

**Adoption and use of E-commerce in the Mainstream Retail Grocery Sector
in the Western Cape, South Africa**

by

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Abstract

In the last two decades, the concept of e-commerce has been embraced and widely adopted by many enterprises across the world. Many enterprises continue to reap the benefits of e-commerce across industries and sectors. Despite the benefits, which have been widely reported, South African retail enterprises have only adopted the concept sporadically. The lack of, or slow pace of, adoption and participation in the e-commerce space by South African retail enterprises is a problem for both the enterprises themselves and individuals (consumers): retail enterprises are challenged with competitiveness at global space, and individuals are constrained and limited in their attempts to partake in transactions with retailers.

This research was therefore undertaken to examine and understand the factors, from both technical and non-technical perspectives, that influence the adoption and use of e-commerce within the South African environment. Two organisations were used as cases in the study. In that human opinions and views were required, the qualitative methods and the interpretive approach were employed in the research. Actor Network Theory (ANT) was applied in the analysis of the qualitative data. Based on the findings and interpretation of the findings, a framework was developed. The framework is intended to guide how e-commerce can be adopted and used in the mainstream retail grocery sector in South Africa.

The research can be of use and benefit to both business and in the academic domain, from either a practical, methodological and theoretical perspective. Practically, small and large retail enterprises in South African or other African countries with similar business cultures and settings can come to a better understanding of the e-commerce influencing factors. Methodologically, the use of ANT was vital, in the way it was used to examine the various networks, actors, relationship and interaction that happens in the process of adopting and or use of e-commerce. Theoretically, this study contributes to existing literature. Also, the study can be used as case study material in the field of information systems by institutions of higher learning.

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Dedication

I dedicate this thesis to my mom for her unconditional love and support. May her soul continue to rest in perfect peace.

Table of Contents

Abstract.....	iii
Acknowledgements.....	iv
List of Tables	ix
Appendices	ix
Clarification of basic terms and concepts	xi
CHAPTER 1.....	1
1.1 Introduction.....	1
1.2 Problem Statement	3
1.3 Research Problem	3
1.4 Literature Review	4
1.5 Aims and Research Objective.....	7
1.6 Research Design and Methodology	8
1.7 Research Design	10
1.8 Research Approach	11
1.9 Data collection	11
1.10 Data Analysis.....	12
1.11 Delineation of the Research.....	13
1.12 Contribution of the Study.....	13
1.13 Ethical Considerations	13
1.14 Conclusion.....	14
CHAPTER 2.....	15
2.1 Introduction.....	15
2.2 Information and Communication Technology	15
2.3 Grocery Store	17
2.4 E-commerce	20
2.5 The Adoption of Technology	23
2.6 Actor Network Theory	23
2.7 Conclusion.....	28
CHAPTER 3.....	29
3.1 Introduction.....	29
3.2 Research Paradigm	29
3.3 Research Methodology	32
3.4 Research Design	34

3.5	Research Approach	36
3.6	Data Collection	36
3.7	Data Analysis.....	40
3.8	Ethical Considerations	41
3.9	Conclusion.....	41
CHAPTER 4.....		42
4.1	Introduction.....	42
4.2	Field Work	42
4.3	Case One – Masala Chain Stores.....	43
4.4	Case Two – Dapper Chain Stores.....	50
4.5	Conclusion.....	54
CHAPTER 5.....		55
5.1	Introduction.....	55
5.2	Overview of Actor-Network Theory	55
5.3	Data Analysis.....	56
5.4	Case One: Masala Chain Store.....	56
5.5	Case Two: Dapper Chain Store	70
CHAPTER 6.....		83
6.1	Introduction.....	83
6.2	Masala Chain Stores Findings	83
6.3	Dapper Chain Stores Findings	89
6.4	Interpretation of Findings	94
6.5	Conclusion.....	100
CHAPTER 7.....		101
7.1	Introduction.....	101
7.2	Summary of the Study	101
7.3	Evaluation of the Study	104
7.4	The Contribution of the Study	106
7.5	The Benefits of the Study.....	107
7.6	Limitations of the Study.....	108
7.7	Recommendations.....	108
7.8	Further Research.....	110
7.9	Conclusion.....	110
References		112
Appendix A: Introductory letter for the collection of research data.....		126

Appendix B: Ethical Approval Letter127

List of Figures

Figure 1 - Ant Moments of Translations.....	25
Figure 2 - Masala Chain Stores Organogram.....	44
Figure 3 – Dapper Chain Stores Operational Divisions	51
Figure 4 - Dapper Chain Stores Organogram.....	51
Figure 5 - Components of E-commerce Deployment at MCS	83
Figure 6 - Components of E-commerce Deployment at DCS	90
Figure 7 - Factors of E-commerce from Both Cases.....	95
Figure 8 - Framework for the Adoption and Use of E-commerce.....	96

List of Tables

Table 1 - Summary of Actors in Masala Chain Stores	59
Table 2 - Summary of Actors in Dapper Chain Stores.....	72

Appendices

Appendix A - Introductory letter for the collection of research data.....	126
Appendix B - Ethical Approval letter.....	127

Abbreviations

ANT - Actor Network Theory

BOP - Balance of Payments

CPUT - Cape Peninsula University of Technology

DCS - Dapper Chain Stores

ERP - enterprise resource planning

GDP - gross domestic product

HR - human resources

ICT - information and communications technology

IS/IT - information systems and technologies

LAN - local area network

MSC - Masala Chain Stores

OPP - Obligatory Passage Point

RFP - Request for Proposal

RMS - Retek merchandising system

SME - small and medium enterprise

UK - United Kingdom

US - United States

WAN - wide area network

Clarification of basic terms and concepts

This section explains the key concepts that are used in this study: Adoption, Credit/Debit cards, Disposable income, E-commerce, Factors, Informal settlement, Mainstream retail grocery sector, Rural areas, Socio-economic, Townships, and Urban areas.

Adoption

Adoption in this study refers to the consenting to take up the use, development, and implementation of e-commerce in the mainstream retail grocery sector (Al-Somali, Gholami & Clegg, 2011).

Credit/Debit cards

Credit/Debit cards in this study are referred to as banking services that facilitate e-commerce by providing one of the most vital trade tools for the purchasing of goods and services over the internet, without it e-commerce would be almost impossible (Patel & Soni, 2013).

Disposable income

Disposable income in this study is referred to as the sum of salary, mixed-income and or social benefits after taxes have been deducted from the income which is paid to workers by employers (Statistics South Africa, 2010; OECD, 2012).

E-commerce

E-commerce in this study is referred to as the selling and purchase of goods or services, which is conducted over computer networks in a specific method for the purpose of placing and receiving orders (Science et al., 2014).

Factors

Factors refer to the circumstance, fact, or influence (Oxford University Press, 2015), that contribute to the adoption and use of e-commerce in the mainstream retail grocery sector.

Informal settlement

Informal settlement refers to an unplanned settlement, which has not been plotted or declared as a residential area consisting mainly of informal homes such as shacks (Statistics South Africa, 2010). As used in this study, informal settlements are referred to as underdeveloped

areas with limited economic functions such as employment and limited infrastructures such as road networks, electricity, telecommunication, internet, and banking facilities.

Mainstream retail grocery sector

As used in this study, the mainstream retail grocery sector refers to large, every day, monthly and common shopping supermarkets that sell food, general household groceries, and services to consumers across economic classes and income groups (Mlitwa & Raqa, 2012).

Rural areas

Rural areas are populated areas in which people farm, including villages and small towns. Furthermore, they include former homeland settlements that were created by apartheid removals (Zuma, 2013). These areas' population, housing, and territory are not within an urban area and have a low-density population (United States Census Bureau, 2015; BBC, 2014; National Geographic, 2015).

Socio-economic status

Socio-economic status refers to the social standing or class of a person or group of individuals. It is often determined by the combination of education, income, and profession (American Psychological Association, 2015). As used in this study, socio-economic status refers to the level of jobs, education and disposable income of a person or group of individuals.

Townships

Townships refer to an area declared by a local authority profiling specific land for use for unique urban functions (Statistics South Africa, 2010). In this study, townships are referred to as underdeveloped areas in South Africa which have specific urban functions but not all of them.

Urban areas

Urban areas in this study are referred to as areas within the jurisdiction of a municipality with a threshold population size between 200 and 50,000 and an economic function such as employment and the presence of urban characteristics such as paved streets, electricity and sewerage (Statistics South Africa, 2010; Unicef, 2012). This also includes infrastructure such as telecommunication and internet, banking facilities and road networks.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The retail grocery sector is one of the major sources of consumable products for the general population, in many parts of the world, South Africa included. This is attributed to the nature of their goods, such as food, which is essential to human lives. Thus, many of the retailers have a chain of stores within cities, countries, and continents. Despite the high and inevitable demand for their goods and services, the competition continues to increase. Hence the retailers employ different approaches for sustainability and competitive advantage. In recent years, the sector has employed electronic commerce (e-commerce) approach in rendering their services and selling their consumable goods to society.

E-commerce is the process of transacting through the use of the internet, which includes the buying and selling of goods and services from retailers (Luk et al., 2018). It supports and enables trading of goods and services through the internet. According to Falk & Hagsten (2015), e-commerce is defined as the use of the internet in the process of buying and selling goods and services as well as the exchange of information. In accordance with this, Patel and Soni (2013) state that e-commerce is a way of using the internet to conduct business transactions. In both definitions, it is clear that “transactions”, “networks” and “internet”, are fundamental key elements in the e-commerce innovation. Mlitwa and Raqa (2012), refer to e-commerce as the transaction of goods and services using the internet. In all definitions, the aim of e-commerce is to conducted transactions over an internet enabled platform.

At the core of e-commerce, consequently, is the enablement of transactions over connected platforms, across time and geographical limitations, which is also quicker and more convenient to both the consumers and the service providers. Using e-commerce, consumable goods producers can interact with retailers, while retailers can interact with consumers virtually. This enables businesses to interact with other businesses and businesses with consumers (ibid). In other words, businesses and consumers can participate in e-commerce activities (Patel & Soni, 2013). Modern business systems approach, such as e-commerce, are vital in the growth of the

economy in societies, in several ways. For instance, businesses which are supported by more consumers regardless of geographical boundaries can increase their revenue and sustainability.

By using e-commerce, businesses can increase their brand awareness to consumers who are interested in the type of goods and services which they provide through e-commerce channels (Maynard, 2010). Due to this, more individuals are aware of their goods and services and can purchase them over the internet. In turn, the government can charge a tax fee on the value of the goods or service (Christian & Nkoro, 2012). The government, as a result, can use this revenue to deliver public services such as education, public health, and other infrastructure to society (ibid). E-commerce enables growth and increases competitiveness in the case of the retail grocery sector. Thus, it contributes to society through the increase of business opportunities, competitiveness and access to different marketplaces. For instance, in the case of a supermarket in the United Kingdom, the use of their website to facilitate the buying and selling of their products helped increase their margins on their products but also enabled the business to reach more consumers (Watson et al., 2008). E-commerce enables businesses to enhance the shopping experience of consumers, in several ways (Mlitwa & Raqa, 2012).

With the help of e-commerce, retailers can reach customers at any time with its automated capabilities (Wilson & Abel, 2002), therefore making the buying of goods or services more convenient for consumers (Luk, Choy & Lam, 2018). In the case of consumers who do not stay close to major urban areas, using e-commerce platforms, they can access different stores remotely from the convenience of their homes or offices. Thus, they avoid travelling long distances to obtain goods or services. Similarly, the time to process or purchase goods and services is reduced. In the case of Pick n Pay supermarkets in South Africa, which have an e-commerce website to exhibit and sell their goods to the public directly (Mlitwa & Raqa, 2012), consumers avoid standing in long lines at the brick and mortar store. E-commerce also provides easier ways in which consumers can access their list of transactions, resources and pay bills at their preferred time (Lin, 2011). Furthermore, e-commerce similarly, enables payment online, wherein consumers avoid carrying physical cash to purchase goods and/or services, which helps to avoid risks such as theft, particularly in the retail business (Molla & Licker, 2001).

Given this context, the implications for society of e-commerce in facilitating business transactions are vast, which is supported by empirical evidence on the conduct of transactions for businesses and consumers in the information age (Raghunath & Panga, 2013). What is even

more important is how e-commerce is employed, through adoption by retail stores in many developing countries, such as South Africa.

1.2 Problem Statement

Some consumers in the Western Cape Province of South Africa seem to be enjoying certain aspects of e-commerce, in their quest for business transactions. At the same time, most consumers remain excluded, despite the growth and adoption of the e-commerce approach by many South African organisations. This is attributed to the fact that access to internet infrastructures is largely limited to major urban areas (Goldstuck, 2012). According to Duff (2014), moreover, access to the internet is available to only 9.2% of homes in urban areas. Only 2% of homes in rural areas, meanwhile, have access to the internet. Thus, many networked consumers are in the urban areas of South Africa. Subsequently, this may have a negative implication on the growth of businesses and the economy in general.

Even where internet infrastructure exists for e-commerce purposes, some consumers still do not take advantage of the benefits e-commerce activities present. This is attributed to a lack of awareness, which manifests in the lack of adoption and use (participation in) of e-commerce. Why factors such as lack of adoption, use and awareness in the Western Cape exist is only subject to speculation and unsupported assumptions, with limited evidence at the time of this research proposal. If this is not addressed based on empirical evidence, it will continue to negatively impact growth, sustainability and competitiveness of businesses, especially in the retail grocery sector.

1.3 Research Problem

In the common purchase of groceries in the mainstream retail stores in South Africa, the adoption and use of e-commerce to enable the buying and selling of groceries is minimal, which affects retail stores in the Western Cape Province. Given the need to buy groceries or services at any point in time by most, it is not clear as to why the advantages and benefits of e-commerce are not being exploited in mainstream retail grocery transactions. There is limited literature on the topic of the study. The continued absence of adequate understanding makes it problematic to understand, clarify, and finally, enlighten on ways of addressing difficulties in the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

1.4 Literature Review

As presented in this section, a review of existing literature was conducted. The three areas of focus comprise information and communication technology (ICT), e-commerce and technology adoption, in the context of this study. A review was also conducted on the theory, Actor Network Theory (ANT), which underpins the study. The review of some of the applicable works by way of introduction is presented in this section as follows:

1.4.1 Information and Communication Technology

ICT can be defined as any technology which is used in support of information gathering, processing, distribution and use (Gono et al., 2013). ICT includes digital technologies such as mobile devices, computers and other digital communication devices which collect, categorise, store, process and analyse information (ibid). As an enabling technology, ICT is being used strategically in more or less all business organizations (Irefin et al., 2012), Through its technological capabilities, ICT has enabled business organizations to benefit by reducing costs through improved internal processes, improved competitiveness, effective communication with their consumers, and promoting their products over the internet (ibid).

In the case of Kalahari.net, the organisation uses its website as an e-marketing tool to provide goods catalogues (e.g. books and DVDs) which are tailored to the consumer's profile (Geel, 2003). By doing this, consumers are able to interact with the goods catalogue and purchase products at any time, without the hassle of long queues and worries about stores operating hours. E-commerce, therefore, enables the business to be more efficient and gain competitive advantage without time and geographical restrictions (Mansor & Abidin, 2010). In this context, the motivation for organisations to adopt and use ICT technologies is to meet their strategic needs to achieve organisational goals and objectives.

1.4.2 E-commerce

The medium of e-commerce helps to improve the interaction between consumers, business and supplier in a secure and fast networked environment (Mlitwa & Raqa, 2012). Furthermore, the use of e-commerce can potentially increase revenue for businesses (ibid). In the same vein, consumers, business and economies can gain benefits from this internet technological innovation (Manyika & Roxburgh, 2011). Access to the internet is an essential basis; however, this alone does not enable e-commerce to succeed. In order for e-commerce to work there is a need for adequate ICT infrastructures (Luk et al., 2018). For consumers to participate in e-

commerce, consumers need to be literate, aware and trust e-commerce as an easy way to shop (Datta, 2011).

Consumers need to have sustainable disposable income, which can be used to buy goods and services using e-commerce (ibid). Further, consumers need to have debit or credit cards, as well as e-commerce retailers' accessibility and delivery services to be able to participate in e-commerce (Patel & Soni, 2013). With these fundamental requirements present, consumers can access, use and reap the benefits of e-commerce. Access to banking services, income, dependable delivery services, knowledge, access to internet and ICT facilities (Comline, 2008) enables consumers to participate in e-commerce (Datta, 2011). In this account, the presence of these factors contributes to the growth of e-commerce (Datta, 2011).

1.4.3 The Adoption of Technology

The adoption of ICT technology in the business context can be viewed as an important tool to improve business functions and processes. ICT has been known as a key tool for improving communication processes and for developing new business opportunities (Peansupap & Walker, 2005). ICT has revolutionised the way in which organisations conduct business (Govender & Pretorius, 2015). ICT technologies such as the world wide web, electronic data interchange, email and e-commerce are enablers for organisations to easily communicate when dealing with information-intensive processes (Den Hengst & Sol, 2001).

The benefit of engaging in e-commerce for organisations is that it improves productivity which can increase profitability for suppliers and retailers, in several ways. One of the ways e-commerce does this is by helping businesses increase their potential market share and reach potential consumers at any time with limited cost (Mlitwa & Raqa, 2012). Through the use of e-commerce, retailers can place orders and monitor orders from suppliers at their own convenience (Molla & Licker, 2001; Ng et al., 1998). For instance, a business can transact with different suppliers in the convenience of its office. Despite the various advantages of e-commerce, unfortunately, there are factors that hinder the use of e-commerce.

There are barriers which affect the adoption and use of e-commerce by businesses and customers in the developing country context, including South Africa. The factors which hinder the use of e-commerce such as lack of ICT infrastructure, poor internet security, high illiteracy rate and lack of beneficial legal frameworks impact the use of e-commerce by business and ultimately consumers (Makame et al., 2014). Due to economic constraints, political instability

and inadequate ICT infrastructure in developing countries, there is a low uptake of e-commerce by businesses and consumers in developing countries (Brakel & Town, 2012).

In the case of South Africa, the online market has shown an increase among its local e-commerce websites. However, with only 24% of online shopping done on foreign shopping websites in 2014, this has reduced from 27% in 2013 and down from 33% in 2012 (Goldstuck & Worx World Wide, 2014). Further, despite the increase in online shopping among its local online stores, online grocery products are still currently not being bought online (PwC, 2013). Pick n Pay and Woolworths are some of the major retailers in South Africa (Gauteng Province Treasury, 2012), but both Pick n Pay and Woolworths receive less than 1% of their total sales from their online grocery internet retailing (Douglas, 2013). In this context, this goes to show that there is a gap in the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

1.4.4 Actor Network Theory

ANT is used to examine the inspirations and activities of groups of actors which are part of a heterogeneous network of aligned interests (Walsham, 1997). ANT can also be defined as a method of analysis that considers all phenomena as the continuous effect of networks of relations in the social and natural world in which they are situated (Law, 2007). It is used to understand how human and non-human actors are linked jointly in stable, heterogeneous networks of aligned interests (Rivera, 2013). Such actors include people, animals, organisations, objects, machines (Crawford, 2004). ANT also offers the moment of translation in a network of actors, which includes problematisation; interessement; enrolment; and mobilization (Walton, 2013).

- Problematisation stage is where the focal actor outlines the nature of a problem which allows the other actors to identify it as a problem (Callon, 1986). Within the process of doing this, the focal actor also convinces further actors to accept an offer which is associated with the interests of the focal actor, which is a process called the obligatory passage point (Heeks & Stanforth, 2015).
- Interessement is referred to as a collection of activities through which an entity aims to carry out and stabilise the identity of the other actors defined by it in the problematisation process (Callon, 1986).
- Enrollment is the set of plans in which the focal actor tries to define and connect different roles that enable other actors to join (Rhodes, 2009).

- Mobilisation which is the last stage in the moment of translation which the focal actor ensures that all allied agents act according to the pact made to meet their interests (Shim & Shin, 2015).

Based on the definition given above, in this study, ANT was used as the theory talks about the interaction between humans and non-humans in heterogeneous networks. Furthermore, ANT was used as a lens to help the researcher understand different stakeholders' interaction during the adoption and use of e-commerce in the mainstream retail grocery sector.

1.5 Aims and Research Objective

Aim of Research

Based on the research problem, the aim of this study was to develop a framework which can be used to guide how e-commerce is adopted and used in the mainstream retail-grocery sector in South Africa.

Research Objectives

The objectives include:

- i. To understand how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa.
- ii. To understand the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.
- iii. To contribute to the improvement of how e-commerce is adopted and used in the mainstream retail grocery sector.

The study was focused on mainstream retailers in the Western Cape. This is mainly because the Western Cape is one of the largest provinces in the country. Another reason for selecting the Western Cape is because the researcher resides in the province. This makes accessibility easier.

1.5.1 Research Question

What were the contributing factors to the development of a framework to understand how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa?

1.5.1.1 Research Sub-Questions

- i. How was e-commerce adopted and used in the mainstream retail grocery sector in South Africa?
- ii. What were the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa?
- iii. How can the adoption and use of e-commerce be improved in the mainstream retail grocery sector?

1.6 Research Design and Methodology

The following section introduces the design and methods, including the approaches and techniques that were applied in the research. A detailed discussion is presented in chapter 3.

1.6.1 Research Paradigm

Research philosophy is defined as the method in which data is collected and analysed in relation to a certain phenomenon (Simiyu et al., 2016). The research philosophy guides the study, helping to structure and shape the researcher's assumptions to be able to provide a comprehensible understanding of a phenomenon (Boström & Krol, 2018). It is used to examine a phenomenon from different realities and contains assumptions about the nature of knowledge (Uddin & Hamiduzzaman, 2009). Fundamentally, a research paradigm is a stance or view about a phenomenon, by unfolding the practices which regulate an inquiry within a discipline by presenting methods in which a study can achieve its aims and objectives (Michel, 2008). Research philosophical underpinnings consist of three paradigms, namely axiology, ontology, and epistemology (Creswell, 2003).

1.6.2 Epistemology

Epistemology is known as the theory of knowledge, which deals with the development and foundation of knowledge (Rahman, 2018). It aims to gain the meaning of "what we know" and "how we know it" (Anastas, 2002). Epistemology can be referred to as a way of thinking and understanding things in the world (Psycharis, 2018). It directs the researcher in understanding social actors' views and opinions, along with shaping the process of data collection and analysis of a study (Carter & Little, 2007). Epistemology methodology consists of three main types of paradigms which include positivism, critical theory and interpretivism (Steiner & Marra, 2017), which assists to offer this study with two classifications of knowledge: objective and subjective.

The Interpretivism Paradigm

The interpretivist paradigm acknowledges that our knowledge is socially constructed (Sefotho, 2015). The goal of an interpretive investigation is to examine the meaning of phenomena in the day to day life of social actors (Hussain et al., 2013). It promotes the need for the researcher to examine and understand the role social actors play in relation to a phenomenon (Saunders et al., 2009). In other words, the interpretivist paradigm enables the researcher to give an interpretation in relation to a certain phenomenon based on the data collected (Steiner & Marra, 2017). The interpretivism paradigm acknowledges that there are two truths which are external and internal realities (Carcary, 2009).

Since this study is based on the interaction of social actors and the e-commerce phenomenon, in which the aim is to understand and explain the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa, the interpretivist paradigm was found suitable for this study. The rationale for this is based on the definition of the interpretivist paradigm. In addition to this, it helped the researcher to gain a better understanding about the e-commerce phenomenon in respect of its subjective context as well as gathering qualitative data which can be interpreted to update theory.

1.6.3 Research Methodology

The research methodology is related to the aims and objectives of why research is being conducted - this can be to describe, explore or explain a phenomenon (Babbie, 2012). Kothari (2012), says that research methodology is the methodical procedure which is used in addressing a research problem. It contains the stages a researcher follows in conducting a study (Ellis & Levy, 2008). Research methodology can be classified into two classifications, namely quantitative or qualitative, or both, which is known as a mixed method. Primarily, these methodologies are used in different ways to address different research questions based on the aim and context of the study (ibid). Irrespective of the methodology that is selected, they outline the type of research tools that can be used at different stages, such as collection and analysis of data. Based on the objectives of this study, which is to explore and examine a natural setting, the qualitative method was selected.

1.6.4 Qualitative Research Methods

Qualitative research methods enable researchers to discover data which is not accessible by quantifiable measures (Warden, 2007). Qualitative research methods aim to discover and

understand the opinions and thoughts of social actors. This includes understanding the meanings or purpose of a phenomenon (Harwell, 2011).

Given the definition above, the aim of this study was to develop a framework which can be used to guide understanding of e-commerce adoption and use in the mainstream retail grocery sector in South Africa, and the factors which influence and affect businesses in the adoption and use of e-commerce in the mainstream retail grocery sector. The qualitative research approach was deemed the most fitting in acquiring qualitative data. The main rationale was the subjective and contextual nature of qualitative methods. The study can be designed to achieve its aims and objectives which can be either explanatory, descriptive or exploratory (Bryman, 2005).

Exploratory Research

Exploratory research is defined as the preliminary study, in which an in-depth, or overarching, investigation into a phenomenon is conducted (Nathan & Rajamanoharane, 2016). It aims to discover fresh insight where there are no predetermined concepts or theories about a phenomenon (Eng et al., 2016). In other words, it enables the researcher to gain a better understanding about a phenomenon and examine the potential for a more in-depth study to be conducted and used as building blocks for future studies (Babbie, 2013).

On that account, exploratory research was conducted to assist the researcher to gain insight into the phenomenon of the study, on which descriptive and explanatory research can be built. One of the research objectives of this study was to understand how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa.

1.7 Research Design

Research can be referred to as the exploration of knowledge through the use of objective and methodical procedures of discovering solutions to a problem (Kothari, 2004). Research design, meanwhile, is defined as the outline according to which a study is carried out and includes guaranteeing that the factors which may affect the legitimacy of the findings are in control (Ogbonnaya, 2018). In other words, it is used to identify the problem, construct a hypothesis and guide the selection of research methods in the data collection and analysis phase of a study, in which conclusions are drawn.

The case study research design was employed in this study. A case study is the empirical examination of a phenomenon in its natural setting, using different sources as evidence (Kučera, 2017). It is used to examine a phenomenon in its real-life situation (Laosethakul,

2005). Large, small and medium-sized retailers were approached for accessibility and used to conduct this study.

1.8 Research Approach

Research approach can be classified into two main classes, namely deductive and inductive (Saunders, Lewis & Thornhill, 2015). Given that the main objective of this study is to explore the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa, for which insufficient theoretical work exists to draw deductive conclusions, the inductive approach, which enables the researcher to carry-out inductive explanations, was found more suitable for this study.

1.9 Data collection

Data collection can be referred to as a process of gathering information in relation to a phenomenon (Barker, 1980). It can be classified into two main sources: primary and secondary data sources (Emmanuel, 2012). Qualitative data collection methods comprise interviews, observation as well as literature analysis (Kawulich, 2005). To gain the necessary relevant information needed to achieve the aims and objectives of this study, the qualitative data collection technique was used. The interview technique was used in the collection of qualitative data in this study.

1.9.1 Interviews

Interview is a data collection technique, which involves discussions or oral probing between individuals or groups (Barker, 1980). Its purpose is to understand social reality from the participants' experiences and to gain understanding and clarify the reality they live in (Kwasnicka et al., 2015). There are two main types of interviews, namely structured and semi-structured interviews (Elliott & Timulak, 2005). The main rationale for this approach was the subjective and contextual nature of this study. The semi-structured interview technique was found the most appropriate due to the subjective nature and contextual nature of the qualitative methodology. With the help of interviews, the researcher can explore "what he/she does not know" in regards to a phenomenon (Westberry, 2009).

Starting from the basis that there is minimal adoption and use of e-commerce in the mainstream retail grocery sector in South Africa, the interview technique enabled the researcher to gain in-depth and comprehensive information on this from the participants' perspectives. The semi-

structured interview technique was employed to elicit responses that did not pre-empt or foreclose the investigation. Face to face interviews was conducted in person with the participants, either one-on-one or in a group session. Where applicable interviews were conducted via electronic and telephonic channels (Creswell, 2003).

1.10 Data Analysis

Data analysis can be defined as the process of analysing text and/or interviews to gain an understanding of a phenomenon (Yim et al., 2015). This process includes methodically searching and organising interview transcriptions and notes in order to enable the researcher to better understanding and provide insight into a proposed discovery (Yunos et al., 2017). The aim of data analysis is to discover patterns in the data collected and compare what is observed with logical reasoning (Babbie, 2012), through summarising and classifying the data into meaningful data to answer the research questions and objectives (Kawulich, 2004).

ANT was used as a theoretical framework, or lens, to examine the interview data. ANT was discussed in the literature review section. The theory was selected based on the research objectives, and was employed as follows:

- i. Through the moments of translation, ANT focuses on how networks of actors are maintained in a social context. Thus, the theory was used to examine how the different heterogeneous networks of actors were formed.
- ii. Another focus area of ANT is interaction and relationship between actors within and between networks. This also makes the theory most suitable for this study. The theory was therefore used to examine the relationships and interactions between human and non-human actors, in understanding the factors that influence and affect the adoption and use of e-commerce for the grocery retail stores in South Africa.
- iii. In contributing to the improvement of the adoption and use of e-commerce for South African grocery retail stores, ANT was used to identify the factors that influence and affect adoption and use of e-commerce for the grocery retail stores in South Africa.

Unit of Analysis

The units of analysis are the individuals, things, or happenings being studied. These are units that the researcher analyses in the context of the study (Trochim & Donnelly, 2006). For example, if the researcher wants to understand why individuals do not use a certain innovation, the unit of analysis will be the individual. Based on the definition given above, in this study the

units were the large retail grocery chain stores such as Woolworths, Pick n Pay and Shoprite and small and medium enterprises such as OK mini stores and Food Lover's Market to name a few. Two organisations used as cases in the study will be the main units in the analysis. In each of the organisations, there were other units (sub-units):

- Technical personnel (senior and middle management, and technologists)
- Business personnel (business managers, business analysts)

1.11 Delineation of the Research

Since the focal point of this study is the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa, this study was limited to mainstream retail grocery chain stores. Additionally, a suitable research sample for this study was selected within the Cape Town population. This considered the time limitations and the available resources of the researcher. The study was carried out in Cape Town, in the Western Cape Province of South Africa.

1.12 Contribution of the Study

The study intends to contribute mainly in three ways:

- i. To provide understanding to members of the scientific community that are interested in the adoption and use of e-commerce in the mainstream retail grocery sector, in a developing country such as South Africa.
- ii. As a consequence of the empirical nature of the study, it can boost managers' confidence in exploring some of the factors that they have always taken for granted.
- iii. Also, it will create awareness among the retailers, helping them with informed decisions on how they can partake in e-commerce activities in the country.

1.13 Ethical Considerations

Ethics is considered an important aspect of research, with the aim being to ensure that the research gains the full potential benefits of the enquiry but with minimal to no harm afflicted to the participants involved (Salah, 2013). Thus, an ethics clearance letter was obtained from the Faculty of Informatics and Design at the Cape Peninsula University of Technology. Consent letters were also collected from the potential participants which granted permission to the researcher to collect data. The letter sent to the participants informed them of the aim and objectives of the study, the procedures involved in the study, the potential benefits and the risks

involved in the study. Furthermore, their right to withdraw from the study at any time was emphasised. In addition, to protect the participants, data collected from all participants were treated with confidentiality. This was important as participants were recorded in the process of collecting data. In addition, a copy of this thesis was made available on request to the participants.

1.14 Conclusion

In conclusion, this study significantly contributes to both the business and academic sectors. This was based on how the articulated research problem related to some of the gaps that were identified and discussed in the review of the literature. The research methods, approaches and techniques that were selected were the most appropriate, in that they were determined by the research objectives. The use of ANT was intended to bring a fresh perspective to the subject of the adoption and use of e-commerce within the grocery stores. Another contribution of the study was the lessons in how the different methods, approaches and techniques, including ANT, can be applied.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Based on the objectives of the study, literature was gathered and reviewed. This chapter presents the review of literature related to the study. The chapter is structured into six main sections, in order of Information and Communication Technology (ICT), Grocery Retail Store, Electronic Commerce (E-commerce), and Technology Adoption, respectively. In the fifth section, a review of the theory, Actor-Network Theory (ANT), which underpins the study is presented. Finally, the chapter was summarised in the last section.

2.2 Information and Communication Technology

ICT is technology that is used to gather, process and share information. ICT can be defined as technology systems that offer wide-ranging functionalities such as information management, processing, exchange and presentation of information across systems and individuals (Van Wart et al., 2017). It consists of hardware, software, networks, and devices which enable storage, processing, exchange and arrangement of information in the form of voice, text or images (Okechi & Kepeghom, 2013). ICT can be used to support organisations' objectives, goals, needs and ultimately increase productivity, and it is important to exploit the benefits of ICT in organisations (Yunis et al., 2018)

The use of ICT for businesses can enable strategic management, effective communication with customers, alliances, information access, decision-making and the management of data and knowledge in different organisations (Zafar et al., 2014). Furthermore, it can help increase competitiveness and enhance performance (ibid). For example, a business can use its website as part of their business process to determine consumers' impressions of the product and actively update the product catalogue to suit customer needs (Zhou & Li, 2017). Further, networked consumers can interact with the commodities in the online advertisements and conduct a transaction at their own convenience. In this way, consumers avoid travelling long distance to acquire goods and/or services.

ICT can help organisations to increase productivity, flexibility and competitiveness, as most retail organisations' activities include purchasing and selling, and the advertising of goods and services using the internet without geographical and time limitations (Wang & Li, 2017) In this context, the motivation for organisations to adopt and use ICT technologies are to meet their strategic needs to achieve the organisational goals and objectives.

2.2.1 ICT for Business

Some of the advantages of using ICT for business organisations is that it enables businesses to compete in global marketplaces, with improved efficiency and improved communication with its customers and suppliers (Tarutė & Gatautis, 2014). Communication is essential for business success as it enables the materialization and achievement of organisational goals (Genç, 2017).

Businesses can use ICT as a tool to market their merchandise and effectively communicate with their suppliers and customers through its networked multi-media capabilities, which can potentially increase the visibility of their products and ultimately increase revenue (Di Fatta et al., 2018). For example, a farm can market and sell their products through its interactive website. This way the farm has the possibility to improve the rate of selling date and gain feedback from its customers (Filouri et al., 2015). In this context, ICT provides businesses with a two-way communication channel in which businesses can effectively communicate with their customer, collect market research data, and ultimately support their online merchandise (Doherty & Ellis-Chadwick, 2009).

ICT can help businesses improve productivity and efficiency through its automated capabilities. Businesses can leverage the use of ICT to improve data processing, reduce cost, increase quality and ultimately increase the overall productivity and efficiency of business (León et al., 2016). For example, a grocery store can load the number of goods they have as inventory into a database, and during their day to day sales they can instantly keep track of the amount of stock remaining. This reduces the time needed to count the number of goods sold and/or remaining. Furthermore, this information can be used to update customers on the availability of goods in their inventory.

For businesses to increase their market share, they need to be able to access different markets (global markets) and take advantage of marketing opportunities (Young, 2013). ICT can support the use of e-commerce to create business opportunities and gain access to different

marketplaces (Muhammad et al., 2016). For instance, an organisation which provides telephone services to its clientele can provide additional services such as internet services to its customers, therefore, enabling the organisation to increase its access to different markets.

However, despite the advantages and benefits presented in the use of ICT, there are barriers and challenges that many organisations encounter in the adoption of ICT to enable and support their business processes and activities (Nkosana et al., 2016). Barriers such as lack of infrastructure, lack of ICT skill, cost and lack of awareness are some of the major factors that affect the adoption of ICT by some businesses (Taylor, 2015; Kurnia et al., 2015). According to Nduati et al (2015), lack of awareness is one of the major barriers to ICT adoption. For example, small and medium enterprises (SMEs) are not aware of where to acquire a customised system to suit their organisational processes needs (ibid). As a result, this factor has impacted negatively on the adoption of ICT for some businesses.

In the developing context, such as in Nigeria, the lack of reliable infrastructure and poor internet service providers are some of the major barriers to the utilization of ICT in various businesses (Faloye, 2014). Nigeria experiences an insufficient supply of electricity to the population (National Bureau of Statistics, 2014). Thus, businesses in Nigeria have to rely on the use of alternative power supply such as generators (Emmanuel, 2012). Hence, business in Nigeria must suffer additional costs in the acquiring of petrol or diesel to power their generators to be able to have access to ICT services. Due to the lack of adequate infrastructure, this has a negative impact on businesses performance, productivity and in turn decreases the use of ICT for businesses (Idris et al., 2017). For example, if business A is trying to communicate or share information with business B, due to the slow internet, this may take longer. As a result, this may affect productivity and performance in terms of getting the necessary information needed to carry out a task.

2.3 Grocery Store

A grocery store is a retail store that mainly sells consumable edible commodities. There are two main units of the grocery business, the retail and wholesale. The retail unit has direct transactions with the public. In Luce (2013), the retail sector is defined as the last stage in the distribution process, in which retailers market and sell commodities in small quantities to the public (Narayan & Chandra, 2015). The wholesale trading unit does not involve or transact business with the public, but with the other businesses (ibid).

Irrespective of the type of grocery business, they do depend on or are influenced by common factors, such as people, processes and transactions, which include the exchange of commodities, monetary values, and logistics (Saskia et al., 2016). However, these factors enable and constrain the grocery businesses in one way or the other, such as opening times, location, additional services and variety of commodities (Campo & Breugelmans, 2015). For example, depending on the location of a store from a consumer viewpoint the opening time, time spent to travel, and the cost of travelling to the store may be a constraint. Thus, ICT is needed to enable a service culture, and mitigate against the constraints (Seitz, 2013). This is primarily because of its (groceries) significance to the economy and the society in general.

Generally, retailing, including grocery stores, has contributed about 10% to the gross domestic product (GDP) of many developed countries, such as the United States (US) and United Kingdom (UK) (Chartered Technofunctional Institute, 2012). For example, in the UK consumers spent around 27 billion euros and of every 1 euro spent in the retail sector (i.e. online and in shop) 47% was spent in food stores, 46% was spent in non-food stores and the rest on other types of retailers (House of Commons Library, 2015). This has contributed to the UK's GDP and played an important role in the improvement of towns, cities and local communities (British Retail Consortium, 2012). The retail industry is highly globalized and operates in almost every country (Luce, 2013). This goes to show the importance of the retail sector to help meet the needs of consumers and in turn, contributes to economic growth.

In the case of South Africa, the retail sector is the biggest in the sub-Saharan region and has been placed as the 20th largest retail sector in the world (Thomas White International, 2011). The South Africa retail sector consists of non-grocery retailers (such as liquor, furniture, clothing and appliances stores) and food retailers (such as Shoprite, Spar, Woolworths and Pick n Pay, etc) (ibid). Due to the sizes of the businesses, they begin to encounter challenges in their traditional ways of carrying out their operations, which include physical contacts and manual processes.

Some of the challenges faced by grocery businesses due to traditional ways of carrying out business processes are the high cost for commercial rental space and limited global reach of potential clientele (Shafiyah et al., 2013). According to Shin (2001), the traditional means of mass marketing by using television commercials and hard copy promotions are not always successful. This is because traditional market research instruments cannot always be used to analyse mass marketing and sales promotions for successful direct marketing initiatives

(Warden, 2007). Thus, mass marketing and promotions of goods and services result in expensive, inefficient brand management (Shin, 2001). For grocery businesses to interact with their customers, customers must visit the physical store depending on its location. This poses a challenge due to geographical constraints, customers have to think of the cost of travelling and time spent on travelling (Mohammed & Abdulkadir, 2012). As a result, grocery businesses may not be able to reach their potential customers.

As competition increases, organisations struggle with the traditional approach, in their zeal and quest for increased productivity, market access, competitiveness and sustainability (Thulani, et al., 2010). Thus, many organisations explore new approaches, such as the deployment and use of ICT artefacts. For example, retail organisations such as Woolworths and Pick n Pay in South Africa, have implemented e-commerce strategies to facilitate the buying and selling of their goods and services. According to Mlitwa and Raqa (2012), the use of e-commerce by grocery stores is mainly to facilitate the merchandising and selling of their products directly to the public.

2.3.1 Localisation and Internationalisation of Grocery Stores

Grocery stores are in many countries and in both urban and rural areas. Grocery stores play an essential organisational role for rural communities in providing edibles and acting as an economic driver, community builder, employer and meeting place (Bailey, 2010). The internationalisation of grocery stores can be defined as the process an organisation undertakes in conducting retail distribution in more than one country (Diallo, 2012). An example of a grocery retailer in multiple contexts is Shoprite. Shoprite has various chains and operates 1456 corporate stores in 17 countries such as South Africa, Nigeria and Ghana. Its focus is to provide a range of groceries and some durable commodities (Sanlam Limited, 2013). In doing so the Shoprite group contributes to the development of stable economies and the social encouragement of its people (ibid). Another example of an organisation which can be found locally and internationally is Pick n Pay grocery retail store. According to Deloitte (2015), Pick n Pay operates in 7 different countries including Namibia, Zimbabwe, Mozambique and South Africa. Woolworths retail group is another example that provides a range of services, including edible commodities, operating in South Africa and 11 countries in the rest of Africa as well as 1 in the Middle East, (Woolworths Holdings Limited, 2014).

In line with this, for grocery organisations to be competitive, efficient, increase productivity and to retain consumer loyalty, organisations have employed the use of e-commerce to facilitate their day to day processes and the buying and selling of commodities to the consumers.

2.4 E-commerce

According to Zwass (1996), e-commerce is the sharing of data, building and conducting business transactions over telecommunication networks. Makame et al (2014) define e-commerce as the process of purchasing, selling, transacting and the trading of goods, services and information using ICT-based platforms among organisations, individuals and governments. E-commerce has the potential to improve organisations' processes, coordinate logistics, and exchange of information and communication when adopted and implemented successfully (Kurnia et al., 2015). Thus, businesses have explored the e-commerce phenomenon to facilitate their businesses.

2.4.1 The Business Context of E-commerce

E-commerce as an ICT tool can be used for businesses to advertise their goods and services in order to increase their market share (Hung et al., 2011). This can be through several marketing mediums such as emails, websites and social media platforms (Kiang et al., 2000). The advantage of using these interactive platforms is that it enables businesses a quick and efficient manner in which to interact with their clients and potential clientele (Mlitwa & Raqa, 2012). Furthermore, it helps to reduce the number of employees needed to conduct direct marketing (Niranjanamurthy et al., 2013).

Another advantage of e-commerce for businesses is that businesses can extend their business beyond their existing geographical reach and enter new markets, therefore overcoming their constraint related to size (Idris et al., 2017). For example, businesses can use different websites such as the International Trade Administration website - www.ita.doc.gov, to find out information about exporting, different industries and sector data. In other words, the use of an e-commerce website becomes necessary for businesses interested in exploring foreign marketplaces. Information related to these businesses can vary from market trends to product information and many more (Wilson & Abel, 2002; F. Salehi et al., 2012). With e-commerce to conduct business transactions over the internet, the following section outlines how business and e-commerce can contribute to economic growth.

2.4.2 E-Commerce for Business & Economic Growth

The use of e-commerce in an organisation can change the way in which their business transactions are conducted internationally and locally (As'ad et al., 2012). In the economies of all countries, including developing economies, businesses play an important role. Hence, businesses have started exploring the opportunities which are offered using e-commerce to improve their business strategies and expand their market share (ibid). Businesses need to have access to different marketplaces to have the opportunities to increase their size, international mobility and contribute to the economy (Young, 2013). Economies of scope is the lowering of production cost by businesses by expanding the variety of goods it provides (ibid). For example, First National Bank has expanded its services from being a financial institution to providing cell phone network sim cards to clients. International mobility is the capability of transferring resources across national boundaries by a business (Roach, 2007). The use of e-commerce is growing in helping businesses reach new markets, thus contributing to the success of an economy through increased opportunities and increased competitiveness.

Businesses can grow to generate foreign exchange earnings through economies of scope and international mobility by retailing their goods and services to the global marketplace (Leigh, 2014). This means they have an influence on and affect an economy's Balance Of Payments (BOP) (Schmitt-Grohe & Uribe, 2014). For instance, in the case of eBay – www.ebay.com, the use of their website to generate income from customers outside the US, allows them to contribute to the BOP of the US. Hence, businesses having access to international marketplaces, have the potential to increase their foreign exchange revenues (Mehra, 2012). The use of e-commerce by consumers has provided them with a wide range of goods and services as well as enabling business to conduct business transactions efficiently by breaching the boundaries of time and location (Liu, 2013). Thus, e-commerce has fascinated retail organisations and consumers, which together can work to improve on economic development.

2.4.3 E-Commerce for Improved Competitiveness

When it comes to traditional marketing, which involves traditional brick and mortar stores, the use of e-commerce offers a way in which businesses can reach out to consumers effectively internationally and locally (Salehi et al., 2012). The use of the e-commerce component, e-marketing, reduces the time it would have taken businesses to print promotional adverts (Oracle, 2011). Through the use of e-marketing, businesses can advertise online reaching

different consumers as compared to the traditional way of marketing which includes travelling to various locations to advertise goods and services (Oracle, 2012). A competitive benefit of the adoption and use of e-commerce in an organisation is that organisations have the potential to capture a larger market share than competitors (Mansor & Abidin, 2010).

For businesses to achieve competitive advantage, businesses need to explore innovative ways in which they can offer a different experience in specialised niche markets (Augusto et al., 2012). One way to do this is for businesses to distinguish their goods and value-added services from their competitors, through efficient delivery to their consumers (Shin, 2001). For example, a customer can place an order through an online store that is immediately sent to the system used to fulfil the order. Through this automated process, the time taken to process orders is reduced and information about products, inventory, item billing and sales are saved in a shared information system. The distribution and delivery of goods and services to consumers efficiently and effectively is related to the use of supply chain management and enterprise resource planning (ERP).

Supply chain management can be defined as a process of managing, scheduling and directing deliveries of goods and services to consumers (Xiao & Zhang, 2000). ERP tools can be defined as the wide-range of packaged software solutions which are integrated with business processes and which present a general view of an organisation from an information technology architecture perspective (Nyandiere et al., 2012). The use of ERP tools and e-commerce to facilitate the automation of business transactions can enable businesses to improve operations across and within the business (Farzaneh, 2014). One way in which businesses can achieve this using these ICT systems is in strategies for the availability and monitoring of inventory as well as consumer demand (Laudon & Laudon, 2010).

However, for businesses to adopt and use e-commerce towards achieving competitive advantage, a conducive environment is needed. According to Moloney (2015), in South Africa, some of the challenges businesses face in the adoption and use of e-commerce are high connectivity cost, lack of legal and policy framework, lack of payment facilities for non-credit card holders and lack of investment. These factors can have a negative impact on the adoption and use of e-commerce in South Africa.

2.5 The Adoption of Technology

Adoption can be viewed as the consent to engage, develop and implement a new innovation, whether it be a new service, product, structure, new plan and/or system in an organisation (Al-Somali et al., 2011). The adoption of ICT in the business context can be viewed as an important tool to improve business functions and processes. ICT has been known as a key tool for improving communication processes and for developing new business opportunities (Peansupap & Walker, 2005). ICT has revolutionised the way in which organisations conduct business (Govender & Pretorius, 2015). ICT technologies such as the worldwide web, Electronic Data Interchange, email, and e-commerce are enablers for organisations to easily communicate when dealing with information-intensive processes (Den Hengst & Sol, 2001).

In a study conducted by Adrians and Warden (2004), constraining factors that affect the adoption of e-commerce by businesses and consumers are lack of skills, cybercrime and the uncertain cost of implementation. In the case of South Africa, the online market has shown a stable increase among its local e-commerce websites. With only 24% of online shopping done on foreign shopping websites in 2014, this has reduced from 27% in 2013 and down from 33% in 2012 (Goldstuck & Worx World Wide, 2014). Despite the increase in online shopping among its local online stores, online grocery products are still currently not being bought widely online (PWC, 2013). Pick n Pay and Woolworths is one of the major largest retailers in South Africa (Gauteng Province Treasury, 2012), both Pick n Pay and Woolworths receive less than 1% of their total sales from their online grocery internet retailing (Douglas, 2013). This goes to show that there is a gap in the adoption and use of e-commerce in the retail grocery sector in the developing context.

2.6 Actor Network Theory

ANT can be interpreted as a practical recursive sociology of process which focuses on how actors can be both human and non-human as well as try to build and maintain networks (Heeks & Stanforth, 2015). ANT can be used as a lens to analyse the socio-technical processes collectively, and acknowledge that transforming the social, technical, conceptual and textual aspects are part of the process (Mchunu, 2013). It considers equally human and non-human components as actors within a network (Cressman, 2009). ANT is used to examine the motivations and actions of groups of actors which are part of a heterogeneous network of aligned interests (Walsham, 1997). ANT is also used to investigate how different actors can

come together to create a network which includes both human and non-human elements, to achieve their interests (Pollack et al., 2013).

ANT consists of the following tenets: Actor, Actor-Network, Black-box and Obligatory Passage Point (OPP). Actor (or Actant) are individual entities who can take actions through which they are visible and can influence other actors (Rivera, 2013). In other words, Actor is an agent, group or individual, that can join or separate with other agents in a network which can define them, name them, and offer them with substance, action, purpose, and subjectivity (Crawford, 2004). Actors can be both human and non-human actors such as computers, organisations or institutions (Walsham, 1997). Over time actors form networks, these networks are a series of various human and non-human elements which are linked to each other over time and are known as Actor-Networks (Rhodes, 2009). Actor-Network is a group of aligned interests, including people, organizations and standards (Walsham, 1997). These networks are formed by the actors and are maintained through the process of enrolment of the actors involved (Williams-Jones & Graham, 2003).

The focal actor persuades other actors, through the process of problematisation, that a problem needs to be solved, using an OPP. This is a process where a focal actor convinces other actors to accept a problem that is aligned with the focal actor's interests (Callon, 1986). A black box is an established network of linked actors that is stable in that it is viewed as one actor (Alexander, 2014). It can also be referred to as a part of a complex system and is stable in that it can be overlooked within that system (Rice, 2011). In support of this, Lihosit (2014) refers to a black box as a machine or a set of instructions that is complex to understand or explain. For example, a computer is a black box, as it is a complex collection of strongly connected actors, such as the central processing unit, hard drives and a motherboard, all acting as one to ensure a functioning computer. These actors act together as one unit so that they are overlooked as individual actors by the end user (Alexander, 2014; Cressman, 2009; Stalder, 2014).

Another tenet of ANT is the four moments of translation, which include problematisation, interessement, enrolment and mobilisation (Walton, 2013), these tenets are discussed in the section below.

2.6.1 Moments of Translation

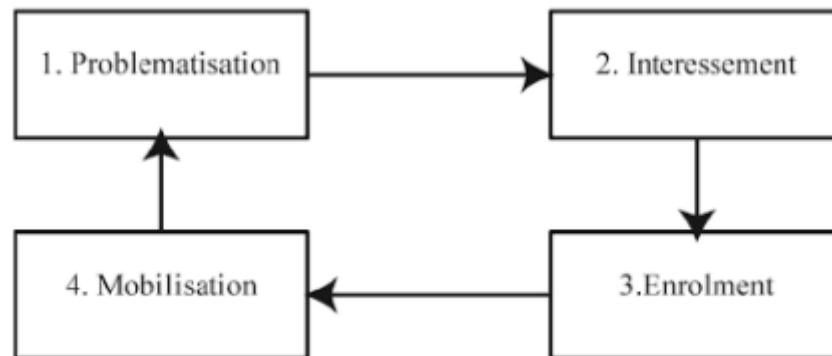


Figure 1 - ANT Moments of Translations (Tatnall, 2010)

- Problematisation - the process of identifying the nature of a problem to be solved by the focal actor which allows other actors to identify it as a problem (Shim & Shin, 2015).
- Interessement - a process where the focal actor stabilises the identity of other actors and creates links between them (Stanforth, 2006).
- Enrolment – the approaches through which the focal actor attempts to define and interconnect different roles that allow other actors to relate within the network (Heeks & Stanforth, 2015).
- Mobilization – the last stage in the moment of translation when the focal actors ensure that all representatives or spokespersons act according to what are now their aligned interests (Rhodes, 2009).

Due to the social-technical nature of this study, the elements of ANT will be used to understand the different actors and how they influence each other to reach their aligned interests.

However, there are some limitations which have been used as a criticism of ANT theory.

2.6.2 Limitation on Actor Network Theory

Even though ANT has been widely applied in the field of information systems, the theory does have some limitations. According to Walsham (1997), theories have limitations and advantages which will attract criticism and ANT is no exception. A criticism directed at ANT is that it is a limited analysis of social structures and it is incorrect in its symmetric treatment of humans and

non-humans (Walsham, 1997). This study does not support or go against the theory. It is also acknowledged that this criticism is not the only criticism of ANT. The discussion is used to give the researcher an in-depth understanding of the limitations of the use of this theory as a lens to guide the analysis of data collected in this study.

Limited Analysis of Social Structures

ANT has been criticised for focusing on local cases without considering the macro social structures, in other words looking at local rather than global. Walsham (1997) states that ANT does not consider the broader social structure which affects the local structure. This was also argued by Reed (1997:29) who stated that:

“They feel no need to look beyond these micro-level processes and practices, because as far as their advocates are concerned, there is nothing, ontologically or analytically ‘there’; flat ontologies and miniaturised local orderings construct a seductive vision of our social world in which everything and everybody is constantly in a ‘state of becoming’ and never in a condition of ‘being.’”

In response to the above suggestion by Reed, Latour (1990) stated that ANT can be used to investigate macro levels with the same procedural tools as the micro level. Latour (1990: 118) goes on to say:

“Network analysis and field work have been criticised for giving interesting demonstrations of local contingencies without being able to consider the “social structures” which influence the course of local history. Yet...the macro-structure of society is made of the same stuff as the microstructure.”

According to Latour (1999), there is no difference between macro structures and micro-interactions. Furthermore, the differences between actors and network are two entities which are part of the same phenomenon.

Macro and micro levels in the context of this study are the same as they both have the same set of goals and objectives. Based on the unit of analysis which are the grocery stores, some of these stores are chains stores which have the same processes locally and globally. Therefore, in the context of this study investigating the local context has similarities to the global context.

Symmetric Treatment of Humans and Non-Humans

Another criticism of ANT is the lack of the analysis it gives in regards to the actor (Stanforth, 2006). It is argued that the symmetrical treatment of humans and non-humans is both logically and morally problematic due to the fact that it eliminates humans from their essential role (Rivera, 2013) In other words, treating all actors (human and non-human) as equal is problematic: not all actors are the same. The criticism is that as humans create these non-human entities such as computers, they are not equal. Callon and Law's (1997: 168) response to this criticism was:

“Often in practice we bracket off non-human materials, assuming they have a status which differs from that of a human. So, materials become resources or constraints; they are said to be passive; to be active only when they are mobilized by flesh and blood actors. But if the social is really materially heterogeneous then this asymmetry doesn't work very well. Yes, there are differences between conversations, texts, techniques, and bodies. Of course. But why should we start out by assuming that some of these have no active role to play in social dynamics?”

Essentially the point is that due to what constitutes the relationship between human and non-human it is difficult to quantify who has a vital role in the actor network context. As humans can't live without non-humans in the technological age and non-humans cannot operate themselves without a human. And when we start assuming that one entity has a more important role to play than the other in a social context we are therefore being biased in data collection and the analysis of that data. In the context of this study it is acknowledged that human and non-humans both have a vital role to play in the adoption and use of e-commerce in the grocery sector.

2.6.3 Actor Network Theory and Information Systems

The criticism discussed above was not to identify gaps in ANT, but to provide awareness, insight, and guidance on the application of ANT in this study. Despite the criticism discussed in the above section, ANT can be used as a lens to understand the interaction of human and non-human actors. ANT addresses the role of technology in a social context and the processes through which it affects or is affected by social elements in a setting over time. It also focuses

on actors, how networks are formed and strengthened based on their aligned interests to generate technical artefacts (Troshani & Wickramasinghe, 2014).

In the implementation of an information system which involves users, this can be viewed by an individual or group of individuals as new (Tatnall & Anthony, 2005). In this case, ANT does not only focus on the network, but it also identifies the roles, technological artefacts and the interaction between human and non-human in a network. There are many studies which have used ANT as a tool for analysis in the area of information systems such as that by Troshani & Wickramasinghe (2014) which used ANT to study how pervasive e-health can be enhanced by using ANT. Rhodes (2009) also used ANT as an analysis tool studying the ICT implementation trajectory in an African women's micro-enterprise, to examine the role of technology in socioeconomic development. Tatnall and Burgess (2002) used ANT to conduct a study of the implementation of a business-to-business portal for regional SMEs in Melbourne, Australia. Another study which employed ANT as an analysis tool is Rivera (2013). ANT was used to discover how actors intended to encourage involvement in the online community, through different strategies which are to enrol the cooperative technology supporting involvement in a network.

2.7 Conclusion

The focus of this chapter was essentially based on the keywords ICT, E-commerce, Grocery Store, Adoption of Technology and ANT, as these are key elements in the investigation in this study. The chapter begins with outlining ICT, how it benefits businesses and the challenges. Due to the phenomenon under study E-commerce was outlined as a type of ICT accruing benefits for businesses, the economy. Further, this chapter explains the adoption of this innovation in businesses and the challenges faced by business focusing on retail grocery stores with the use of this innovation. ANT is also presented in this chapter focusing on the four moments of translation, as this will be used as a lens to analyse data collected in this study.

In conclusion, despite the benefits e-commerce offers to the retail grocery sector in South Africa, there are challenges faced by businesses, which contributes to the slow growth of e-commerce in the retail grocery sector. These challenges include the unfavourable environment and inhibiting factors that have a negative impact on the adoption and use of e-commerce. This overview was based on a literature review relating to the area of study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter includes a detailed discussion about the research design and methodology that was applied in this research. This consists of approaches, techniques and methods. The chapter is divided into six main sections as follows: Research Paradigm, Research Methodology, Research Design, Research Approach, Data Collection, and Data Analysis.

3.2 Research Paradigm

According to Saunders et al (2015), research philosophy refers to beliefs and claims in regards to the expansion of knowledge. Philosophy studies objects in a social context, from different perspectives such as reality and nature of knowledge (Uddin & Hamiduzzaman, 2009). It aims to question reality as well as understand the reason behind the cause of a phenomenon (ibid). Essentially, philosophy is a viewpoint of something (Michel, 2008). It helps to explore factors which can influence research by describing practices and beliefs within a discipline using methodological processes in which the research can be achieved (ibid). The research philosophy consists of three convictions, namely axiology, ontology and epistemology (Creswell, 2003).

3.2.1 Axiology

Axiology is defined as the science of moral choice and of fundamental values (Engle, 2009). In other words, It is a branch of philosophy which deals with values and ethics (Petrescu, 2015). According to Tomar (2014), axiology focuses on what is the nature of ethics, by dealing with the nature of values relating to the teaching of fundamental moral values and personality development. Furthermore, these values guide our decisions based on what is right, good and true. Though this study does not deal with the nature of values, there is a section on ethics which is involved in the context of the study. A concern with axiology fell outside of the realm of this study. Answers to the questions posed were revealed participants' point of view on the adoption and use of e-commerce in the mainstream retail grocery sector. The section below will discuss ontology.

3.2.2 Ontology

Ontology is the study of existence (Sefotho, 2015). It refers to the nature of social objects and the viewpoint of reality which is under study (Graue, 2015). In other words, ontology is the perception of reality (Durant-law, 2014). It aims to clarify how knowledge exists and is represented (Chandrasekaran et al., 1999). Ontology can be broken down into two categories, which are objectivism and subjectivism (Saunders, 2003). Subjectivism argues that reality only exists based on experiences, while objectivism argues that reality exists without the experience of it (Flowers, 2009).

Given one of the aims of this study is to understand how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa, the phenomenon under study deals with subjective human factors. Furthermore, this includes their perspectives on the worth of e-commerce. In other words, the subjective ontological viewpoint about the existence of e-commerce is socially constructed and contextual reality is implied in this study. In addition to this, to understand how the actors understand e-commerce, a suitable philosophy which deals with the nature of knowledge is needed to inform the study. This is known as epistemology, which will be discussed in the next section.

3.2.3 Epistemology

Epistemology focuses on the nature of knowledge and how it is acquired (Dick, 2013). It aids the researcher in structuring the conceptualisation of the participant in the process of data collection and analysis (Carter & Little, 2007). Furthermore, it helps the researcher gain a detailed understanding of the values and attitudes of the participants based on their own perspectives (ibid). Epistemology methodology can be further divided into 3 paradigms which include positivism, critical theory and interpretivism. These 3 paradigms will be discussed in more detail in the subsequent sections.

The Positivism Paradigm

The positivist paradigm argues that reality can be observed empirically, proved and explained using logical analysis (Kaboub, 2008). It states in an objective reality, a researcher is an observer (Mack, 2010). Positivists believe that the phenomenon under study and the researcher are treated differently and can be studied separately (Mlitwa & Raqa, 2012). Conversely, during the process of the research, the researcher is independent of the process, to prevent biases from influencing the results of the research (Rivera, 2013). Thus, the positivism paradigm is

more appropriate for studies which involve measurements in relation to statistics and statistical inference.

Based on the above definition, the positivism paradigm would not be suitable for this study. Given the importance of gaining in-depth understanding and the participants perspective in the adoption and use of e-commerce, there are social variables which may influence the activities and actions of the participants. Thus, it was impossible to separate the actors from the phenomenon under study, as the participants are central to the subjective reality. For these reasons, different paradigms are discussed in the subsequent sections.

The Critical Theory Paradigm

The critical theory paradigm aims at permitting social actors to go beyond the boundaries placed on them such as gender and socio-economical class (Cresswell, 2003). Equally, the paradigm focuses on reviewing and altering society as a whole (Reeves et al., 2008). Its purpose is to free social actors by altering their social, political, and cultural settings (Hussain et al., 2013). Critical theorists denote that people can perceptively act to alter their social and economic circumstances (Shemi, 2012). A critical researcher, for instance, may conduct a study which involves peoples' thinking, interaction, the formation of networks, and aid in examining the environment of their being (Creswell, 1997).

Based on the definition of the critical paradigm, which seeks to establish some alteration in social constructs, it was found not suitable for this study. Based on one of the objectives of this study, which is to understand and obtain explanations on how e-commerce is adopted and used in the mainstream retail grocery sector, the research would need to develop the evaluation features of the theory to complement the interpretivist epistemology philosophy followed in this study. The interpretivist philosophy is conversed in the following section.

The Interpretivism Paradigm

The interpretive paradigm acknowledges that our knowledge is socially constructed (Sefotho, 2015). It supports that there is a need to understand the roles people play as social actors (Saunders et al., 2009). The interpretive paradigm aims to examine in detail the complexity and contextual sense of a phenomenon in the daily lives of people (Hussain et al., 2013). Simply put, the interpretivism paradigm acknowledges that there are two different realities - the world we know as external reality and internal realities. These realities are subjective to a social actor (Carcary, 2009).

This study deals with understanding the interaction between social actors and phenomena in its aims of getting clarification on how e-commerce is or is not adopted and used in the mainstream retail grocery sector. Based on the above definition of the interpretivism philosophy, this paradigm was found the most suitable for this study. The rationale for this is that it enables the researcher to gain detailed information about the phenomenon under study in its subjective nature. Thereafter, qualitative data which is collected can be interpreted to update theory.

3.3 Research Methodology

Methodology is related to the point of the research, including whether it is to explore, describe or explain (Babbie & Mouton, 2001). Kothari (2012) states that research methodology can be referred to as a methodical technique which is used to solve a research problem. It contains steps which a researcher can follow in conducting a study (Ellis & Levy, 2008). Research methodology can be categorised into quantitative or qualitative, or both, which is called a mixed method. Primarily, they are used to answer different research questions based on the aim and objectives (ibid). Irrespective of the methodology that is selected, they outline the type of research tools that can be used at different stages, such as collection and analysis of data.

3.3.1 Quantitative Research Methods

Quantitative research methodology is based on the quantities of some features (Kothari, 2004). It aims to maximise the objectivity, replicability, and generalisability of outcomes (Harwell, 2011). To follow this methodology, the views and experiences of the researcher will need to be set aside to avoid subjectivism in conducting the study and the conclusion (ibid). Methods such as tests or survey are used in the collection of quantitative data. The quantitative research approach generally follows the positivism paradigm towards the development of knowledge, as the positivist believes in an objective reality (Cohen & Crabtree, 2012).

However, since one of the objectives is to understand how e-commerce is adopted and used in the mainstream retail grocery sector, without any numerical measurement, the quantitative methodology was not suitable for this study. The rationale for this is that examining the phenomenon requires a subjective detailed understanding. Based on the objectives of this study, which was to explore and examine a natural setting, the qualitative method was selected.

3.3.2 Qualitative Research Methods

Qualitative research methodology is referred to as a research method which assists in the discovery of data that is not available by numerical measures or other means of quantification

(Warden, 2007). It aims to uncover and understand the opinions and experiences of the social actors, by discovering the purpose of a phenomenon (Harwell, 2011).

Given the definition above, since the aim of this study was to develop a framework which can be used to guide an understanding of how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa, and understand the factors that affect the adoption and use of e-commerce in the mainstream retail grocery sector, to this end, the qualitative research approach was deemed the most suitable. The rationale was due to the subjective and contextual nature of the qualitative methodology. In line with this, the study can be designed based on its aim and objective to be either descriptive, explanatory, or exploratory (Bryman, 2005).

Descriptive Research

Descriptive research can be referred to as the research design, questions, and data analysis applied in a study (Knupfer & McLellan, 1996). It aims to describe the current state of a phenomenon (Kothari, 2012). It presents an image of the current condition of a phenomenon as it naturally occurs in relation to its social context (Burns & Grove, 2003; Babbie, 2013). This will assist the researcher to present a descriptive report on how e-commerce is used in the mainstream retail grocery sector in South Africa.

However, after a detailed account of the standing of e-commerce in the mainstream retail grocery sector, clarification of the factors that influence and affect the use of e-commerce will be necessary. Thus, the descriptive research was not found the most appropriate for this study. To be able to update the community of practice and the members of the scientific community who are interested in the phenomenon, explanatory research was best suited for this study.

Explanatory Research

Explanatory research aims to establish relations among two or more sides of a context (Saunders, 2003). It focuses and attempts to answer the “why” questions in a study (De Vaus, 2001). For instance, why organisations use e-commerce to facilitate their goods and services.

Given the above definition, the explanatory research was founded to be suitable for this study, since one of the objectives of this study is to gain an understanding of the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa. In addition to explaining the reasons for the sparse adoption and use of e-commerce in the mainstream retail-grocery sector in South Africa, a possible framework can be developed to guide future participation in e-commerce.

Exploratory Research

Exploratory research is a preliminary inquiry into a phenomenon, which forms a foundation in which further in-depth examination can be conducted in a study (Singh, 2007). It is used when there is minimal knowledge about a phenomenon (Burns & Grove, 2003). Exploratory research is typically conducted to better inform understanding of a phenomenon or topic and can be used as a building block for proceeding studies (Babbie, 2013).

In line with this, exploratory research was used in this study to assist the researcher to acquire in-depth insight into the phenomenon of study. Thus, general information gained in an exploratory way becomes the basis for descriptive and explanatory studies to build on – in this case understanding how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa.

3.4 Research Design

Research is the pursuit of knowledge through objective and methodical approaches to find answers to a problem (Kothari, 2004). On the other hand, research design is the articulation of the methodical procedure of a study (ibid). This includes identifying the problem, framing a hypothesis, the selecting of research methods, data collection, analysis and the conclusion which can be a solution or generalisations. In keeping with the methodology chosen, the section below discusses the different types of qualitative research design including ethnography, grounded theory, phenomenological and case study.

Ethnography

Ethnographic research design derives from anthropology's custom of understanding the methods and products of cultural behaviour (Thorne, 2000). Ethnography aims to gain a deeper understanding of individuals' point of view and how they participate in their own social and cultural world (Westberry, 2009). It is used to analyse the hypothesis that participants have the cultural knowledge, and the investigator systematically records the words of participants in context (Onwuegbuzie et al., 2012). It helps the researcher understand the culture of the participant.

Ethnographic study states that the researcher (ethnographer) has to spend long periods of time in the phenomenon to understand the participants' social and cultural life (Shemi, 2012). Since this study was not focused on observing the cultural behaviour of the participants in this study, therefore this method was not found suitable for this study.

Grounded Theory

Grounded theory design seeks to gain an explanation that is developed in interaction with the data and is continually tested and refined as data collection carries on (Schutt, 2012). In other words, grounded theory is revealed, developed, and provisionally verified through the use of a methodical data collection and analysis process of data regarding the phenomenon of study (Bowen, 2009). It helps the researcher to understand the ways people use to cope with, respond to, or change their environment (Golicic et al., 2002).

Grounded theory uses a comparative method where data are compared and contrasted in the context of a phenomenon (Walton, 2013). In the context of this study, the aim and objectives were not to compare any similarities in phenomena, therefore, grounded theory was not found appropriate in designing this study. Furthermore, phenomenology and case study designs are discussed in the next sections.

Phenomenology

Phenomenological research is that designed with the aim of explaining the structures of subjective experiences and consciousness from the participants' point of view (Reeves et al., 2008). In other words, it focuses on the experiences and subjective views of participants as a phenomenon (Hussain et al., 2013). It is used to describe social reality from the participants' subjective point of view and to understand the meanings of their experiences (Bhattacharjee, 2012).

Since the aim of this study was to develop a framework that can be used to guide how e-commerce is adopted and used in mainstream retail grocery sector by retailers, the study, therefore, requires an understanding of the phenomenon from the subjective perspectives of the retailers (organisations). In line with this, this design will allow the researcher to gain and interpret the subjective views of the participants in its contextual and qualitative nature. Therefore, phenomenology design would be appropriate for this study with the use of a case study design.

Case Study

A case study is a research design used to gain a detailed understanding of a complex phenomenon within its real-life context (Crowe et al., 2011). In support of this Laosethakul (2005) states that a case study is used to study a phenomenon in its real-life setting, particularly when the boundaries between the phenomenon and setting are not clearly evident. It is used in a case where the researcher has minimal control over events that occur in relation to the

phenomenon within some real-life context (Kohlbacher, 2006). Case study permits the researcher to gain a general view of a phenomenon and can provide an overview when many sources of evidence were used (Noor, 2008).

This study employed a case study research design. The rationale for this was due to the exploratory nature of this study. Finally, this study focused on a specific context - grocery retail stores (i.e. large, small and medium-sized retailers) - which was approached for accessibility and used to conduct this study.

3.5 Research Approach

Research approaches can be categorised into two branches, namely deductive and inductive (Saunders, Lewis & Thornhill, 2015). The deductive approach is built on the basis of analysing existing literature, theories and existing findings with logical conclusions, in the form of assumptions and propositions, drawn (Bergdahl et al., 2018). Conversely, the inductive approach is based on data, clarifications and theories which are provided by the participant in a study (Harwell, 2011). Simply put, annotations are first made in which logical conclusions are created from the result of the data analysed (Schadewitz & Jachna, 2007). For instance, the objective of a researcher is to understand a phenomenon and the reasons behind it occurring, in this light, an inductive approach becomes suitable to examine the phenomenon.

The inductive approach was found suitable for this study as it allowed the researcher to conduct inductive observations. The main rationale for this was that the objective of the study was to probe the reasons for the adoption or otherwise of e-commerce in the mainstream retail grocery sector, and secondly because there is limited theoretic work upon which to base a deductive study.

3.6 Data Collection

Data collection can refer to the process of collecting and measuring information on variables of interest (Barker, 1980). Data collection methods such as observation, literature analysis and interviews are used in the process of collecting qualitative data (Kawulich, 2005). To get the necessary data needed for this study, the interview technique was used in the collection of qualitative data.

3.6.1 Interviews

Interviews are a data collection method which involves discussions or verbal questioning between an individual or group of people in order to get detailed information about their views and feelings about a certain topic (Baaken, Orazbayeva & Riemenschneider, 2016). The aim is to understand and gather information from social actors for the purpose of a research (Mudau, 2017). Interviews can be categorised into two main types, namely structured and semi-structured interviews (Elliott & Timulak, 2005).

Structured Interview

Structured interviews are fixed questions and answers which sway towards the direction of the quantitative method (Sheikh & Bibi, 2006). It involves the researcher asking a standard set of questions (Ndayizigamiye, 2012). They are close-ended questions which lack the ability to be flexible during an interview (Shemi, 2012). Therefore, based on the exploratory nature of this study for the researcher to be able to probe further to better understand the contributing factors to the development of a framework on the adoption and use of e-commerce in the mainstream retail grocery sector, structured interviews were not found suitable.

Semi-structured Interview

Semi-structured interviews enable a flexible approach, which acts as a guide to the researcher with the capability of diverging to fulfil the objective of the research (Westberry, 2009). It provides the researcher with a pure focus on the participant and offers the chance for explanation and in-depth understanding through the use of additional questions (Carcary, 2009). For this reason, a semi-structured interview was found appropriate for this study. The main rationale is due to the subjective and contextual nature of this study. Semi-structured interviews were found to be suitable for this study because of the subjective and contextual nature of the qualitative methodology. It is beneficial to help the researcher explore the inevitable occurrence of “what he/she does not know” about a phenomenon (Westberry, 2009).

Based on one of the objectives, which is to understand how e-commerce is adopted and used in the mainstream retail grocery sector, the researcher set out to gain detailed and comprehensive information, in the form of the participants’ opinions, understanding and experiences, through the semi-structured interview technique. Face-to-face interviews were conducted in person with the participants either one-on-one or in a group session. Interviews can also be conducted telephonically (Creswell, 2003).

3.6.2 Interview Demography

In this study, potential grocery retail organisations were selected based on the area under study and the location of the researcher at the time this study was conducted. Technical personnel (senior and middle management, and technologists) and business personnel (business managers, business analysts) who have a role in the adoption and use of e-commerce were interviewed. Due to commercial privacy, the names of the participant organizations are kept hidden.

3.6.3 Interview Guidelines

Interview guidelines are created to assist the researcher in choosing discussion areas during the interview. The interview guideline structure is shown below:

1. How is e-commerce adopted and used in the mainstream retail grocery sector in South Africa?
 - 1.1. Is the organization participating in e-commerce for your businesses?
 - 1.2. How is the organization doing so (participating in the e-commerce)?
 - a. Does the organization have a strategy or guidelines, which guide your participation in e-commerce?
 - 1.3. In which area/s of your business is e-commerce being used?
 - a. Can you please share with me why that business area/s was/were chosen?
 - 1.4. Who is your target market?
 - a. Are there specific reasons why that market is targeted?
 - 1.5. What tools or systems are being used to support or enable your e-commerce?
 - a. Why do you think the organization selected those tools or systems?
 - b. Can you please explain how those tools or systems were selected?
2. What are the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa?
 - 2.1. In your view, why did the organization decide to participate in e-commerce?
 - 2.2. In your view, do you think that the organization have requirements for e-commerce?

- a. Where do the requirements (technical and business) come from?
 - b. Who are the custodians of the requirements in the organisation?
 - c. In your view, why do you think those individuals are the custodians?
- 2.3. What are some of the benefits of e-commerce to the organization so far?
- a. In your view, why do you think that those benefits are from e-commerce?
- 2.4. What are some of the challenges that you have encountered so far?
- a. Why do you think those challenges existed?
 - b. Who do those challenges affect?
 - c. How were those challenges addressed?
3. How can the adoption and use of e-commerce be improved in the mainstream retail grocery sector?
- 3.1. In your view, do you think that the organization is using e-commerce to its full potentials?
- a. Why do you think so? Please give me some examples.
- 3.2. How often are the e-commerce activities reviewed in the organization?
- a. Why do you think that the review is done/not done?
 - b. What have been some of the results from the reviews? And what do you think the organization did with those results?
- 3.3. In your view, what would you suggest can be done differently?

The interview guidelines were formulated based on the three research questions; (1) How is e-commerce adopted and used in the mainstream retail grocery sector in South Africa? (ii) What are the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa? (iii) How can the adoption and use of e-commerce be improved in the mainstream retail grocery sector? These questions were broken down further into questions which enables the researcher to gather information which helps answer the research questions.

These questions were constructed in a way in which the participants can clearly understand the questions. As stated in the previous section, the interview guidelines were created for technical personnel (senior and middle management, and technologists) and non-technical personnel

(business managers, business analysts) who have a role in the adoption and use of e-commerce. The rationale for this is that the different actors - technical and non-technical - understand the phenomenon under study differently. The IT personnel focus on the technical aspect of the phenomenon and the non-technical focus on the business aspect of the phenomenon.

3.7 Data Analysis

In this study, the qualitative data which was collected from the interviews with the participants was analysed through an interpretive process. The interpretive process involves the researcher interpreting and making sense of the data to make meaningful discoveries and draw conclusions from the analysis (Graue, 2015). The raw data which was collected was proofread for grammatical errors, spelling errors, sentence correction before the data analysis was conducted. The data was transcribed from spoken to written data, in which they were documented, formatted by inserting page and line numbers. The participants were assigned a number, this was to protect the identities of the participants. This is in line with the ethics of Cape Peninsula University of Technology (CPUT). Furthermore, this helped the researcher in referencing the participant's opinions during the data analysis. This is discussed in more detail in chapter 5 of this study.

The objectives of this study were:

- (i) to understand how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa,
- (ii) to understand the factors that influence and affects the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa, and
- (iii) to contribute to the improvement of how e-commerce is adopted and used in the mainstream retail grocery sector. The data analysis was conducted by employing the interpretive approach, which was guided by the 'moments of translation' from the Actor Network Theory (ANT) perspective, which was discussed in detail in chapter 2 of this study.

The use of ANT was used as a lens, or theoretical framework, through which the data were analysed to gain a deeper understanding of the following:

- (i) How networks of actors are maintained in a social context. Thus, the theory will be used to examine how the different heterogeneous networks of actors are formed.
- (ii) The interaction and relationship between actors within and between networks, including the relationship and interaction that happens between human and non-human actors, so as, ultimately, to understand the factors that influence and affect the adoption and use of e-commerce in grocery retail stores in South Africa.
- (iii) To identify the factors that influence and affect the adoption and use of e-commerce for the grocery retail stores in South Africa.

3.8 Ethical Considerations

The CPUT's research code of ethics was followed in this study as a guide to ethically conduct the research. This was applied in this study as follows:

- i. The ethical form was completed and submitted to the CPUT ethical committee.
- ii. An introductory letter signed by the supervisor and the CPUT ethical committee was sent to the organisations for consent to carry out the interviews.
- iii. Permission letters were acquired from the organisations to collect data.
- iv. These consent letters from the organisations were then sent to the ethical committee.
- v. All participants involved in this study were not forced to take part in this study. All participants voluntarily took part in the study.
- vi. All participants were informed of the ethical considerations such as confidentiality, right to pull out from the study at any time and anonymity.
- vii. Data that was collected was kept confidential to the researcher supervisor and examiners for auditing purposes.

3.9 Conclusion

This chapter focuses on the research methodology; philosophical assumptions, approaches and research techniques that were followed in this study. In addition, this chapter presents an overview of the different steps that were taken by the researcher to achieve the objectives of the study. The next chapter (Chapter 4) discusses the cases that were selected for the study.

CHAPTER 4

Overview of Cases

4.1 Introduction

This chapter presents an overview of the two organisations that were selected and used as cases in this study. The cases were selected based on the criteria which were presented in Chapter 3 of this thesis. The chapter is divided into three main sections. In the first section, the field work is discussed. The second and third sections provide detailed information about the organisations, respectively. The last section concluded the chapter.

4.2 Field Work

During the proposal stage of this study, after submitting the research proposal to the Cape Peninsula University of Technology (CPUT) Faculty of Informatics and Design, the research proposal was provisionally accepted by the ethics committee of the CPUT. This was due to the absence of a consent letter from the relevant case studies. Thereafter, contacting the relevant cases over a period of 5 to 6 months, the researcher managed to obtain the required consent letter from the two identified cases. Both organisations head offices are in Cape Town, in the Western Cape of South Africa.

Based on the aim of this study, the qualitative methodology was followed as outlined in Chapter 3. The research design was a case study, as it enables the researcher to obtain an in-depth understanding of the phenomenon within its real-life situation. The names of the organisations were kept anonymous and were given pseudonyms. The first case in the study was named Masala Chain Stores (MCS). Using semi-structured interviews within the qualitative methodology, 4 participants were interviewed, consisting of technical, non-technical, senior management and managers in the organisation. The second case was called Dapper Chain Stores (DCS), of which 3 participants were interviewed, consisting of technical and non-technical employees at the organisation.

All interviews conducted were recorded using a voice recorder to ensure that all information voiced by the participants was captured and available as evidence. The interviews were further, transcribed to quote and reference the participants during the analysis stage in the study. The interviews were conducted within the premises of the organisation by utilizing the meeting

rooms and/or office space of the participants. To adhere to ethical considerations, the participants were given codenames to avoid the disclosure of their identities. The codenames were MCS_ID which refers to MCS – the organisation, and ID – the number assigned to the participant.

4.3 Case One – Masala Chain Stores

MCS is one of South Africa's leading retailers. Since 1967 MCS started building its retail empire. Starting from 4 small stores in Cape Town, MCS has expanded its business into different parts of South Africa, which saw it enter the Business Times Top 100 companies. MCS slashed the cost of food across all its stores to create a campaign to cut the cost of living. In 1975, thousands of consumers descended on South Africa's first hypermarket which was MCS hypermarket in Boksburg. Shortly after this MCS launched its own no-name brand to its customers.

In 2001, MCS welcomed the digital age, introducing online shopping to its customers. After opening 111 new stores in 2014, MCS has 1076 stores which are currently operational in South Africa, Namibia, Zambia, Botswana, Swaziland, Lesotho and Zimbabwe. MCS made a turnover of R66.9 billion in 2015 making a significant increase to R72.4 billion in 2016 - 8.2% growth, MCS is known as South Africa's number one grocery store.

4.3.1 Organisational Structure

The structure of MCS consists of 14 different units. Each of these units exists to facilitate one or more functions within the organisation. This spans from the board of directors all the way to the information services unit, which is responsible for the deployment of e-commerce within the organisation. This unit was the focus of this study as it plays an essential role in the adoption and use of e-commerce within the organisation.

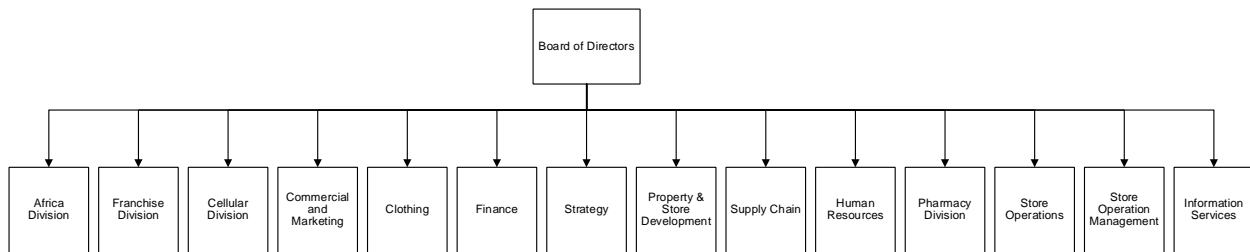


Figure 2 - Masala Chain Stores Organogram

4.3.1.1 Africa Division

MCS identified Africa to be its second engine of growth. Because of this, MCS aspires to play a key role in community building and development in each of the countries they operate in. The Africa division is responsible for leveraging MCS capabilities and experience in the core South Africa market to achieve efficiency and success in Africa and ultimately to be a major retailer in the countries in which the organisation resides. MCS currently operates in 6 different markets outside South Africa, namely Namibia, Botswana, Lesotho, Zambia, Zimbabwe and Swaziland, and plans to further grow their business into West Africa. This division consists of different roles and responsibilities such as a chief accountant, manager operations etc.

4.3.1.2 Franchise Division

The Franchise division is responsible for the management of the MCS operating model. This model expands across the footprint of the brand by introducing dynamic entrepreneurs into the company to trade their stores in the various communities around the country. MCS entrusts the franchisees with the brand in various formats, Family Supermarkets, Mini Markets, Express stores and Market stores depending on the operational environment. The strategy for future sustainability is to be the best fast-moving consumer goods franchise model in the country and to create a lucrative partnership with the franchisees, which is needed to keep the business model relevant for MCS, the franchisees and most importantly, the customers.

4.3.1.3 Cellular Division

The Cellular division within MCS falls under the MCS money division. The division consists of 2 staff members, the head of the cellular division and the assistant. Both personnel are responsible for the airtime/data bundles sold at the point of sale through all the major networks within South Africa and the selection and ranging of all cellular devices and accessories sold within the stores. MCS currently has over 160 stores nationwide that offer cellular devices in store. This division is also responsible for negotiating all commercial agreements between MCS and the network operators, namely Vodacom, MTN, Cell C, Telkom, Neotel etc.

The compiling of all cellular deals within the stores ensures that MCS remains competitive across all cellular products within the market. In addition, the cellular division manages all relationships between MCS and the cellular providers, which includes the network operators and third-party distribution partners, for both cellular devices and accessories. Compiling all marketing material for the cellular is a process that involves the selection of which handsets are to be advertised and at what price point. Any additional value to be included is also managed through the cellular department. Currently, MCS's main revenue stream from the cellular division is from airtime/data bundles sold to prepaid customers.

4.3.1.4 Commercial and Marketing Division

At MCS, they believe that the customer is at the centre of everything they do and the team that delivers what its customers want is the commercial and marketing division team. This division is responsible for the buying, merchandise, finance, support, planning, technical, digital marketing, brand marketing, customer insights and advertising as well as the smart shopper offering. This division works in collaboration with the manufacturers, stores, logistics and lastly the customer. Furthermore, MCS clothing forms part of this commercial division and is one of the favourite low-price clothing stores.

4.3.1.5 Clothing Division

The Clothing division is responsible for all the clothing sold in stores. All merchandise sourced by the clothing division is manufactured and delivered to the clothing distribution centre and allocated to the various stores. This division was created in 1975 and has expanded across all

the MCS stores such as the hypermarkets, selected supermarkets, family stores and stand-alone stores countrywide, as well as internationally, in Namibia and Zambia.

The clothing division consists of personnel who are responsible for the procurement and distribution of stock for that department. The team must consider many factors which affect what they buy. They need to look at the performance of current lines, consider overseas trends and look at what competitors are doing. Once the garment reaches the store it is the task of the department to continue to monitor sales performance throughout the season and adjust production and allocations of stock according to the performance of the store and trading conditions.

Some of the roles that exist in the clothing division are: buyers who are responsible for choosing the style of the garment for the season: the cut, colour, trim details; and planners, who are responsible for the production and stock holding of merchandise by producing a category and assortment plan and who also plan price points, margins, stock levels and intake to stores to ensure the flow of merchandise into the stores throughout the season. Further, once a garment has been manufactured and is ready for distribution it is quality checked by quality assurance and the buyer, to ensure that the garment has been made to exact specification. Once this is done the goods are shipped to the Clothing Distribution Centre and dispatched to stores.

An allocator has the role of allocating the correct amount of stock to be sent from the Clothing Distribution Centre to each store. The clothing finance & administration and human resources personnel ensure that all the relevant policies and procedures are followed and that the management and staff in stores are well trained to merchandise the stock, run a store and look after the customer. The clothing store plans, orders all the fixtures and fittings and sets up all new and refurbished stores both in the stand-alone sector and nationally. The clothing marketing personnel ensure that all promotions and advertising activities are well executed.

4.3.1.6 Finance Division

The finance division at MCS is responsible for the management of tax, treasury, payroll, risk and assurance, corporate procurement, planning and performance. This division consists of the chief financial officer, finance director and other accountants. This division spans across all areas of the organisation, both technically and operationally, supporting both the local and

international markets. Within the finance division are the following departments: store operations, supply chain, commercial and marketing divisions. They provide and allocate funds to these different divisions within the organisation. In addition, this division manages the operational risks and controls of the various operating divisions of MCS.

4.3.1.7 Strategy Division

The Strategy division is responsible for assessing the whole organisation and putting together plans for each of the different divisions into a single, coherent plan as well as exploring and evaluating options for future growth inside and outside South Africa. This is for the organisation to make informed decisions on its future investment and direction.

This division looks in depth at specific issues, so that the organisation can plan on emerging issues and challenges so that solutions can be created to those problems by exercising determination, intellectual curiosity and creativity to every challenge. The strategy division analyses and draw conclusions based on data. As they work closely with the senior leaders in the organisation such as the business unit and board of directors, it is important that they provide insights to make informed decisions.

4.3.1.8 Property and Store Development Division

Store development is a very specialized discipline due to the heavy demands placed on retail space. The primary purpose of retail space is to stock and sell the product to consumers, so the spaces must be designed in a way that promotes an enjoyable and hassle-free shopping experience for the consumer. The property and store development team combine several different areas of expertise together in the design and construction of MCS retail space.

This division's primary role involves a combination of architecture and construction practices, which incorporate elements of interior decoration, industrial design, and the fit-out of various elements of equipment required to operate in the retail space. The division consists of drawing technicians, architects, construction and project managers.

4.3.1.9 Supply Chain Division

The Supply Chain division deals with all aspects of moving and storing products from the suppliers to the stores, which ultimately influences the add value service to the customer. This

division's role consists of: forecasting, replenishment, distribution centre management, strategic development, logistic operations, demand planning (forecasting and ordering stock for the store) financial management, franchisee and vendor engagement, and finance. A supply chain is a system of organisations, people, activities, information, and resources involved in moving a product or service from supplier to customer. MCS follows a centralised supply chain model; suppliers deliver goods to distribution centres around the country and MCS delivers to the stores. It is the primary function of a supply chain team to ensure that product is moved through the chain in the most cost-effective manner. Finding innovative solutions, through process engineering, new technologies and skilled talent is all in a day's work.

Stock management is a key driver of the supply chain. Forecasting sales trends, promotional activity and market requirements are the responsibility of the supply chain planners. Analytics, systems and well-designed algorithms are the tools that the supply chain planning team have at their disposal. MCS has distribution centres across South Africa that deliver within South Africa, neighbouring states and to other countries in Africa. Transport management is a crucial part of logistics involving understanding the fleet requirement, route optimisation and cubic configuration of how much can fit on a truck and ensures effective cost management. MCS also has an online channel for distribution and this too follows a centralised supply chain model, offering home delivery and click-and-collect from selected stores. Across the full supply chain, there are varied roles and responsibilities.

4.3.1.10 Human Resources Division

The Human Resources (HR) division is responsible for developing talent and contributing towards creating a bright and sustainable future for all. The HR division recruits develops and retains a high performing and diverse talent. It fosters a healthy, safe, and productive work environment for employees to maximize individual and organizational potential and develops the people capabilities and talent required to put the business ahead of its competitors. Its role is to strengthen the culture and leadership and to inspire people to go the extra mile for customers.

Through strategic partnerships and collaboration with the IT division, the implementation of purpose HR solutions that are aligned and supportive of business strategy help this division to collaborate in an efficient manner with the other divisions. This division enables line managers to manage people better for competitive advantage and to contribute to the growth and success

of a greater MCS. The HR division provides insights that will enhance and accelerate decision making to increase execution speed and effectiveness.

4.3.1.11 Pharmacy Division

MCS pharmacy division is responsible for providing acute and chronic medication to the public. This also includes primary healthcare procedures. The division consists of managers, pharmacists, assistants, vitamin advisors as well as qualified clinic sisters. This division of MCS ensures that they provide each customer with the best possible health care, from medical advice to making sure medication is more affordable to the customers.

4.3.1.12 Store Operations Division

The store operations are the core of MCS business. This is the front line that deals with the customers. The Store Operations division is responsible for the management, constantly leading and directing store operations from the sales floor. Ensuring each store adheres to the trading standards set by MCS also means putting in hours before the customers arrive and after the store has closed. This division consists of the store manager, assistant store manager, floor manager, department manager, supervisors, receiving managers, inventory managers, customer service managers. Together this group of personnel ensure that the day-to-day operations that happen in the store work as smoothly as possible.

4.3.1.13 Store Operations Management Division

Store Operations Management's role is to manage resources such as people, merchandise, finances and promotions to deliver optimal customer service. This involves interacting with customers and employees. It requires someone who can plan, organise, delegate and adapt to constantly changing circumstances and demands. In addition to the roles discussed in the previous section, this division also includes merchandise sales managers, heads of department and security managers, regional managers, general managers of hypermarkets, HR managers, planners and division-specific support (Produce, Deli, Bakery, Butchery or General Merchandise).

4.3.1.14 Information Services Division

The Information Services team is a dynamic group of IT professionals that are focused on and responsible for all the systems that are used in the business. All information and communication technology deployed in MCS is aimed at enabling rapid, high volume performance in the business and is managed by teams within Information Services. This includes the deployment of e-commerce within the organisation. The business, sales, supply chain, finance and buying systems are integrated into different systems to keep track of all the commercial activities within the organisation.

This division consists of technical personnel such as software developers, network administrators, business analysts, deputy chief executive officer, who is also the chief information officer, general manager of e-commerce, marketing managers, IT manager of digital unit and IT manager of step program manager. Based on their roles and responsibilities, the Information Services division is responsible for the deployment and management of technological infrastructure, hardware and software which are deployed within the organisation.

Some of the hardware deployed by this division includes the computers, switches, hubs, servers, and other devices such as scanners and phones. Together with the different software and systems, they enable the deployment of e-commerce within the organisation. Some of the systems that were deployed are SAP Hybris, Content Management System, Silver Pop (Email engine), SAP PIPO, SAP ERP (retail engine), SAP CRM (loyalty program engine), SAP Finance, SAP POS DM and VM (reporting engine), website and third-party systems such as PayU (payment gateway).

4.4 Case Two – Dapper Chain Stores

DCS is one of the top 40 companies listed on the Johannesburg Stock Exchange with operations across the southern region of Africa. The DCS head office is in Cape Town, in the Western Cape province of South Africa. The first store was opened to the public in 1931, after which it expanded its stores in Durban, Port Elizabeth and Johannesburg 3 years later. The business has also expanded into 11 countries in the sub-Saharan region in Africa and in New Zealand, building a reputation for superior quality, innovation and value. DCS has three major operational divisions namely DCS, Da Vinci and Gravel Group.

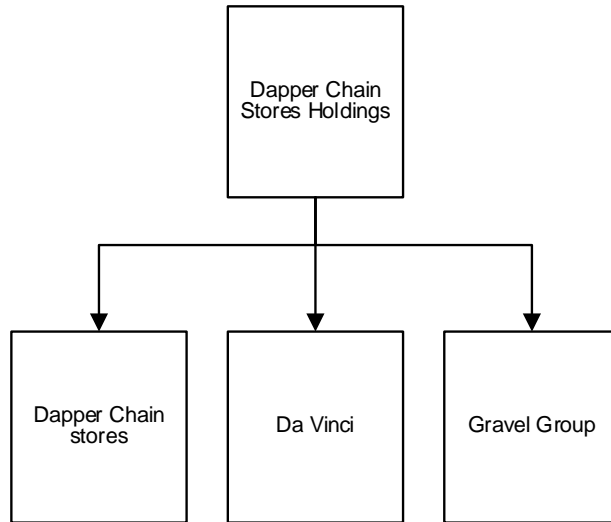


Figure 3 – Dapper Chain Stores Operational Divisions

For this study, we will be focusing on the DCS division which is in line with the focus of the study. The DCS division offers a unique selection and mix of merchandise from food and clothing to homeware and beauty products to the South Africa public. To make shopping convenient for their customers, they have employed the use of e-commerce to facilitate the buying and selling of this merchandise.

4.4.1 Organisational Structure

The structure of DCS consists of 8 units. These units play a different function or role within the organisation, from governance to merchandise. The diagram below shows the different units that exist within the organisation.

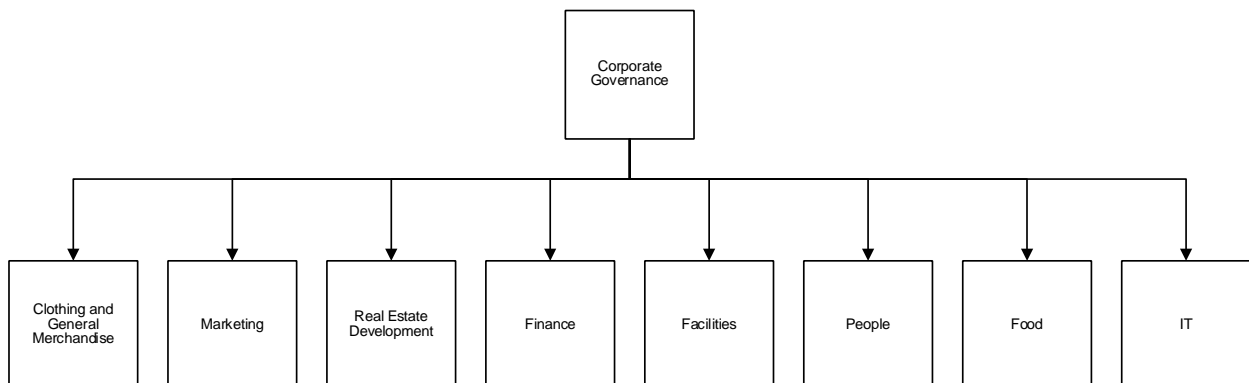


Figure 4 - Dapper Chain Stores Organogram

4.4.1.1 Corporate Governance Division

The corporate governance unit encompasses the board of directors who are responsible for directing and controlling the organisation. This unit is responsible for the legal aspects of the organisation, including compliance with the different laws which guide how the organisation functions, as well as internal audit, risk, and company secretariat. This unit can be considered the head of the organisation.

4.4.1.2 Finance Division

The finance unit's role in the organisation is to manage the funds within the organisation and plan the organisation's expenditure of funds for several resources. The planning can be both long-term and short-term strategies. This unit consists of the chief financial officer, finance director and other accountants. The finance department is also responsible for the following functions: financial analysis, financial accounting business analysis, tax accounting, accounting, financial control, system administration, and financial clerical. This unit is key as they help in ensuring that the organisation has enough funds to conduct its business.

4.4.1.3 Facilities Division

The facilities unit is responsible for amenities which exist within the organisation and across stores. The unit plays one key role in the organisation, which is to ensure that the stores and facilities are operational for customers to have a smooth shopping experience. The unit oversees the office planning services, building engineering, facilities management, office services (maintenance, catering), printing & mailing services, and catering management. This runs across different locations and includes upgrading and the management of these facilities.

4.4.1.4 Real Estate Development Division

The real estate development unit's main purpose is to create a retail space which promotes an enjoyable shopping experience for the customers. This unit plays a role in the following areas; construction project management, quantity surveying, mechanical and electrical engineering, real estate development and management. This unit consists of technicians, architects, quantity surveyors, engineers and project managers.

4.4.1.5 People Division

The people unit is also known as the HR unit is responsible for the employees that work within the organisation. The day-to-day activities of this unit comprise HR administration, HR business partnering, learning and development, recruitment, organisational development, employee relations, occupational health, remuneration and benefits. This unit is key in acquiring skilled individuals to support the business in achieving its goals and objectives.

4.4.1.6 Marketing Division

The marketing unit's role in the organisation is to ensure that the business goals and mission are promoted. It is responsible for brand management, strategic planning, graphic design, visual merchandising, packing design, and public relations of the organisation. The purpose of this department is to reach out to potential customers, retain customers, while in the process of doing so, ensuring that the organisation is perceived in a positive light by the community.

4.4.1.7 Clothing and General Merchandise Division

This unit is responsible for all the clothing and general merchandising in the stores. The clothing and general merchandise stores are key in sourcing all merchandise and allocating it across the different stores. The unit is also responsible for product development, a technology which facilitates the buying and selling of general and clothing merchandise online, sourcing, buying, planning, supply chain management, designing, and merchandising. This is one of the key units that exist in DCS.

4.4.1.8 Food Division

The food unit's purpose within DCS is to facilitate the food area of the business. This includes product development, technologies which facilitates the buying and selling of food online, product selection, planning, supply chain management. This is one of the biggest units within the organisation as they are one of the biggest contributors in revenue to DCS. The reason for this is that the organisation wanted to be a big food business with a difference. This was mainly through ensuring quality, fresh produce and innovation in order to deliver competitive pricing to its customers.

4.4.1.9 Information Technology Division

The IT unit is a group of IT professionals whose purpose is to enable and support the business towards achieving its goals and objectives. The unit is responsible for the deployment of technology, systems analysis, system management, system development, service management and support, IT business partnering, and process analysis. The unit consists of software developers, support analysts, business analysts, IT managers, system managers, chief information officer, marketing managers, online operations manager, online foods category manager, and solution architect.

Furthermore, the unit is responsible for the deployment of different systems and hardware into the DCS environment. These systems and hardware include computers, hubs, servers, switches and other devices, payment gateway, Oracle e-commerce (ATG), picking application, Retek merchandising system (RMS) and Google analytics, support application, wide area network, and local area network.

4.5 Conclusion

This chapter presents an overview of the two cases which were selected as part of the case study. The reason for this was to give a clear view of the cases and the different functions in the organisation. Fieldwork took place as described and involved the process of acquiring data as discussed. The following chapter presents how the data was analysed using Actor Network Theory as a lens to guide the analysis.

CHAPTER 5

DATA ANALYSIS

5.1 Introduction

The aim of the study was to develop a framework that can be used to guide how e-commerce is adopted and used, from both retailers' and consumers' perspectives in the mainstream retail grocery sector in South Africa. In achieving this aim, data was collected from two organisations. Details about the two organisations are presented in chapter 4. As discussed in chapters 1, 2 and 3, the Actor Network Theory (ANT) was selected and used to guide the analysis of the data. This chapter presents the analysis of the data.

This chapter consists of six main sections. The first section discusses how ANT was applied to guide the analysis of the data. The second and third sections cover the two cases that were used in the study. The findings from the analysis are discussed in the fourth section. The fifth section presents the interpretation of the findings including the framework that was developed. A summary of the chapter is presented in the sixth section.

5.2 Overview of Actor-Network Theory

ANT was used as a lens, to guide the analysis and understand the actions that actors use to mobilise allies and resources and to make heterogeneous networks (Dedeke, 2017). It is used to study a phenomenon in a dynamic and socially constructed environment including their interactions (Burga & Rezania, 2017). Furthermore, ANT focuses on how networks are formed. ANT does not aim to discover why networks occur but aim to explain how actors come together to form different networks (Shim & Shin, 2016).

In this study, ANT was used as a lens to focus on the actors making up the area of study. These actors can be human or non-human actors. In addition, ANT was also used to analyse the different networks in which human and non-human actors are involved, treating them equally within the network. E-commerce enables organisations to expand their customer reach and ultimately maximize profits. For organisations to reap the benefits that e-commerce has to offer, organisations need to be able to adopt and use e-commerce for their business. Both human and non-human actors are required for the adoption and use of e-commerce within an organisation.

The next sections focus on the two cases which were approached and consented to participate in this study.

5.3 Data Analysis

As mentioned above, ANT was selected to guide the analysis of the data. A separate analysis was conducted on the two cases, Masala Chain Stores (MCS) and Dapper Chain Stores (DCS), that were used in the study. To appropriately make use of the data from the organisations that were used in the study, a referencing pattern was adopted as followed:

The labelling code “ORG_ID, PP: LL” refers as follows:

- ORG - represents the name of the organisation.
- ID - represents the number that was assigned to the participants, to avoid identifying individuals’.
- PP - is the page number of the transcribed interview document.
- LL - represents the line number on the document.

In the case of MCS, an example is MCS_01, 05:10-15 which represents the first interviewee in MCS, page 5 on the interview document, and line number 10 to 15.

The analysis is presented as follows:

5.4 Case One: Masala Chain Store

MCS is one of the two organisations that were used as cases in the study. The organisation has branches across the country, South Africa. The main branch in Cape Town, in the Western Cape, was used in this study. Comprehensive detail about the organisation is presented in chapter 4. The data collected from the case was analysed, using ANT, and is presented as follows:

5.4.1 Actor

In ANT, an entity, whether human or non-human is considered an actor if it has the ability to make a difference (Shim & Shin, 2016). Towards the deployment of e-commerce and achieving its goals and objectives in MCS, there were combined efforts from both human and non-human

actors. The human and non-human actors were within the IT, Business and Operational units of the organisation. The human actors held various positions towards supporting and enabling the organisation's goals and objectives.

The IT unit – the human actors included software developers, network administrators, business analysts, deputy chief executive officer (Co-CEO), who was also the chief information officer (CIO), general manager of e-commerce, marketing managers, IT manager of digital unit and IT manager of step program manager.

Business unit - the human actors within the business unit consist of the chairman of the organisation, chief executive officer (CEO), deputy chief executive officer (deputy CEO/CIO), the chief financial officer (CFO), business managers and other employees.

Operational unit – the actors included the operational manager, logistics personnel, stock management personnel, grocery-pickers who pick groceries on behalf of the customer, call centre agent and quality assurance personnel.

At MCS, the business personnel (actors) were involved in the adoption of e-commerce for different reasons, which were either personal or organisational interest. Some of the primary reasons included: (1) to assess e-commerce as a viable proposition; (2) to provide strategic plans; and (3) to further objectives as well as requirements for e-commerce which were communicated to the IT unit. According to one of the participants: “The concept of e-commerce in the organisation was a *business decision, which the IT unit adheres to, in carrying out its activities of enabling the business objectives*” (MCS_01, 5:68-69).

Once the requirements have been consolidated by the business personnel, these requirements rely on the CIO as this is a technological innovation. The CIO then communicates these requirements to the IT personnel which belong to different sub-units and were responsible for gathering system requirements, marketing, analysis, implementation of systems, developing and the administration of networks. The operational personnel are responsible for day-to-day operations, stock management, delivery and assuring the quality of goods provided to the customer are of quality standard. Despite having skilled human actors to take part in e-commerce, the human actors rely on the non-human actors to be able to accomplish the goals and objectives of MCS.

At MCS, the non-human actors were in two main categories: information systems and technologies (IS/IT) artefacts and process. The IS/IT artefacts comprise hardware; information systems, which include database and software applications; and technology network. These artefacts were used to facilitate the different processes such as the in-store picking, quality assurance etc.

The hardware that was deployed and used within the organisation includes computers, hubs, servers and other devices such as scanners. Some of the software that is used and associated with e-commerce in the organisation at the time of this study included SAP Hybris, Content Management System, Silver Pop (Email engine), SAP E-commerce (PIPO), SAP ERP, (retail engine) SAP CRM (loyalty program engine), SAP Finance, SAP POS DM and VM (reporting engine), website and third-party systems such as PayU (Payment gateway) which enables e-commerce in the organisation. The network was made of wide area network (WAN), local area network (LAN) and switches, which were used to enable e-commerce between logistics, stores and distribution warehouses. Using these non-human actors (hardware, systems, and networks) with the contribution of the human actors, together enable work towards the objectives of the organisation.

To participate in e-commerce, MCS business units rely on the non-human actors (artefacts) such as the SAP E-commerce (PIPO), SAP ERP and SAP Finance to facilitate the e-commerce initiative. These artefacts were implemented by the personnel from both IT and Operational units of the organisation. Some of the non-human actors such as systems which were used to facilitate e-commerce were acquired through a process of Request of Proposal (RFP). The RFP process allows different service providers to showcase their systems capabilities, whereupon MCS decides whether to acquire it or not based on price and integration with the rest of the organisation, such as PayU (Payment gateway). In addition, some of the systems were acquired because some part of it already existed and many employees were familiar with it in their processes within the organisation. For example, SAP Finance: *“Basically these systems were chosen primarily because many of our employees were familiar with them. Also, the systems were preferred from the ease of use viewpoint. Thus, all we needed to do was to integrate the systems with the e-commerce process”* (MCS_02, 07:168-170). One of the advantages of doing this was that there was no need to replicate systems and processes which already existed in the organisation. According to one of the employees, *“The advantage of using the same systems as the rest of the organisation is you use a lot of the teams and processes”* (MCS_02, 07:147-148).

MCS utilized some of the processes that existed in the organisation. However, new processes were created in the execution of the e-commerce concept. One of the processes that existed was the stock management process which is handled by the stock team. This process involves making goods available to the organisation to be able to sell in the brick and mortar store and the online store.

In addition to this, there was a picking process which was adopted by the organisation, one of the participant stated: *“As part of the e-commerce activities, we make use of an in-store picking process, through which an order gets picked from a store and delivered to the customer”* (MCS_01, 05:97-98). This process starts from when an order is placed by the customer through the website which is used to facilitate e-commerce. There are systems which have been put in place which allocate a grocery picker to orders which need to be fulfilled. Once the grocery picker has been notified of this, the system guides the grocery picker through the store on where to find certain products. Once this process is completed, there is a quality audit process: *“The quality assurance person checks that the order is accurate and then it gets dispatched out the store”* (MCS_02, 04:47-48). The quality assurance process which was adopted by the organisation was to make sure the quality of the order was fulfilled to meet the customer's expectation.

Table 1 - Summary of Actors in Masala Chain Stores

Table 1 presents a summary of the actors that existed in the relevant units of MCS, which are further detailed in the discussion that follows:

Human Actors	
Business Unit	Chief executive officer, deputy chief executive officer/chief information officer, and Other stakeholders (board of directors and retail group executives).
IT Unit	Head of online, general manager of e-commerce, marketing manager, IT manager/digital step program manager and development team (developers).
Operations Unit	Operational manager, logistic personnel (drivers), grocery pickers, quality assurance personnel, stock management personnel, supply chain personnel, call centre agent.
Non-Human Actors	

Hardware	Computers, switches, hubs, servers, other devices such as scanners, phones.
Systems	SAP Hybris, Content Management System, Silver Pop (Email engine), SAP PIPO, SAP ERP (retail engine), SAP CRM (loyalty program engine), SAP Finance, SAP POS DM and VM (reporting engine), website and third-party systems such as PayU (payment gateway).
Network	Logistics, stores, distribution warehouses.
Process	In-store picking, quality assurance, Request of Proposal (RFP).

No single actor operates in a vacuum. Together, both human and non-human actors form networks. This they do consciously or unconsciously. Through various networks, actors carry out their roles and responsibilities in achieving the goal and objectives of e-commerce in the organisation.

5.4.2 Network

In ANT, networks are formed by actors of allied interest. Thus, networks exist because there are actors of common interest. Also, actors cannot operate without networks, meaning no actor acts outside of a network. For example, in the adoption and use of e-commerce, there are networks that existed within MCS. There were networks that were consciously or unconsciously formed to perform various e-commerce tasks in the organisation.

One of the networks which were consciously formed is the E-commerce division, which consists of employees (actors) such as digital step program manager, operational manager, and marketing manager. The objective of forming this network was to facilitate the e-commerce initiative linking the organisation and its customers. One of the networks which were unconsciously formed included the e-commerce operational unit and the stock management team. Although the stock management team was created to support the traditional brick and mortar stores in the organisation, the team were also supporting the online store in providing availability of goods to the online store.

These networks were directly or indirectly linked or based on individual's groups, roles, and responsibilities. One of the networks which were directly linked is the business unit and the IT unit. This is because the IT unit supports the objectives of the business unit. The business unit

drives the organisation based on strategic plans and the IT unit is used to support these strategies. An example of an indirectly linked network is the board of directors and the e-commerce division. Although the board of directors may not be directly involved in the day-to-day running of the e-commerce operation it does not mean they are not linked. This is because they are part of the decision-makers in the organisation and are part of the strategic team driving the organisation towards e-commerce capability. The groups encompass actors from the IT, Business and Operational units as well as the hardware systems they use. These groups were further divided into sub-units, and some individuals were involved in more than one unit, which makes networks heterogeneous within the organisation. For example, the e-commerce division consists of actors from the stock management team, marketing team, logistics team, thus, making it a heterogeneous network as it comprises different actors from other networks.

The Business unit is a network, which consists of CEO, deputy CEO/CIO, Head of Online and other stakeholders (board of directors and retail group executives). The Business unit was responsible for the strategic planning, allocation of funds, and evaluating/review and planning of the road-map for e-commerce within the organisation. Furthermore, it administrates the business decisions and requirements for e-commerce. Once the decisions and requirements are finalized and ready it is handed over to the IT unit by the CIO with the head of Online to analyse and to implement systems and processes in which e-commerce can be adopted by the organisation.

Within the IT unit, there were the E-commerce and Technical divisions. The E-commerce division was created in 2001, to facilitate the concept of e-commerce within the organisation. As stated by one of the participants: *"We have a division called e-commerce. The division which facilitates e-commerce to our customer since 2001"* (MCS_01, 03:6-7). This division consists of deputy CEO, head of Online, marketing manager, IT manager/digital step program manager and development team (developers), operational manager and operational team. To fulfil the logistics and orders placed by the customer, there is an operational team which is responsible for the fulfilment of orders by the customer.

At MCS, the Operational unit was split into sub-units, which include logistics team, quality assurance, and grocery pickers. The grocery pickers are responsible for picking each item on the customer's order list. Once this is done this goes through a quality check, an activity that is carried out by the quality assurance team. This was to ensure that the order's quality is in good condition and delivered to the customer on schedule. Consequently, to be able to facilitate e-

commerce there are systems which need to be employed by the organisation which is tasked to the technical team. The technical team consists of developers, network administrators, and system support teams.

In achieving the goals and objectives of e-commerce in the organisation, translations of processes and activities happen among the actors, and within networks, which include teams, units, and divisions. The translations entail negotiation of meaning, activities or events in the adoption of e-commerce by the MCS. From an ANT perspective, translation consists of four moments as discussed in chapters 1 and 2. The four moments of translation comprise problematisation, interessement, enrolment and mobilisation (Shim & Shin, 2016).

5.4.3 Moment of Translation: Problematisation

In the problematisation stage, one or more focal actors try to frame the nature of the problem from their own point of view; they also identify and involve actors whose roles and relations shape an initial problem (Rivera, 2013). It also involves a focal actor bringing all the other actors through an obligatory passage point (OPP) in which all actors need to agree to journey through this point, irreversibly (Walton, 2013). OPP is a process in which a focal actor motivates other actors to accept a proposal that is aligned with the focal actor's interests (Shim & Shin, 2016). Consequently, the OPP becomes an important element for the formation of a network and the obligations to be performed by the actors. It mediates all the communications between actors in a network.

Owing to the increasing competition among retailers to grow their market share in the retail grocery sector, MSC had a strategy, which was to become a multi-channel retailer that offered the traditional brick and mortar stores as well as an online store to its customers. Thus, the e-commerce concept was problematised at the MCS organisation. One of the participants described the process as follows: *"We had a strategy to be part of e-commerce to be a multi-channel retailer. We want to make life easier for our customers by offering them the convenience of shopping. Within the channel we have a strategy on how we implement, roll out and make it better as well as growing the business"* (MCS_01, 03:16-19).

At MCS, the adoption of the concept of e-commerce was problematized through strategic meetings. Generally, at the organisation, meetings were used to evaluate strategic plans on how to grow business initiatives by using technology as an enabler. The business unit of the

organisation which encompasses different actors in the organisation were key stakeholders at the strategic meetings. The approval by all the actors in the business unit was critical as the e-commerce initiative was new at the organisation, which means that it stood the risk of being rejected. One of the interviewees explained as follows: *"In the case where the business wants to make a change for a new business initiative and the board of directors should invest their money, it comes down to: 'do we invest in a team that has 700 stores or a team with one store (online store). They may want to focus on the core of the business (which is the brick and mortar stores), which can be a challenge for the e-commerce side of the business'."* (MCS_02, 10:249-253).

Thus, the strategic meetings were needed monthly in which stakeholders were educated on the motivators and benefit of e-commerce to gain the buy-in from the different organisational stakeholders into the e-commerce initiative. As explained by one of the employees: *"We do discuss our strategies as a team with our CEO/CIO and the general manager of online, who is responsible for the online shop - we all meet monthly, we discuss our strategy and what our plan is and how we are going to drive sales, so it's quite collaborative and we set the guidelines and filter it down to our teams so that everyone is on the same page driving it."* (MCS_03, 03:19-22).

Based on the outcome of the strategic meetings, the organisation decided to adopt the concept of e-commerce, with the intention to grow their business processes and activities. Despite the approval, business requirements were needed to guide the adoption of the concept. This was to evaluate and ensure that the organisation had the foundation to adopt e-commerce. According to one of the employees that participated in this study: *"I think the requirements were more of what the customers want, which include how do we make it easy for our customers to shop through the concept of e-commerce"* (MCS_01, 05:67-68). Another requirement was how can the organisation grow their market share using technology. This was stated by one of the employees as: *"How do we grow our market share using e-commerce"* (MCS_01, 05:69-70). Once these requirements were formulated by the business unit, these requirements were tasked to the deputy CEO who is also the CIO in the organisation, due to the role he plays within the organisation.

Although the requirements for the e-commerce initiative were articulated by the business unit, these requirements need to be translated into IT requirements which are therefore passed on to the relevant personnel. This was stated by one of the employees: *"Our deputy CEO who is also*

our CIO is the head of IT; a lot of the requirements come from him" (MCS_02, 09:217-218). The CEO/CIO translates the business requirements to the IT unit to adopt e-commerce within the organisation. According to one of the employees: *"The business would have briefed the IT unit on: 'this is what we need and how can we make it work together and success"* (MCS_03, 05:89-90). The general manager of online was therefore tasked with these requirements as he was responsible for managing the e-commerce business within the organisation: *"I am the business owner, I manage the website, am responsible for driving performance of e-commerce, what the customer sees on the website, how it works in the background, to the delivery"* (MCS_01, 05:80-82).

Even though the general manager of online was responsible for the e-commerce activities, the IT manager shares general manager responsibilities. Thus, the requirements were also communicated to the IT manager of the organisation. This was done through the IT unit weekly basis meeting in which discussions are conducted on operational topics. One of the employees explained this as follows: *"We do a weekly basis meeting where we discuss what is happening at an operational level"* (MCS_02, 12:347-348).

In executing the strategy to adopt e-commerce for the company, the general manager of online and the IT manager had to conduct analyses and research relating to e-commerce. The general manager describes this: *"Internal research [was carried out] to see if we have any part of the business who already uses some of the systems and processes we need to adopt e-commerce"* (MCS_01, 04:54-56). The internal research entails engagement with other members of the units and departments in an inclusive manner, getting broader views and opinions on the e-commerce initiative that the organisation was about to embark upon. The internal research was conducted by considering the organisation's current processes, systems and technologies which can be used, rather than replicating them just for the e-commerce business.

The internal research was part of existing processes in the company, called RFP. The RFP is a verification, where business requirements are mapped (or translated) against technology capabilities. This process happens before new systems or technologies are deployed within the environment of the organisation. The IT manager was responsible for the RFP process. This means that the IT manager authenticates the RFP process without the IT unit involvement based on his technical knowledge of the organisation. The challenge with the IT manager being responsible for RFP and systems integration is to check and balance, which affects quality

control of the different systems and technologies which are introduced and implemented within the organisation.

Three fundamental requirements needed to be considered in the selection of systems and technologies to enable e-commerce in the organisation. These requirements determine whether a system is selected and deployed into the organisation's environment. One of the requirements is around the IT unit's skills and knowledge, which influences the selection of systems and technologies in the organisation. One of the employee stated: *"Skill is a big thing, finding the right people - do they have experience in this, as it is still new to South Africa; so very often there are skills shortages, so you have to see if you have the right people, it's all very well buying the right systems and platforms but if you don't have the people who know how to use them that's a problem"* (MCS_03, 05:81-85).

Another requirement to consider in the selection and deployment of systems and technologies in the organisation is cost implications. This was described by one of the employees: *"We look at when we start a new initiative how much money it will cost to get to that, what is the turn over if we do this?"* (MCS_02, 13:382-383). The cost implications primarily are a big factor in the selection of systems and technologies within the organisation. The reason for this is that the cost factor can determine if these systems and technological solutions are explored further regarding possible deployment or not. Furthermore, due to the e-commerce initiative being new and different from the organisation's brick and mortar business model, there were systems and technologies which were already in place in the organisation. Due to this, integration with the other systems in the organisation was a requirement that had to be considered. One of the employees explained: *"We look at many service providers and because the price is a big factor, we need to be able to afford any system we are going to buy, and can it integrate with the rest of the business"* (MCS_03, p4:64-66).

The e-commerce initiative and requirements in MCS start from the business unit. After which it is passed on to the IT unit in the organisation. This means that there is no single unit accountable for the e-commerce initiative. The e-commerce initiative goes through different processes in which many stakeholders are involved such as the board of directors', IT managers and other employees etc. Based on this, the different stakeholders have different interests which are challenging to manage.

5.4.4 Moment of Translation: Interessement

The interessement stage focuses on the actions which the focal actor(s) uses to convince the other actors to align their interests and to motivate for them to overcome problems through the OPP (Gunawong & Gao, 2017). In the adoption of e-commerce in MCS, there are different stakeholders which are involved. The stakeholders are both internal and external individuals or groups. The internal stakeholders consist of the business units (board of directors, CEO and other stakeholders), IT managers (general Manager of the online and IT manager) and e-commerce division. On the other hand, the external stakeholders are the end users which are the organisation's customers.

The business unit within the organisation showed their interest in the e-commerce initiative as this was informed by the company's strategic plan to become a multi-channel retailer. In addition, the business unit interest was also informed by the financial benefits of the adoption of e-commerce. This, in turn, informs their interest in the aspect of the potential Return on Investment; what is the potential return on money invested if they decided to participate in e-commerce. This was explained by one of the employees: *"We discuss plans, see if we have to change our strategy slightly, maybe focus on one category more. And when you are assigned money to do initiatives you have to go explain periodically how the initiative is going. For example, stakeholders gave us money, and we said the return on investment will be 10% - this is how much we have so far; because ultimately, we are working with stakeholder's money"* (MCS_03, 13:353-358).

As the e-commerce initiative was new to the organisation, all stakeholders' interests had to be aligned and motivated regarding the benefits of e-commerce for the organisation to pass the initial stage of decision making. The business unit had to be convinced on how e-commerce can be a big part of the business and ultimately contribute towards the growth of the business. To align the business unit's interest, there were motivations presented to the business unit to persuade the business unit to participate in the e-commerce initiative. This is key to the adoption of e-commerce within the organisation.

One of the motivators to the business unit to participate in e-commerce was that customers were seeking convenience, which e-commerce facilitates. One of the participants stated: *"Due to the need of customers wanting to shop more conveniently, the business had to intensify its strategy to implement technology infrastructure to enable and support online facilities and*

shopping" (MCS_01, 03:9-10). Another motivator which was presented to the stakeholders was the fact that digital business was evolving, and the presence of e-commerce was growing with consumers seeking to take part in e-commerce. One of the employees stated: *"E-commerce presence was growing strongly and has grown, and customers started asking when [we] were going to take part in e-commerce and we started looking at how can we create an online portfolio and utilize it to grow our business."* (MCS_01, 04:61-66).

Based on these motivations the business unit's interest in participating in e-commerce was informed by non-technical factors - the potential to be competitive and grow their market share, which was in line with the organisation's strategic plan. Due to the e-commerce initiative being a technological phenomenon, the IT managers showed their interest in the e-commerce initiative. The interest of the IT managers was because IT is an enabler to facilitate e-commerce. The business objective, which in this case was the adoption of e-commerce within the organisation, required IT to enable it. This was stated by the general manager of online: *"It was a business decision, in which the IT unit follows, carrying out their activities in enabling the business objectives"* (MCS_01, 05:75-76). Therefore, for the organisation to be able to participate in e-commerce the IT managers had to be informed of how this can be done within the organisation.

The adoption of e-commerce was intended to enable the organisation to accomplish its strategic goals and objective. Due to e-commerce being a new initiative within the organisation there was a need to create a dedicated e-commerce division. Thus, the division's directive was to oversee all the e-commerce related activities within the organisation and to understand how e-commerce can become part of the organisation. This directive was driven by the organisation's goals and objectives to adopt e-commerce to be a multi-channel retailer. The general manager of online stated that: *"We do have a dedicated team to the online business who oversees everything from operational to logistics"* (MCS_01, 05:88-89). Due to this, there is a challenge in understanding how the current business model works at MCS and how it can be translated into an online business model. One of the employees explained: *"I think not having the right people, processes and a good understanding of how the business works there will be some challenges. It's a challenge for us. As a small core team of 10 people, you need to understand how everything in the business works because it impacts you"* (MCS_02, 10:270-272).

As a result, there was a lack of communication between the business unit and the e-commerce division who are responsible for overseeing the implementation of e-commerce within the organisation. Therefore, the e-commerce division translated the traditional brick and mortar

business model into an e-commerce model based on their own interpretation of business from a technological point of view rather as a business. Despite the interest from different stakeholders (individuals and groups), not all participants took part in the deployment of e-commerce in the organisation. The stakeholders showed different levels of knowledge and diverse perspectives on e-commerce.

5.4.5 Moment of Translation: Enrolment

Once interest has been gained from the different actors, the participation of the different actors in the deployment of e-commerce within MCS is influenced by the different factors such as roles and responsibilities. The enrolment phase (the third stage of the moment of translation) is when the main actor(s) effectively create and organize the roles of the different actors who will represent the interests in the network of stable alliances (Soares & Joia, 2014).

To effectively deploy e-commerce within the organisation, the business unit decided to create a new division within the organisation to coordinate the deployment of (which entails the RFP process and business process analyses) and all e-commerce related activities in the organisation. This was described by one of the participants: *"We have been participating in e-commerce since 2001, in which we have an e-commerce division which facilitates the e-commerce part of the business to our customers"* (MCS_01, 03:6-8).

As part of this division, other IT personnel such as the IT manager were responsible for the internal research into different systems, which was called the RFP. This process involves external vendors (service providers) demonstrating the capabilities of their systems to match the business requirements of MCS. According to one of the participants: *"Well before we go into any system we normally do an RFP. We need to be able to afford any system we are going to buy, and can it integrate with the rest of the business, I mean [MCS] is very big and complicated, so you must make sure it can talk to the rest of the systems"* (MCS_03, 03:64-67).

Based on this process, SAP was chosen as an external stakeholder in the deployment of e-commerce within the organisation. The motives behind selecting SAP as a vendor were that the rest of the organisation was already using SAP and there were processes that already existed which could be used to enable the deployment of e-commerce within the organisation. This was described by one of the participants: *"The SAP decision was made based on the rest of the business using SAP and they picked that 12 years ago. The decision of the online team was*

either we use SAP and go along with the rest of the organisation or we use systems which we want. The advantage of using the same systems as the rest of the organisation is that, there are already a lot of teams and processes which already exist" (MCS_02, 07:154-158).

Despite the motivators for selecting these systems, there were some challenges which were presented by these systems. Some of the challenges that were presented by these systems were the alignment between the system processes and the business processes. This was explained by one of the participants: *"What happens is the system does it one way and the business has been doing it the other way, and they try to make the system do this and to do that; there are a lot of people, time and development needed which can be very expensive"* (MCS_02, 07:170-175). There were some actors who participated in the e-commerce activities unconsciously. This is due to some of the e-commerce activities at MCS operating on existing processes within the organisation. However, this is not as easy as it becomes challenging to manage and coordinate different people from different departments to include the e-commerce division in decisions that are been made at the organisation.

5.4.6 Moment of Translation: Mobilisation

The focal actors who mobilized the other actors into participating, therefore ensuring that the deployment of e-commerce at MCS met the business requirements were from the IT division of the organisation. These individuals were delegated or volunteered based on their roles and responsibilities. To be able to focus and deploy e-commerce successfully within MCS, the business unit decided to create a dedicated e-commerce division to coordinate and mobilize e-commerce activities. As this was a technological innovation, this division directly reported to the CIO of MCS who also plays a role of as the deputy CEO of the organisation. The e-commerce division is the unit that interacts with the rest of the organisation to find out the current processes which can be re-used, current systems within the organisation and how e-commerce can be deployed despite the challenges they faced.

The decision made by the business unit worked fine for the IT division as this was a technological innovation which IT enables. This was also part of the organisation's strategic objective to be a multi-channel retailer. According to one of the participants: *"We had a strategy to be part of e-commerce to be a multi-channel retailer"* (MCS_01, 03:19-20). The e-commerce division took it upon themselves to become mobilised and ensure that they met the business

requirements. They ensured that the streamlined the processes and systems that enable them in achieving the Masala chain stores objectives.

The above analysis which was guided by the Actor Network Theory (ANT), helped in identifying the factors which were thought to be significant in the deployment of e-commerce in MCS, which were: Technology Facility, Integration of System and Processes, Compliance, Workflow Approach, Actors' Collaboration, and Organisational Processes. These findings will be discussed in detail in Chapter 6 of this study.

5.5 Case Two: Dapper Chain Store

DCS is the other of the two organisations that were used as a case in the study. Similar to MCS, the DCS also has branches across South Africa. The head office of DCS which is situated in Cape Town, in the Western Cape, was used as a case in this study. Chapter 4 presents a comprehensive detail about DCS. As with MCS, data collected from DCS was also analysed by using ANT, as follows:

5.5.1 Actor

Towards achieving the goals and objectives of DCS, both human and non-human actors play roles in successfully deploying e-commerce at the organisation. At DCS, the human and non-human actors were employed within the IT, Operational and Business units of the organisation. The human actors held different roles in enabling and supporting DCS's goals and objectives.

Business unit – the human actors within the business unit consist of employees, which included the chief executive officer (CEO), the chief financial officer (CFO), chief information officer (CIO), the chief operating officer (COO), strategy and business development officer, head of food manager, business managers, and other stakeholders.

The IT unit – the human actors within the IT unit include software developers, support analysts, business analysts, IT manager, system manager, CIO, marketing managers, online operations manager and online foods category manager, and solution architect.

The Operational unit – the actors in this unit include the operational manager, foods manager, logistics personnel (drivers), pickers, packing personnel and the customer service personnel.

In the adoption of e-commerce at DCS, the business personnel (actors) were involved for different reasons, which were either personnel or organisational interest. Some of the reasons were, (1) to evaluate the e-commerce initiative as a feasible proposal; (2) to have business strategic plans (3) to provide requirements and objectives for e-commerce which were relied on by the IT unit at DCS. According to one of the participants: *“The requirements come from the business, as there are financial implications to it and the business’s long-term goals. The technical side supports it”* (DCS_01, 07:164-166).

The requirements compiled by the business unit are then communicated to the different teams who were involved in the deployment of e-commerce. This was stated by one of the participants: *“The business would have identified the direction we need to head in and they would have briefed the different teams on what needs to be done”* (DCS_03, 04:53-54). Due to technology enabling the e-commerce initiative, some of the requirements which were communicated to the CIO are the resources that are required from a technology perspective. The CIO then communicates these requirements to the IT personnel who were responsible for gathering system requirements, gap analysis, marketing, development and implementation of systems, and administration of networks. The operational personnel were responsible for the day-to-day operations, stock management, picking of orders, packing of orders, delivery and customer service support. To accomplish the objectives and goals of DCS, there is a need for non-human actors which help the human actors in the deployment of e-commerce.

The deployment of e-commerce at DCS required relationships and interaction between the human and non-human actors. The non-human actors were in two main categories: IS/IT artefacts and process. The IS/IT artefacts include hardware and information systems, which comprises a database, software, and network. These artefacts were used to enable the different e-commerce activities such as the picking of customer orders, making of payments etc. The hardware that was deployed and used within DCS included computers, hubs, servers and other devices. Some of the software used in enabling the e-commerce initiative at DCS included a payment gateway, Oracle e-commerce (ATG), picking application, RMS, support application and Google analytics. The technology network comprises WAN, LAN and switches, which were used to enable e-commerce such as logistics, stores and distribution warehouses. Some of the processes were the picking process, the packing process, and the system evaluation process.

To participate in e-commerce at DCS, the business and operational unit rely on the non-human actors such as the RMS which handles all the merchandising, product information and pricing

for the organisation. These artefacts were deployed and implemented by personnel from the IT unit of the organisation. Some of these software and systems were either built in-house at DCS or acquired from an external service provider through an 'evaluation process'. One of the participants stated: *"We go through an evaluation process of how much will it cost to build or to buy a system"* (DCS_01, 06:136-137). The evaluation process allows the system analyst to assess the different systems needed for the deployment of e-commerce. The decision to acquire a software or system was based on cost and the integration between the system, business and data processes. One of the participants stated: *"The organisation can acquire a fancy system but if it does not support the business and data processes, it's not going to achieve what you want it to achieve"* (DCS_01, 06:137-139).

In DCS, some processes existed within the organisation, however, due to the e-commerce initiative been new to the organisation, there were new processes which were implemented to facilitate e-commerce activities. One of the participants stated: *"We had to create a dark store, where the stock is kept specifically for online shopping"* (DCS_03, 06:85-86). This dark store was created to handle the process of making goods available to online customers.

Table 2 - Summary of Actors in Dapper Chain Stores

Table 2 presents a summary of the actors that exist in DCS, which are further detailed in the discussion that follows:

Human Actors	
Business Unit	Chief executive officer, chief financial officer, chief information officer, chief operating officer, strategy and business development officer, Head of food manager, business managers, other stakeholders.
IT Unit	Software developers, support analysts, business analysts, IT manager, system manager, chief information officer, marketing managers, online operations manager, online foods category manager, solution architect.
Operations Unit	operational manager, foods manager, logistics personnel (drivers), pickers, packing personnel, customer service personnel.
Non-Human Actors	
Hardware	Computers, hubs, servers, switches and other devices.

Systems	Payment gateway, Oracle e-commerce, picking application, Retek merchandising system and Google analytics, support application.
Network	Wide area network, local area network.
Process	evaluation process, picking process, lift and shift process.

No single actor operates in a vacuum. Together, both human and non-human actors form networks. This they do consciously or unconsciously. Through various networks, actors carry out their roles and responsibilities in achieving the goal and objectives of e-commerce in the organisation.

5.5.2 Network

Actor Network Theory aims to explain social order through the networks of connections between humans and non-humans (Shirazi, 2014). Actors do not act outside a network or networks, in other words, actors cannot operate without a network. These network(s) exist because actors exist, and they have a common interest. In DCS, there are networks which existed to facilitate the deployment of e-commerce within the organisation. The networks were consciously or unconsciously formed to perform various e-commerce activities in the organisation.

In the adoption and use of e-commerce at DCS, one of the networks which were consciously formed was the IT unit. The IT unit consists of employees (actors) such as the online operations manager, online foods category manager and solution architect. This network was formed based on the need for an ICT infrastructure within the organisation. As well as to facilitate the deployment of e-commerce within the organisation. One of the networks which were unconsciously formed was between the online team and the operational personnel. This network unconsciously formed based on the e-commerce initiative depended on existing processes and employees within the organisation. To facilitate the picking process for e-commerce the online team depended on the in-store staff to carry out this process. This was stated by one of the participants: *“The food business specifically depends on a physical store being in that region, cause the food picking is done in the store where a customer can physically walk into”* (DCS_01, 03:25-28).

Based on individual groups, roles, and responsibilities, these networks were directly or indirectly linked. One of the networks which were directly linked was the business unit and the operational unit. This is because the organisation’s traditional brick and mortar model depended on the

interaction between the business and the operational unit. This is to have a continuous strategy and feedback on how to improve and grow the business. On the other hand, a network which was indirectly linked was between the customer service support team and the IT unit. Although the customer service support team existed before the deployment of e-commerce, they also facilitated support for the e-commerce customers, making sure each customer, both online and offline, was satisfied with the services the organisation provided. In DCS, these groups included actors from the different networks to facilitate the deployment of e-commerce within the organisation. This included actors from the business unit, IT unit, operational unit and the non-human actors such as the hardware and system that were used to facilitate and support the e-commerce initiative. These groups were additionally divided into sub-units, and some individuals were involved in more than one unit, which makes networks heterogeneous within the organisation. For example, the chief information officer (CIO) belongs to the business unit network and was part of the IT unit; thus, this makes it a heterogeneous network as it comprises different actors from other networks.

The business unit consists employees including a chief executive officer (CEO), chief financial officer (CFO), CIO, chief operating officer (COO), strategy and business development officer, head of food manager, business managers, and other stakeholders. This unit was responsible for the strategic planning, financial planning, and requirement for e-commerce within the organisation. Once the decision to participate in e-commerce was reached, the business unit formulated a set of requirements, which other departments such as the IT unit made use of, to support and enable the initiative.

The employees at the IT unit consist of an IT manager, system manager and a CIO who were responsible for IS/IT deployments and management in the organisation. These employees (actors) made use of the available IS/IT artefacts to facilitate the deployment of e-commerce within the organisation. One of the requirements was the resources needed to enable the deployment of e-commerce. This was stated by one of the participants: "*What are the resources required from a technology perspective*" (DCS_01, 07:159-160). This was crucial as the integration and resources needed were key aspects in the deployment of e-commerce within the organisation. The operational unit includes actors such as the operational manager, foods manager, logistic personnel, pickers, packing personnel, customer service agent. This network was responsible for day-to-day e-commerce activities within the organisation such as picking of the customers' orders, delivery of the orders and customer support. This network can be broken

down further into sub-units such as the picking team, the drivers and customer service personnel.

To accomplish DCS's goals and objectives in the deployment and facilitating e-commerce, according to ANT, the different actors go through a translation process. This includes the activities that occur between the actors and within the different networks which includes the teams, units, and divisions. As discussed in chapters 1 and 2, ANT translation consists of four moments, namely problematisation, interessement, enrolment, and mobilisation.

5.5.3 Moment of Translation: Problematisation

Owing to the increasing demand by customers, competitiveness among retailers, and the quest to grow market share in the retail grocery sector, DCS decided to problematize the e-commerce approach. The approach was intended to enable the organisation to facilitate marketing, sales and purchases of goods and services to its customers. According to one of the participants, *"There was a strategic move to take part in e-commerce"* (DCS_02, 05:68-68). This was one of the strategic plans of DCS to have an omnichannel to grow its businesses. Also, e-commerce was problematized at DCS in a way that allows assimilation of processes and interactions between the organisation and its customers and partners.

The e-commerce initiative was problematised through different strategic meetings, which were attended by actors such as the CEO, CFO, CIO, COO, strategy and business development officer and other stakeholders. These meetings were used to evaluate the different strategic plans for the business. One of the participants described this: *"We have a team that is responsible and attends the strategy session at least twice a year. The team holds the long-term plan on behalf of the organisation"* (DCS_02, 03:14-15). Furthermore, these meetings were used to create the requirements for the deployment of e-commerce within DCS, in which these requirements were then communicated to the different departments. As stated by one of the participants: *"The business would have identified the direction we need to head in and they would have briefed the different teams on what needs to be done"* (DCS_03, 04:53-54).

Although the business unit created the requirements for e-commerce within the organisation, these requirements were translated into either operational or IT requirements. One of the requirements that were passed to the operational unit was to make decisions on where fulfilment store should be situated. According to one of the participants: *"The actual decision, as*

to where to open a fulfilment location for something like food, for instance, is done by the operational team that work with stores" (DCS_01, 03:31-32). This was because the operational manager was responsible for managing the picking teams, therefore this became the responsibility of the operational team.

One of the requirements that were passed on to the IT unit was the evaluation of resources needed to facilitate e-commerce within the organisation. This was communicated to the CIO who is the head of the IT unit. This was described by one of the participants: "*What are the resources required from a technology perspective*" (DCS_01, 07:159-160). Even though the CIO was responsible for all IT-related activities, the solution architect shared some of those responsibilities. Thus, the requirements were also communicated to the solution architect of the organisation. One of the participants stated: "*The solution architect is responsible for the implementation of ATG. Cause he understands the ATG Oracle platform from beginning to end*" (DCS_01, 07:168-170). The challenge this brings is that this can be used to satisfy personal goals rather than the business objectives. As a result, there was a conflict of interest in the implementation of the e-commerce systems within the organisation. The conflict had an impact on the communication between actors, and the assimilation of processes and activities in the adoption and use of e-commerce in the organisation.

A research process referred to as an 'evaluation process' was followed in anticipation of IS/IT artefacts deployment within the DCS environment. The evaluation process was used to verify the cost associated with either the building or buying of a system(s). This goes to show that cost was a key factor in the decision process to either buy or build systems. In addition to this process, there were standards which needed to be met before systems or technologies were deployed within the organisation. One of the technical standards which were required from the systems or technologies was the ability of the system to be upgradable. According to a participant: "*Will this technology place the business on a good upgrading path. Because we don't want to have a legacy system*" (DCS_01, 07:161-162). Together, these key factors played a role in acquiring of IS/IT artefacts prior to deployment and implementation within the organisation.

Once these systems have been acquired, during the implementation process, there is an approach which is applied in the implementation of the new systems, which was called the "lift and shift". One of the participants stated: "*The requirements were to replace AS-IS call it 'lift and shift'*" (DCS_01, 07:162-162). This approach is a strategy for moving systems, applications

or processes from one technological environment to another, without any change in processes and workflows. The motivator for this approach is to reduce the cost and time taken in the implementation of new systems. Despite the benefits of this approach, there are still implementation challenges faced when implementing new systems. This was described by a participant: *“For each implementation, there is a period of stabilization - doesn’t matter how much testing and planning, there are often gaps when big implementation happens”* (DCS_01, 09:206-208).

In DCS, the e-commerce initiative and requirements are created by the business unit of the organisation. These requirements are then passed on to the different units in the organisation, such as the IT unit, which works independently towards achieving the objectives and goals of the organisation. Due to the lack of collaboration between the different units, the challenge to manage the different interests of the actors in the deployment of e-commerce within DCS became a challenge. Different teams/department are given different requirements and work in silos, therefore making it challenging to manage expectations from the different teams.

5.5.4 Moment of Translation: Interessement

The interessement stage involves a process where the focal actor(s) negotiate with the known actors in order to uphold their interests (Twum-darko & Harker, 2017). At DCS, various stakeholders were interested in the adoption and use of e-commerce. These stakeholders were members of different networks such as the business unit which consists of CEO, CFO, CIO, COO and other stakeholders. Actors from the IT network consist of software developers, support analysts, business analysts, IT manager, system manager, CIO, marketing managers, online operations manager, online foods category manager and solution architect. And from the operational unit which includes an operational manager, foods manager, logistic personnel (drivers), pickers, packing personnel, customer service personnel.

The business unit at DCS showed their interest in the e-commerce initiative as this was a strategic plan to be an omnichannel retailer to meet customers’ needs. Furthermore, the business was also informed by the potential financial benefits that e-commerce offers. According to one of the participants: *“Some of our shareholders are asking and would like to know how much e-commerce brings to the total revenue of DCS”* (DCS_02, 07:134-135). The fact that the concept of e-commerce was new to the organisation, many of the stakeholders had to align their interest in anticipation of the benefits. To get the buy-in from the business unit was

crucial as the e-commerce initiative stood a chance of being rejected. One of the participants stated: *"You find 60% of the board says 'Yes' in approval and 40% says 'No' in disapproval to e-commerce. To get them to buy into the idea becomes a challenge due to some of the stakeholders not buying into the idea of e-commerce"* (DCS_02, 06:116-119). This goes to show that motivating and persuading the business unit to participate in the e-commerce initiative was vital.

One of the motivators which were used to persuade and draw the interest of the business unit was competitiveness, which they are confronted within the grocery retail industry. Some member of the business unit discovered that some of their competitors were already exploring the concept of e-commerce. Thus, the business unit realised that for DCS to have a competitive advantage over their competitors, they needed to show their interest and support the deployment of e-commerce in the organisation. One of the participants stated: *"I think if the business did not participate in e-commerce, we would not have the competitive advantage over our competitors"* (DCS_03, 04:41-42). Along with this, another participant stated: *"We look at both international and local trends and try to stay ahead of the market and our competitors"* (DCS_02, 03:28-29). Another motivator which was presented to the stakeholders was the potential increase in additional revenue that e-commerce could generate for the business. One of the participants described this: *"DCS's online food offering is probably its biggest sale generator as it is throughout the business"* (DCS_01, 03:10-11).

Based on these motivations, such as the increased revenue and competitive advantage, the business unit's interest to participate in e-commerce was informed by the non-technical factors. As these motivators were in line with the organisation's goals and objectives. E-commerce is a technological phenomenon, due to this, the IT unit showed their interest in the deployment of e-commerce. The IT unit interest was informed since IT is an enabler in the participation of e-commerce within the organisation. This was stated by the system analyst: *"The IT unit itself provides the technology to deploy to those areas"* (DCS_03, 03:25-25). Consequently, for DCS to participate in e-commerce, the need for the interests of the IT unit to be aligned with the business unit is important to facilitate e-commerce within the organisation.

In the participation of e-commerce, there are activities which are dependent on the operational unit. This is due to the responsibility of the operational unit which is to oversee the day-to-day activities within the business. Some of these activities are the picking of customers' orders, the delivery of orders and support to customers. In this light, it is important to gain the interest of the

operational unit in participating in e-commerce. However, in DCS there was a misalignment with the operational unit on participation in e-commerce. For example, one of the participants stated: *“I think the delivery partner is key as they are the one person in contact with the customer, so we should align ourselves with our delivery partner”* (DCS_03, 07:156-157). Another example of this misalignment was with the customer service team. In this case, there was a new store which was opened and there was no communication between the different teams involved. One of the participants described this as: *“For example, the call centre didn’t know a new store was opened”* (DCS_01, 08:188-189). Due to this, the customer service personnel are either over tasked and taken unaware of the customers who may need help from that location.

In the adoption of e-commerce, it is important to align the interests of the stakeholders with their participation. Otherwise, adoption of the concept will be a challenge, and as result, the benefits will not be realised. To emphasise this, one of the participants stated that: *“We need to keep everyone on the same page all the time, keeping the right people aligned with what is going on”* (DCS_01, 09:224-225).

One of the challenges was the lack of alignment between the business, IT and operational units, which influenced how and what types of interest were shown in the concept of e-commerce in the organisation. Thus, irrespective of the interest in the e-commerce initiative from different stakeholders, not all participants took part in the deployment of e-commerce in DCS. Another influencing factor is knowledge, which the stakeholders employed differently to reach their conclusion about the concept. Based on individuals’ knowledge, the stakeholders were able to form their perspectives about e-commerce.

5.5.5 Moment of Translation: Enrolment

At the enrolment stage, the focal actor(s) delegates different roles to the stakeholders (other actors), based on their interest, through which the actors participate in an activity or network (Twum-darko & Harker, 2017). The participation in e-commerce by the different actors within DCS was influenced by various factors, which manifested in roles and responsibilities. Thus, employees and stakeholders participated in activities such as requirements gathering, technologies selection, technologies implementation, support, maintenance and policy formulation. The employees within the business and operational units participated in the deployment of e-commerce, from a non-technical perspective. While the technical activities were carried out by those in the IT unit.

The role and responsibilities of the IT unit were to deploy IS/IT artefacts that enable and support the e-commerce in the organisation. One of the participants stated: *“The IT unit itself provides the technologies needed to facilitate e-commerce”* (DCS_01, 03:25-25). This also included the ‘evaluation process’ of acquiring new systems and technologies within the organisation. This is the process where the decision to either acquire or build a system was carried out. This decision is based on cost and the integration between the system, business and data processes.

Based on this process, there were different systems, such as Oracle e-commerce (ATG), which were acquired by the IT unit to facilitate e-commerce within the organisation. One of the rationales behind selecting ATG was that it fell within the knowledge domain of the solution architect. One of the participants stated: *“The solution architect is responsible for the implementation of ATG. This is because the architect has a holistic understanding of the ATG Oracle platform, from its beginning to end”* (DCS_01, 07:168-170). Consequently, this made the solution architect responsible for the implementation of this system. Another motive for selecting this system was because other organisations were using it. According to a participant: *“ATG (Oracle Commerce) is used internationally in such stores as Mr Price.”* (DCS_03, 04:31-32). Because of these motivators, the organisation decided to acquire these systems to facilitate e-commerce for their business.

Despite the rationale behind the selecting of these different information systems and technologies, there are challenges which surface because of these systems. One of the challenges displayed was integration between the system, the business and data processes. This was described by one of the participants: *“In my experience, at the time I was doubtful the organisation could acquire a fancy system; if it does not support the business and data processes, it’s not going to achieve what you want it to achieve”* (DCS_01, 04:137-139). The importance of the integration between the different systems to facilitate e-commerce is crucial as this also affects the operational unit’s role and responsibilities in providing service towards the customers.

The operational unit which was responsible for the day-to-day activities in the facilitation of e-commerce within the organisation depended on the flow of data between systems and technologies implemented by the IT unit; for example, the support application which enables the customer service personnel to assist customers when needed. One of the participants stated: *“Support application which is more important is the Oracle commerce offering. Which is the customer service module where the customer call centre services the customer”* (DCS_01,

06:119-122). There also needs to be integration with the picking application, which facilitates the picking process of customers' orders. One of the participants explained: *"The picking application gives the person in a store or a distribution centre the order to be completed; basically, manage the order itself with integration to the couriers"* (DCS_01, 06:122-124).

As different actors and networks participated in the deployment of e-commerce in the organisation, it was vital to ensure that processes were well executed to fulfil the objectives. This involved management of both technical and non-technical activities. At DCS, the management of e-commerce activities was challenging, due to three main factors: (1) different levels of understanding based on individuals' knowledge; (2) increasing numbers of different actors and teams that were involved; and (3) combining technical and non-technical activities. As stated by one of the participants: *"Growing from 12 people to 80 people has its effect on from the support perspective. And processes don't survive that type of change, so the processes evolve over time, it must work for everyone"* (DCS_01, 06:214-1216).

The implication of having such constant growth and evolving processes can have a negative effect on communication, productivity and efficiency of the organisation which ultimately affects the customer. One of the participants described an example of this: *"For example, a supplier can't supply cheese if no one tells the food online department we are promoting cheese online then we have a problem as this will impact our services to the customer"* (DCS_03, 05:75-77). This goes to show that with the growth in teams and evolving process, the understanding and communication around these processes are vital to the adoption and use of e-commerce.

5.5.6 Moment of Translation: Mobilisation

At the mobilisation stage, the focal actor(s) ensures that interested actors carry out their tasks accordingly. In DCS, the focal actor(s) ensures that all the other actors participate in the deployment of e-commerce within the organisation to achieve business requirements, goals and objectives. These individuals or teams were nominated based on their roles and responsibilities. In DCS, there is no single focal actor(s) in the mobilisation of e-commerce within the organisation. This is due to the different actors and networks who play a vital role in participating in e-commerce.

It is unclear as to who was responsible for ensuring that all the stakeholders played their roles and fulfilled their responsibilities in the participation in e-commerce. This is due to each of the

different units being given a requirement to fulfil, therefore working in silos. According to one of the participants: “*The business would have identified the direction we need to head in and they would have briefed the different teams on what needs to be done*” (DCS_03, 04:53-54). Consequently, this can create an unstable network within the organisation during the different e-commerce activities within the organisation. Despite the lack of clarity as to who mobilises the other actors, the different teams can meet the business requirements and work towards DCS’s goals and objectives.

Given the analysis, using ANT as a lens, the factors which were highlighted and deemed important in the deployment of e-commerce in DCS were: Business Drivers, Stock of Knowledge, Training and Skills, Assimilation of Processes, Alliance of Actors. These findings will be discussed in detail in Chapter 6 of this study.

CHAPTER 6

FINDINGS AND INTERPRETATION

6.1 Introduction

This chapter presents a discussion of the findings which were drawn from the analysis conducted on both Masala Chain stores (MCS) and Dapper Chain Stores (DCS) in the previous chapter. Furthermore, to make sense of the findings, an interpretation of the findings was conducted towards the development of a framework which will guide the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

6.2 Masala Chain Stores Findings

Based on the analysis through the 4-part moment of translation presented in the previous chapter, some of the factors that were considered important in the deployment of e-commerce in MCS were: Technology Facility, Integration of System and Processes, Compliance, Workflow Approach, Actors' Collaboration, Organisational Processes. These findings will be discussed in detail in the subsequent sections

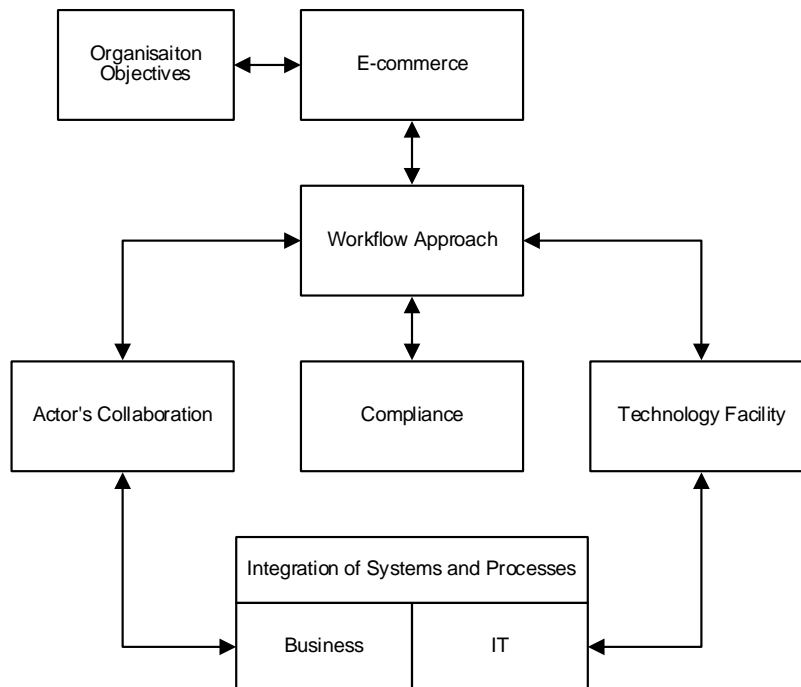


Figure 5 - Components of E-commerce Deployment at MCS

6.2.1 Technology Facility

To be able to adopt e-commerce, there are different systems and technologies which are needed to facilitate, support and enable the concept. The facility can be defined as a technological architecture which assists a business in their day-to-day activities. Technological facilities are deployed in organisations to support the business's core processes and improve performance through efficiency and improved customer service (Rahimi et al., 2016). These systems and technology are needed as they enable MCS to be able to participate in e-commerce. For example, to be able to facilitate payment on the MCS e-commerce website, there was a needed to implement a payment gateway on the website which enables customers to make payments for their orders. The different systems and technologies which are needed are used to fulfil a purpose, process or an operational need.

For the business to be able to use these systems and technologies to facilitate e-commerce within the organisation, the implementation and integration of new and existing systems are crucial. The successful integration of these technological facilities can lower operation and communication costs and enable more efficient decision making (Taylor, 2015). Because technology enables the participation in e-commerce, in turn, it is essential that IT is involved in the integration and deployment of these systems and technologies into the infrastructure environment. Therefore, it is necessary to ensure that each system and technology that is deployed is integrated correctly, successfully and fulfils its purpose in achieving the goals and objectives of the organisation.

6.2.2 Integration of systems and processes

The e-commerce concept was new to MCS and because of this, there were new artefacts which were acquired to enable the deployment of e-commerce within the organisation. Due to the existing artefacts at MCS, there was a need for the integration of new and existing concepts which included systems and processes. Thus, integration was viewed: (1) from the business perspective, and (2) the technology perspective.

From a business perspective, integration can be viewed as the collection and coordination of processes connected through an architecture platform to facilitate decision-making and problem solving for different individuals (Shang, 2012). The integration between these systems and processes needs to have the capability to connect people, processes, and information in a way

that allows the organisation to be flexible and to adjust to change. According to Didia & Nwokah (2015), the integration between sales, marketing, supply chain and logistics is key to improving organisation performance, customer satisfaction and increase revenue. For example, after the SAP e-commerce system was acquired to facilitate the e-commerce initiative at MCS, the integration with the existing SAP finance system enabled MCS to streamline the processing of transactions between systems. The integration of new and existing systems and processes within the organisation is vital as it creates a link across systems, process, people and ultimately the customers. For an organisation to integrate business processes with new and existing technological architectures, there is a need for integration from a technological perspective.

From a technology point of view, integration can be defined as the process of bringing different technological architecture artefacts together to ensure that each artefact functions as a system to achieve the business goals and objectives (Vertakova et al., 2014). Integration requires complete conceptualisation and a well-defined approach to enable and support the implementation of business processes such as e-commerce in an organisation. Thus, the architecture of these systems and processes needs to ensure flexibility and alignment with the business objectives. This goes to show that, the collaboration between business and IT during the integration of new and existing systems and processes is vital to avoid waste of resources.

6.2.3 Compliance

In the business context, compliance refers to ensuring that defined business processes are executed in the correct manner to achieve the business goals and objectives. Pham & Thanh (2016) defined compliance as guaranteeing that the business processes, rules, and policies are not violated. To ensure that the business processes are being adhered to, these processes need to be monitored. The monitoring of business processes does not only include the nonstop observing of probable compliance violations, but also the ability to prevent possible future compliance violations (Ly et al., 2015).

These rules need to be governed and monitored by the organisation to ensure that each defined process in the use of e-commerce is followed by the individuals and groups (units) in MCS, to ensure customer satisfaction. For example, one of the processes in facilitating e-commerce at MCS is to ensure that before a customer order is ready for delivery, there is a quality assurance process to make sure that the customer order meets the standards set by the business. In the case that this process is not executed, this could have a negative impact on the e-commerce

process, the organisation and ultimately the customers. Consequently, this goes to show that the governance of the different activities that are carried out in the e-commerce process needs to be monitored and governed.

In the deployment of e-commerce at MCS, there were different technology artefacts which were deployed in the IT environment. These systems need to comply with the technical standards which the organisation and the IT department governs. The governance of the IT systems includes ensuring the use of systems by defining, implementing processes and guidelines, which enables these systems to create value towards the organisation (Rikhardsson & Dull, 2016). This was vital as a prerequisite for the adoption of e-commerce at the MCS organisation. This is because the deployment of e-commerce brings about the transfer of organisational data and information as well as customer information over the internet. For example, on the MCS website customers enter their personal information such as address and contact details before making payments. To guarantee the integrity and prevention of abuse of access to customer information, there was a need to define procedures, privileges, responsibilities, prohibitions, permissions and monitoring access to information.

The governance of both business and IT compliance to policies is critical in that it helps with the management of information, proprietorship, processes and procedures, records and archives towards achieving the organisation's e-commerce goals and objectives. Without the organisational governance of these policies to ensure processes, security, and assurance of information during e-commerce activities, this can cause inconsistency in information and a breach in information. Therefore, this has a negative impact on the organisation and customer and ultimately results in failure in the implementation of e-commerce. To be able to monitor these different activities and processes in the use of e-commerce, workflows need to be clearly defined to highlight the key points in the e-commerce process at MCS.

6.2.4 The Workflow Approach

Workflow refers to well-defined processes, which are regularly recurring as part of an organisation's usual operations (Xu et al., 2017). The adoption and use of e-commerce follow different steps, which are from requirement gathering to implementation, review and evaluation. These steps happen in a "to and from" approach, between the organisation and the customers. Workflow is important in the adoption of e-commerce as it helps in defining tasks, roles, and rules in the organisation during the planning and execution of e-commerce activities. In addition,

the workflow makes communication more efficient and effective for a better understanding of the process between individuals, actor networks and activities across the organisation.

The workflow approach also helps in the re-evaluation and re-defining of both new and existing business processes. The approach focuses on the optimisation of the business process to increase the efficiency and effectiveness of the organisation to align processes with customer needs (Kluza & Nalepa, 2017). Processes are analysed and improved before they are implemented into the workflow. This is to avoid incorrect processes in the adoption of e-commerce. For example, post the deployment of e-commerce at MCS, customer orders were picked up directly from the store. In the process of doing this, one of the challenges encountered was that the stock in the store couldn't cater for the e-commerce website and the brick and mortar model. Consequently, the e-commerce division carried out a re-evaluation and because of the re-evaluation, the process was re-defined. This was intended to create warehouses that cater to the e-commerce website. This shows that workflow helped MCS to reduce processing times, improve quality and ultimately better value services to the customer. To be able to enable e-commerce at MCS, there were processes which needed to be followed to deploy new technological artefacts in the organisation.

From a technology point of view, one of the workflows which were carried out in the acquiring of new systems was the Request for Proposals (RFP) process. This process helps the IT division to ensure that systems which are going to be deployed in the IT environment were flexible and can be integrated with existing systems in the organisation. Workflow helps in making better business decisions and the monitoring of e-commerce activities within the organisation. To implement well-defined workflows, the organisation's key stakeholders should focus on the business objectives, understanding the different processes within the organisation and therefore having collaboration and communication with different stakeholders involved in the deployment of e-commerce as this is important to gain support, educate and convince stakeholders of the benefits of e-commerce.

6.2.5 Organisational Processes

As in other organisations, it was vital to have defined processes at MCS. This is advantageous to the organisation as it helps increase efficiency and productivity and to create better value for the customers. Organisational processes provide an outline of information systems requirements, documentation of the organisational processes and required technology

infrastructure (Ritchi, 2017). These processes would help enable the more effective and more streamlined deployment of e-commerce. However, the lack of clearly defined organisational processes can contribute towards the failure of the implementation of new systems and innovation within an organisation (Al-mashari & Al-mosheleh, 2015).

In MCS, there were pre-existing processes that were being used for the traditional brick and mortar business model. The e-commerce division tried to use some of these existing processes for the e-commerce initiative. However, this was very challenging as it was unclear, difficult to manage and it was hard to coordinate different people and departments in the deployment of e-commerce in the organisation. This resulted in challenges in the supply chain of the e-commerce initiative, because of the changes that were made to different processes at the organisation.

This goes to show that it is valuable for an organisation to have clear and defined processes which are consistent. In addition, it is important for the organisation to have a clear understanding of the different e-commerce trends and processes which have been adopted and used worldwide and by their competitors.

6.2.6 Actors' Collaboration

The stakeholders who were involved in the deployment of e-commerce at MCS worked in different silos. This stemmed from and was caused by the distinguished roles and responsibilities that were assigned to the different actors. Due to this, some actors make decisions they believe are right for the deployment of e-commerce. The collaboration between the business and IT units was vital to successfully deploy systems and processes in the adoption and use of e-commerce. Also, this could be because collaboration is an approach that is used to align existing business processes and supporting systems that affect the performance of business processes in an organisation (Aversano et al., 2016).

The business unit decided to create an e-commerce division which was responsible for the deployment of e-commerce in the organisation. This division includes the IT manager who was responsible for the RFP process in the selection of e-commerce systems in the organisation. During the process, the business unit was not involved in the selection of systems used to facilitate e-commerce within the organisation. Because of this, there were challenges in adapting the system to the business processes as the systems dictated how the e-commerce

processes and activities would be conducted. This means that the systems selected did not fit their processes, because the IT manager did not fully understand if the systems would aid in achieving the business goals and objectives. Ultimately this affects the checks and balances of the organisation. The need for collaboration between the business and IT during the implementation and integration of new and existing systems became more important as this transforms the business operations and processes (Tarhini et al., 2015).

It is vital for the business unit to be involved when the IT unit acquires systems that will be used in the organisation. The collaboration between the business and IT units would be valuable in understanding the different business process and how the new systems can meet the business requirement. This is because the lack of collaboration can be costly for the organisation as systems that do not meet business requirements could have been acquired, even going unused.

In summary, through the lens of ANT, the main factors that influence the adoption and use of e-commerce at the MCS organisation are revealed. Figure 5 depicted the connectivity and interactions that happen between the factors in the adoption of e-commerce. The factors influence the e-commerce at MCS through various conscious and unconscious translations of activities.

The following section discusses the components of e-commerce deployment at DCS.

6.3 Dapper Chain Stores Findings

Given the analysis through the 4-part moment of translation presented above, the factors that were considered important in the deployment of e-commerce in DCS were: Business Drivers, Stock of Knowledge, Training and Skills, Assimilation of Processes, and Alliance of Actors. These findings will be discussed in detail in this section.

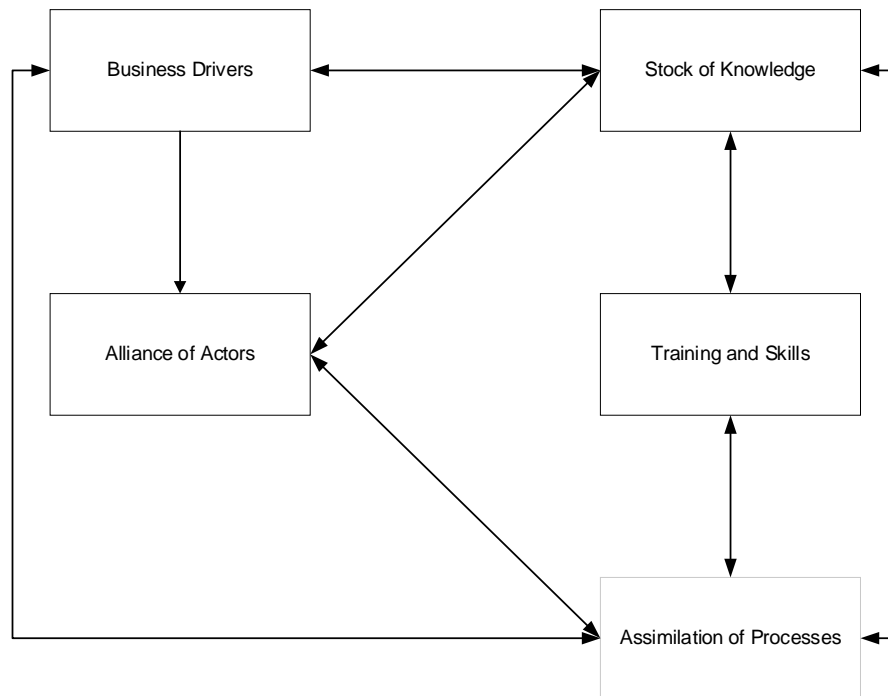


Figure 6 - Components of E-commerce Deployment at DCS

6.3.1 Business Drivers

In many organisations, the use of ICT artefacts is primarily to enable and support business strategies, goals and objectives (Agboh, 2015). Thus, strategies, goals and objectives collectively form the business drivers, which some organisations cite as their rationale for the selection, deployment and use of ICT artefacts. As a result, business drivers dictate the adoption and use of the e-commerce concept in an organisation. These business drivers consist of both information, technology and business requirements.

This means that the organisational goals, strategies and objectives are key elements in the deployment of technological innovation such as in the concept of e-commerce in an organisation. In the case of DCS, the adoption of e-commerce was a strategic plan, which was to attract more customers, grow their market share in the retail industry sector, and ultimately increase their revenue. However, the formulation of the business drivers was not as easy as it was proclaimed. The difficulty was primarily to constitute the various actors (stakeholders) in a team that formulated the drivers on behalf of the organisation. Some of the actors accepted, and others rejected the deployment of e-commerce in the organisation. The decisions were informed and influenced by two main factors: (1) an understanding of the concept relative to the business

drivers of the organisation; and (2) personal interest as opposed to the business drivers of the organisations.

The personal interests manifested was because the employees concerned felt that they would not benefit from the adoption of e-commerce. This is because some employees felt the adoption of e-commerce would cause them to have control over fewer resources. Also, some knew that they would not be involved in the actual activities of the adoption, which they thought would make them less relevant in the organisation. These fears were based on the transformative process through the adoption of e-commerce at the time. The personal interest of the actors was relevant because they exercised the power, which was bestowed on them in accordance with the organisation's structure, making them influential in the decision process.

6.3.2 Stock of Knowledge

The deployment of ICT artefacts relies on the knowledge of different actors (stakeholders) in an organisation. These actors come from different organisational areas such as strategic, business, operational and technical. Together, this creates a stock of knowledge within the organisation, which is used to facilitate the selection, deployment and use of ICT artefacts. For example, at DCS, the ATG e-commerce system was acquired and implemented based on the knowledge of the solution architect in the organisation. This indicates that the knowledge from these different areas plays a vital role in the deployment of technological innovation such as the concept of e-commerce in an organisation.

However, the sharing of knowledge by the different stakeholders involved in the implementation and use of e-commerce is a challenge. This is mainly based on the use of knowledge to negotiate personal interest rather than the business drivers of the organisation. The implication of this is a lack of documentation and knowledge on the implementation and use of e-commerce within the organisation. Also, actors consequently use knowledge as bargaining power to achieve their own personal interests.

The implication of the lack of documentation on the selection, implementation and use of ICT artefacts can affect the maintenance of these technological artefacts. According to Satish & Anand (2016), the nonexistence of documentation can result in the wastage of time resources on gathering information before making changes to a system or software. Consequently, this affects the productivity of the IT unit and ultimately the organisation. In knowing this, actors thereby use knowledge as bargaining power to exercise control over the adoption of e-

commerce within the organisation. According to Qureshi & Evans (2015), some employees in an organisation believe that knowledge is power and that in sharing this knowledge they lose their power or position within the organisation. Thus, some actors have a negative attitude towards knowledge sharing to protect their personal interest.

This means that the management of this knowledge becomes difficult for the organisation. Knowledge management is key in any organisation as this enables the organisation to improve the efficiency of processes, productivity, and service delivery to their customers and ultimately to find new innovations in the organisation's interest (Donate & Sánchez de Pablo, 2015). The management of knowledge can be achieved through the use of training guides, process and policy documents, and workshops for innovation (Dave & Koskela, 2009). By achieving the management of knowledge within the organisation, the different stakeholders who are involved in the adoption and use of e-commerce can work together towards achieving the organisational goals and objectives

6.3.3 Alliance of actors

Alignment of the different actors (stakeholders) plays a vital role in the selection, implementation and use of ICT artefacts. These actors come from business, operational and IT units in an organisation. Thus, the different units work hand in hand to facilitate different activities and processes towards the achievement of the organisational goals and objectives. An example of this is, at DCS once a customer has placed an order on the website, this order is sent to the operational unit's picking team, once the order has been picked, it moves to the packing team and then to the logistics personnel. Based on this example irrespective of the actors, they form a heterogeneous alliance of networks consciously or/and unconsciously towards the business drivers of the organisation.

Nevertheless, a lack of alignment between the different stakeholders can have negative implications for the productivity of the organisation. For example, at DCS there was a new store which was opened, and the operational unit was not aware of this. Thus, there were customers who needed assistance and the operational unit was inadequately staffed to handle the workload. In this line, the lack of alignment was a consequence of poor communication between the different stakeholders involved in the use of e-commerce. Communication plays a key role in the implementation of new systems within an organisation. The lack of good communication between stakeholders can have a negative impact on the sharing of knowledge within an

organisation. According to Charoensuk et al (2014), communication has an indirect relationship in the alignment between business and IT through knowledge sharing. Thus, high-quality communication, in the articulating of problems, needs and sharing knowledge within an organisation can increase efficiency and effectiveness in the organisation. Therefore, business, IT and the operational unit can work together towards achieving the organisation goals and objectives.

6.3.4 Training and Skills

In many organisations, the selection, implementation and use of ICT artefacts depend on trained and skilled actors. The rationale for this is that actors involved in the selection, implementation and use of ICT artefacts need to understand the different technical standards and processes involved in the deployment of new ICT artefacts. According to Salehan et al., (2018) in an organisation, training is required in the adoption of new technology. Therefore, training helps to bridge the actors' unequal levels of understanding, in the same light upskilling them.

This means that to understand the different processes, organisational standards and policies involved in the adoption and use of e-commerce, training and skills play a vital role in the adoption and use of e-commerce within an organisation. However, the implication of the lack of well trained and skilled actors in the adoption and use of e-commerce can have a negative impact on the organisation. For example, at DCS, an employee may not know that after picking an order, this order needs to go through a quality check before it is sent out for delivery. Consequently, this can have a negative impact on the quality of service towards the customer as the picking of the order may not be up to the standard set by the organisation. The significance of training in the adoption and use of e-commerce within the organisation is to create a common understanding of the different systems and processes related to the e-commerce activities. In the implementation of new technologies, by using well-defined training programme, organisations can lessen the barriers to knowledge which are related with the assimilation of new processes and systems (Ram, et al., 2014). Some ways in which training can be done is using documentation, training manuals, workshops, seminars and as well knowledge management strategies.

6.3.5 Assimilation of processes

In the deployment of new technologies in an organisation, the assimilation of the different processes involved is key in the successful implementation of these technologies. Assimilation of processes can be described as the understanding of a process which starts from the awareness of an innovation to the adoption and use of the innovation (Pudjianto, 2010). These processes can be complex such as research, analysis, implementation, evaluation of the new technologies as well as the business processes which are involved in the implementation of new technologies (Hossain et al., 2016). The lack of assimilation of these processes can have a negative impact on the successful adoption and use of these technologies. This can be attributed to the lack of skills and technical knowledge in the process of the adoption and use of technological innovation (Al-Somali et al., 2011).

The lack of skills and technical knowledge can affect the different processes involved in the deployment and use of e-commerce. For example, a lack of understanding of the business processes within the organisation can inform bad decision making in the acquiring of new systems within the organisation. Because of this, the system may not meet the business process requirements, therefore, affecting the productivity and efficiency of the organisation. According to Van Wart et al (2017), the lack of skills and knowledge in the implementation of new technologies can be attributed to the failure of the implementation of these systems and ultimately costing the organisation.

The assimilation of the different processes in the adoption and use of e-commerce within the organisation is deemed vital in this study. As this is key in the acquiring, implementation, adoption and use of this innovation to achieve competitiveness and ultimately the organisational goals and objectives. Once the different actors understand the different processes involved during the e-commerce activities, the actors can, therefore, align themselves towards the organisational goals and objectives.

6.4 Interpretation of Findings

The factors that influence the adoption and use of e-commerce were empirically revealed by the findings as presented in the analysis of both cases (MCS and DCS) in the study. This section presents the interpretation and discussion of the findings, towards the development of a framework that can be used to guide the adoption of e-commerce. This was done, following the three steps:

1. Findings from both cases as shown in figures 5 and 6 were mapped against each other, in Figure 7.
2. Based on subjective reasoning from an interpretive perspective, similarities between the sets of findings were identified and merged.
3. The factors that emerged from the mapping were interpreted, based on which Figure 8 was developed.

The main rationale for this was to gain a holistic view of the e-commerce phenomenon, and the factors that influence the concept in the mainstream retail grocery sector.

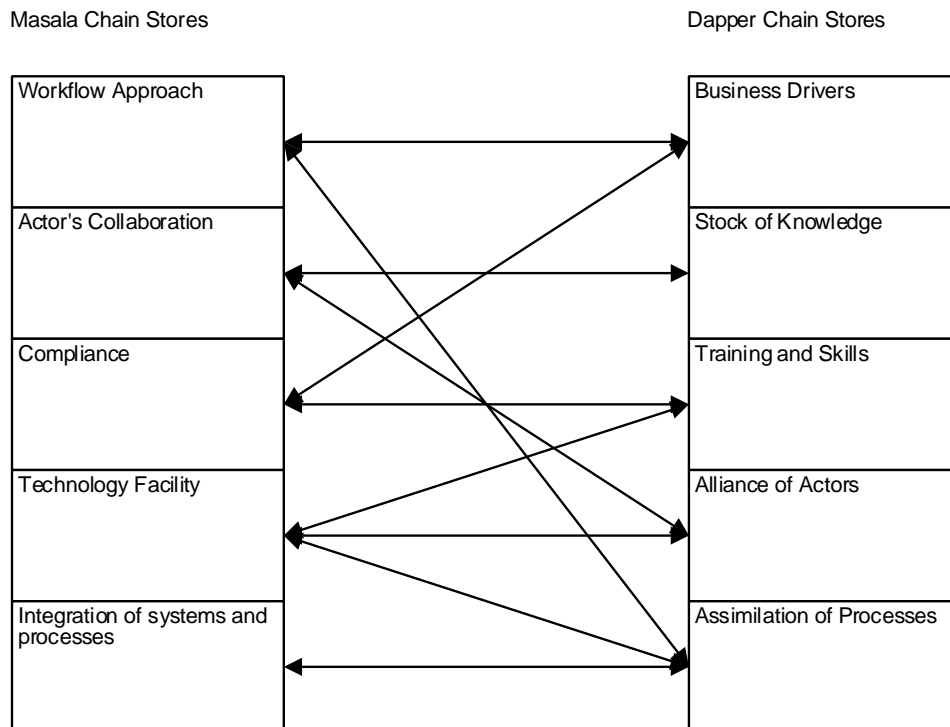


Figure 7 - Factors of E-commerce from Both Cases

The findings from the two cases were interpreted, subjectively. The interpretation of the findings from the analysis helps in gaining a better understanding of the factors that influence the adoption and use of e-commerce in a mainstream grocery business in South Africa. Based on the interpretation, four factors, namely Organisational Requirements, Network of People, Technology Architecture, and Culture, emerged. These factors are critical, particularly because they manifest in other factors, as shown in Figure 8, as they influence the adoption of e-commerce within an organisation.

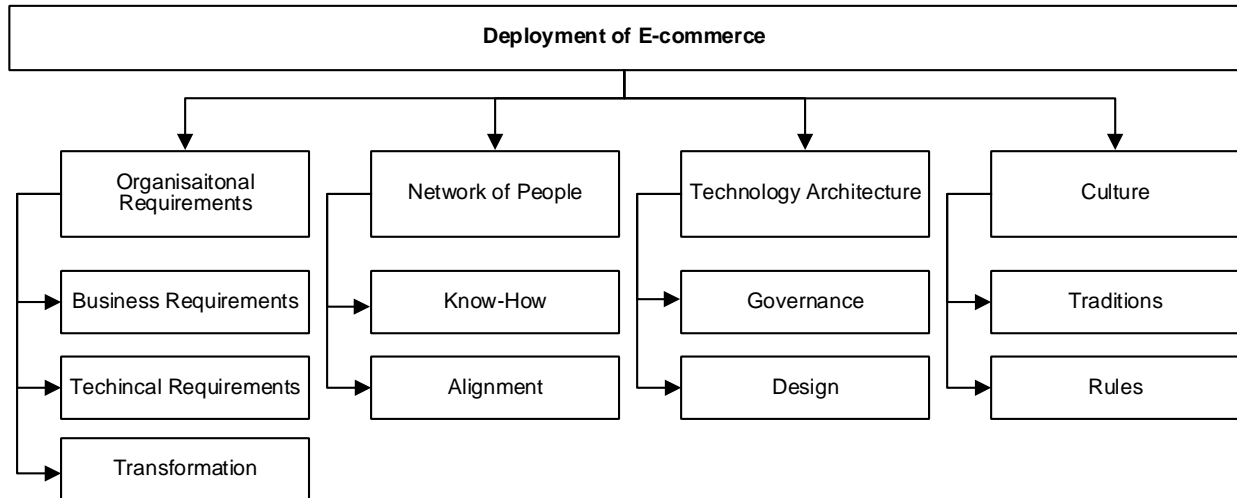


Figure 8 - Framework for the Adoption and Use of E-commerce

6.4.1 Organisational Requirements

As revealed by the analysis of the cases, it is vital that the business drivers of an organisation are understood by the actors that are involved in the adoption and use of e-commerce. In this study, business drivers consist of and refer to strategies, goals and objectives. The rationale for this is that the business drivers inform the way in which e-commerce is adopted and used within the organisation. Therefore, the business drivers inform the organisational requirements of both business and technical (IT) requirements.

The business requirements need to be clearly defined and understood by the different actors involved in the deployment of e-commerce within the organisation. This is primarily because the business requirements determine what decisions are taken in the implementation of systems, as well as the processes that are followed in the organisation. The business requirements ensure that systems and processes implemented in the adoption and use of e-commerce are executed in an effective manner. The importance of understanding the business requirements helps in justifying the rationale behind the use of e-commerce in the organisation. In addition, technical requirements are needed to enable and support the e-commerce concept within an organisation.

The technical requirements are defined and gathered based on the business requirements. This is because technology enables the e-commerce initiative within the organisation. The technical requirements consist of requirements that cover artefacts such as systems (software), infrastructure and networks including integration of the artefacts. These requirements ensure that the development or acquisition of a system and its implementation aligns with the business

drivers towards achieving the goals and objectives of the organisation. The significance of clearly defined business and technical requirements is, therefore, to ensure the deployment of e-commerce is executed properly. This is mainly because the deployment of e-commerce affects other decisions taken within the environment, such as the implementation of new processes and the acquisition of systems, towards achieving the organisational goals and objectives. In addition, the implementation of new processes and systems can bring a transformative process within the organisation.

Transformation can be consequential in the implementation of new systems and processes within an organisation. The implementation of new systems and processes can also result in the re-evaluation of workflows and processes in an organisation. Therefore, changes can potentially be made to existing processes and systems or in the integration of existing and new processes and systems. In addition, through the transformative processes, the organisation can define and clarify different processes and tasks for better understanding by the actors as they execute these processes and tasks in the correct manner in pursuit of the business goals and objectives.

6.4.2 Network of People

In the adoption and use of e-commerce, it is important that the different actors involved have not only the skills and understanding of different processes but are also aligned with one another towards the business drivers of the organisation. Thus, the know-how and alignment of the different actors are key in the adoption and use of e-commerce as this affects how the implementation and processes are executed. The lack of knowledge (know-how) of the different processes involved in the adoption and use of e-commerce can result in unproductivity.

According to Shang (2012), inadequate knowledge about new system processes can affect the productivity of the organisation. In this light, it is important that each actor across the organisation have or acquire the knowledge of the different processes involved in the adoption and use of e-commerce. However, different actors exist with the organisation from different backgrounds; technical (IT) and non-technical (business). This makes it challenging, as different units, teams and departments have different understandings and processes within the organisation. Consequently, there is a need to ensure that actors are aligned in relation to the know-how, understanding and processes involved in the deployment of e-commerce.

The alignment of the actors from both technical and non-technical is vital in the adoption and use of e-commerce within an organisation as both technical and non-technical actors heterogeneously need to collaborate between units, teams and departments. The rationale for

this is to ensure that each actor can work together using their knowledge towards achieving the goals and objectives of the organisation. The lack of alignment between actors can affect the organisation in a negative way. Some of the negative impacts this can have are a duplication of processes and an increase in the cost of integration of new systems. Therefore, it is important that actors have knowledge about the e-commerce concept which can be used to align different actors towards achieving the organisational goals and objectives.

6.4.3 Technology Architecture

The development, deployment and use of e-commerce technologies require design and governance, which forms part of technology architecture. This is important because the design and governance ensure uniformity, compatibility, and flexibility in the deployment of technologies that enables and supports the concept of e-commerce in an organisation. This is critical as this will assist the organisation in the development or acquisition of systems to facilitate e-commerce within the organisation. The design of the technology architecture needs to be flexible to accommodate the business processes of the organisation. The rationale for this is that this will ensure that the systems which are deployed to facilitate e-commerce can work according to the business process of the organisation. Thus, it is important that the business processes need to be clearly defined and understood by the actors involved directly or indirectly in the adoption and use of e-commerce within the organisation. In line with this, there is a need for a structure which is used to govern the acquiring of systems, processes and procedures that its employees need to follow in the deployment of e-commerce.

The governance entails processes and procedures which guide the development or acquisition of systems for the e-commerce concept. This is vital in that governance, therefore, provides stability for the deployment of e-commerce in an organisation. This is to ensure that there are architectural standards which are applied within and across the organisation. Furthermore, the governance of the technology ensures that there is consistency in the systems and processes in the organisation. Thus, it is important that actors involved in the deployment of e-commerce are aware and understand the standards, processes and procedures. In the case that different actors, units and departments do not adhere to these standards, processes and procedures, actors will follow or create their own processes in the acquisition of systems to facilitate e-commerce. Consequently, this can result in unnecessary cost and the deployment of systems which do not fit within the organisation architecture.

The design of the technology architecture needs to be able to be in line with the business processes. The business processes need to be clearly defined and understood by the actors. Once the processes have been clearly defined, the governance of processes, procedures and systems will be used as rules to govern the deployment of e-commerce within the organisation.

6.4.4 Culture

Culture plays a key role in the adoption and use of e-commerce in an organisation. The reason for this is that culture impacts how tasks or processes are executed within the organisation. Thus, culture influences how actors carry out different processes in the deployment of e-commerce within an organisation. Culture can be informed by rules and traditions that exist within the organisation. Rules set the boundaries in the way practices and processes are carried out within an organisation. Rules can be used to complement different practices and processes within the organisation. For example, in the adoption and use of e-commerce it is a rule that before acquiring any system, the organisation needs to go through an RFP process. Thus, the rule complements the process of acquiring new systems in the organisation.

These rules can be written and non-written. Written rules are formal and can be both business and technical rules. Written business rules are guidelines which are established by the business to facilitate the different processes within the organisation. These rules can be formulated to suit the business drivers within the organisation. An example of a business rule would be that, before new business models are implemented, there is a need for a strategic meeting to evaluate the models. Written technical rules are used to ensure that technologies deployed to facilitate the e-commerce concept are aligned to the business drivers of the organisations. These rules can be written into the specification document, technological standards and/or usage policies within the organisation. An example of this is a rule which ensures that new systems acquired can be flexible to integrate with existing systems in the organisation.

This goes to show that rules are used to govern compliance by actors across the organisation in the adoption and use of e-commerce. However, some of these rules are not always formal and/or written. Non-written rules are part of the customs or informal culture of an organisation. These are rules that have been sanctioned by an actor or actors based on perceived power. An example of a non-written rule is, in MCS, although the decision to acquire a system is made by the department, based on customs it is fine if the IT manager makes the decision without consulting the department. Thus, the impact of rules on the adoption and use of e-commerce in an organisation can be negative if not governed properly by the organisation. It is vital that rules

are governed to ensure that actors involved in the adoption and use of e-commerce adhere to these rules to ensure the business drivers are met accordingly.

6.5 Conclusion

This chapter focuses on the analysis of the data which was collected using the interview technique from the two cases (MCS and DCS). The analysis was guided through the social-technical theory Actor Network Theory (ANT). Through the application of the theory, the researcher was able to identify the factors which influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector, as well as interpret these factors. Without the application of the different tenets of ANT, it would have been problematic for the researcher to understand, identify and interpret these factors.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

This is the last chapter of the study, which concludes the study. The aim of this study was to develop a framework which can be used to guide how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa.

This chapter was broken into eight sections. Section one presents a summary of the study. Section two focuses on how each of the research questions was answered. Section three provides the contribution of the study from a theoretical, methodological, and practical perspective. Section four of this chapter presents the benefit of the study, followed by section five which discusses the limitation of the study. The study proposes specific recommendations in efforts to improve the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa in section six. Section seven presents further studies which can be carried out regarding the improvement of e-commerce. And lastly, section eight provides a conclusion drawn from the analysis and findings of this study, which was discussed at length in the previous chapter.

7.2 Summary of the Study

Chapter 1

Chapter 1 of this study provides a general background to the adoption and use of ICT tools such as e-commerce to facilitate the buying and selling of goods and services over the internet. Furthermore, chapter 1 gives clarifications to basic terms and concepts used in the study. Section 1 introduces the theme of the study; which is the adoption and use of e-commerce in the mainstream retail grocery sector and the gap which exists in the adoption of e-commerce in the mainstream retail grocery sector. In addition, section 1 also states the problem statement and research problem justifying the necessity of carrying out the research to understand, explain, and ultimately, inform a redress of the hindrances to the adoption of e-commerce in the mainstream retail grocery sector in South Africa. Section 2 presents an overview of the main

keywords; Information and Communication Technology (ICT), E-commerce, Adoption of Technology and Actor-Network theory (ANT).

Section 3 provides the aim of the research; which is to develop a framework which can be used to guide how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa for both retailers and consumers. The three research objectives are (1) To understand how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa, (2) To understand the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa, (3) To contribute to the improvement of how e-commerce is adopted and used in the mainstream retail grocery sector. The research questions which needed to be answered in the context of the study were also stated in the section. Section 4 focuses on the research philosophy, research methodology, research design, research approach, data collection methods which were selected in the context of the study and on the application of ANT in the analysis of the data collected in the study. Section 5 discusses the delineation of the study, section 6 focuses on the contribution of the study from the perspectives of the scientific community, managers and retailers in respect of the adoption and use of e-commerce and section 7 discusses the ethical considerations which are essential in research to minimise harm to and risk for the participants involved in the study.

Chapter 2

Chapter 2 of this study provides a review of literature in five main areas in relation to the study: (1) Information and communication technology (ICT), (2) Grocery Retail Store, (3) E-Commerce), (4) Technology Adoption and (5) a review on ANT. Section 2.1 focuses on the use of ICT for business, in relation to some of the advantages ICT presents to organisations. In addition, this section also explores and provides insight into the challenges faced in the adoption and use of ICT in organisations. Section 2.2 explores the grocery retail stores, highlighting some of the fundamental roles of grocery retail stores play in a country and the rationale behind grocery retail sector organisations exploring the use of ICT for their businesses. The next section (Section 2.3) focuses on the major theme of the study which is e-commerce. This section discusses the use and advantages of e-commerce in the business context, the use of e-commerce for business and economic growth and how e-commerce can improve competitiveness for organisations. Section 2.4 discusses the adoption of technology in the business context and some of the barriers organisations encounter in the adoption of technology. Section 2.5 reviews the ANT which is used to underpin the study. It examines the tenets of ANT (the four moments of translation), acknowledges some of the articulated criticisms

of ANT to provide awareness, insight and guidance on the application of ANT in the context of the study and in addition, considers the relation of ANT and information system studies.

Chapter 3

Chapter 3 includes the Research Paradigm, Research Methodology, Research Design, Research Approach, Data Collection, Data Analysis and Ethical Considerations. The first section (Section 3.1) discusses the research philosophy and provides context to the rationale behind the selection of specific paradigms in the context of the study. Section 3.2, discusses the quantitative and qualitative methodology and elaborates on research types which can be adopted in the qualitative methodology. Section 3.3 presents an insight into the research design by highlighting some of the major research designs such as ethnography, grounded theory, phenomenology and the case study. Section 3.4 discusses the two main categories of research approach: deductive and inductive. The last section (Section 3.5) outlines the data collection method, which was interviews, and further discusses the different types of interviews. Furthermore, this section gives insights into the demography of the participants which were interviewed and the interview guidelines which was used to assist the researcher during the interview process.

Chapter 4

Chapter 4 presents an overview of the process, experience and challenges faced by the researcher during the field work of this study in section 4.1. Section 4.2 and 4.3 presents an overview of the two cases which were selected in the context of this study. This was done through the illustration of the organizational structure and the explanation of the different department's roles and functions. These cases were selected based on criteria which were presented in chapter 3 and both cases have adopted and use e-commerce for their business.

Chapter 5

Chapter 5 includes an overview of ANT, analysis of both cases, discussion of the findings from the analysis, the interpretation of the findings. Section 5.1 presents an overview of the application of ANT to guide analysis of the data collected. Section 5.2 explains the referencing pattern which was adopted by the study to make appropriate use of the data collected from the different organisations. Section 5.3 and 5.4 present a methodological approach in the analysis of the first case (MCS) through the four moments of translation and the findings which were considered important in the adoption and use of e-commerce in the organisation. Section 5.5

and 5.6 present the analysis of the second case (DCS) through the four moments of translation to guide the analysis and the discussion of the findings which were drawn from the analysis. The next section (Section 5.7) presents the interpretation and discussion of the findings. This was done in 3 steps: (i) findings from both cases were mapped against each other, (ii) from subjective reasoning from an interpretive point of view, similarities between both sets of findings were identified and merged, and (iii) the factors which emerged from this process were interpreted to develop the framework towards achieving the aim of the study.

Chapter 6

Chapter 6 of this study presents a summary of the study; the evaluation of the study which focuses on how each research question was answered; the contribution of the study from a theoretical, methodological and practical perspective; the benefit of the study to the body of knowledge, managers and retailers interested in e-commerce; the limitation of the study; recommendations and further research and lastly the conclusion of the study.

7.3 Evaluation of the Study

The aim of this study was to develop a framework which is intended to guide how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa. To achieve the aim of this study, there were 3 questions which needed to be answered. These three questions and how they were answered by the data analysis follow:

How is e-commerce adopted and used in the mainstream retail grocery sector in South Africa?

This question was answered through the analysis conducted in chapter 5 of this study. Through the application of ANT as a lens to guide the study, the study presents empirical evidence into how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa through the application of the components of the ANT, namely problematisation, interessement, enrolment and mobilisation.

In the problematisation stage, the reason for how e-commerce was considered as a potential initiative to facilitate the grocery sector in the organisation was described. The interessement stage focuses on how the interest of the different actors involved in the adoption and use of e-commerce was drawn towards the e-commerce initiative. This was either through the organisational goals and objectives or personal interest of the actors. The enrolment stage

focuses on the roles and responsibilities each actor took on and how they did so in the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa. Finally, in the last stage, mobilisation, which focuses on how the actor(s) who problematised the e-commerce initiative ensured that all the actors involved work towards the goals and objectives of the organisation, which is to successfully adopt and use e-commerce for their business.

Through the data analysis of both cases selected for this study, this question was answered by providing insight into how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa.

What are the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa?

Based on the data analysis conducted in chapter 5 on the two organisations that were used as cases in this study (MCS and DCS), the factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector were analysed and interpreted. The analyses of this study were conducted through the lens of ANT as a guide. The researcher using the interpretive approach had to make sense of how the factors influence the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

Through analysis and making sense of the findings from both cases, the factors which influence and affect the adoption and use of e-commerce in the mainstream retail grocery were illustrated in Figure 8 in chapter 6. These factors are organisational requirements, network of people, technology architecture and culture.

Organisational requirements regarding the adoption and use of e-commerce were highlighted as one of the key factors. The rationale for this is that the organisational requirements inform both the business and technical requirements needed to achieve the organisational goals and objectives. As a result, the significance of this factor is that it guides how tasks, processes and systems are implemented and executed in the organisation. In the adoption and use of e-commerce in the mainstream retail grocery sector, it is important that the different stakeholders involved have the knowledge and are aligned toward the goals and objective of the organisation. In this line, the second factor, which is the network of people, plays a key role in the adoption and use of e-commerce. The implication of the lack of knowledge of processes and systems can be a lack of productivity in the organisation, therefore, affecting the success of the adoption and use of e-commerce in the organisation. Furthermore, this also creates a misalignment between the different actors involved in the e-commerce initiative.

The third factor, highlighted from the interpretation of this study is the technology architecture. The significance of this factor is that it helps in the implementation of systems and processes in the adoption and use of e-commerce in the mainstream retail grocery sector. The governance of the processes and procedures is essential in the acquisition of systems to facilitate the e-commerce initiative. The design of the systems needs to be compatible and flexible to accommodate existing or new systems and processes within the organisation, as this affects the way in which the different stakeholders involved in the e-commerce initiative execute processes and tasks. In this light, the culture was also emphasised as a key factor in the adoption and use of e-commerce in the mainstream retail grocery sector. The rationale for this is that both written and non-written rules affect the way in which tasks and processes are carried out regarding e-commerce. Thus, it is important to ensure that all tasks and processes are adhered to by the different stakeholders involved in the adoption and use of e-commerce in the organisation.

How can the adoption and use of e-commerce be improved in the mainstream retail grocery sector?

The adoption and use of e-commerce in the mainstream retail grocery sector in South Africa can be improved through the practical application of the framework developed in this study. The framework developed shows the factors which organisations need to be aware of and consider to be able to make an informed decision into how they can participate in e-commerce in the South African context. In other words, through the practical application of the framework which was intended to improve the adoption and use of e-commerce in the mainstream retail grocery sector, organisations can have an improved adoption and use of e-commerce for their business. In line with this, the study contributes to the body of knowledge in three ways, which are discussed in the subsequent section.

7.4 The Contribution of the Study

The contribution of this study is divided into three subsections, focusing on the theoretical, methodological and practical contributions.

7.4.1 Theoretical Perspective

Through the application of ANT as a lens to guide the data analysis, this study was able to provide insight into the relationships and activities that occur in the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa. Furthermore, the study highlights the factors which influence and affect the adoption and use of e-commerce within the

mainstream retail grocery sector in South Africa. These factors include organisational requirements, network of people, technology architecture and culture. The implication of these factors was highlighted in both cases in the analysis, where these factors were either undervalued or not taken into consideration. Theoretically, the study contributes to the existing body of knowledge the understanding of the relationship between human (people) and non-human (technology) and the factors which influence and affect the adoption and use of e-commerce. This will help managers, business and IT personnel make informed decisions on how to adopt and use e-commerce within their organisations.

7.4.2 Methodological Perspective

The methodological contribution of this study lies in the application of the concepts problematisation, interessement, enrolment and mobilization from ANT to guide the analysis. The rationale for this is that, through the successful use of ANT, it helps to clarify how different networks are formed in an organisation and explain how actors consciously and unconsciously influence a network(s). In doing so, it helps to gain a deeper insight into and identify the factors and the role they play in the adoption and use of e-commerce. Furthermore, ANT has been used in several studies, but not in the context of this study. As a result, this helps bring a new perspective into the factors that influence the adoption and use of e-commerce within the grocery stores in a developing country context such as South Africa.

7.4.3 Practical Perspective

The practical contribution of this study lies in the framework which was developed through empirical evidence discovered in the process of analysis. The framework which was developed is intended to improve the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa. Through the practical application of the framework by organisations and IT personnel, the framework will guide and help stakeholders to implement policies, standards, requirements etc. in the adoption and use of e-commerce for their business. To this end, the framework developed can be used as a practical instrument.

7.5 The Benefits of the Study

The benefits of this study can be viewed from the perspective of two domains; (i) business domain and (ii) the academic domain.

The benefit of this study for the business domain is that it will enable managers, business and IT personnel to make informed decisions in the deployment of e-commerce with the organisation.

The practical application of the framework will create awareness among managers, business and IT personnel on the importance of the factors which influence the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

The study also contributes to the academic domain, as the study findings can be used as a building block towards the improvement of understanding of the adoption of e-commerce in the mainstream retail grocery sector in South Africa. The benefit of this study for the academic domain is also in the contribution to the existing body of knowledge. This study presents empirical evidence which can be used as a building block towards the continual improvement of e-commerce in the mainstream retail grocery sector in South Africa. The factors highlighted influence and affect the adoption and use of e-commerce and the success of it within the mainstream retail grocery sector in South Africa. Another academic benefit of the study is in ICT research and application of the concepts of ANT. The theory as a lens helps in understanding the relationship between human and non-human actors, how different networks are formed consciously and unconsciously and how actors influence these networks. In addition, it identifies the factors which influence the adoption and use of e-commerce towards achieving the aim and objectives of the study.

7.6 Limitations of the Study

There are two major limitations of this study that may have an implication on future research studies.

The first limitation was that the study focused on the adoption and use of e-commerce by organisations. Therefore, consumers who have adopted or use e-commerce in one way or another were not taken into consideration in this study. This study could, in turn, be a building block in the improvement of e-commerce from the consumer perspective. The second limitation of this study is related to the fact that the framework developed in chapter 5 of this study was based on the adoption and use of e-commerce in the retail sector. Consequently, the generalisability of the framework to other sectors may be limited.

7.7 Recommendations

Based on the data analysis, the recommendations are drawn from interpretations and findings highlighted in chapter 5 of the study. The interpretation and findings emphasized that organisational requirements, network of people, technology architecture and culture are the factors which influence and affect the adoption and use of e-commerce within the mainstream

retail grocery sector in South Africa. Due to this, it is recommended that managers, business and IT personnel are educated on understanding the factors in the deployment of e-commerce.

It was outlined that organisation requirements play a vital role in the adoption and use of e-commerce. Managers, business and IT personnel need to understand both the business and technical requirements as these components determine the decisions taken in the deployment of e-commerce. The implication of the lack of understanding of the business and technical requirements is that processes and systems which are not able to achieve the organisational goals and objectives are implemented. As a result, it is vital that all stakeholders understand the organisational requirements. In the deployment of e-commerce, it is important that the stakeholders involved have the knowledge about the processes and systems which are used to facilitate e-commerce. In doing so, both technical and non-technical stakeholders can work together using their knowledge towards achieving the organisational goals and objectives. The lack of alignment between all the stakeholders can have a negative impact on the organisation. It is recommended that all stakeholders have the knowledge and understand how the different processes and systems work hand in hand to meet the organisational requirement.

From a technical point of view, it is recommended that the design and governance of the technology architecture are informed, compatible and flexible to facilitate the deployment of e-commerce. Senior stakeholders who are involved in the deployment of e-commerce should ensure that the technical architecture of new and existing systems meet the organisational requirements. This can be achieved through the governance of clearly defined policies and standards which all stakeholders need to adhere to, and that each stakeholder understands the policies and standards set by the organisation. In line with this, by ensuring the governance of policies and standards, this creates a culture where all stakeholders adhere to the culture of executing processes or tasks according to the written and non-written rules. Managers need to ensure that all stakeholders involved in the adoption and use of e-commerce comply with the rules and regulations of the organisation to ensure the successful adoption and use of e-commerce.

For each of the factors which have been provided by the framework, the study recommends that each factor is developed as a guideline for the implementation of systems and processes in the adoption and use of e-commerce. These guidelines should be used to create policies, standards and processes on how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa.

7.8 Further Research

Based on the limitations of this study, it is recommended that further studies making use of other social-technical theories can be applied to cover the gaps which ANT could not address. For example, the application of Structuration Theory can help gain a deeper understanding of the different rules and regulations that exist in the use of e-commerce, understanding how different actors interact with the rules, regulations and technologies. The application of Activity Theory would help in understanding the technical components, roles, responsibilities and processes which are used in the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

Furthermore, a comparative study can be conducted to identify the similarities and differences between both cases from which a conclusion can be drawn. In addition to this, a further research area could be from the consumer point of view. There is a need to focus on the awareness and the acceptance of the e-commerce concept by consumers, therefore, identifying the factors which affect the use of e-commerce in the mainstream retail grocery sector in South Africa from a consumer perspective is recommended.

7.9 Conclusion

In this chapter, an overall summary of the study was presented. The study's aim was to develop a framework which can guide how e-commerce is adopted and used in the mainstream retail grocery sector in South Africa. In line with this, data was collected from two cases in which the data was analysed through the lens of the ANT as a guide. The analysis of the data was presented in chapter 5 of the study. The application of ANT in this information systems study helped to identify and understand how heterogeneous networks are formed by both human and non-human actors. Furthermore, it also helped to highlight the relationship and interactions that occur between human and non-human actors in a network(s). In doing so, ANT helped to identify and understand both the technical and non-technical factors that influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa. Based on this, it was evident from both cases that the factors, namely organisational requirements, networks of people, technology architecture, culture, are factors which influence and affect the adoption and use of e-commerce in the mainstream retail grocery sector in South Africa.

Organisational requirements play a vital role in the adoption and use of e-commerce. The rationale for this is that the business drivers inform the organisational requirements for both business and technical (IT) requirements. Both these requirements need to be clearly defined

and understood by all actors who are involved in the deployment of e-commerce. This is significant as this guides how e-commerce is deployed and used in the organisation. The lack of such requirements can result in misalignment from both business and technical perspective. The network of people who are involved in the adoption and use of e-commerce needs to be skilled and understand the different processes involved. The lack of skilled and knowledgeable actors can result in lack of productivity and duplication of processes and systems which can increase cost for the organisation. Furthermore, based on the different understandings and knowledge of the actors from both technical and non-technical backgrounds, there is a need to manage the knowledge to align all actors to ensure collaboration towards achieving the goals and objectives of the organisation.

Technology architecture was viewed as an influential factor in the adoption and use of e-commerce. The technologies which are selected and deployed into the organisation's environment need to be compatible, flexible and enable and support the organisation towards achieving their e-commerce goals and objectives. The design of the system needs to accommodate the business processes to ensure productivity. Organisations need to govern the deployment of systems and execution of processes to ensure that the standards are applied within and across the organisation. This also helps in creating a culture that executes tasks or processes according to the organisation's goals and objectives. Culture plays a key role in the adoption and use of e-commerce as it impacts how actors carry out different processes. The culture of an organisation can be influenced by rules and traditions that exist in the organisation. These rules and traditions can be written or non-written. It is important that the rules are governed and adhered to by the different actors involved in the adoption and use of e-commerce.

These factors are crucial in the adoption and use of e-commerce. Through the practical application of the framework which was developed in this study, businesses can make informed decisions on how to adopt and use e-commerce for their businesses.

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Appendix A: Introductory letter for the collection of research data

OLUFEMI JAGUNMOLU JOHNSON is registered for the M Tech (IT) degree at CPUT (214323765). The thesis is titled the Adoption and Use of e-Commerce in retail grocery sector, Western Cape, South Africa and aims to gain insight into the underlying factors for retailers and consumers on the adoption and use of e-Commerce, so as to contribute to the improvement of knowledge for the members of the scientific community interested in the discipline. The supervisor(s) for this research is/are:

Prof Tiko Iyamu - lyamuT@cput.ac.za - 0716770300

In order to meet the requirements of the university's Higher Degrees Committee (HDC) the student must get consent to collect data from organisations which they have identified as potential sources of data. In this case the student will use Interviews to gather data.

The unit he would be focusing on will be the Technical personnel, Business personnel, Senior management and Other employees around the focus of this study.

If you agree to this, you are requested to complete the attached form (an electronic version will be made available to you if you so desire) and print it on your organisation's letterhead.

For further clarification on this matter please contact either the supervisor(s) identified above, or the Faculty Research Ethics Committee secretary (Ms V Naidoo) at 021 469 1012 or naidoove@cput.ac.za.

Yours sincerely



Prof. Tiko Iyamu

30-09-2016

Appendix B: Ethical Approval Letter



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80 Roeland Street, Vredehoek, Cape Town 8001

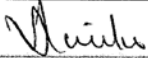
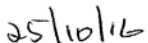
Office of the Research Ethics Committee	Faculty of Informatics and Design
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The Faculty Research Ethics Committee, on 25 October 2016, granted ethics approval to Mr Olufemi Jagunmolu Johnson, student number 214323765, for research activities related to the MTech: Information Technology degree at the Faculty of Informatics and Design, Cape Peninsula University of Technology.

Title of dissertation/thesis:	Adoption and use of e-commerce in the retail grocery sector, Western Cape, South Africa
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Comments

Research activities are restricted to those detailed in the research proposal.

 Signed: Faculty Research Ethics Committee	 Date
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