary data to validate the research questions as well as to give a description of the research context. The study found that perceived ease of use as well as the ease of doing business influenced the adoption of technology. The issue of competition and gaining competitive advantage also influenced the adoption of technology by salespeople in the retail sector.

Basarir-Ozel and Mardikyan (2017) noted that technology adoption was on the rise and a number of factors were influencing this surge among salespeople. In their study they sought to establish the factors which influenced the adoption of technology. They found that perceived usefulness, trust, and perceived ease of use were the main factors which influenced the adoption of technology by salespeople. Basarir-Ozel and Mardikyan (2017) used the TAM research model as framework for their study.

Ratanapoophun and Lee (2010) investigated the factors that influence the adoption of technology in Thailand banks by their sales personnel. They developed a questionnaire survey that was carried out to measure the influence of the various factors that impacted technology adoption. Data was obtained from 600 employees inclusive of executives, middle managers, and operating employees of the banks in Thai Bangkok area. Out of 600 questionnaires sent to the respondents, 416 were returned, giving a 70% response

rate. The findings indicated that the environment influences the adoption of technology in the banking industry.

Dhewanto, Lestari, Heliana, Aliya and Lawiyah (2018) examined the determinants which influenced the adoption of technology amongst salespeople in Indonesia. The study focused on the small to medium enterprises sector which were increasing from year to year. These businesses were adopting information technology and e-commerce for their salespeople. Survival and competition were the driving factors that had led to the adoption of technology. Dhewanto et al. (2018) used external and internal interviews to obtain data regarding the factors influencing the adoption of technology. This study carried out its analysis by comparing and contrasting 6 small to medium enterprises in South Bandung in a cluster that have same of types of products. The study found that market forces, competition, and perceived ease of use influenced the adoption of technology by the salesperson.

2.6 Conceptual Framework

Based on the literature discussed in the preceding section, the following conceptual framework and subsequent hypotheses were formulated regarding factors which influence the adoption of technology by sales representatives in Figure 2.1

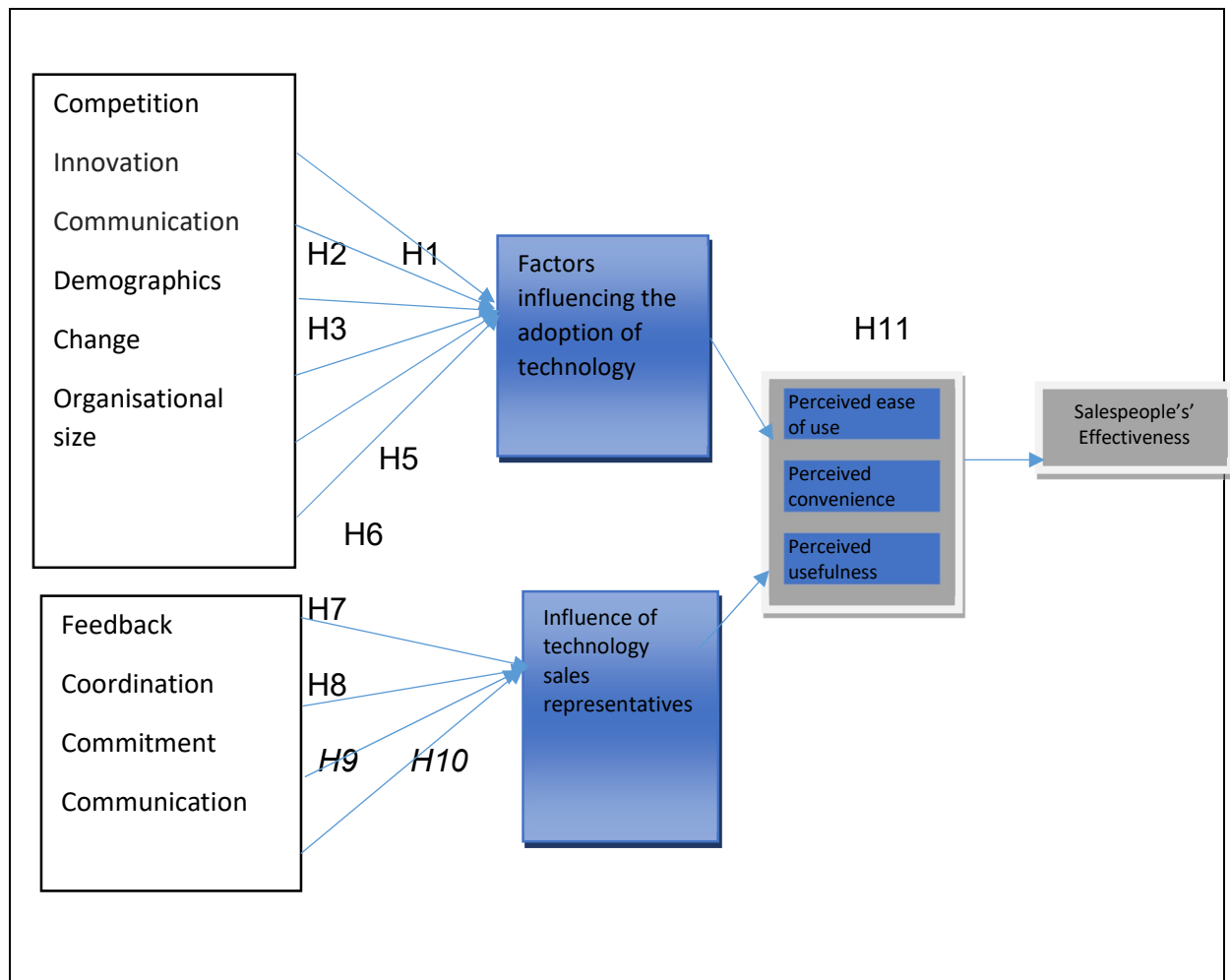


Figure 2.1 Conceptual Framework

Source: Own construct

2.6.1 Hypothesis

H1: Competition positively influences the adoption of technology by salespeople

H2: Innovation positively influences the adoption of technology by salespeople

H3: Communication positively influences the adoption of technology by salespeople

H4: Demographics positively influences the adoption of technology by salespeople

H5: Change positively influences the adoption of technology by salespeople

H6: Organisational size influences the adoption of technology by salespeople

2.6.2 The Influence of technology adoption on sales representatives' performance in the pharmaceutical industry

Talukder and Jan (2017) examined the influence of the adoption of technology on sales representatives in Bangladesh within the communication sector, where technology had become the medium most widely used by sales representatives. The study found that technology failed to provide job satisfaction to the sales representatives, which caused poor sales on the part of the organisations. The study also found that technology adoption influenced extrinsic and intrinsic motivation as well as organisational commitment. These are the factors that typically motivate sales representatives to work diligently and put more effort into carrying out their duties. Motivation is a significant factor in any sector of labour and commerce, including the pharmaceutical sector. Since the study by Talukder and Jan (2017) was undertaken in the communication sector and its findings cannot be generalized to any other sector, the current study seeks to look at the influence of technology adoption on the performance of sales representatives in the pharmaceutical sector.

In a study which was similar to that of Talukder and Jan (2017) in that it involved the sector of telecommunications, Magandini and Ngwenya (2015) examined the performance of sales representatives in Zimbabwe. According to Magandini and Ngwenya (2015), there are several reasons why some salespeople succeed while others fail. The study found that self-efficacy, internal locus of control, and a proactive personality influence how salespeople work with their clients. The study by Magandini and Ngwenya (2015) made use of secondary data, obtained from reports and customers' feedback, as well as primary data obtained through interviews, questionnaires, and personality testing. Although the study did not target technology adoption as such, it is conceivable that the personality traits that enhance the likelihood of good of relationships between salespeople

and the clients that they serve could also influence the way in which they adopt the use of technology for the purpose of serving their clients. This prompts further research to cover the existing gap in knowledge by taking a similar study within the pharmaceutical sector of South Africa. The study will further make use of the same research philosophy, namely, an interpretive research philosophy.

Serdaroglu (2009) sought to investigate how the adoption of technology through sales forces automation influenced salesperson performance. The study aimed at exploring how technology investments influence business value through salesperson performance in a world largely dominated by the use of technology. The quantitative study was conducted within the pharmaceutical industry. The study employed survey methods of data collection and observation to complement the experimental research design. The study found that the adoption of technology is vital for increasing sales for the pharmaceutical industry. The results indicated that technology adoption by salespeople facilitates commitment which is a strong motivator to work as hard as possible for the organisation. Serdaroglu (2009) found that the adoption of technology helps to manage internal administrative tasks as well as relationships with customers. The adoption of technology is described as a customer relationship enhancement tool, since customers are in favour of the adoption of technology. In addition, technology is a cost cutting tool for organisations within the pharmaceutical industry. The study by Serdaroglu (2009) made use of observations as a source of data collection but did not give any particulars on how it was done.

Agnihotri, Dingus and Krush (2016) hypothesised that the adoption of technology by sales representatives influences customer satisfaction. They point out that social media as a component of technology has changed how sellers and buyers interact with each other. The study made use of salesperson data which was reported within the context of B2B and made use of a structural equation model. The study found that the adoption of technology had opened channels of communication between the salespeople and customers which yielded responsiveness as well as customer satisfaction. Furthermore,

the results suggested that technology plays a vital role in disseminating information to clients, but as an antecedent which enhances salesperson's behaviours to increase client satisfaction.

Christ and Anderson (2011) in their study sought to ascertain the influence of technology on the roles of sales people due to the glaring gap which was existing in literature regarding this subject. The study traced the adoption of technology by salespeople through data which was obtained from a review of works which had been published for a 130-year period time frame. The study data was also cited from historical publications. The study by Christ and Anderson (2011) found out that adopting technology by salespersons instilled commitment and loyalty amongst the salespeople whilst on the other hand the adoption of technology caused some employees to lose their jobs and created some form of insecurity which led to demotivation amongst sales personnel. The study also found that the adoption of technology led to innovation and creativity by the salespeople, which in turn generated considerable revenue. In a sense the adoption of technology also impacted skills and knowledge amongst salespeople, who now had a sense of belonging and commitment, while customer engagement had changed drastically.

Basir, Ahmad and Kitchen (2010) sought to establish the relationship between the adoption of technology and salesperson performance in Malaysia. The study objective was to get an understanding of the influence that technology had on the skills of salespeople in the telecommunication industry. The study involved 270 respondents and made use of an internet-based survey questionnaire to elicit data from the. The study findings showed that technology had enhanced the performance of salespeople because it had helped foster interpersonal skills. The study results revealed that the adoption of technology was vital in obtaining customer feedback, which could enhance their satisfaction and meet their needs and demands.

The adoption of technology by salespeople made transactions easy as well as faster than ever before, which yielded customer satisfaction. The study by Basir et al. (2010) gave respondents limited time to respond to the survey. This may have impaired their judgment as they may have ended up rushing to respond to the questionnaire and this may have compromised the credibility of the findings. The current study seeks to give more time to the respondents, with a response time of more than four weeks.

Ural (2008) argued that the adoption of technology facilitates job satisfaction on the part of salespeople. His study had a narrow focus on the theoretical models that served as job inhibitors regarding satisfaction of salespeople. The study found that the adoption of technology influences motivation and satisfaction amongst salespeople, which tend to generate value to clients. The adoption of technology led to job satisfaction to the sales representative and at the same time to customer satisfaction, which boosted the performance of the organisation. The adoption of technology was also found to lead to a sustainable competitive advantage. The adoption of the technology enabled the salespeople to facilitate communication with each other and improve coordination. Poor communication and coordination had been a cause of poor performance by the salespeople.

Basir, Ahmad and Kitchen (2010) sought to establish the relationship between the adoption of technology and salesperson performance in Malaysia. The study was carried out in the Malaysian telecommunication corporation. The study made use of judgmental sampling to select 114 sales supervisors, and found that the adoption of technology impacts technical and marketing skills but not the sales representatives' performance. This is in contrast with the findings of other studies. The study also found that the adoption of technology facilitates organisational commitment by the salespeople, which in turn yields customer satisfaction. Basir, Ahmad and Kitchen (2010) argued that once there is organisational commitment on the part of salespeople, they will be determined to please their clients and generate revenue for the organisation.

Ul Zia and Akram (2016) examined the influence that adoption of technology had on salespeople's performance within the Dairy industry in Kuwait. The study found that the adoption of technology yields customer satisfaction because of the convenience it brings to many clients in Kuwait. The sample size of the study was 500 retailers who were within the city of Lahore and the study made use of a convenient sampling technique to choose them. The study was qualitative and made use of open-ended survey questions as the tool for data collection from 391 participants. The adoption of technology by the salespeople resonated well with the customers and hence there was an increasing number of transactions taking place online. The adoption of technology was saving costs for the salespeople as well as the customers and led to customer satisfaction.

Based on the literature reviewed in section 2.5.1, the following hypotheses are formulated regarding the influence of technology on sales representatives.

H7: Feedback impacts positively on the adoption of technology by salespeople

H8: Coordination impacts positively on the adoption of technology by salespeople

H9: Commitment to work impacts positively on technology adoption by salespeople

H10: Communication impacts positively on technology adoption by salespeople

2.6.2 Antecedents to the factors influencing sales representatives' intention to adopt technology usage in the pharmaceuticals sector

According to Zahid and Haji Din (2019), trust, attitude, subjective norms, and perceived behavioural control are antecedents to the factors which influence the adoption of technology by sales representatives. The study by Zahid and Haji Din (2019) was carried out within the academic industry where e-government was being considered as a tool which could be valuable for the delivery of substantial and timely services to the public.

The study found that attitudes of trust and subjective norms were antecedents influencing sales representative adoption of technology. Perceived risk and facilitating conditions were found to have insignificant influence. The study by Zahid and Haji Din (2019) made use of SEM software to analyse the data. SEM is an outdated analytical tool which has been proven to provide misleading data. The use of this software to analyse data may have comprised the results of the study.

Sathye, Prasad, Sharma and Sathye (2018) investigated the antecedents to the factors influencing the adoption of technology amongst sales representatives within the mobile sector in Fiji. The study reported that perceived usefulness and perceived ease of use are the antecedents that influenced the adoption of technology. Perceived usefulness was identified as an antecedent which has a direct influence on the sales representatives' adoption of technology. Sathye et al. (2018) report that this antecedent ensures a positive attitude towards adopting mobile banking. The study had shortcomings regarding its methodology. The main instrument for data collection was interviews but Stata 11.0 was used to analyse data. Stata 11.0 is an analytical tool for quantitative data and hence the study should not have employed the tool. Appropriate use of statistics is essential for credible research. Furthermore, the study respondents were 75 out of a target population of 522 respondents. It is possible that the sample size was not reflective of the total population under study.

Mourad and Hussein (2018) examined the antecedents of factors which influenced the adoption of technology by sales representatives within the higher education sector. The study focused on the adoption of technology by students in sales representatives roles. The

study developed a model which was premised on the resource based theory to find out the antecedents to factors which were influencing the intention to adopt technology usage. Mourad and Hussein (2018) collected data from a convenient sample drawn from three universities with 300 questionnaires being distributed. The study found that perceived ease of use and organisational culture were antecedents to factors that influenced the adoption of technology by salespeople.

Brandon-Jones and Kauppi (2018) examined the antecedents that influenced the adoption of the technology acceptance model within e-procurement salespeople. The study examined the key antecedents of the technology acceptance model (TAM) at an individual level for employees expected to use technology in their day-to-day activities. The study made use of survey data which was collected from 139 salespeople within e-procurement in Netherlands. It was found that perceived use, professionalism, and usability were the antecedents which influenced the adoption of technology by the salespeople. Alshare, Grandon and Miller (2000) as cited in Qasim and Shanab (2016) also investigated the antecedents that influenced the usage of technology by salespeople. The study found that attitudes, perceived ease of use, and perceived usefulness were antecedents which influenced the adoption of technology by salespeople. Both studies arrived at the same conclusion, namely, that perceived use, usability, and professionalism were the main antecedents. The study made use of data collected from 166 respondents and quantitative tools were employed to analyse the data. Both of the studies, by Brandon-Jones and Kauppi (2018) and Alshare, Grandon and Miller (2000) as cited in Qasim and Shanab (2016), were quantitative in nature and made no use of qualitative data which could have given a more comprehensive set of results.

Chau, Lam, Cheung, Tso, Flint, Broom and Lee (2019) explored the antecedents influencing sales representatives' intention to adopt usage of wearable technology within the health sector. The researchers recognised that technological advancement has led to an increase in people using and responding to wearable technology. The study was cross sectional, used a self-administered online survey, and included 1717 respondents. The study by Chau et al. (2019) found that perceived convenience, perceived irreplaceability, and perceived use were the antecedents that influence the adoption of technology.

The following Hypothesis were developed following the review of literature.

H11: Perceived ease of use impacts positively on the intent to adopt technology

H12: Perceived convenience impacts positively on the intent to adopt technology

H13: Perceived usefulness impacts positively on the intent to adopt technology

2.7 Chapter Summary

This chapter evaluated both theoretical and empirical literature on technology adoption and its influence on sales representatives in the pharmaceutical and other industries in South Africa and the rest of the world. The purpose of the evaluation is to analyse the theories used and identify the research gap in the published research. The theories and empirical studies will assist in providing an applicable framework for the study. The central theories were the technology acceptance theory (or TAM), alongside the unified theory of acceptance and use of technology (UTAUT). From the review, it is noted that the adoption of technology has a positive impact on cost, service delivery, and organisational growth. No local studies have been carried out to analyse the impact of technology adoption and its influence on sales representatives in the pharmaceutical industry in South Africa. These gaps provide a background for analysing the topic and enables the conceptualization of the research variable. The next chapter presents the research methodology adopted for the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

A number of scholars have described research methodology as being well-structured and systematically coordinated. They posit that it is a well-designed foundation, a set of principles and ideas that inform the design of a research study and determine the way of collecting and analysing data. It acts as the funnel that directs the research to the study findings (Kumar, 2019; Kothari, 2004; Mackey & Gass, 2015; Noor, 2008). This chapter details the research methodology of the study, that is, the research philosophy, followed by the research approach and the research design underpinning the study. The chapter previews the research population, sampling, and its procedures. The chapter also highlights the sources of data and how data will be analysed and presented. It outlines how reliability and validity will be ensured. A summary is given at the end of the chapter detailing the key aspects of the research methodology which the study employed.

3.1 Research Philosophy

According to Creswell and Poth (2016), the world view of the researcher determines the philosophical thinking of the researcher when carrying out a study. The research paradigm is defined as a set of principles and contingent beliefs that shapes the outlook of the researcher and the researcher's manner of conducting research (Mertens, 2014). Saunders, Lewis and Thornhill (2016) point out that the research philosophy determines how the researcher chooses from available options on how to carry out a study, collect and analyse data for a particular study, validating a school of thought which other scholars have expressed (Saunders, Lewis & Thornhill, 2016; Mkansi & Acheampong, 2012). The current study adopted the positivism research paradigm.

3.1.2 The Positivism research philosophy

The positivism research philosophy encapsulates the worldview of the researcher which advocates that factual knowledge is primarily gained through observations (Bunniss & Kelly, 2010). The positivism research philosophy is anchored in the worldview that knowledge is generated by following a set of rules as well as procedures. The study adopted the positivism research philosophy because the study was mainly quantitative in nature and the study objectives were quantitative in nature. The instrument for data collection was structured, and this was in accord with the positivism research philosophy because it collected quantitative data. This research philosophy was adopted because it provided the scope for accurate inferencing regarding the subject under study rather than conjecture. The positivism research philosophy advocates the collection of statistical data, which was regarded as imperative for making accurate deductions regarding technology adoption by sales representatives.

3.1.3 Ontology of the positivism research philosophy

Ontology tries to answer or refers to what constitutes reality within the study (DeForge & Shaw, 2012). The positivist ontology believes that there is a single objective reality to any research phenomenon or situation regardless of the researcher's perspective or belief. It therefore follows that within the context of this study the topic of technology adoption by sales representatives referred to a real situation. The researcher was cognisant of the reality that technology has been adopted and that this is evidenced by the reality within the pharmaceutical industry. Moreover, the use of technology has provided results, whether good or bad, so that technology has ceased to be an assumption and is a reality which confronts the word of trade.

3.1.4 Epistemology of the positivism research philosophy

Epistemology refers to what constitutes knowledge, and how knowledge is created, is arrived at and how the truth can be differentiated (Hothersall, 2019; Östman & Wickman, 2014). Epistemology under the positivism research philosophy assumes that only facts derived from the scientific method can make legitimate knowledge claims, and is therefore constructed using systematic procedures and validated using reliable statistical tools (Aliyu, Singhry, Adamu & Abubakar, 2015). For this study, the adoption of technology and its use by salespeople within the pharmaceutical industry constituted data that gave the researcher what can be referred to as knowledge. The subsequently lived reality of its usage by other stakeholders in interaction with salespeople, is the reality of the epistemology stance taken within the context of this study. The study obtained its knowledge through reported knowledge regarding the feelings that salespeople experience and come across in the usage of technology. Moreover, the study made use of knowledge extracted from secondary data sources and also made use of logical processes to create new knowledge based on the study findings.

3.1.5 Axiology of the positivism research philosophy

Axiology looks at the values of the researcher in understanding reality (Östman & Wickman, 2014). The axiology of the study principally refers to the influence of the values that the researcher has on how reality is construed, how the study will progress and will subsequently finish to its logical conclusion (Biddle & Schafft, 2015; Morgan, 2007). Within the positivism philosophy, the axiological question is: How can the researcher go about finding out whatever he or she believes can be known? For this study, the researcher wanted to find out what can be known about the adoption of technology by salespeople within the pharmaceutical industry. The way to obtain the desired knowledge was to ask questions of the salespeople by means of a questionnaire and through interviews, as well as to consult publications reporting on sales performance in recent years.

3.2 Research design

According to Creswell and Poth (2016), the term research design refers to a plan or blueprint which connects the problem under study to empirical research. The research design prescribes the type of data required by a study, which sort of methods can be employed to collect the required data, and the tools required to analyse the data to answer the research question (Maxwell, 2012; Groenewald, 2004; Bordens & Abbot, 2002). A research design has also been described as a strategic framework that facilitates the formulation of the study problem and the subsequent steps of how to conduct the research (Myers, Well & Lorch, 2010; Durrheim, 2004; MacMillan & Schumacher, 2001). In other words, the research design guides the researcher in choosing subjects, sites of research, and procedures of data collection to obtain the results sought from the study. There are mainly four types of research design namely explanatory, descriptive, experimental, and explorative research design. However, not all designs are suited all research methods. Mixed methods research, which was used in the current study, combines qualitative and quantitative forms. The two research designs typically employed to give effect to a mixed-method design are sequential and embedded designs (Saunders, Lewis, Thornhill & Bristow, 2015). The study in hand employed a sequential explanatory design consisting of a quantitative phase followed by a qualitative phase.

3.2.1 Descriptive research design

Descriptive research design and data analysis will be used to investigate the subject. The study adopted this descriptive research design, given that the study was predicated on the positivism research philosophy. The study adopted this research design because it gathered quantitative data regarding the adoption of sales technology, but also rich data reflective of the participants' opinions regarding technology adoption. It provided methodological flexibility given that the study was carried out in a COVID-19 environment.

3.3 Study population, sampling, and sampling techniques

This section highlights the study population, the sampling size as well as the sampling techniques that were used to select the study elements.

3.3.1 Population of the study

According to Maxwell (2012), the study population denotes objects and individuals who have an underlying characteristic or attribute that is of relevance to the researcher or in essence meets a particular and specified criterion. The population of the study refers to humans in their different capacities, be it individuals, groups, or occupation, having something of interest to the researcher (Kothari, 2004). Further, a study population has been described as referring to objects, organisations, or people who offer substantial input about the area under research (Saunders et al., 2015). There are two types of population namely the target population from which the study draws its respondents, and the sample population which consists of the respondents employed to carry out research (Bernard, 2017). The study population in the current study comprised all the pharmaceutical manufacturers, wholesalers, and retailers in South Africa. The Pharmaceutical Society of South Africa (2019) indicated that there are slightly over 3000 dealers in South Africa which are made of, 30 local manufacturers, 700 wholesalers, and more than 2,700 retailers. These pharmaceutical dealers' sales representatives will constitute the study population. The study population comprised 500 participants who were sales representatives. The 500 sales representatives/participants were based on the access the researcher had when collecting data as well as informed by Covid-19 regulations which impacted travel of the researcher to collect data.

3.3.2 Sample size determination of the study

The sample size of the study refers to the subset of the study population. It is a statistical measure of elements which has been drawn from a particular study population for purposes of data collection (Saunders et al., 2015). A sample is determined to be employed in a study where it is not possible to gather data from all the study elements, therefore the sample becomes representative of the study population. The study identified sales representatives of various pharmaceutical companies to get a diverse and rich opinion regarding the influence of technology and its subsequent influence on their performance. The study employed the Krejcie and Morgan (1970) model to determine the

appropriate sample size. The study's sample comprised 217 sales representatives/participants. Due to covid restrictions other sales representatives did not have Wi-Fi

connectivity. The Krejcie and Morgan (1970) model is provided in Table 3.2.

Table 3.2: The Krejcie and Morgan (1970) model

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Source: Krejcie & Morgan, 1970

Source:

3.4 Sampling techniques

They are two types of sampling techniques in research namely probability and non-probability sampling techniques (Stehman, 2014). This study adopted the simple random sampling technique which is a probability sampling technique to select the sales representatives.

3.4.1 Justification of the simple random sampling technique

According to Kothari (2004), the simple random technique is a technique of sampling which ensures that every item within the population has an equal and even chance of being chosen so as to minimise bias. The study employed the manual lottery method to generate the sample size. Making use of the lottery method, the researcher assigned

numbers to the target population and randomly selected those who had been assigned an odd number. The study adopted the use of random sampling technique because it has higher chances of accuracy and it is easy to use. The technique does not group participants into clusters, which was important because the study participants all were deemed to have homogenous characteristics.

3.4.2 Sampling Error

Taherdoost (2016) highlighted that a plethora of errors can occur and the researcher must safeguard against or minimize this eventuality given that it can impact the study findings. The study may end up with a sample size that is not reflective of the study population size. The study employed the Krejcie and Morgan (1970) model which has already pre-calculated sample sizes to avoid any sampling error which may have arisen as a result of calculations.

3.5 Sources of Data

Saunders et al. (2015) mention two sources of data namely a primary data source and a secondary data source. The study employed both primary and secondary data sources. Primary sources of data employ tools that gather data directly from the elements of the study at first hand, while secondary data is gathered from already processed information that has been stored (Blumberg, Cooper & Schindler, 2014). The study employed closed-ended questionnaires as well as conducted interviews for primary data, and made use of textbooks, reports, journals, and statistical reports from the past three years regarding sales performance for secondary data.

3.5.1 Questionnaire Development

The study employed a closed-ended research instrument to collect quantitative data for the study. According to Kothari (2004), there are four types of closed-ended questionnaires namely the Likert/scalar type where the respondent is pre-given choices

to select, the ordered type, the unordered type, and partial closed-ended questionnaires. These types of closed-ended questionnaires can be consolidated in one questionnaire. The types can be arranged in sections or can be distributed evenly (Gouldthorpe & Israel, 2014). A study of the available literature guided the development of the study's questionnaire, and some pre-validated multiple indicators were identified for the factors that influenced the adoption of technology. The questionnaire was designed and divided into sections with demographics being the first section or construct. The ease of technology was the second construct which was formulated using the Technology Acceptance Model. The third construct in the questionnaire was the facilitation conditions of technology access and was formulated using existing literature regarding technology adoption. The other constructs in the questionnaire were personal innovativeness, trust, behavioural intention, trust, social influence, and attitude, which were formulated using the research instrument adopted by Munyasi (2016) in a similar study and supported by the Technology Acceptance Model literature. The last construct, which was performance expectancy, was conceptualized using the Unified Theory of Acceptance and Use of Technology (UTAUT).

The study employed the five-point Likert scale ranging from 'strongly agree' to 'strongly disagree' to quantify the multiple responses where respondents were mandated to tick one answer. The questionnaire was underpinned by the research variables which formulated the research objectives of the study. The closed-ended technique was used because it is easy and does not take much time for the respondents. Furthermore, the collected data is easy to code and analyse given that there are predefined responses (Kumar, 2019). The study employed Likert /scalar type closed-ended questionnaires to gather data from the respondents because it needed purely quantitative data to correspond with the research paradigm and the research philosophy. The Likert scale for the research instrument is provided in Table 3.1. The last part of the questionnaire looks at the performance indices.

Table 3.1 Likert scale of the closed-ended questionnaire

Response	Strongly agree	agree	neutral	disagree	Strongly disagree
Point	5	4	3	2	1

Source: Own construct

3.6 Reliability and Validity

3.6.1 Reliability

The ability of research instruments to produce consistent results if employed within similar conditions is referred to as reliability. Reliability is a measure of consistency that acts to prevent research instruments from providing biased data. Reliability can also be termed precision. There are two types of reliability namely internal and external consistency (Noble & Smith, 2015; Leung, 2015; Heale & Twycross, 2015). Descriptive and inferential statistical analyses will be used in this research. The study adopted the Cronbach Alpha coefficient to test for the internal consistency of the research instrument. A Cronbach alpha value above 0.70 is considered very good reliability, a value above 0.50 is considered good while on the other hand any Cronbach alpha value below 0.50 is considered to be unreliable or an indication that the instrument collected data under different conditions (Noble & Smith, 2015). The study also used split half correlation to test for the internal consistency of the research instrument.

3.6.2 Validity

According to Noble and Smith (2015), validity is one of the key forms of assessment whether a research instrument is accurate or trustworthy. The ability of the research instrument to measure what it is intended to measure is principally referred to as validity. There are four types of validity namely construct validity, criterion validity, face validity, and content validity (Noble & Smith, 2015). Construct validity principally refers to whether

the data instrument is collecting what it was intended to collect, while criterion validity refers to how the study results agree with a standing measure of set standards (Leung, 2015). Face validity focuses on the suitability of the content while content validity looks at whether the instruments are indeed representative of all aspects under study (Roberts & Priest, 2006; Franklin & Ballan, 2001). Kumar (2019) highlights that validity cannot be adequately summarised by a numerical value but rather as a matter of degree, ranging from weak to strong . The researcher undertook a pilot study to ascertain the content validity of the study. The closed-ended questionnaires were administered to 20 respondents who were part of the total population and their responses were observed and recorded. Some aspects which were resulting in outliers were altered, and the researcher ensured that interviewees were not respondents within the study.

3.7 Data analysis and Presentation

The process of data analysis is the heart of any particular study. It is a process that revolves around analysing data that has been gathered by the researcher using the data collection instruments. The process involves making interpretations to lead up to the subsequent conclusions of the study (Saunders et al., 2015). The study employed the Statistical Package for Social Science software (SPSS) Version 26 to analyse quantitative data. Version 26 was used as it was the latest edition of the software available at the time of data analysis. The study presents the results of the analysed data in descriptive tables to facilitate easy interpretation. The proposed hypotheses were statistically tested, while qualitative data was sorted into related categories and subsets based on specified themes. Patterns of responses were coded and grouped in terms of relatedness.

3.8 Ethical Considerations

Ethics in research principally refers to the application of and adherence to the principles of morality when researching, conforming to established rules, procedures, and norms. Ethical practice in carrying out research is highly regarded by scholars (Resnik, 2015). The study ensured that there was autonomy in the participation of the respondents in the

research process. The study asked respondents to participate voluntarily without any incentives being offered, through informed consent. The element of informed consent entails that the research participants should be fully appraised of what will be asked, how the data collected from them will be utilised, and what the consequences could be (Resnik, 2015). The researcher ensured that there was no conflict of interest. The participants were accorded their rights and their identity was kept under guard. The researcher took steps such as ensuring that respondents did not write their names on the questionnaires. Further, the study did not disclose the data for any other purposes except for the intended study. The study acknowledged all work used in this study using the APA referencing system.

3.9 Chapter Summary

The study employed pragmatism as a research paradigm and adopted a mixed-methods approach, using the explanatory sequential mixed methods research design. The study made use of the Krejcie and Morgan (1970) model to determine the sample size of the study. Both probability and non-probability sampling methods were used to select the study participants. The study made use of both primary and secondary sources of data, with closed-ended questionnaires and interviews as the main instruments of data collection. The study employed SPSS to analyse quantitative data and content analysis to analyse qualitative data. Ethical considerations were upheld. The next chapter covers data analysis and presentation.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND DISCUSSION

4.0 Introduction

This chapter of the study presents the data which was gathered using a structured questionnaire regarding technology adoption by salespeople within the pharmaceutical industry. The data is analysed with the aid of SPSSV23 and its subsequent inference tools, and all the analysed data is presented in tables. Kumar (2019) posits that the answer to any research question is anchored within the gathered data. The study is purely quantitative, which is compatible with the Positivism research philosophy as well as the use of descriptive research design. The study demographics, response rate as well as reliability of results are discussed in this chapter. The data analysis was driven by the study objectives which were namely:

1. Determine factors influencing technology adoption by salespeople in the pharmaceutical industry in South Africa
2. Establish the influence of technology adoption on the performance of salespeople in the pharmaceutical industry in South Africa
3. Establish the antecedents to the factors influencing sales representatives' intention to adopt technology usage in the pharmaceuticals sector in South Africa.

4.1 Response rate

A total of 217 structured questionnaires were distributed to the study respondents to gather data. The structured questionnaire was the sole data collection instrument and the response rate is provided in Table 4.1.

Table 4.1: Response rate of the study

	Frequency	Percent	Valid Percent
Unreturned questionnaires	43	19.8	19.8
Returned questionnaires	174	80.2	80.2
Total questionnaires	217	100.0	100.0

Source: Primary Data, 2020.

As depicted in Table 4.1, a total of 217 questionnaires were distributed to the respondents. Of these, 174 were returned while 43 of the questionnaires were not returned. This meant that the response rate was 80.2%. A total of 19.8% of the respondents did not return their questionnaires, possibly because of lack of interest in the research or other unforeseen reasons. Abowitz and Toole (2010) in their scholarly work posit that any response rate above 60% is deemed representative of the population under study. The study's 80% response rate surpasses that threshold and therefore the collected data can be deemed representative for analytical purposes.

4.2 Respondent Demographics

The study gathered demographic data regarding the gender, age, level of education as well as the length of service of respondents.

4.2.1 Respondent Gender

The study gathered the gender demographic of the respondents to ascertain if gender affected salespeople's performance as a result of technology adoption. The results are presented in Table 4.2.

Table 4.2: Gender of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	105	60.3	60.3	60.3
Female	69	39.7	39.7	100.0
Total	174	100.0	100.0	

Source: Primary Data, 2020.

Table 4.2 shows that 60.3% of the respondents were male while 39.7% were female. The fact that the majority of the respondents were males may indicate that the occupation is dominated by. Heilman (2012) postulated that before technology was adopted, women were discriminated against with regard to employment opportunities, which may explain the gender distribution to some extent.

4.2.2 Education level of the respondents

The study gathered data regarding the level of education of the salespeople and the results are presented in Table 4.3.

Table 4.3: Level of Education

	Frequency	Percent	Valid Percent	Cumulative Percent
Matric	51	29.3	29.3	29.3
Diploma	74	42.5	42.5	71.8
Bachelor's degree	42	24.1	24.1	96.0
Master's degree	7	4.0	4.0	100.0
Total	174	100.0	100.0	

Source: Primary Data, 2020.

A total of 29.3% of the respondents had a matric qualification while a total of 42.5% had a diploma qualification, as depicted above. A total of 24.1% of the respondents had a

bachelor's degree while 4.0% of the respondents had a master's degree. The results indicate that while the majority of the respondents had a diploma, every respondent had a qualification of some kind that would qualify them to give an opinion regarding the study in question. The use of technology requires an individual who can comprehend information, and this explains why the academic level displayed by the sample of respondents may reflect the criteria for being hired. However, in most cases those with degrees were employed as sales supervisors, while those with lower qualifications were sales representatives. The results therefore reveal that the pharmaceutical industry represents a group of learning organisations, a school of sorts, as alluded to by Senge (1995).

4.2.3 Age of the respondents

The study sought to ascertain whether the age of the respondents had any relationship with technology adoption. The findings regarding the age of the respondents are presented in Table 4.4.

Table 4.4: Age of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Below 25 years	62	35.6	35.6	35.6
25-35 years	65	37.4	37.4	73.0
36-44 years	25	14.4	14.4	87.4
Above 45 years	22	12.6	12.6	100.0
Total	174	100.0	100.0	

Source: Primary Data, 2020.

As depicted in Table 4.4, a total of 35.6% of the respondents were below the age of 25 years while those within the age group of 25-35 years constituted 37.4%. A total of 14.4% were those within the age group of 36-44 years while those above 45 years constituted 12.6%. The results indicate that the youths (age below 35 years) are dominant within the

salesperson job and this is possibly because the job requires individuals who are technology enthusiasts and are able to fit in with the dynamic use of technology. The results support assertions in literature by Hynan, Murray and Goldbart (2014) that young people are eager to work within organisations which have adopted technology. This narrative appears to be confirmed by the study results.

4.2.4 Length of Service

The study sought to establish the length of time the respondents had been working within the pharmaceutical sector. The findings are depicted in Table 4.5.

Table 4.5 Length of Service

Time employed	Frequency	Percent	Valid Percent	Cumulative Percent
Less than 2 years	48	27.6	27.6	27.6
2- 5 years	65	37.4	37.4	64.9
6-10 years	27	15.5	15.5	80.5
11-15 years	16	9.2	9.2	89.7
Above 16 years	18	10.3	10.3	100.0
Total	174	100.0	100.0	

Source: Primary Data, 2020.

The results reveal that just over 35% of the respondents had been employed in the sector for more than five years and should therefore have sound knowledge regarding technology adoption and sales performance. The results further suggest that the sector is good at retaining employees, or perhaps technology adoption has been a factor which has motivated the stay of employees, which would support the argument of Guha and Chakrabarti (2016) that technology adoption would lead to employee motivation.

4.3 Reliability Statistics

The study employed the use of the Cronbach Alpha coefficient to ascertain the reliability of the study instruments which gathered the quantitative data. According to Creswell and Poth (2016), reliability is the ability of the research instrument to reproduce data if undertaken under similar conditions. The study reliability results are given in Table 4.6.

Table 4.6: Reliability Statistics

Constructs	Sample size	Number of Items	Cronbach's alpha
Competition	174	4	.786
Innovation	174	4	.774
Communication	174	4	.821
Demographics	174	5	.754
Change dynamics	174	4	.724
Organisational size	174	4	.741
Feedback	174	4	.712
Coordination	174	4	.732
Commitment	174	4	.841
Communication	174	4	.745
Perceived ease of use	174	4	.763
Perceived convenience	174	4	.712
Perceived usefulness	174	4	.715

Source: Primary Data, 2020

All the constructs Cronbach alpha coefficient were above 0.7, implying that the results are reliable and acceptable, there was internal consistency. The results further suggest that the research instrument collected data within similar conditions and was reproducing consistent results as a good instrument should do (Creswell & Poth, 2016). Further, Creswell and Poth (2016) highlight that a good reliability coefficient should be above 0.7. All of the study constructs surpass that 0.7 threshold, thus the research instrument was reliable and the data collected can be deemed valid and reliable for analysis.

4.4 Factors influencing technology adoption

The study sought to establish factors influencing technology adoption by salespeople in the pharmaceutical industry in South Africa. The study established various factors and a confirmatory factor analysis was run for various components established from the study.

The research model had six variables of interest under study, namely, completion, innovation, demographics, changed dynamics, organisational size, and communication. Each variable was further sub-divided into various components of measurement as given under each discussion. Confirmatory Factor Analysis (CFA) was used to test for validity of the constructs adopted to measure the variables. CFA confirms if a number of factors used to test a model best fit (Williams, Brown & Onsman, 2012). The constructs and the items developed for the completion variable were adapted from the UTAM model whilst those for innovation were adapted from Roger's Diffusion of Innovation theory (Moen et al., 2018). The constructs for demographics were extracted from the work of Heilman (2012), change dynamics variables were adopted from Fujimoto et al. (2016), and organisational size items were obtained from Palacios et al. (2015). Lastly, communication variables were adopted from Borhani (2016). It was necessary to confirm if they best fit the model to explain the relationship between them. However, Tabachnick and Fidell (2007) recommend some preliminary tests to be conducted to confirm suitability of the data for factor analysis before applying CFA. The preliminary tests include ensuring that sample cases are above 150, the strength of correlations amongst items is greater than .3, the Bartlett's Test of Sphericity (BTS) must be significant at $\alpha < .05$ and the Kaiser-Meyer-Olkin (KMO) be greater than 0.6 or more (Pallant, 2020). Suitability of data for CFA

for the current study was, therefore, assessed based on the criteria stated above. The study sample cases were 174 and analysis of the correlation matrix revealed the presence of coefficients of 0.3 and above.

Confirmatory factor analysis is the measure of validity in a quantitative study, that is, the ability of the research instrument to measure what it is intended to measure (Borhani, 2016). The study dropped the item which had a factor loading below 1. All the items which had a factor loading above 1 were then used to ascertain reliability and inference validity of the entire data set collected by the study.

4.4.1 Confirmatory factor analysis of the Competition factor

Factor analysis was run for components in the competition factor. Results are depicted in Table 4.7.

Table 4.7: Confirmatory factor analysis of the Competition factor

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.357	27.140	27.140	1.343	26.860	26.860
2	1.178	23.560	50.700	1.164	23.280	50.140
3	1.036	20.720	71.420	1.022	20.440	70.580
4	1.023	20.460	91.880	1.009	20.180	90.760
5	.406	8.120	100.000			

Extraction Method: Principal Component Analysis.

The actual components extracted from the competition factor are shown in Table 4.7. Component 1 to 4 had initial Eigen values above 1 and factor loadings above 1 (component was valid as evidenced by Eigen values above 1). The study Likert scale variable of measure had 5 questions. This shows that 4 of the 5 components were valid. Component 5 was dropped, as recommended by Greenbaum and Overton (2020).

4.4.2 Factor analysis of the Innovation factor

Factor analysis was run for components from the innovation factor. Table 4.8 shows the results.

Table 4.8: Factor analysis of the Innovation factor

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.336	26.720	26.720	1.322	26.440	26.440
2	1.225	24.500	51.220	1.211	24.220	50.660
3	1.103	22.060	73.280	1.089	21.780	72.440
4	1.068	21.360	94.640	1.054	21.080	93.520
5	.268	5.360	100.000			

Extraction Method: Principal Component Analysis.

Table 4.8 shows the extracted components from the innovation factor. Components 1 up to 4 were accepted because they had Eigen values above 1 whilst the fifth component was dropped because it had an Eigen value below 1. The results imply that 4 out of the 5 components were valid and collecting the data as they were intended to (Kumar, 2019).

4.4.3 Factor analysis of the Demographics factor

Factor analysis was run for components from the demographics factor. Table 4.9 provides the results.

Table 4.9: Factor analysis of the Demographics factor

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.462	29.240	29.420	1.448	28.960	28.960
2	1.189	23.780	53.020	1.175	23.500	52.460
3	1.114	22.280	75.300	1.100	22.000	74.460
4	1.012	20.240	95.540	1.002	20.040	94.500
5	.223	4.460	100.000			

Extraction Method: Principal Component Analysis.

The actual components extracted from the demographics factor are depicted in Table 4.9. Component 1 to 4 had initial Eigen values above 1 and factor loadings above 1 (component was valid as evidenced by Eigen values above 1). The study dropped component 5 because its factor loading was below 1, as recommended by Greenbaum and Overton (2020).

4.4.4 Confirmatory factor analysis of the change dynamics factor

Factor analysis was run for components from the change dynamics factor. Table 4.10 shows the results.

Table 4.10: Confirmatory factor analysis of the change dynamics factor

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.263	25.260	25.260	1.249	24.980	24.980
2	1.243	24.860	50.120	1.229	24.580	49.560
3	1.201	24.020	74.140	1.187	23.740	73.300
4	1.009	20.180	94.320	1.003	20.060	93.360
5	.284	5.680	100.000			

Extraction Method: Principal Component Analysis.

Component 1 to 4 of the change dynamics factor were valid (Eigen value >1) and component 5 was dropped because its Eigen value was below 1, as depicted in Table 4.10, implying that the component was not collecting data as it was intended to. It was not valid. This is in line with the recommendations by Greenbaum and Overton (2020). The study made use of a 5 Likert scale.

4.4.5 Confirmatory factor analysis of the Organisational size factor

Factor analysis was run for components from the Organisational size factor. Table 4.11 gives the results.

Table 4.11: Confirmatory factor analysis of the Organisational size factor

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.298	25.960	25.960	1.284	25.680	25.680
2	1.243	24.860	50.820	1.229	24.580	50.260
3	1.110	22.200	73.020	1.096	21.920	72.180
4	1.087	21.740	94.760	1.073	21.460	93.640
5	.262	5.240	100.000			

Extraction Method: Principal Component Analysis.

The actual components extracted from the organisational size factor are shown in Table 4.11. Component 1 up to the fourth component were collecting data as they were intended to, as evidenced by the Eigen values above 1. Component 5 was dropped because its factor loading was less than 1. Accordingly, the study only adopted the four factor components because they were collecting the intended data regarding the influence of technology adoption on the salespeople in the pharmaceutical industry.

4.4.6 Factor analysis of the communication factor

Factor analysis was run for components from the change dynamics factor. Table 4.12 shows the results.

Table 4.12: Factor analysis of the communication factor

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.312	26.240	26.240	1.298	25.960	25.960
2	1.190	23.800	50.040	1.176	23.520	49.480
3	1.141	22.820	72.860	1.127	22.540	72.020
4	1.098	21.960	94.820	1.084	21.680	93.700
5	.259	5.180	100.000			

Extraction Method: Principal Component Analysis.

The actual components extracted from the communication factor are shown in Table 4.12. Component 1 to 4 had initial Eigen values above 1 and factor loadings above 1. This shows that 4 of the 5 components were valid. Component 5 was dropped as recommended by Greenbaum and Overton (2020).

4.4.7 Correlation of Gender results and technology Adoption

The study gathered data to establish the relationship between gender results and technology adoption by the salespeople within the pharmaceutical industry, and the results are depicted in Table 4.13.

Table 4.13: Pearson Correlation

		Technology adoption	Gender
Technology adoption	Pearson Correlation	1	.711
	Sig. (2-tailed)		.00
	N	174	174
Gender results	Pearson Correlation	.711	1
	Sig. (2-tailed)	.001	
	N	174	174

Source: Primary Data, 2020

As depicted in Table 4.13, gender can be correlated with technology adoption within the pharmaceutical industry in South Africa. The study established that there is a positive correlation of 0.711 between technology adoption and gender of the respondents as evidenced also by the significant value of 0.01 which was less than 0.05. The study results seem to suggest that gender plays a large part in determining whether or not technology will be used by the salespeople. As the gender demographic (Table 4.2) established that the sector is male dominated, the correlation between technology adoption and gender is interesting. The results seem to confirm earlier findings by Heilman (2012) who established that the sector remains heavily skewed towards males against their female counterparts, but also suggest the possibility that males choose this career path because of the potential to use technology.

4.4.8 Multicollinearity Tests

Prior to computing a regression analysis of the factors influencing the adoption of technology by salespeople within the pharmaceutical industry, the researcher did a multicollinearity test. According to Pallant (2020), multicollinearity exists when the

intercorrelation amongst the independent variables is greater than 0.9. The test results are given below.

Table 4.14: Multicollinearity results

		Competit ion	Innovati on	Communica tion	Change	Organisat ional size	Demograp hics
Compet ition	Pearson	1	.301	.229	.003	.408	.111
	Correlation						
	Sig. (2-tailed)		.000	.002	.000	.000	.004
	N	174	174	174	174	174	174
Innovati on	Pearson	.301	1	.685	.652	.580	.261
	Correlation						
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	174	174	174	174	174	174
Commu nication	Pearson	.229	.685	1	.815	.839	-.040
	Correlation						
	Sig. (2-tailed)	.002	.000		.000	.000	.005
	N	174	174	174	174	174	174
Change	Pearson	.003	.652	.815	1	.667	.002
	Correlation						
	Sig. (2-tailed)	.000	.000	.000		.000	.002
	N	174	174	174	174	174	174
Organis ational size	Pearson	.408	.580	.839	.667	1	.055
	Correlation						
	Sig. (2-tailed)	.000	.000	.000	.000		.003
	N	174	174	174	174	174	174
Demogr aphics	Pearson	.111	.261	-.040	.002	.055	1
	Correlation						
	Sig. (2-tailed)	.004	.000	.005	.002	.003	
	N	174	174	174	174	174	174

Source: Primary Data, 2020

A coefficient above 0.9 implies the existence of multicollinearity (Pallant, 2013). As depicted in Table 4.14, there is no Pearson Coefficient which is above 0.9 and also no p-

value which is above 0.005. All six constructs of the first objective as depicted on the conceptual framework which sought to employ the use of regression results were considered. There was no multicollinearity, therefore all six variable constructs were adopted and the regression analysis was employed.

4.4.9 Coefficients of regression of factors that influence technology adoption

The study sought to establish the factors that influence technology adoption by salespeople within the pharmaceutical industry. Data regarding this objective was gathered by means of a structured questionnaire and the coefficient of regression was employed. Given that there were multiple factors, the study made use of the linear regression coefficient to establish factors that influenced technology adoption. The results are depicted in Table 4.15.

Table 4.15: Coefficients of regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	23.749	1.752		13.553	.000
Valid Competition	.210	.126	.568	1.665	.001
Innovation	.165	.125	.199	1.321	.004
Communication	.141	.130	.441	1.083	.002
Demographics	-.055	.146	-.516	-.464	.060
Change	-.403	.149	-.211	-.693	.053
Organisational Size	.470	.188	.661	1.372	.000

a. Dependent Variable: Technology adoption

Source: *Primary Data, 2020*

As shown in Table 4.15, competition (H1) and technological adoption are positively correlated with a coefficient of 0.568 or 56.8%. This result was statistically significant as substantiated by a p-value of 0.01 ($P < 0.05$). The result means that as competition increases, the pharmaceutical sector companies are being forced to adopt technology. The fact that pharmaceutical industry companies are being forced by competition to adopt technology is evidenced by the significance value of 0.00. Competition has a positive and significant relationship with technology adoption. This validates earlier findings by Macher et al. (2017).

As depicted in Table 4.15, there is a positive relationship between technology adoption and innovation (H2) but the relationship is weak. This is evidenced by the weak positive beta coefficient of 0.199 which was substantiated by the marginally significant p-value ($P < 0.04$). The study results seem to suggest that since innovation is taking place at a personal level, its effects can fail to overcome group effort and this is possibly because there may be resistance to the innovation or the new initiative. The results are in agreement with earlier reports by Talukder (2012) who found that personal innovativeness impacts technology adoption but it is more effective if the innovation is influenced by group dynamics.

There is a positive correlation between communication (coordination and marketing aspects) (H3) and technology adoption, as depicted in Table 4.15. This is evidenced by the positive beta correlation of 0.441 or 41%. The result obtained was statistically significant as evidenced by the p-value of 0.02 which was less than 0.05. The results seem to imply that communicating enhances technology adoption because it is required for coordinating and marketing of products. The study found that there is a strong positive

correlation between communication and technology, validating earlier findings by Borhani (2016) who arrived at the same conclusion.

As depicted in Table 4.15, Demographic factor (H4) (Age) has a strong negative correlation with technology adoption, as evidenced by the negative beta coefficient (-0.516). The result was not statistically significant, as substantiated by a p-value of 0.060 ($P > 0.05$). Nevertheless, the results indicate that as people grow older, they become less interested in adopting technology. The pharmaceutical sector salespeople who are older appear to be averse to the use of technology. The study results depicted in Table 4.15 are in contrast to earlier research findings by Kinyangi (2014) who found that age corresponds positively with technology adoption.

There is a negative coefficient between change dynamics (H5) and technology adoption, as evidenced by the negative beta coefficient of -0.211. The result was not statistically significant given that p-value was 0.053 ($p > 0.005$). The study results imply that there is a negative relationship between change dynamics and technology adoption. While the negative relationship is weak, change dynamics do impact negatively by 21% the adoption of technology, possibly because change yields uncertainty. The study results were in contrast to the findings by Fujimoto et al. (2016) who found that change dynamics enhance technology adoption.

Table 4.15 shows a positive relationship between the firm size (H6) and technology adoption, with a beta correlation of 0.661. The results show a 66% necessity to adopt technology within the pharmaceutical sector by the salespeople. The result was statistically significant, as evidenced by a p-value of 0.00 ($p < 0.005$). The results seem to suggest that as the organisation grows, the need grows for salespeople to adopt technology in order to enhance their performance. Similar findings were noted by Palacios et al. (2015) in a similar study.

4.5 Hypotheses Test Results and Discussion

Following the coefficient regression analysis results depicted in Table 4.15, the study tested the six hypotheses which relate to the six factors as given in the conceptual framework. The results are depicted in Table 4.16.

Table 4.16: Hypothesis Test Results

Hypothesis	Coefficient	T-value	P-value*	Decision
H1	0.568	1.665	0.001	Accept
H2	0.199	1.321	0.004	Accept
H3	0.441	1.083	0.002	Accept
H4	-0.516	-0.464	0.060	Reject
H5	-0.211	-0.693	0.053	Reject
H6	0.661	1.372	0.000	Accept

***Sig =0.05**

4.5.1 Hypothesis 1:

H1: Competition positively influences the adoption of technology by salespeople

Competition has a t-value of 1.665, this dovetails well with the low p-value of 0.001 hence hypothesis (H1) that competition positively influences the adoption of technology by salespeople in the pharmaceutical industry of South Africa, can be accepted. The coefficient of 0.568 and the p-value 0.001 ($p < 0.005$) are in synchronisation. The study results are in agreement with Kerava's (2017) results in a related study that competition influences the adoption of technology by salespeople.

4.5.2 Hypothesis 2:

H2: Innovation positively influences the adoption of technology by salespeople

Innovation has a t-value of 1.321, this works well with the low p-value of 0.004 ($p < 0.05$), hence it is possible to accept hypothesis (H2) that innovation positively influences the adoption of technology by the salespeople within the pharmaceutical industry of South Africa. The coefficient of 0.199, which is positive, and p-value of 0.004 are in tandem. The study result concur with Albar and Hoque (2019) who reached similar conclusions that innovation influences the adoption of technology by salespeople.

4.5.3 Hypothesis 3:

H3: Communication positively influences the adoption of technology by salespeople

Communication has a t-value of 1.083 and p-value of 0.002 ($p < 0.05$), hence we accept the hypothesis (H3) that communication positively influences the adoption of technology by salespeople within the South African pharmaceutical industry. The coefficient of 1.083 synchronises well with the p-value 0.002. The study results are similar to those obtained by Borhani (2016) who found that communication positively influences technological adoption by salespeople.

4.5.4 Hypothesis 4

H4: Demographics positively influences the adoption of technology by salespeople

Demographics has a t-value of -0.464, and a p-value of 0.060 ($p > 0.05$), so that the hypothesis that demographics positively influences the adoption of technology within the pharmaceutical industry of South Africa is rejected. The coefficient of -0.516 and the p-value of 0.060 ($p > 0.05$) which is not statistically significant support the rejection of the hypothesis. The study findings are in contrast, however, with the findings of Kavandi and Jaana (2020) who found out there is a positive relationship between demographics and technology adoption.

4.5.5 Hypothesis 5

H5: Change positively influences the adoption of technology by salespeople

Change has a t-value of -0.693 and p-value of 0.003 ($p < 0.05$). Therefore, the hypothesis that change influences technology adoption by the salespeople within the South African pharmaceutical sector is rejected. The coefficient of -0.211 and p value of 0.053 ($P > 0.05$) support the rejection of the hypothesis. The study findings seem to suggest that resistance to change is high among salespeople, in contrast with findings by Kerava (2017) who affirmed the relationship.

4.5.6 Hypothesis 6

H6: Organisational size influences the adoption of technology by salespeople

Organisational size has a t-value of 1.372 and a the p-value of 0.000 ($p < 0.05$). Therefore, the hypothesis that the organisation size influences the adoption of technology adoption by salespeople is accepted. The coefficient of 0.611 synchronises with the p-value ($p < 0.05$). Palacios et al. (2015) arrived at similar findings of the organisational size positively influencing technology adoption.

4.6 The Influence of technology adoption on the performance of pharmaceutical salespeople

The study further sought to establish the influence of technology adoption on the performance of pharmaceutical salespeople and the results are presented in Table 4.9. The study employed the Pearson correlation to establish the influence of technology adoption.

Table 4.17: Pearson Correlation

	Technology adoption	Salespeople Performance
Pearson Correlation	1	.820
Sig. (2-tailed)		.000
N	174	174
Pearson Correlation	.820	1
Sig. (2-tailed)	.000	
N	174	174

Source: Primary Data, 2020

Brand growth, sales revenue, profitability, competitiveness, international outreach, and number of clients were the constructs which were measured to ascertain salespeople performance (See Appendix 1). As depicted in Table 4.17, there is a positive relationship between technology adoption and the performance of salespeople within the pharmaceutical industry in South Africa as evidenced by the positive correlation coefficient of 0.820. The coefficient which was above 0.5 indicates that the relationship between technology adoption and salespeople performance is significant. The study results imply that service delivery and sales productivity have been enhanced as a result of technology adoption by salespeople. The results further imply that salespeople have been working well within their jobs and are finding technology useful in conducting their tasks. Cost reduction has resulted from technology adoption. The study results seem to imply that for every one unit of technology adoption, there is an enhancement of 82% of performance by salespeople within the pharmaceutical industry. The results further suggest that if the technology were not adopted, sales performance would be significantly reduced, by 82%. The results are similar to those arrived at by Ahearne and Rapp (2010)

who found a positive relationship between technology adoption and performance of salespeople.

4.6.1 Regression analysis

The regression analysis was employed after the correlation test to ascertain the impact of the study variables (Technological adoption and performance by salespeople).

Table 4.18: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820 ^a	.672	.669	.856

a. Predictors: (Constant), Technology adoption

There is a strong and positive relationship between technology adoption and performance of the salespeople, as evidenced by the Pearson coefficient of 0.820. The goodness of fit of the model was 67.2% (R-squared=0.672). The t-values were 13.972 and the p-values were less than 0.05, and this shows that the relationship between sales performance and technological adoption was statistically significant.

4.6.2 Coefficient of regression

Table 4.19 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.818	.174		4.709	.000
Technological adoption	.715	.051	.729	13.972	.000

a. Dependent Variable: Salespeople performance

As depicted in Table 4.19, the standardised coefficient was 0.729. The Pearson correlation coefficient of 0.820 (Table 4.17) showed that the relationship was positive and that it existed while the regression coefficient revealed that technological adoption influences salespeople's performance by 73% as shown above. Further, the p-value is 0.000 ($p < 0.05$), implying that the result is statistically significant.

4.7 Antecedents to the factors influencing sales representatives' intention to adopt technology usage

The study established the antecedents to the factors which influenced the salespeople's intention to adopt the use of technology. The study employed Spearman correlation to ascertain if the factors influenced the intention to adopt the technology. The study results are depicted in Table 4.20.

4.7.1 Pearson Correlation

Table 4.20: Correlations

		Perceived usefulness	Perceived convenience	Perceived ease of use	Technology usage
Perceived usefulness	Pearson Correlation	1	.529	.686	.529
	Sig. (2-tailed)		.003	.001	.002
	N	174	174	174	174
Perceived convenience	Pearson Correlation	.529	1	.033	.630
	Sig. (2-tailed)	.003		.001	.002
	N	174	174	174	174
Perceived ease of use	Pearson Correlation	.686	.033	1	.068
	Sig. (2-tailed)	.004	.001		.003
	N	174	174	174	174
Technology usage	Pearson Correlation	.529	.063	.068	1
	Sig. (2-tailed)	.004	.003	.002	
	N	174	174	174	174

As shown in Table 4.20, perceived usefulness had a positive correlation of 0.529 with technological usage. The result is statistically significant since the p-value of perceived usefulness and technology usage is 0.02, which is less than 0.05. The study results suggest that perceived usefulness is an antecedent factor that influences salespeople's intention to adopt the technology. The results seem to suggest that salespeople's perception regarding the use of technology influences their intention to use technology, based on their experience. The findings are in agreement with those of Chau et al. (2019). Furthermore, the study established that perceived ease of use had a positive correlation coefficient of 0.68 with technological usage. The result is statistically significant since the p-value of perceived ease of use and technology usage is 0.03, which is less than 0.05. This implies that it is an antecedent that influences salespeople's intention to adopt the usage of technology. The results seem to suggest that past experiences regarding difficulties confronted by salespeople are easily resolved by the adoption of technology. The study results validate earlier findings by Mourad and Hussein (2018).

Furthermore, the study found that perceived convenience had a positive correlation coefficient of 0.630 with technology use by salespeople. The result is statistically significant since the p-value of perceived usefulness and technology usage is 0.02, which is less than 0.05. Perceived convenience is an antecedent factor that influences salespeople's intention to adopt the technology usage. The study results seem to suggest that work experience prior to technology adoption has stimulated the intention of salespeople to embrace technology, validating the assertion by Qasim and Shanab (2016). All the variables are statistically significant ($p > .05$). All the study coefficients were positive and were above 0.5, thus they were all significant, and they were all less than 0.9, implying that there was no problem of multicollinearity (Creswell & Poth, 2016).

4.8 Chapter Summary

The chapter reports on the response rate of the study, which was 80.2%. The demographics statistics of the study and the data regarding each of the study objectives were discussed. The study employed Spearman correlation as well as regression coefficients as statistical inference tools, aided by SPSS V. 26. It was established that the study was not subject to multicollinearity since there was no statistical coefficient which was above 0.9. The final chapter of the study presents the study findings as well as the conclusions of the study.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.0 Introduction

This chapter gives a synopsis of the entire study. It presents the major findings of the study, the conclusions and the recommendations. The chapter highlights areas of further research that other scholars can build on to cover the existing gap within the body of knowledge.

5.1 Summary of findings

- The response rate of the study was 80.2%. The data revealed that 60.3% of the respondents were male while the female contingency constituted 39.7% of the respondents. The majority of the respondents had a diploma and all the research participants had a qualification of some nature and were well qualified to give an opinion.
- The study found that predominantly young people below the age of 35 years were employed as salespeople within the pharmaceutical industry of South Africa.
- The study found that a large percentage (just over 35%) of the respondents had been employed in the sector for a sufficient length of time to be able to have sound knowledge regarding technology adoption as well as sales performance.
- The study found that the study reliability result was above 0.7, signalling that the study instruments delivered replicable results.
- The study found that 1 component of each of the six factors which were subjected to factor analysis had an Eigen value less than 1.

5.1.2 Factors influencing technology adoption by Salespeople in the Pharmaceutical industry

- The study found that competition influences technological adoption as evidenced by the positive regression coefficient of 0.568 or 56.8 percent.

- The study found that the demographic factor influences technology adoption negatively as evidenced by the negative beta coefficient (-0.516).
- The study found that communication influences technology adoption positively as evidenced by the positive beta correlation of 0.441 or 41%.
- The study found that innovation influences technology adoption only marginally, as evidenced by the weak positive beta regression coefficient of 0.199.
- The study found that the size of organisations influences technology adoption, as evidenced by the regression beta correlation of 0.661 which implies that there is a strong relationship.
- The study found that change dynamics in the environment influence the adoption of technology adoption negatively as evidenced by the negative beta coefficient of -0.211.
- The study accepted hypotheses H1, H2, H3, H6. The study rejected hypotheses H4 (Demographics) and H5 (Change).
- The factors of communication, innovation, competition, demographics, change dynamics, and organisational size each had four components which were deemed valid by the factor analysis, and each had one component which was dropped because the Eigen value was below 1.
- The study found that there was no multicollinearity, as there was no coefficient above 0.9.

5.1.3 Influence of technology adoption on the performance of pharmaceutical salespeople

- The study found out that there is a positive relationship between technology adoption and the salespeople's performance within the pharmaceutical industry in South Africa as evidenced by the positive correlation coefficient of 0.820.
- The study found out that the Pearson coefficient was above 0.5 which implied that the relationship between technology adoption and salespersons' performance was largely significant.

- The study found out that the t-values were 13.972 and the p-values were less than 0.05 and revealing that the relationship between sales performance and technological adoption was statistically significant
- The goodness of fit of the model was 67.2%.
- The study found out that service delivery and sales productivity have been enhanced as a results of technology adoption by salespeople

5.1.4 Antecedents to the factors influencing sales representatives' intention to adopt technology usage

- The study found that perceived usefulness is an antecedent factor that influences salespeople's intention to adopt technology, as evidenced by the positive correlation of 0.529.
- The study found that perceived ease of use had a positive correlation coefficient of 0.761, which was statistically significant, implying that it is an antecedent that influences the intention by salespeople to adopt the usage of technology.
- The study found that perceived convenience had a positive correlation coefficient of 0.690, implying that it is an antecedent factor that influences salespeople's intention to adopt the technology.

5.2 Conclusions

The following conclusions are based on the research findings relating to each objective.

5.2.1 Factors influencing technology adoption by salespeople in the Pharmaceutical industry

- It can be concluded based on the Eigen values that the study data collection instrument was collecting data as it was intended to.
- Based on the hypothesis which was accepted, it can be concluded that competition influences the adoption of technology by salespeople within the pharmaceutical sector. The study also concluded that the age factor influences technology adoption negatively.

- It can be concluded that communication influences technology adoption by salespeople within the pharmaceutical sector in South Africa positively. This conclusion is supported by the fact that the hypothesis was accepted (using p values as well as the t values).
- It can be concluded that innovation influences technology adoption by pharmaceutical sales representatives only marginally, as evidenced by the accepted hypothesis.
- The study concluded that the company size influences technology adoption by the salespeople.
- Lastly, the study concluded that change dynamics and demographics do not positively influence the adoption of technology by sales representatives within the pharmaceutical industry, as evidenced by the rejected hypothesis.

5.2.2 Influence of technology adoption on the performance of pharmaceutical salespeople

- It can be concluded that there is a positive relationship between technology adoption and the salespeople's performance within the pharmaceutical industry in South Africa.
- The study also found that the Pearson coefficient was above 0.820, implying that the relationship between technology adoption and salespersons' performance is of strong significance.
- Based on the results, it can be concluded that service delivery and sales productivity have been enhanced as a result of technology adoption by salespeople.

5.2.3 Antecedents to the factors influencing sales representatives' intention to adopt technology usage

- The study concluded that perceived usefulness is an antecedent factor that influences salespeople's intention to adopt technology.

- The study concluded that perceived ease of use and perceived convenience are antecedents that influence the intention of salespeople to adopt the usage of technology.

5.3 Recommendations

Based on the findings and conclusions, the recommendations are:

5.3.1 Be Receptive to Change management

The issue of adopting change remains an issue to which salespeople are not receptive, and thus efforts should be channelled into making sure the salespeople in pharmaceuticals are operating in line with global changes in order to make their jobs easy and boost their performance. Initiatives should be employed which inculcate a paradigm shift regarding the use of technology.

5.3.2 Embrace full adoption of technology

The turbulence of the environment in which salespeople are operating dictates that they should swiftly change the culture that determines the way in which they do things, in particular during and in the aftermath of the Covid-19 pandemic. Technology adoption also makes organizations more productive as well as helping them to achieving more while doing less. The pharmaceutical sector should embrace change by fully adopting technology to enhance their performance, particularly during crises such as the Covid-19 pandemic. The industry should put in place change management strategies as a matter of urgency. Technology adoption requires massive infrastructure and resources to be adopted. The pharmaceutical sector should provide the requisite infrastructure and resources needed to enable salespeople to embrace the use of technology.

5.3.3 Train Salespeople

Based on the research findings, technology adoption is coming into effect now and many salespeople may not have relevant information on its usage. The salespeople should be fully trained and educated on how to adopt the use of technology. The salespeople should be fully equipped with the knowledge vital for the adoption of technology.

5.3.4 Providing incentives

The adoption of technology is a new development which may be resisted by the salespeople for factors best known to them. As such, the sector should provide incentives to encourage the use of technology by employees in order to enhance their performance.

5.3.5 Benefits of Pharma Companies Adopting Technology

Technology adoption can thus benefit the Pharma industry in that they can compete with other companies in the industry with the field resource to targeted territory. This will result in an output of a more effective sales pipeline throughout which will result in reduced operational cost.

5.3.6 Areas of further Study

This study of technology adoption and its influence on salespeople's performance in the pharmaceutical industry in South Africa was purely quantitative. Future researchers should consider a similar study with a different methodology as well as a different sector, to cover the gap which currently exists in literature.

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Appendix 1: Questionnaire for the Salespeople

The aim of this research project is to examine technology adoption and its influence on sales people's effectiveness in the Pharmaceuticals industry in South Africa. The research is titled: **Technology adoption and its Influence on Sales Performance in The Pharmaceutical Industry in South Africa.**

As part of this project, I would like to invite you to take part in answering an online survey. This activity will involve answering whether you agree or disagree with the statement. The questionnaire should take around ten minutes.

Please answer the questions below by ticking in the appropriate boxes or filling in the spaces provided.

1. Kindly indicate your gender.

Code	Male	Tick
F	Female	
M	Prefer not to say	

2. Kindly indicate your highest Level of education

Code	Level of Education	Tick
M	Matric	
N	None	
D	Diploma	

UD	Undergraduate Degree	
PG	Postgraduate qualification	
PHD	PHD	

3. Kindly indicate the number of years you have been with your company, your sales or selling experience as well as sales management experience by tucking in the appropriate boxes in the table below.

	Less than 2 years	2-5 years	6-10 years	11-15 years	More than 15 years
Number of years working					
Number of years with current company					
Number of years in sales or selling					
Number of years in Sales management					

4. Kindly indicate your Age group

Code		Tick
L25	Below 25 years	
L35	25-35 years	
L44	36-44 years	
A45	Above 45 years	

5. Ease of Use of Technology

The following items asks you to rate your level of ease during the use of technology to sell. Please Indicate your level of ease, where 1=extremely difficult; 2=difficult; 3=somewhat easy; 4=easy; 5=very easy.

Code		1	2	3	4	5
LUT	Learning to use technology					
UTG	Using the technology in general.					
UTM	Using technology makes to do my sales job.					

Factors influencing technology adoption by Sales people in the Pharmaceutical industry in South Africa

For each of the following questions, please indicate your level of agreement with each statement, where 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

6. Demographics

Cod e		1	2	3	4	5
D1	My age plays a vital part in using technology					
D2	My gender is a vital component in using technology					
D3	The dopamine effect affects my work					
D4	My level of income influences my decision regarding adoption of technology					
D5	My level of education influences my use of technology					

7. Organisational size

Cod e		1	2	3	4	5
OS1	Technology facilitates easy coordination					
OS2	I incur a lot of expenses as a result of the size of the organisation					
OS3	I think growing the size of the customers requires technology					
OS4	I think technology will facilitate accountability in the organisation since it's too big					

Cod e		1	2	3	4	5
C1	The level of competition within the pharmaceutical continues to grow					
C2	Technology adoption has become a source of competitive advantage					
C3	Pharmaceuticals which are competing better adopted technology					
C4	Technology adoption enhances the level of competitiveness in the industry					
C5	I have access to computer and Internet as a competitive advantage					

8. Communication

Code		1	2	3	4	5
------	--	---	---	---	---	---

COM 1	I face difficulties in communicating with clients					
COM 2	I have challenges in informing others about decisions making					
COM 3	I have challenges in the delivery of information					
COM 4	I find difficulties coordinating my work					
COM 5	All the contents of technology service are easy to read and understand.					

9. Change dynamics

Code		1	2	3	4	5
CD1	I am open to embracing new methods of doing things					
CD2	I respond to changes in customers preference and taste					
CD3	I am responsive to the business environment in my work					
CD4	I am influenced by global trends in my work					
CD5	I am always encountering change in my life					

10. Innovation

Cod e		1	2	3	4	5
i1	If I heard about a new technology, I would look for ways to experiment with it.					
i2	Among my peers, I am usually the first to try out new selling technologies.					
i3	In general, I hesitate to try out new technologies.					
i4	I love to experiment with new technologies.					
i5	I am intrinsically motivated to use new technologies at my workplace.					

Establish the influence of technology adoption on the performance of sales people in pharmaceutical industry in South Africa

For each of the following questions, please indicate your level of agreement with each statement, where 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

11. Feedback

Code		1	2	3	4	5
Fd1	There is two-way communication with my superiors as well as clients					
FD2	There is empowerment as a result of technology adoption					
FD3	There is reduction of accidents and improved communication					
FD4	There is an element of motivation through the adoption of technology					

12. Coordination

Code		1	2	3	4	5
CO1	The sales levels tend to increase as a result of motivation					
CO2	There are more clients as a result of technology adoption					
CO3	The level of interaction changed as a result of technology adoption					
CO4	I received feedback from the clients about our service					

13. Commitment

Code		1	2	3	4	5
COM1	My morale has improved as a result of technology					
COM2	My work has been made easy as a result of technology adoption					
COM3	I can work without any supervision to attain my set goals					
COM4	I am able to contribute my opinions and ideas since the adoption of technology					

14. Enhanced communication

Code		1	2	3	4	5
EH1	The adoption of technology provides me with feedback regarding complaints					
EH2	The adoption of technology makes it easy for me to plan					

EH3	The adoption of technology enhances the marketing of my products					
EH4	my firm is now using technology as a competitive tool					

15. Skills and knowledge

Code		1	2	3	4	5
SAK1	My firm provides sufficient training for new technology given to sales force members.					
SAK2	My firm provides sufficient tutorials for new technology given to sales force members.					
SAK3	My firm provides sufficient training/help manuals for new technology given to sales force members.					
SAK4	my firm provides sufficient support services for new technology given to sales force members					

16. Improved Attitude

Code		1	2	3	4	5
IA1	Using technology in my current sales job is quite a good idea.					
IA2	Using technology in my current sales job is beneficial to my customers and management.					
IA3	My attitude towards use of technology is influenced by the perceived ease of use of the technology.					

17. Encourages social Influence

Code		1	2	3	4	5
ESI1	People who influence my behaviour think I should use technology for selling.					
ESI2	People who are important to me think that I should use technology facilities for selling					
ESI3	The colleagues are helpful in the use of technology services for selling.					
ESI4	The Company encourages use of technology services for selling.					

18. Builds Trust

Code		1	2	3	4	5
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BT1	The Company is competent in providing technology services.					
BT2	Using technology aids in sales and is interested in my well-being, not just its own.					
BT3	Technology usage in sales has enough specialists to detect information theft.					
BT4	Using technology helps in improving my productivity in general.					
BT5	Using technology improves my job performance					

19. Technological influence

Code		1	2	3	4	5
TI1	With the use of technology, I can cut on my selling costs.					
TI2	When I use technology, I improve on my service delivery.					
TI3	If I use technology to sell, I can reduce my selling time.					
TI4	I still rely on my personal presentation skills even if I use technology.					
TI5	When I use technology I can easily meet my sales targets.					
TI8	Overall, I find technology useful in my job.					

20. Performance

Code		1	2	3	4	5
P1	The brand of my firm grown and now established					
P2	The sales revenue volume has grown as previous years					
P3	The profitability being declared by the firm has significantly increased					
P4	The firm has experienced a decline in expenditure as a result of technology					
P5	The firm has improved its competitiveness					

Establish the antecedents to the factors influencing sales representatives' intention to adopt technology usage in the pharmaceuticals sector in South Africa

For each of the following questions, please indicate your level of agreement with each statement, where 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree.

21. Perceived ease of use

Code		1	2	3	4	5
PEU1	I view technology more convenient than I used to sell in the past					
PEU2	I view technology as less time consuming as compared to the previous methods					
PEU3	I find technology adoption easy to communicate with clients as before					
PEU4	I find technology more efficient					
PEU5	I find technology adoption more flexible than the old methods we used					

22. Perceived convenience

Code		1	2	3	4	5
PC1	I am able to work from home than what I used to do					
PC2	I can work without being pressured and with flexibility					
PC3	I have tutorials if I encounter challenges which are made available					
PC4	My clients find technology adoption better than					
PC5	My clients can make transactions wherever there are					

23. Perceived usefulness

Code		1	2	3	4	5
PU1	I am able to multi task using technology					
PU2	My firm is able to account for progress easily					
PU3	My job is made secure because there are systems which can trace malpractices					
PU4	My clients are able to access me easily					
PU5	My firm is now able to offer service in international markets					

Appendix II: Ethics Letter of consent



SCHOOL OF GRADUATE SCHOOL OF BUSINESS ADMINISTRATION ETHICS COMMITTEE
CONSTITUTED UNDER THE UNIVERSITY HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: WBS/SM1528099/555

PROJECT TITLE

Technology Adoption and its Influence on Sales People's
Performance in The Pharmaceutical Industry in South Africa

INVESTIGATOR

Ms Makibi Mafitoe

SCHOOL/DEPARTMENT OF INVESTIGATOR

MM (Strategic Marketing)

DATE CONSIDERED

18 August 2020

DECISION OF THE COMMITTEE

Approved unconditionally

RISK LEVEL

MINIMAL RISK

EXPIRY DATE

30 JUNE 2021

ISSUE DATE OF CERTIFICATE 8 September 2020

CHAIRPERSON

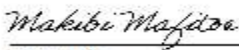

(Dr MDJ Matshabaphala)

cc: Supervisor: Dr Saruchera

DECLARATION OF INVESTIGATOR

To be completed in duplicate and **ONE COPY** returned to the Chairperson of the School/Department ethics committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.



Signature

Date

08 / 09 / 2020

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix III: Introduction Letter



Good day,

My name is Makibi Mafitoe and I am a Master's student in Strategic Marketing at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project, and I am investigating "Technology adoption and its Influence on Sales Performance in The Pharmaceutical Industry in South Africa." under the supervision of Dr Fanny Saruchera. The aim of the study is to examine technology adoption and its influence on sales people's effectiveness in the Pharmaceuticals industry in South Africa.

As part of this project, I would like to invite you to take part in answering an online survey. This activity will involve answering questions based on whether you agree with the statement or not and will take around ten minutes.

There will be no personal costs to you if you participate in this project, you will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or if you withdraw from the study. You may withdraw at any time or not answer any question if you do not want to. The survey will be completely confidential and anonymous as I will not be asking for your name or any identifying information, and the information you give to me will be held securely and not disclosed to anyone else. I will be using a pseudonym (false name) to represent your participation in my final research report. If you experience any distress or discomfort at any point in this process, you may stop the interview or resume another time. By completing and submitting this online survey it is taken to mean consent.

If you have any questions during or afterwards about this research, feel free to contact me on the details listed below. This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you. The data collected from this research project will be stored in password protected hard-drive and will be kept for five years. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), telephone +27(0) 11 717 1408, email hrec-medical.researchoffice@wits.ac.za

Yours sincerely,
Makibi Mafitoe

Researcher:

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Supervisor:

Dr Fanny Saruchera, fanny.saruchera@wits.ac.za, 011 717 3787

Appendix IV: Certificate of Consent



Technology adoption and its Influence on Sales Performance in The Pharmaceutical Industry in South Africa.

Makibi Mafitoe (researcher)

I,, agree to participate in this research project. The research has been explained to me and I understand what my participation will involve. I agree to the following:

(Please circle the relevant options below).

I agree that my participation will remain anonymous	YES	NO
---	-----	----

I agree that the researcher may use anonymous quotes in his / her research report	YES	NO
---	-----	----

I agree that the information I provide may be used anonymously after this project has ended, for academic purposes by other researchers, subject to their own ethics clearance being obtained.	YES	NO
--	-----	----

..... (signature)
..... (name of participant)
..... (date)

..... (signature)
..... (name of person seeking consent)
..... (date)

Appendix V: Letter for Language Editing

ELSIE C NAUDÉ

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2021-02-03

This is to affirm that the manuscript

**TECHNOLOGY ADOPTION AND ITS INFLUENCE ON SALESPEOPLE'S PERFORMANCE IN THE
PHARMACEUTICAL INDUSTRY IN SOUTH AFRICA**

By

MAKIBI MAFITOE

was edited by me with regard to language and style. Editing did not involve any structural re-writing of the content and did not influence the academic content in any way.



Elsie Naudé