



Cape Peninsula
University of Technology

**THE ROLE OF BIG DATA FOR THE DEVELOPMENT OF OPPORTUNITIES FOR
SMMES**

by

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DECLARATION

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ABSTRACT

Digitalisation, the internet and mobile data are offering large amounts of unstructured data that can be analysed and utilised by Financial Service Providers (FSPs) to achieve better effectiveness and competitive advantages. Big data analytics (BDA) is a tool for supporting the competitive advantages of FSPs by increasing data driven strategies.

With the new stream of technologies, FSPs are facing challenges on how to utilise their existing data in creating new innovative products or enhancing the existing services so that their customers can benefit. Despite the high adoption rate of digital strategies by South African FSPs, little is known on how these FSPs can use Big Data (BD) to differentiate their customer segments and to create a competitive advantage. The following research questions are asked: (i) What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage and (ii) How can FSPs utilise BD analytics in order to create a competitive advantage?

The aim of this study is to explore how FSPs can use BD to differentiate their customer segments and to create a competitive advantage. The objective of the study is to (i) determine if FSPs sees the value of BD for their businesses, (ii) identify any challenges faced by FSPs to include BD strategy to their businesses, (iii) identify FSPs strategy to meet their customer's needs and (iv) examine the way FSPs are measuring their success.

An inductive research approach are followed on this study. Qualitative survey (experts) using interviews by means of semi-structured questionnaires were used during data collection. Fifteen FSPs were used to obtain experts (15) within the SMMEs. The sampling was done by non-randomly, purposively and convenient selected techniques. Data was collected by recording the interviews. Recordings were transcribed and the analysed. A thematic analysis was done on the data. The study considered several ethical issues and the researcher made sure that all research ethical standards were adhere to.

Keywords: Big Data; FSPs; BD analytics; customer segments; competitive advantage; and qualitative survey interview

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DEDICATION

This dissertation is dedicated to my late father, Loyiso Lovender Swartbooi, although you are no longer present in our lives, I still feel your impact every day!

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ABBREVIATIONS

Abbreviation	Full word / term
BD	Big data
FSPs	Financial service providers
BDA	Big data analytics
SMMEs	Small, medium and macro enterprises
NSBASA	The National Small Business Act of South Africa
NSB Act: 14	The National Small Business Amendment Act of 2003 and 2004
ICT	Information and communications technology
RQ	Research question
RSQ	Research sub-question
CEO	Chief Executive Officer
CFO	Chief Financial Officer
SWOT	Strengths, weaknesses, opportunities, threats
IEEE	Institute of Electrical and Electronics Engineers
CPUT	Cape Peninsula University of Technology
ERP	Enterprise resource planning
CRM	Customer relationship management
SCM	Supply chain management
Three Vs	Velocity, variety and volume
GDP	Gross Domestic Product
SA	South Africa
5Vs	Volume, velocity, value, variety and veracity
IT	Information technology
CDR	Call detail records
KM	Knowledge management
BDM	Big data management
TOE	Technology organisation Environment Framework
TAM	Technology Acceptance Model
DOI	Diffusion of Innovation
NIST	The National Institute of Standards and Technology

DEFINITIONS AND KEY CONCEPTS

Definitions and key concepts	References
Accounting is defined as “a system to document all the information about the business transactions and events”.	Chen et al. (2020:1197)
Big Data is defined as a “large and complex data assets that require cost effective management and analysis for extraction of insights from them”.	Tabesh et al. (2019:348)
Big Data is defined as “data that exceeds the processing capacity of conventional database systems”	Santos and Costa (2020:13)
Big Data is also define as a “large data sets that are often challenging to examine and investigate due to their complexity and variability”.	Gupta et al. (2020:949)
Big Data management is defined as “a vital requirement to secure data while also allowing users to query and retrieve the data.	Alhaji et al. (2020:05)
Big Data management can be defined as “the organisation, administration, storage and management of large volumes of structured and unstructured data sets”.	Ghavami (2020:04)
Cloud Computing is defined as a “paradigm that enables utility computing, for example the leasing of computing resources in real time, with minimal interaction with the provider”.	Aceto et al. (2020:03)

Definitions and key concepts	References
Cloud computing is a “model in which computer processing, storage software, software and other services are supplied as a set of virtualized resources over the internet”.	Sutaj (2017:299)
The National Institute of Standards and Technology (NIST) has defined cloud computing as a “model for enabling ubiquitous, convenient, on demand network access to a shared pool of configurable computing resource (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”	Yamin and Makrami (2015:854)
Customer segmentation is defined as a “process of dividing a broad customer base into manageable sub-groups of customers”	Munusamy and Murugesan (2020:1922)
Data Management is defined as “a vital requirement to secure data while also allowing users to query and retrieve the data”.	Alhaji et al. (2020:05)
Data Management is also a “reality that represents a set of challenges involving Big Data modelling, storage, retrieval analysis and visualisation for several areas in organisations”.	Nda and Tasmin (2019:5009)
Finance is defined as “ways of breaking down physical basis of earnings that become central to securitised flows of funds generated from different asset classes”.	Purcell et al. (2020:444)
Information Technology refers to “the idea that IT assets might not be viewed as strategic by top executive’s goals and implementing its strategies”.	Paré et al. (2020:01)
Segmentation is defined as the “process of dividing the total market into a number of smaller, more homogeneous submarkets and termed market segments”	Thoeni et al. (2016:2195)
Small, Makro, and Medium Enterprises are defined according The National Small Business Act of South Africa (NSBASA) as “distinct business entities which are not part of a group of companies”	Joubert et al. (1999:24)
Small, Makro, and Medium Enterprises are defined as “separate and distinct business entity, including co-operative enterprises and nongovernmental organisations, managed by one owner or more which including its branches or subsidiaries, if any is predominantly carried on in any sector or sub sector of the economy”	Section 1 of the National Small Business Act of 1996 as amended by the National Small Business Amendment Acts of 2003 and 2004 (NSB Act:14)
Small, Makro, and Medium Enterprises are defined as a “solution to attain economic development from establishing traditional family businesses employing over a hundred people with the aim of reducing poverty in the developing economies”	Maloka (2013:12)

CHAPTER ONE: INTRODUCTION

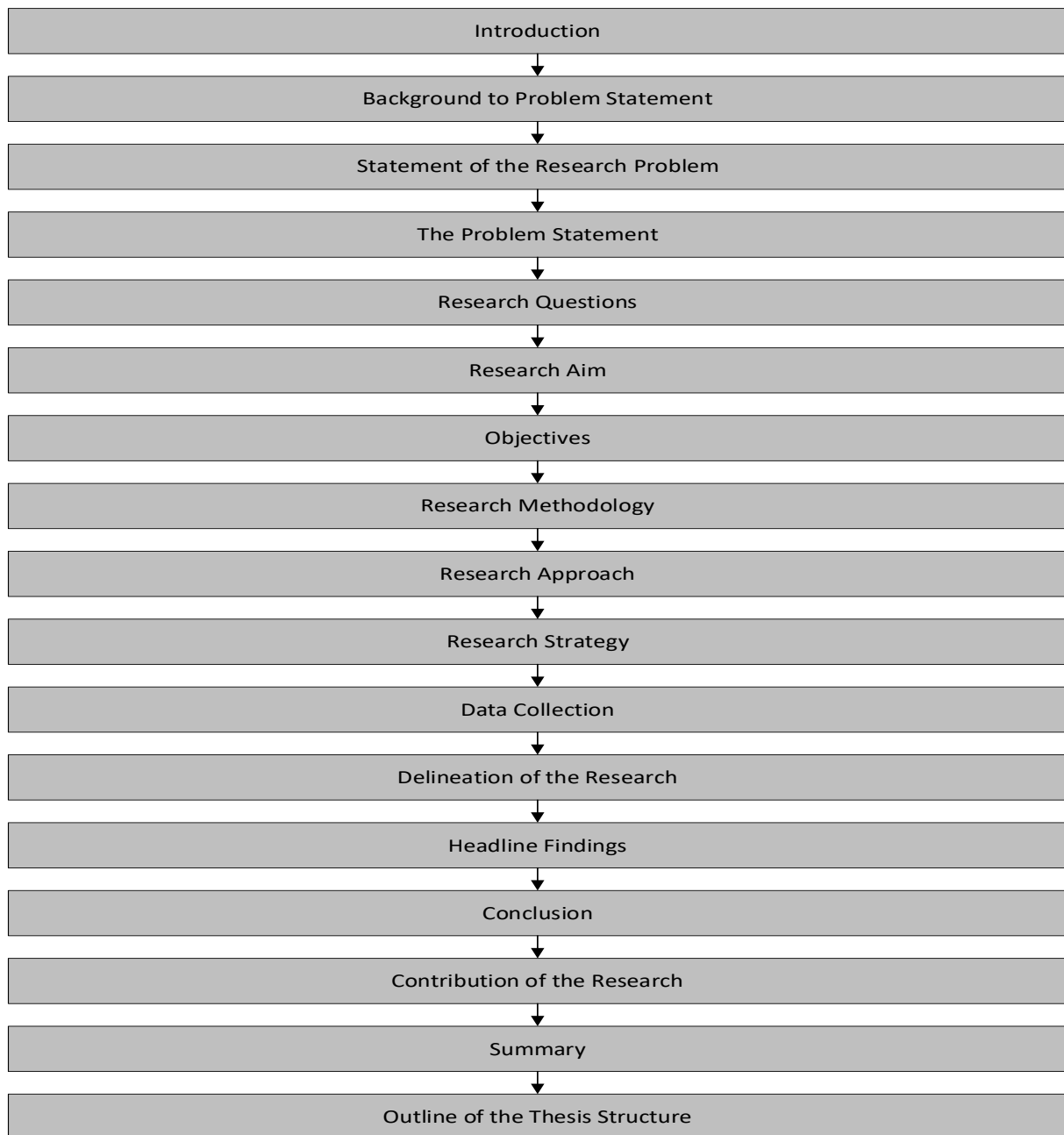


Figure 0.1: Layout of Chapter One

1.1 Introduction

Big Data (BD) increases challenges and opportunities for Small, Macro and Medium size enterprises (SMMEs), information technology (IT), and research communities (Wang & Wang, 2020). By leveraging BD, SMMEs can grow its organisational agility, adaptability and resilience to overcome the competitive environment by becoming a valuable and innovative organisation (Han & Trimi, 2022). In a complex business environment, agility is a crucial success factor, since it provides innovative and a competitive advantage (Vahid et al., 2022). According to Vahid et al. (2022) agility is important for firms operating in different contexts with

multiple characteristics. BD is forcing organisations to change their business models, strategies and management decision practices (Fernandez-Vidal et al., 2022).

According to Santos and Costa (2020), there are new technical model changes on how organisations are collecting, storing, processing and analysing data. SMMEs need to be aware of these new technological models that can improve their business value. BD is key to any business to make decisions and offers both opportunities and challenges (Ghavami, 2020). According to Ghavami (2020) BD is well known by its three key elements as the three Vs which are: (i) volume, (ii) velocity and (iii) variety. Volume is the data size or quantity of data, velocity is the speed and frequency of processing data and variety is the type of data that is being analysed (Ghasemaghaei & Calic, 2020). BD can change the FSPs innovation's ability by effectively and efficiently increasing the relevance between customer preferences and product offering (Ghasemaghaei & Calic, 2020).

BD is arguable difficult to define because of determining the exact point where data is viewed as big. In many cases BD is often defined by its core elements (Santos & Costa, 2020). Tabesh et al. (2019:348) define BD as a "large and complex data assets that require cost effective management and analysis for extraction of insights from them". Santos and Costa (2020:13) defined BD based on the technological restrictions as "data that exceeds the processing capacity of conventional database systems". BD is also define by Gupta et al. (2020:949) as a "large data sets that are often challenging to examine and investigate due to their complexity and variability". For the purpose of this research, BD is defined as data sets (volume, variety & velocity) that are so large or complex than normal analytical or processing capability aimed to assist SMMEs to gain a competitive advantage and in decision making cannot be done by standard analytical tools.

SMMEs are defined according The National Small Business Act of South Africa (NSBASA) as "distinct business entities which are not part of a group of companies" (Joubert et al., 1999:24). Like any other country the definition of SMMEs in South Africa is of a major concern with various researchers giving it different definitions (Kamble et al., 2020). According to Kamble et al. (2020) SMMEs are defined in different ways through either their number of employees, their turnover bands or through the combination of both as stated in the National Small Business Act 1996. In the South African perspective, the SMME sectors is made up of small businesses that are set up from macro sized enterprises such as family traditional businesses employing 50 people or less with a turnover of less than 10 million rand (Cant, 2020).

According to Khoase et al. (2020) South African macro enterprises employ between 11 and 50 employees per enterprise. South African medium enterprises employ between 51 and 250 employees. Micro enterprises in South Africa employ between 1 and 10 employees. In South Africa, SMMEs are defined in Section 1 of the National Small Business Act of 1996 as amended by the National Small Business Amendment Acts of 2003 and 2004 (NSB Act:14) as a "separate and distinct business entity, including co-operative enterprises and

nongovernmental organisations, managed by one owner or more which including its branches or subsidiaries, if any is predominantly carried on in any sector or sub sector of the economy". For the purpose of this research, SMMEs are defined through its combination of both the number of employees (50 people or less) and the turnover band (less than 10 million rand). Some organisations are benefiting from their stored data, having successfully implemented competencies to utilise and benefit from these large structured and unstructured data sets. These organisations have launched initiatives to complement their analytical proficiencies (Ogbuokiri et al., 2015; Akhtar et al., 2019). To date, most attention regarding BD focusses on large enterprises. The diffusion of low-cost data producing devices (e.g. Cell phones and internet-enabled cameras), easy access to very large data systems, and the spread of data analytics expertise mean that BD analytics is a reality, fundamental and available to business for decision making (Carbonell, 2016; Ghavami, 2020).

With the progressive globalisation of the economy, many organisations are investing in BD to discover innovative techniques to differentiate themselves from their competitors (Ghasemaghaei & Calic, 2020). According to Rialti and Marzi (2020) an organisation is innovative when it has an ability to exploit the current market opportunities and at the same time investigating new opportunities. When determining the best strategy for a company it is essential that the data the company collects is properly analysed. Due to the arising potential of BD, SMMEs need to start investing on systems to transform large data sets into information that can improved performance and decision making (Rialti & Marzi, 2020).

In this research focus is placed on the use of BD within SMMEs with special reference to Financial Service Providers (FSPs). FSPs are used as an example of SMMEs (Chapter One section 1.2; Chapter Three, section 3.4.2). FSPs were chosen as case studies since the Financial Advisory and Intermediary Services Act 37 (2002) is forcing FSPs to manage all written voice and other communication by means of Information and Communication Technology (ICT). This Act are creating huge volumes of data for the FSPs that need to be securely stored, available on demand and analysed.

1.2 Background to problem statement

People, processes, data, and objects have been grouped together to make networked connections more relevant and valuable by transforming information which creates new experiences, wide opportunities, growth, innovation and customer relationship for SMMEs (Abazi, 2016; Santos & Costa, 2020). In South Africa there is a need for SMMEs to be innovative, create new business opportunities and business models, to be competitive since most corporates have already adopted digitisation strategies in their quest to create a competitive advantage in the industry they are functioning in. According to Abu-Salih et al. (2021) BD has the potential to support SMMEs in making intelligent decisions based on evidence rather than intuition for their businesses.

ICT plays a vital role in the growth and development of SMMEs towards participating in knowledge management by facilitating connectivity that assists them to create and deliver products on a global scale (Rehman et al., 2016; Marnewick & Bvuma, 2020). According to Kossaï and Piget (2014), and Walaza et al. (2020) ICT is identified as a major contributor towards the economy in developed countries, and can be utilised to increase the economic growth and decrease poverty. However, there is limited knowledge on BD and SMMEs in developing countries. BD is creating opportunities for current and future research topics for example on SMMEs to gain the strategic competitive advantage since large companies have already invested in leveraging it (Matt et al., 2020).

Globalisation and driven interest of SMMEs into BD orchestrate SMMEs to develop and utilise BDA to bring technological innovation to them (Saleem et al., 2020). Even though SMMEs may not have BD, they can still insource BD from other organisations. Once insourced they can use the BD sets to seek for innovative opportunities, new business opportunities, and intelligent business decision making. BD is well known, but the majority of people are thinking it only exist and benefit large organisations. However, there are some sets of BD that exists for SMMEs and they can gain useful advantages which can improve SMME's performance (Alshahri, 2016; Saleem et al., 2020).

1.3 Statement of the research problem

SMMEs do not utilise innovation to improve performance, contribute to their competitiveness and to grant them access to international markets (Matekenya & Moyo, 2022). BizConnect (2014:02) indicates that on average "50 percent of all start-up businesses fail within 24 months". The lack of innovative skills, experience, finance, new market development, planning as well as the inability to implement innovative ideas are key contributors to start-up business failures.

With the new stream of technologies, FSPs are facing challenges on how to utilise their existing data in creating new innovative products or enhancing the existing services. According to Saleem et al. (2020), there is a need for SMMEs to re-evaluate BD strategies by reviewing their competitive landscape of products. If SMMEs and more specifically FSPs do not perform this exercise they can lose their competitive advantage, sales momentum and market share. SMMEs can utilise BDA to create a clear picture of their customers and their demands so that they can make well informed decisions when creating marketing strategies (Nasrollahi et al., 2021).

According to Matt et al., (2020), the global economy is a strong competitor of SMMEs. SMMEs are required to establish new types of innovative and digital strategies in order for them to maintain their competitive advantage. BD can assist SMMEs to increase their agility, adaptability and competitive advantage (Han & Trimi, 2022). BD not just bring opportunities for FSPs, but also some challenges that need to be addressed. SMMEs are facing challenges

in acquiring BD knowledge, in creating and implementing BD strategies, in analysing their data and cannot afford to purchase sophisticated computer systems to perform analysis (O'Connor & Kelly, 2017; Liu et al., 2020). BD is made up of enormous datasets that exceeds the collection, management, use and processing capabilities of human beings in an appropriate time (Chuah & Thurusamry, 2021). FSPs do not use BD to differentiate their customer segments and are losing their competitive advantage resulting in a negative impact on market share and potential profit gains.

1.4 Research questions

The research questions and research sub-questions are presented in Table 1.1.

Table 1.1: Research problem, research questions (RQs), research sub-questions (RSQs), methodology and objectives

Research problem	FSPs do not use BD to differentiate their customer segments and are losing their competitive advantage resulting in market share as well as potential profit losses.	
RQ1	What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?	
Research sub-questions	Research method(s)	Objectives
RSQ 1.1: What are the perceptions of FSPs towards the value of BD for their businesses?	Interviews by means of semi-structured questionnaires.	Determine if FSPs sees the value of BD for their businesses.
RSQ 1.2: What are the factors affecting FSPs when adopting BD analytics for creating a competitive advantage?	Interviews by means of semi-structured questionnaires.	Examine the way FSPs are measuring their success, is it: Products/services. Sentiment (Net promoter score [NPS]) Revenue
RQ2	How can FSPs utilise BD analytics in order to create a competitive advantage?	
Research sub-questions	Research method(s)	Objectives
RSQ 2.1: How do FSPs determine the needs of their customers?	Interviews by means of semi-structured questionnaires	Determine FSPs strategies to meet their customer's needs.
RSQ 2.2: How can FSPs incorporate BD in their business strategies?	Interviews by means of semi-structured questionnaires.	Identify any challenges faced by FSPs to include BD strategy to their businesses, is it because of: <ul style="list-style-type: none"> • Lack of innovative ideas • Lack of technology expertise • ROI too low / costs too high • Lack of expertise with a digital business model

*RSQ = Research sub-question

1.5 Research aim

The aim of this study is to explore how FSPs can use BD to differentiate their customer segments and create a competitive advantage.

1.6 Objectives

- i) Determine if FSPs see the value of BD for their businesses.
- ii) Identify any challenges faced by FSPs to include BD strategy to their businesses.
- iii) Identify FSPs strategy to meet their customer's needs.
- iv) Examine the way FSPs are measuring their success.

1.7 Research methodology

1.7.1 Research philosophy

As stated by Holden and Lynch (2019:401), research philosophy consists of two main approaches namely: i) ontology and ii) epistemology. Research philosophy has been defined by Saunders et al. (2009:127) as “a technique a researcher look on the world by developing knowledge and determining the nature of that knowledge”. Research philosophy empowers the researcher to determine an approach, to comprehend the reason behind the choice, and to choose the research strategy and methods of that strategy (Tashakkori & Creswell, 2007). Methodology is used for solving problems systematically, and provides a scientific investigation on how research should be conducted which also include all procedures used by the researcher to perform specific tasks and processes for the research (Myers, 2013). In the next sub-section ontology and epistemology is discussed and the philosophical stance of the research declared.

1.7.1.1 Ontology

Ontology has been defined by Zhu et al. (2015:27) as an “idea invented from the philosophy which mainly describes the existing knowledge”. Ontology is anxious on how we view the reality and the assumptions behind that reality. The ontological assumption is what establish the reality, which means researchers must take a stand regarding how things are in reality and on how things really work (Scotland, 2012). Ontology can be used by researchers to solve problems related to data analysis, data search and data integration (Yilmaz et al., 2018). Ontology is mainly divided into objectivism and subjectivism (Chapter 3, section 3.2.3).

The ontology of this research was based on a subjectivism stance.

1.7.1.2 Epistemology

Epistemology is the nature and the method of knowledge creation. According Scotland (2012:09), the epistemology assumptions are “concerned on how to create the knowledge, gather the knowledge and also communicate the gathered knowledge”. Epistemology's concern is on how researchers go about in attaining knowledge around the world (Mati, 2016). There are mainly three epistemological types used to conduct a research that have been mentioned by Rahman (2022:40) namely: i) Positivism, ii) Interpretivist and iii) Critical Realism. (Chapter 3, section 3.2.2) .

This research was based on an interpretivist paradigm because the research was conducted among people rather than the objects and the researcher acknowledged the different views from interviewees.

1.8 Research approach

The research approach to theory development can be deductive, abductive or inductive (Saunders et al., 2019). Aljaroodi et al. (2020:3) state that “the deductive approach is a top down approach which means it’s from theory to data, and the inductive approach is a bottom up method which means theory is created by finding relationships between the themes that develop from participant’s opinions”. Currently little is known on how SMMEs are utilising BD, what challenges they are facing and which factors should be consider when considering BD strategies and analytics (Chong et al., 2015; Verma & Bhattacharyya, 2017). As a result and in an attempt to contribute towards the body of knowledge an inductive approach was followed (Chapter 3, section 3.3).

1.9 Research strategy

1.9.1 Case study

A case study involves the collection of data by means of interviews, questionnaires, observation and archives, generating qualitative and quantitative data (Yin, 2003). A multiple case study strategy (Saunders et al., 2019) was chosen as the research strategy as the research aims to explore how FSPs can use BD to differentiate their customer segments and create a competitive advantage. The main criteria for the selection of a multiple case study was FSPs with a formal structure, and with less than 50 employees.

1.9.2 Unit of analysis

The unit of analysis was the 15 FSPs (Chapter 3, section 3.4.3, Chapter 4, section 4.3) in the Western Cape and Gauteng provinces of South Africa. FSPs from other provinces were not included due to time and financial constraints.

1.9.3 Unit of observation

The unit of observation was the FSP’s decision makers’ i.e. two (2) Chief Executive Officer (CEO), one (1) Head of Risk Compliance, one (1) Chief Financial Officer (CFO), two (2) Managing Directors, one (1) Fund Manager, one (1) Financial Advisor Category 2, two (2) Chief Operating Officers, one (1) Head of business / Chief Operating Officer, two (2) Owners and key Individuals, one (1) IT Manager and one (1) Principal Owner of the business.

1.9.4 Sampling

Ruxwana et al. (2010:17) describe a sample as “a process whereby certain part of the population is selected by the researcher using a specific technique to produce knowledge about the population and also to uncover multiple realities about such a population”. When

targeting a diverse population using a correct sampling strategy is very necessary. South African FSPs with a formal structure with a potential of using BDA as a strategic tool in making decisions were purposively, non-random and convenient sampled. Snowballing was also used to increase the number of FSPs for the study.

1.10 Data collection

Data collection was done using interviews with an interview guide (Appendix A) with semi-structured questions. Interviews is a qualitative research method that requires conducting interview with a small number of participants (Jamshed, 2017). This method normally provides context to other data offering a complete view of what happened and why. The interviews were recorded with the permission of the participant.

1.11 Data analysis

There are two data analytical techniques, namely: i) qualitative and ii) quantitative techniques (Chong et al., 2015 Verma & Bhattacharyya, 2017). This research made use of qualitative data analytical techniques. Content and thematic analysis are the two frequently used methods when performing qualitative data analysis (Vaismoradi et al., 2013). The data was analysed by means of a thematic analysis (White et al., 2017). The recorded interviews were transcribed and mailed back to the participant in order to validate the transcriptions. Once the data had been validated, it was coded, recoded and then summarised, categorised and thematic developed.

1.12 Ethics

The current study adhered with the CPUT research ethic policy. The compliance certificate was provided by the University Ethics Committee, before the researcher was given a go ahead to start the research. All the participants agree to participate in the research study by signing the consent letter, and each participant was guaranteed the confidentiality and the right to withdraw from the research at any given time if needed to do so. Data and all the information provided by the participants were kept confidential and have been protected.

Cooper and Schindler (2003:56) define ethics as “rules or behaviour standards which distinguish and guide moral principles that govern a person’s behaviour and the relationships with other people”. According to Myers (2013:34) principles of ethics consist of the following elements: i) honesty, ii) plagiarism, iii) informed consent and iv) permission to publish. Resnik (2015:2) further defines the principles of ethics as:

Honestly: All the findings must be reported by the researcher honestly without any made-up data

Integrity: All promises and agreement made to the interviewees or participant must be followed

Openness: A researchers must be open to the criticism or any ideas raised by the participants

Confidentiality: The data must be protected and treated confidentially at all times by the researcher

The study also considered several ethical issues and the researcher made sure that all questions asked don't offend the participant in any way. All appointments for the qualitative interviews were made in advance and were used to get informed consent. As stated by Welman et al., (2005) the researcher needs to pay attention to the following ethical consideration:

Permissions: acquiring permission from the participant to carry out the research was an essential requirement. The researcher used an email to send out invitations to all the FSPs (Appendix B) and in most of the times physical visits to the FSPs was done. Electronic follow-ups via the use of email were done before interviews took place.

The researcher assured all the participants about the rights of their privacy. During the interview process all the participants were asked to freely accept and signed the consent letter to participate of the research. All the participants signed a letter of consent to participate in the research.

Assurance, unethical tactics and techniques were not used by the researcher during interviewing. In this study, a semi-structured questionnaire was used for data collection, all interviews were guided by an interview guide (Appendix A). Some participants requested interview questions prior to interview in order to prepare for the interview. All interviews were recorded by the researcher, and participants were asked upfront before the interview starts to grant permission to record the interview. The records taken from the interviews were transcribed and texted analysed for additional analysis using inductive approach.

1.13 Delineation of the research

The following were excluded from the study:

- i) All FSPs without formal structure where there had been a potential of using BDA as a strategic tool in making decisions.
- ii) All FSPs operating from other provinces beside Western Cape Province or Gauteng Province.
- iii) FSPs that are not categorise as SMMEs for example large corporates.
- iv) FSP that are not registered under the Financial Institution.

1.14 Headline findings

Twenty-eight (28) findings were derived from the interviews and seven (7) headline findings were identified as listed below.

Headline finding 1: Most of the FSPs are aware of BD.

Headline finding 2: FSPs do not have the knowledge and experience to utilise BD for their organisations.

- Headline finding 3: FSPs lack time and reliable resources, cost, skills, and collecting reliable data as a major constraints to implement BD.
- Headline finding 4: FSPs have challenges in adopting BD.
- Headline finding 5: FSPs are seeing benefits in BD to create competitive advantages for their organisations.
- Headline finding 6: FSPs mentioned that BDA can be used to identify gaps, assist in terms of identifying customers' needs.
- Headline finding 7: FSPs do not have a strategy for BD.

1.15 Conclusion

BD can be utilised by FSPs to create various values, such as:

- i) Creating transparency – by simple making BD more easily accessible to all the stakeholders can create tremendous value. FSPs can utilise BD to improve quality.
- ii) Enabling experimentation to discover needs, expose variability and improve performance – While creating and storing more transactional data, FSPs can collect more accurate and detail performance data from their product inventories. Use the data to analyse their performance and also manage their current performance to higher levels.
- iii) Innovating new business models, products and services – BD will enables FSPs to create new products and services. FSPs can either enhance the existing products and services or invent a new business models.
- iv) Segmenting their customers – BD will allow FSPs to create highly specialised segmentations and tailor their products and service to meet those customer's needs.
- v) FSPs should gain fundamental advantage from BD to make better decisions and explore new opportunities.

1.16 Contribution of the research

The research contributed to the general body of knowledge by providing guidelines for South African's FSPs on the effective usage of BD to differentiate their customer segments and also create competitive advantage.

1.17 Summary

BD has drawn the attention of the ICT world as many organisations collect and store more data than ever before as their businesses depend on it. FSPs can embrace BD and FSPs need to start looking at using BDA so that they can be able to analyse the needs of their customers. The aim of this study is to explore how FSPs can use BD to differentiate their customer segments and to create a competitive advantage.

The study purposefully and conveniently selected South African FSPs (15) in the Gauteng Western Cape and Gauteng Provinces. These FSPs have formal structure, and the potential of using BDA as a strategic tool in making decisions. One person per FSP was purposefully and conveniently selected as unit of observation.

Data was collected by means of interviews using semi-structured questionnaires. All the data were summarised and categorised and there after a thematic analysis was conducted. Ethics were observed in accordance with the Cape Peninsula University of Technology ethics governance, policies and procedures.

1.18 Outline of thesis structure

Chapter One addresses the introduction to the research as well as the research problem, background to problem statement, statement of the research problem, aim of study, research objectives, research methodology, research strategy, contribution of the research and chapter summary.

Chapter Two addresses the literature review which covers SMMEs definitions, SMME's contribution to the South African economy, the status of SMMEs in South Africa, the challenges facing SMMEs, BD definitions, Dimensions of BD, characteristics of BD solution for SMMEs, SWOT analysis for BD, innovation strategy to guide successful implementation of BD by SMMEs, strategic capabilities, the role of BD in decision-making, the role of BD in customer segmentation, the role of BD in innovation, BD and Cloud Computing for SMMEs, BD analytics, the competitive advantage of using BD analytics, BD management, BD and SMMEs, adoption of BD by SMMEs using theories of a new technology framework and chapter summary.

Chapter Three elaborates on the research philosophy, approach, strategy, aim, data collection, data analysis, ethical consideration and chapter summary.

Chapter Four reports on the data analysis and summarised findings following the research questions.

Chapter Five addresses the themes of the study with regard the research questions.

Chapter Six provides the conclusions, recommendations and future research.

The next Chapter (2) presents the literature review.

CHAPTER 2: LITERATURE REVIEW

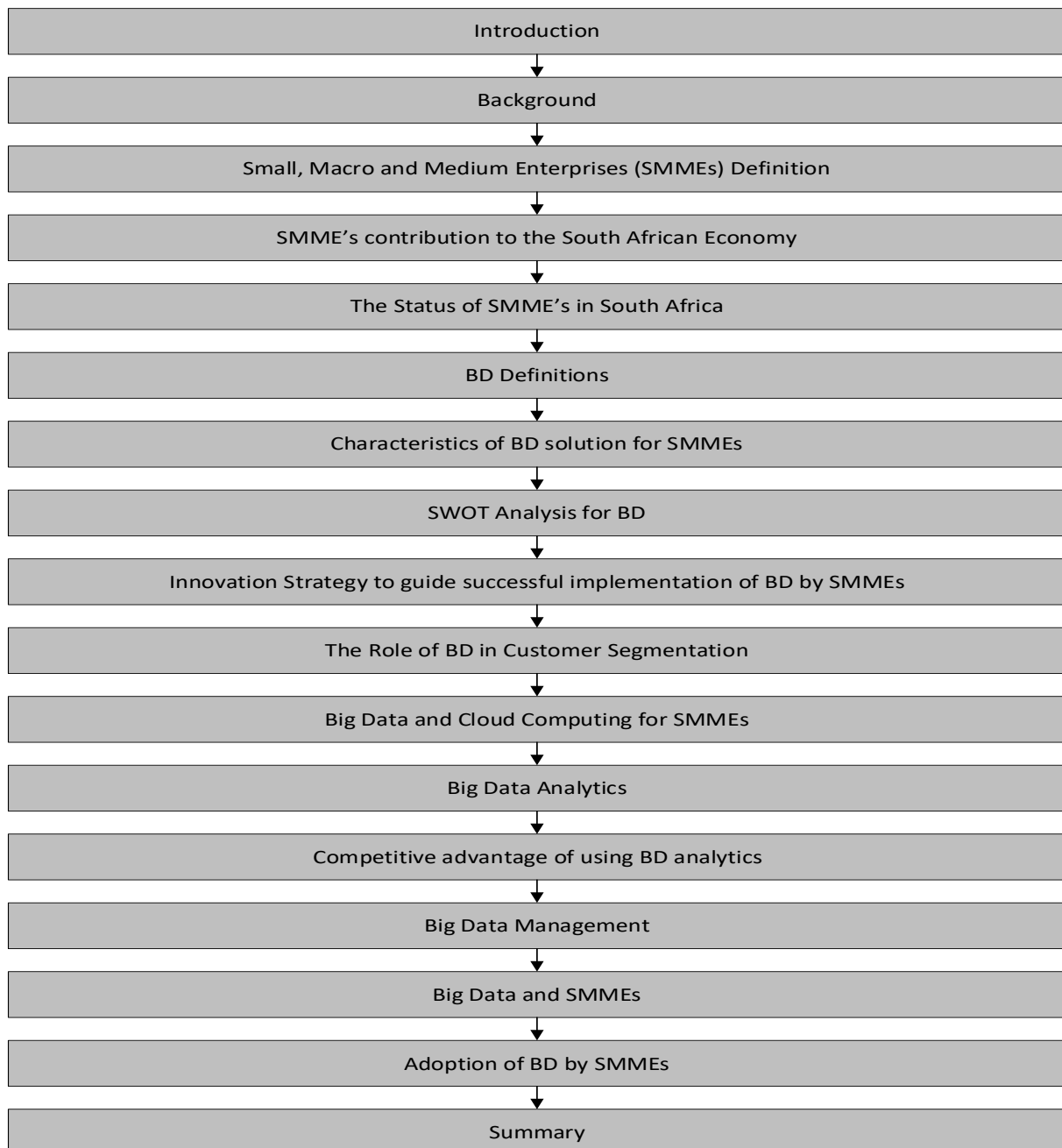


Figure 0.1: Layout of Chapter Two

2.1 Introduction

The literature review is a substantial part of any academic studies because it assists in providing arguments and justification about the phenomena being studied (Ho, 2016). Thus, this review used the key concept derived from the problem statement, research questions and aim of this study, which was to explore how FSPs can use BD to differentiate their customer segments and create a competitive advantage.

This chapter presents an review of work which has been published related to this study. The key areas of the study within which the review was carried out include BD, SMMEs, BD

analytics; characteristics of BD, solution for SMMEs, and the use of BD in customer segmentation. Peer reviewed articles, reports, conference papers and articles were sourced from CPUT's subscribed databases libraries. Data bases such as ScienceDirect, Social Science journals, EBSCOhost, the Institute of Electrical and Electronics Engineers (IEEE) and Google Scholar were utilised to conduct the comprehensive literature study.

This chapter provides a summary on how BD can be useful for SMMEs. The Chapter is constructed as follows: i) definitions of SMMEs, ii) SMME's contributions to the South African economy, iii) BD definitions, iv) dimensions of BD, v) characteristics of BD solution for SMMEs, vi) SWOT Analysis of BD, vii) innovation strategy to guide successful implementation of BD by SMMEs, viii) strategic capabilities of BD, ix) the role of BD in decision-making (structured decision making and Unstructured decision making), x) the role of BD for customer segmentation, xi) BD in innovation, xii) BD and cloud computing for SMMEs, xiii) Big Data analytics, xiv) the competitive advantage of using BD analytics, xv) BD management, vxi) BD management tools, xvii) BD and SMMEs, xviii) adoption of BD by SMMEs and xix) summary.

2.2 Background

The term BD was created in 1997 by Cox and Ellsworth. Although research was slow on BD it exploded since 2011 (Figure 2.2) and has been one of the most trending topics in technological environments. BD has been considered as one of the breakthrough technological development of our times (Blasiak, 2014; Emrouznejad & Charles, 2019).

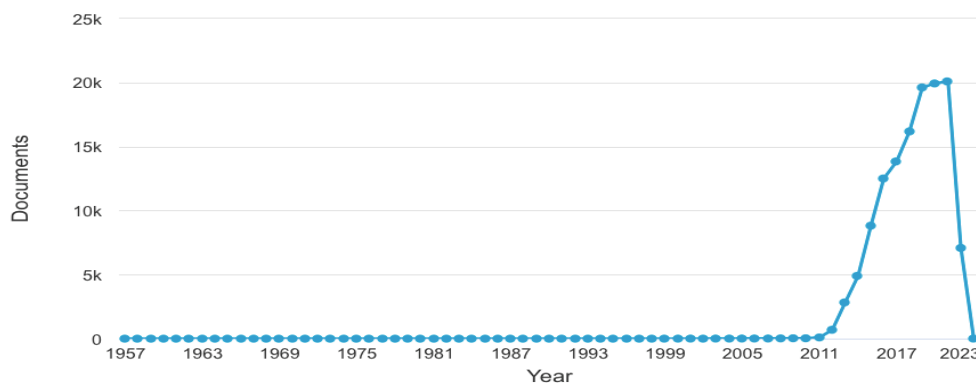


Figure 0.2: Number of documents reported on BD (Scopus, 2 July, 2022)

BD has great potential to revolutionise any area of knowledge and has an impact on any aspect of our lives (Emrouznejad & Charles, 2019). Large amounts of data have been generated continuously from social network platforms, blogs, sensor-enabled ecosystems such as Internet of Things, digital devices including smartphones, large scale enterprise systems such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM) (Bhadani & Jothimani, 2016; Baesens et al., 2018; Emrouznejad & Charles, 2019).

According to Dubey et al. (2019) BD is mentioned as a competitive powerful tool for any organisation to make better effective decisions and to improve operational performance. There

has been a focussed increase on BD from researchers because BD has an ability to influence any organisation from different sectors to become more competitive when utilised to its potential abilities. It is a big game changer in most contemporary industries (Ogbuokiri et al., 2015; Kumar et al., 2019). Some of these potential abilities of BD are to bring new business opportunities for an organisation, assist any organisation to satisfy their customer's needs and also help these organisations in creating innovative products to gain more revenue.

Volume, Variety, Variability, Value and Veracity have been mentioned by Schosser (2020:131) as the most commonly characteristics of BD. However, the three Vs: Velocity, Variety and Volume have been used in defining the BD concept (Ndambo, 2016; Schosser, 2020). Velocity being the speed used to produce and process data or rate of data generation, Volume the quantities of large data stored or the amount of data coming from traditional and non-traditional sources and Variety being a graphical image view of the available different data sets or the amount of data currently available (Ndambo, 2016; Schosser, 2020). Two basic features are used by Fuster and Scherrer (2016:10) to describe BD namely: "the ability to access, utilisation of huge amount of data so as to meet the conditions of 3V's and the technique to process and use data for unidentified patterns".

SMMEs can enhance their existing operating processes by starting to transmit all the data coming from different data sources into a single storage device, analyse it for making better decision in order to gain more profitable, satisfying and long lasting relationship with their customer (Silva et al., 2016; Zhang et al., 2020). Emrouznejad and Charles (2019) as well as as well as Sriram (2022) state that BD can be the most important powerful tool for an organisation in creating more business opportunities, making better and faster decisions and help them develop new products and service. SMMEs can use BD in making more informed decisions, provide better services to improve communities and also creates new opportunities for business avenues (Abdulla, 2015; Emrouznejad & Charles, 2019). SMMEs can lower their cost of collecting data if they buy the existing data from other organisations and use it to achieve their business objective or if they can obtain their available data sets.

2.3 The definitions of small, medium and macro enterprises

There is no consensus on defining an SMME because researchers acknowledge that SMMEs are easier to describe than to define. SMMEs play an important role in both economic growth and employment opportunities (Mamman et al., 2015; Falahat et al., 2020). In order to describe the situation, it is important to explain what is meant by SMMEs. Numerous definitions for SMMEs are to be found in the literature. SMMEs are differently defined across countries and regions. SMMEs can be defined according to their size or structure of the economy. However, the main common parameters used to define SMMEs are staff headcounts, turnover and invested capital (Mamman et al., 2015; Thrassou et al., 2020). SMMEs are defined by Maloka (2013:12) as a "solution to attain economic development from

establishing traditional family businesses employing over a hundred people with the aim of reducing poverty in the developing economies”. The National Act of South Africa (NSBASA) defines SMME as “a different trade entity which doesn’t form part of the group of companies, but if there are any subsidiaries or branches for that particular SMME they must also be included when assessing the size” (Joubert et al., 1999). In South Africa SMMEs are defined as businesses that includes formally registered, informal and non-VAT registered organisations in which owners are fully involved in management and employ less than 200 employees (Strydom, 2017; Cant, 2020).

As in many other countries the definition of SMMEs in South Africa is a major concern with various researchers giving different myriad of SMMEs definitions (Kamble et al., 2020; Lesejane, 2021). According to Kamble et al.(2020), SMMEs are defined in different ways through either their number of employees, either their turnover bands or through the combination of both as stated in the National Small Business Act 1996. The definition of SMME through its size is very necessary but not sufficient when the researcher wants to understand a sector where the realities are not only common but also dynamic (Kamble et al., 2020). In South Africa, SMMEs are defined in Section 1 of the National Small Business Act of 1996 as amended by the National Small Business Amendment Acts of 2003 and 2004 (NSB Act:14) as a “separate and distinct business entity, including co-operative enterprises and nongovernmental organisations, managed by one owner or more which including its branches or subsidiaries, if any is predominantly carried on in any sector or sub sector of the economy”. According to the National Small Business Act 102 of 1996 and its amendment of 2003, SMMEs are classified as either small, micro or medium enterprise when using a condition such as number of employees, annual turnover or total capital assets. For the purpose of this research, SMMEs are defined through its combination of both the number of employees (50) and the turnover band (less than R50m). SMMEs have been described on the White Paper on National Strategy for the Development and Promotion of Small Business in South Africa into four categories (Ladzani & Netswera, 2016; Moyo & Gumbo, 2021). In Table 2.1 the proposed categories and subsectors namely, agriculture, mining, manufacturing construction, retailing and transport are presented (Ladzani & Netswera, 2016; Moyo & Gumbo, 2021). Table 2.1 summarises the four categories of SMMEs.

Table 0.1: Average breakdown for SMMEs according to size or class (Ladzani & Netswera, 2016:227; Lesejane, 2021:16)

Size or Class	Description	Total Full-time equivalent of paid employees	Total Annual Turnover	Total Gross Asset Value
Medium	“Still mainly owner-managed, but decentralised management structure with the division of labour and operates from fixed premises with all formal requirements”.	<200	<25.00 million	<8.00 million
Small	“More established than very small enterprise, formal and registered, fixed business premises and owner-managed, but more complex management structure”.	<50	<10.00 million	<3.00 million
Very Small	“Part of the formal economy, use technology, less than ten paid employees and include self-employed artisans and professionals”.	<10	<2.50 million	<0.70 million
Micro	“Usually the owner and family, formal, no license, formal business premises, labour legislation turnover below the VAT registration level of R300 000 per year, basic business skills and training, and potential to make the transition to a viable formal small business”.	<5	<0.50 million	<0.10 million

In many developing countries such as South Africa, firms with more than 200 employees are considered large, whereas in Europe there is an upper limit of 99-499 for medium enterprises (Mamman et al., 2015; Moyo & Gumbo, 2021). Other countries in Africa, for example, Ghana consider firms with 6 to 9 employees as small enterprises, whereas Vietnam defines 50-100 employees as small enterprises (Mamman et al., 2015; Lesejane, 2021). In the next section the contribution of SMMEs to the South African economy is discussed.

2.4 Small, medium and macro enterprises’ contribution to the South African economy

Small businesses worldwide have been understood as a main economy contributors for employment, creation of country’s wealth and are considered as valuable assets for any economy (Strydom, 2017; Cant, 2020). Evidence from a study by Mbinda and Spencer (2016) and Cant (2020) on the risks connected to the work force of SMMEs indicate that SMMEs have an ability to address all the challenges of skills strategies to improve the quality of life and job creation which could assist in Gross Domestic Product (GDP) of the South African economy. According to Mantje and Rambe (2021), SMMEs are considered as the driving force in the South African economy because they add value to achieve socio-economic objectives such as poverty eradication and contributes to eradication of joblessness keeping national

unemployment rates low. In 2015, Statistics South Africa (Stats SA, 2015) has indicated that SMMEs are contributing roughly 42 percent to the South Africa's gross domestic product with 60 percent contribution to the employment rate. In 2018, the South African unemployment official rate stood at 28 percent (Rungani & Potgieter, 2018; Cant, 2020). According to Oji et al. (2017) and Lesejane (2021) SMMEs are fundamental to the economic growth because they have an unique abilities to create job opportunities and are notable as pillars for sustaining the economies of most countries.

Access to finance by SMMEs has been indicated by Ndayizigamiye and Khoase (2021) as major constrain. Some of these SMMEs are getting funding from families and friends because the majority of banks and financial institution are heavily charging them high interest rates with indemnity requirements. South African SMMEs are also being assisted by public and private supporting institutions to secure funding (Khoase et al., 2018; Maduku & Kaseeram, 2021). These institutions also provide strategic and operational support to the SMMEs during start-up and growth phases (Ndayizigamiye & Khoase, 2021).

In order for SMMEs to be able to achieve their primary business objective in sustaining economic growth to reduce unemployment, inequality and poverty, they need to be able to manage basic management activities namely: analysing, planning, implementing, and coordinating (Strydom, 2017; Maduku & Kaseeram, 2021). In the same manner, marketing activities are also required for SMMEs to be able to develop, build and maintain their products and services for customers (Nair & Ganesh, 2016; Steinhoff et al., 2019).

2.5 The status of small, medium and macro enterprises in South Africa

In order to emphasise the important role BD can play towards SMMEs in South Africa (SA), the current status of SMMEs in SA are presented. SMME's have been declared by the SA's finance minister as critical role players in both economic growth and employment opportunities (Falihat et al., 2020). According to Thrassou et al. (2020) the SA economy is losing jobs. SA has been reported with the world highest failure of SMMEs growth with a rate of 75 percent. The following has been identified by Troisi et al. (2018) as a major impediments for SA's SMMEs success:

- i) Financial (Internal factor)
- ii) Markets (External factor)
- iii) Management (Internal factor)
- iv) Economic (External factor)
- v) Infrastructure (External factor)

SMMEs are contributing 50 percent of the gross domestic product and are meant to address the 34.5 percent of unemployment disaster in SA (Falkena et al., 2021). Even though SMMEs have been regarded as a potential generators for job creation, the SA government means to provision the sector has been minimal for success (Taylor et al., 2018; Thrassou et al., 2020).

2.6 The challenges facing SMMEs

According to Falkena et al. (2021) SMMEs are declining in supplying services and goods in rural areas and townships. As a result large corporations started meeting the demands of customers call for high quality of products with value for money on pricing, greater convenience and providing a wide range of choices. This now resulted in gaining a competitive advantage for large organisations over SMMEs. SMMEs are struggling to play at larger scale and scope and they don't want to spend more since they consider spending as a waste (Steinhoff et al., 2019).

The following has been identified by Steinhoff et al. (2019:60) as the causes that lead to the failure of SA's SMMEs:

- i) Lack of basic skills and establishing an SMME for wrong reasons
- ii) Lack of adequate market
- iii) Lack of inadequate business plan
- iv) Lack of financial literacy and poor financial management
- v) Inability to secure funding

However, SMMEs do require much support from large organisations, government agencies and financial institutions in order for them to become more competitive (Khoase et al., 2018; Falkena et al., 2021).

According to Alsheikh et al. (2016:26) and Zhang et al. (2019:86) research conducted by Forrester conclude that the majority of business entities are only effectively utilising less than five percent of their existing data because of the following reasons: i) dealing with BD is costly, ii) to get more useful it must be collected from all different sources, and also iii) BD doesn't just contain only the old existing data but also involve any data currently growing at a fast rate. organisations can utilise their existing data to create valuable insights into business processes and some can implement technologies which can help them to resolve BDA to enhance organisation productivity. But, SMMEs are still in the process of getting solutions to compete better in their markets (Baskaran, 2019; Saleem et al., 2020). According to Baskaran (2019), organisational expectations of BD from their managers are to either implement or in improving their BDA techniques.

Most organisations are facing many challenges with the implementation of BD analytics of which some of these challenges are linked with the acceptance of BD by users as an important indicator for organisations to improve their productivity (Saleem et al., 2020). Other challenges are associated with cost in collecting data, storing the collected data and systems to decodify these extremely large datasets (Kache & Seuring, 2017; Rialti & Marzi, 2020).

Since the world is transforming into a growing and changing digital ecosystem, data has been indicated as new a commodity for any organisation to gain opportunities for new business innovation and create a clear picture of customer's demands to make well informed decisions in designing strategies (Dautov & Distefano, 2017; Nasrollahi et al., 2021). Technological

advancements are forcing SMMEs to look for better ways of doing business (Ikram et al., 2017; Nasrollahi et al., 2021). However, SMMEs are faced with challenges to invest in data management systems, some don't even have a qualified personnel to handle large quantities of data in order to attain valuable information and it is imperative that SMMEs receive all the necessary support for these challenges (Mattera, 2018; Marnewick & Bvuma, 2020). It is with no doubt SMMEs are operating in era of dynamic data coming from different resources such as social networks, online transactions, sensors, smart devices web pages, images, videos and personal browsing history and which is currently presented in different formats likely structured, semi structured and unstructured data format (Li et al., 2017; Gentsch, 2019).

Technology and innovation has been pointed by Sen et al. (2016) and Marnewick and Bvuma (2020) as a most important strategy for SMME's growth and with BD recommended as a key drivers for it. SMMEs can use BD to increase productivity, responsiveness, anticipation and meeting customer's needs from making better decisions to gain competitive edge (Sen et al., 2016; Nasrollahi et al., 2021).

2.7 Big data definitions

Researchers across different industries see BD as core topic more specifically in computer science and information technology because it changes the way industries operate by providing opportunities for the organisation to collect, generate, analyse and process a huge amount of data (Al-Emadi et al., 2015; Nasrollahi et al., 2021). The phenomenon of large amounts of data is constantly increasing from dozens of terabytes of data (TB) to petabytes (PB) of data in single data set, hence BD analytical techniques need to be applied on BD sets (Elgendy & Elragal, 2016; Gentsch, 2019). The BD model is applied to all data which doesn't adapt to the normal structures of the existing database (Al-Emadi, Zakir & Seymour, 2015; Kalra & Ranjan, 2021). The following technologies for BD have been mentioned by Santos and Costa (2020:222) namely: i) Hadoop, ii) HDFS, iii) NoSQL, iv) MapReduce, v) MongoDB, vi) Cassandra, vii) PIG, viii) HIVE, and ix) HBase. The above-mentioned BD technologies work together in achieving the same end goal of getting the value from the existing unused data (Al-Emadi et al. 2015; Santos & Costa, 2020).

Tabesh et al.(2019:348) define BD as "large and complex data assets that require cost effective management and analysis for extraction of insights from them". Santos and Costa (2020:13) defined BD based on the technological restrictions as "data that exceeds the processing capacity of conventional database systems". BD is also define by Gupta et al. (2020:949) as "large data sets that are often challenging to examine and investigate due to their complexity and variability". BD has also been defined by Zhao-hong et al. (2018:202) as a "mass, high speed, data rich information asset that re quires efficient, new forms of information processing to enhance insight, make good decision and optimise processes".

For the purpose of this study, BD is defined as data sets that are so large or complex than normal analytical or processing capability aimed to help SMMEs to gain a competitive advantage and in decision making.

Scholars are classifying BD as the next big thing for innovation, the fourth model of science, the next cutting edge for innovation, competition and productivity, the next management uprising and are also identifying BD as the next revolution in the science and technology (Sen et al., 2016; Wu & Guan, 2018). SMMEs are required to influence their technical and management performance capabilities. This is done by constantly increasing their amount of data of which size and complexity is beyond their capability to manage, store and analyse it to retrieve value for the organisation (Shah et al., 2017; Santos & Costa, 2020).

Literature has many definitions of BD. Some researchers are using a V-model with five V's to describe BD others usually define BD using its three characteristics called 3Vs (Baaziz & Quoniam, 2013; Vajjhala & Ramollari, 2016; Schosser, 2020). According to Wang and Wang (2020) BD is distinguished by volume, velocity, variety and veracity. BD is an abstract theory because there is no single definition for it but different explanations about it are constantly stated by different research scholars, scientific and technological enterprises, data analysts and technical practitioners (Shah et al., 2017; Wu & Guan, 2018).

According to Saleem et al. (2020) SMMEs can utilise BD to transform their traditional business into a modern innovative business that can lead to adopting new methods and strategies to improve SMME's performance. Mining useful information from BD and then processing it can help SMMEs to improve customer services from customer's purchase analysis, enhance marketing strategies and sustain long term risk analyses (Wang & Wang, 2020). South African SMMEs can utilise BD to achieve their objectives of gaining competitive advantage, satisfy their customer's needs or for better decision making organisation and have an ability to respond to customers quickly. This is possible if SMMEs adopt the V-model (Blasiak, 2014; Rahman & Aldhaban, 2015; Matt et al., 2020) as illustrated in Figure 2.2 below:

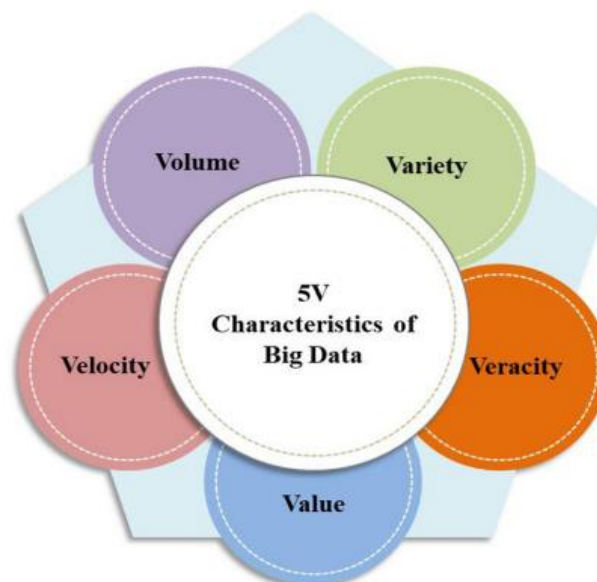


Figure 0.3: Summary of the “5Vs” of BD (Li, Chen & Shang, 2022:02)

The concepts in Figure 2.2 has been used by Chehbi-Gamoura et al. (2020) and Li et al. (2022) to summarise BD dimensions. The five characteristics of BD are defined as follows:

- i) **Volume:** refers to the quantity of data which is being collected or generated every second and it contains data from traditional and non-traditional sources (Charles & Gherman, 2013; Bhadani & Jothimani, 2016; Schosser, 2020). The generation of data has increased at a fast rate from being a terabytes to petabytes hence volume has form part of the five characteristics of BD (Bhadani & Jothimani, 2016; Alwan & Ku-Mahamud, 2020). According Giacalone and Scippacercola (2016) the estimated data that will be generated by 2020 will amount to 35 thousand billion gigabytes. As stated by Li et al. (2015) and Schosser (2020) volume refers to the large volumes of data being generated. Volume has also been defined by Nda and Tasmin (2019) as terrific amount of data which is regularly challenging to be stored, processed, analysed and presented.
- ii) **Velocity:** refers to the speed of purchase information generated and the flow of data into the FSPs sales journeys. SMMEs can analysis the growth of data coming to their organisation. Driven data marketing can be utilised by SMMEs to collect, analyse and process insights from BD and also drive customer engagement to improve marketing (Schosser, 2020). According Nda and Tasmin (2019) velocity can be referred as a growing rate at which data streams within an organisation.
- iii) **Variety:** refers to the amount of data currently available for SMMEs to utilise it for marketing. Marketing strategies can be implemented for both end user and data sources. SMMEs must combine both their transactional data and unstructured data coming from different sources so that marketing can use them effectively. For better customer engagement SMMEs need to connect both their analytics analysis and marketing communication features in return they will gain more profitable, satisfying and long lasting relationship with their customers (Zhang et al., 2020). It refers to the diverse data format which are both structured and unstructured (Nda & Tasmin, 2019; Walker & Brown, 2019).
- iv) **Veracity:** refers to the quality of generated data, which will bring value for SMMEs to solve their current problems (Marja, 2016; Mai et al., 2020). It is the fourth dimension on data, which discusses the trustworthiness of data because as numerous data source increases unreliability and inaccuracy also increases (Shah et al.,2017; Mai et al., 2020). It covers trust issues, security and uncertainty (Zhu et al., 2018).
- v) **Value:** offers greater and new vision to generate SMME’s value (Rahman, 2016; Kalra & Ranjan, 2021). It refers to the data being used to generate insights value for the benefit of an organisation (Franková et al., 2016; Mai et al., 2020).

SMMEs can also utilise three major sources to collect their structured, unstructured and semi-structured data, the three major sources are:

- i) **Social data** refers to all data collected from various social media platforms like Twitter, Facebook, Google and LinkedIn (Shinde et al., 2017; Emrouznejad & Charles, 2019).
- ii) **Machine data** to all data collected or created from enterprise planning, global positioning system and weblogs (Moon et al., 2017; Emrouznejad & Charles, 2019).
- iii) **Transactional data** refers to the data generated from various ecommerce systems like Amazon, Walmart, eBay and Takealot (Shalaginov et al., 2017; Emrouznejad & Charles, 2019).

Once the data has been stored, SMMEs must secured it before and after their analysis process and the structured, unstructured and semi-structured must be processed to transform into valuable insights for the business by means of categorising, summarising, matching-up and performing advanced functions and algorithms (Saleem et al., 2020). In order for SMMEs to get valuable information they must implement or use an appropriate tool to visualise data better and to analyse it quicker than ever before (Moon et al., 2017; Solé-Beteta et al., 2021). There are different BDA tools available from numerous vendors and these tools are promising the same thing to save time from data retrieval to data visualisation (Huang et al., 2018; Walker & Brown, 2019).

SMMEs must require new techniques and technologies ranging from engineering to business, including computer science, networking or analytics if they want to manage large quantities of data effectively (Storey & Song, 2017; Solé-Beteta et al., 2021). Additionally SMMEs also require skilled professionals with the correct IT analytics skills and design skills in order to manage BD effectively (Zhou et al., 2016; Walker & Brown, 2019). According Bhadani and Jothimani (2016) SMMEs can use value chain to produce value from their available data. A value chain is a concept presented by Porter (1980), discussing all set of activities as well as their interactions an organisation needs to perform in order to add value on delivering product(s) or service(s) for their customers (Bhadani & Jothimani, 2016; Faroukhi et al., 2020). According to Soroka et al. (2017) it is a framework that deals with a set of events to create value from available data and has been divided into six phases as illustrated in Figure 2.3.

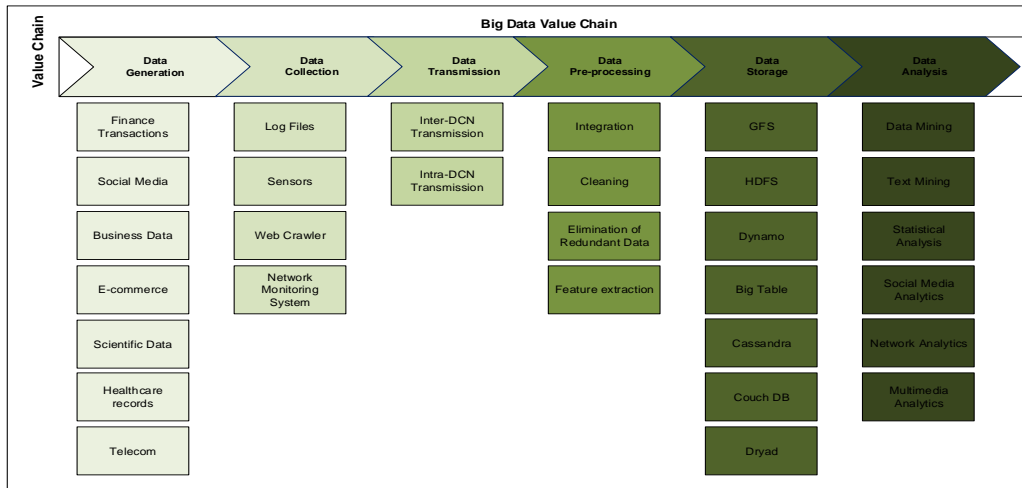


Figure 0.4: BD Value Chain (Soroka et al., 2017:694)

- i) **Data generation:** Generation of data is the first step of the BD value chain for capturing and recording data (Faroukhi et al., 2020). Data is generated from different sources which includes Call Detail Records (CDRs), social media and finance transactions (Bhadani & Jothimani, 2016).
- ii) **Data collection:** collect, validate and store data (Faroukhi et al., 2020). Data is acquired from all possible data source including Log files, sensors, web crawlers and network monitoring systems. For example SMMEs can use CDRs and also obtain customer's opinions and complaints from social network in order to predict churns from their existing customers (Bhadani & Jothimani, 2016).
- iii) **Data transmission:** After data being collected, it gets transferred to the storage and processing infrastructure in order to be processed and analysed. It gets passed into two phases namely: Inter-Dynamic Circuit Network transmission and Intra-Dynamic Circuit Network transmission. Inter-Dynamic Circuit Network transmission helps with the removal of data from one data source to the data centres, while latter also helps with the removal of data within data centres, helps in organising data and helps in managing data (Soroka et al., 2017; Faroukhi et al., 2020).
- iv) **Data pre-processing:** It implies a validation processing, cleaning, reduction and data integration to set up storage (Faroukhi et al., 2020). Data collected from various sources may cause redundancy, noisy and inconsistency hence pre-processing is vital in order to improve data quality for analysis, improve accuracy on analysis and reduce storage expenses. According Bhadani and Jothimani (2016) data can be pre-processed using the following steps:
 - **Integration:** The data coming from various sources are shared to deliver a unified and uniform view of available data. The two commonly used traditional methods are data federation and data warehouses. Data warehouses fulfils the extraction process, transformation process and loading process. When extract process executes, data must be selected, collected and analysed. The

transformation process is when converting the extracted data into an ordinary format. Loading process is when importing the extracted data and transformed data into a storage infrastructure.

- **Cleaning:** Data must be tested for correctness, comprehensiveness and consistency. In order to increase data quality, data may be removed or modified. The following are five step processes for cleaning mentioned by Soroka et al. (2017) namely: error types are distinct and determined, errors are recognised from the data, errors are modified, error types and corresponding examples are documented and data entry procedure may be modified to avoid future errors.
 - **Elimination of redundant data:** Data redundancy is when datasets have additional data or data duplications. This has an impact on storage cost, have an increase to data inconsistency and disturbs data quality. To reduce this various data reduction methods such as data filtering and compression must be used.
- v) **Data storage:** process and analyse data to generate new potential insights (Faroukhi et al., 2020). BD storage applications must offer consistent storage space and powerful access to the data. Factors such as consistency, availability and partition tolerance must be considered by storage systems.
- vi) **Data analysis:** Data analysis utilise analytical methods or tools to model, inspect and mine data to extract value (Faroukhi et al., 2020). When all data have been collected, transformed and stored then data needs to be analysed. Once the data is analysed and the results has been visualised then the decision makers for SMMEs must whether to reward the positive behaviour or to change any negative behaviour. If there is any particular problem, it can be analysed to comprehend the root cause of it and allow SMMEs to take informed decisions and also planned for any necessary actions.

2.8 Characteristics of BD solution for SMMEs

SMMEs must have capabilities to deep understand data characteristics in order for them to be able to collect, process, analyse and transform data coming from different formats into information, insights and meaning for business purposes (El Aboudi & Benhlima, 2018; Ghavami, 2020). Ogbuokiri et al. (2015:340) state that for SMMEs to gain competitive advantage within their markets, they should start looking for the below characteristics when acquiring BD solutions:

2.8.1 Flexibility and choice

Large organisations usually purchase an all or nothing solution that requires their customers to automatically stop using their existing system which contributes to a high cost and time consuming process for their IT departments (Ogbuokiri et al., 2015). With regards to SMMEs

there is a different approach because when a specific department wants to automated its current system it works independently with no co-relationship or a team effort with its IT department as a results that specific department proposes their own requirements, justify all the costs for the new system requirement and also choose a solution which only solve their problem (Ogbuokiri et al., 2015). For SMMEs to achieve their objectives with BD they must choose a BD solution that will conform to their existing system and also a solution which has all the capabilities to resolve all their needs (Ogwang, 2016). The solution must be complete with all the features SMMEs might need to resolve their needs and it must not force the SMMEs to replace their existing system (Ogbuokiri et al., 2015; Ahmadi et al., 2016; Ogwang, 2016).

2.8.2 Simplicity

The BD solution must be easy deployed with less than a week for SMMEs to start using it, the BD solution must work seamlessly without the need of a special resource to train the employees and the BD solution must also provide SMMEs with a self-service capability for business users to use (Ogbuokiri et al., 2015).

2.8.3 Cost

The BD solution must be priced to meet SMMEs budget, SMMEs must only pay for features they needed to resolve their needs and licensing must start at a lower cost and grow together when SMMEs increase their scope of work (Ogbuokiri et al., 2015).

2.9 SWOT analysis for BD

The BD SWOT analysis is discussed from a perceptive of SMMEs but there are no limits to discuss or applied SWOT analysis in large organisations because they have more resources and more capacity than SMMEs to implement BD in their organisations (Marja, 2016). According to Ahmadi et al. (2016) BD holds many promises for SMMEs. SMMEs can use BD to benefit new business opportunities, or SMMEs can use BD to understand their strengths and limitations. In order for these SMMEs to have a better understanding, the below SWOT analysis approach will be discussed in more detail:

2.9.1 Strength

The Volume, Velocity and Variety (3Vs) as mentioned by Ahmadi et al. (2016) and Schosser (2020) are the most fundamental strengths of BD for SMMEs. SMMEs can use the 3Vs to get new business opportunities, gain competitive advantage and also making better decisions across all different functional areas either it's from finance, marketing, human resource or operations (Collins, 2016; Schosser, 2020). Some of the other strengths for BD which has been identified by Li (2022:599) are as follows:

- i) BD is generated in volumes meaning the data is available for everyone to use.
- ii) BD can be used SMMEs to limit fraudulent transactions within their organisations.

- iii) BD also provides real time tracking for SMMEs which will allow them to respond quickly to any problem.

2.9.2 Weaknesses

The cost to use BD has been mentioned by Collins (2016) and Li (2022) as one of the weaknesses as it is costly for SMMEs to store, collect and analyse large volumes of data. Some of the weaknesses of BD for SMMEs which have been identified by Kaisler et al. (2020:35) are:

- i) Skilled resource – SMMEs are facing a challenge of not having a skilled professional to utilise BD to its high potential.
- ii) Infrastructure – Some of the SMMEs doesn't have enough infrastructure to store all the data needed to resolve their problems and also are facing a challenge of getting new technologies to utilise BD.
- iii) Data quality – the current data stored is becoming old fast since SMMEs doesn't have a skilled person to utilise it.

2.9.3 Opportunities

As mentioned before Schosser (2020) states BD holds many promises for SMMEs. Some of these promises are also opportunities for SMMEs for using BD. Some of the opportunities for BD to assist SMMEs are to i) gain new business opportunities, and ii) develop quality products and service that will help SMMEs to satisfy their customers' needs (Marja, 2016; Steinhoff et al., 2019). According to Ahmadi et al. (2016) and Lies (2019) using BD by SMMEs will allow them to be able to customise their products and service, improve SMME's reliability, prevent fraudulent activities with their organisations, and also assist them with effective marketing of their products. SMMEs can also use BD to enhance their working environments by improving flows of information and responses, and also increase their business value (Marja, 2016; Li, 2022).

2.9.4 Threats

As much as Volume has been mentioned as one of the most fundamental strength for BD, collecting of more and more data has its own risks because some of the collected data will not be used appropriately by SMMEs (Ahmadi et al., 2016; Li, 2022). Some of the other Weakness for BD which has been identified by (Marja, 2016:09) are as follows:

- i) Analysing wrong data by SMMEs will cause a waste of resources.
- ii) Privacy and cyber-security issues has also been identified a major threat for SMMEs.
- iii) SMMEs might suffer a backlash from the public if the community feel that their data are misused.
- iv) Also SMMEs might need to hire a new skilled resource for working with BD applications.

2.10 Innovation strategy to guide successful implementation of BD by SMMEs

IT innovation strategy has been described by La-Olivo et al. (2016) and Bagherzadeh et al. (2020) as an organisation's strategy which uses IT as a main principle to improve innovation performance and facilitate economic activities performed by each organisation. The main drive of an IT strategy is to make sure that development of a project portfolio is implemented effective and efficient, and to increase competitive business environment (La-Olivo et al., 2016; Bagherzadeh et al., 2020). However Rogers (2003:12) has defined innovation as an "idea, practice or object that is perceived as new by an individual or other unit of adoption". SMMEs cannot be competitive if their IT strategies are not implemented carefully.

It is important for SMMEs to response in time and with accuracy to the customer's needs in order to achieve a competitive edge, and provide efficiency and effective solutions to clients (Alwan & Ku-Mahamud, 2020). However, it has been recognised by researchers that the adoption of BD by SMMEs will not only bring opportunities and optimisation, but also challenges to them (Zhao & Yang, 2017). Table 2.2 illustrates opportunities and challenges faced by SMMEs when implementing innovation strategy for BD (Zhao & Yang, 2017:04).

Table 0.2: Some opportunities and challenges faced by SMMEs when implementing innovation strategies for BD (Zhao & Yang, 2017:04)

	Domains	Dimensions	Explanation
Opportunities	Environment	Technical Environment	SMMEs must emphasis on data management tools in order to use more and more data collecting from different sources.
		Task	Operations Management
	Improve their services and customer segmentation.		
	Enhance product design by reducing defects cost for all products.		
	Obtain new business opportunities.		
	Strategic Management		Ability to implement customer segmentation strategies in order to create competitive advantage.
			Ability to determine strategies to meet customer's needs and make better decisions.
			According Intezari and Gressel (2019) the analysis of BD will help SMMEs to take immediate actions, adapt business processes and also improve their customer experiences.
	Marketing Management	SMMEs can use BD to improve the usage of existing assets and also use BD to drive an open innovation strategy to increase new business opportunities (Trabucchi & Buganza, 2018).	
		Improve after-sales services.	

	Domains	Dimensions	Explanation
		Human resource Management	Majority of SMMEs will have a functionality to provide accuracy online recruitment.
Challenges	Technology	Data Management	SMMEs are facing challenges of shortage skilled personnel for analysing and managing data effectively.
		Data Technology	SMMEs are not following to their data opportunities because of either they do not know about BD or are not yet matured enough to handle BD (Revathy & Mukesh, 2017:98).
			BD processing is also a critical challenge faced by SMMEs which needs efficient strategies on how to collect, analyse, store and aggregate huge quantities of data (Boubiche et al., 2018).
			Lack of Business cases – Lack of case studies or success stories is a major concern for SMMEs to successful spread innovation within the organisation (Coleman et al., 2016).
	Task	Human Resource Management	Shortage of in-house data analytics expertise. SMMEs are faced with either less or no in-house data analytics to analyse BD (Coleman et al., 2019).
			Lack of executive sponsorship.

2.11 Big data strategic capabilities

BD can transform SMMEs IT functions into a dynamic capabilities offering SMMEs opportunities for performance advantages and assist them in examining customer's behaviours, evaluations and their needs (Green et al., 2018; Ciampi et al., 2021). SMME's market competition is increasing, and as a result decision makers are more dependent on BD to classify performance trends, improve product performance and enhance inventory management (Lamba & Singh, 2018; Ciampi et al., 2021). Exploiting the capabilities and unknown potential of BD can lead SMMEs to make better decisions in order to improve profits, make better customer satisfaction and quick resolution of customer issues (Ciampi et al., 2021). SMMEs can utilise BD to detect if any of their products usage are slowing in order avoid possible churns from the consumers and also assist them to implement value co-creation initiatives (Hofacker et al., 2016; Ciampi et al., 2021).

According to Trabucchi and Buganza (2018) and Olszak and Zurada (2020) BD can help SMMEs to improve on the current usage of the existing assets, increase the level of personalising their offering services, competitiveness and survival. BD can enhance SMMEs to drive open innovation strategy as a mechanism to gain new business opportunities and develop an innovative value proposition where data is either used a central or supportive role (Rajapakse & Kiran, 2019; Ciampi et al., 2021). SMMEs can utilise BD to make decisions on whether to continue or discontinue with a product based on the real movements in the stock

price over the past six month or a year period (Intezari & Gressel, 2019). SMME's management can use BD to understand their business at a more granular level, invent new products or services, respond to business changes at a fast rate and help SMMEs to take complex decisions that are more competitive in the market place (Santos et al., 2017; Dubey et al., 2019).

BD will have a substantial influence on value creation and competitive advantage for SMMEs by improving or creating new ways on interacting with customers or developing new products and services strategies to raise profits (Santos et al., 2017; Line et al., 2020). Furthermore SMMEs can use BD to become smarter and innovative on doing things that were considered not possible before and assist them to implement user centred innovation and user driven innovation (Alharthi et al., 2017; Ciampi et al., 2021). SMMEs operating in a manufacturing industry can use BD to assist on the usage of smart grids in order to monitor the energy supply, usage within the production process and improve supply chain and operational performance (Shah et al., 2017; Dubey et al., 2019). SMMEs can utilise BD to change the creation of new products by limiting the time to the market, reduce cost and optimise product adoption by the customers (Zhan et al., 2019; Line et al., 2020).

2.12 The role of BD in decision-making

It is with no surprise that decision making is the most imperative duty of any manager, and sometimes it has a direct and huge effect on SMMEs (Thore-Olsson et al., 2019). According to Thore-Olsson et al. (2019:1068) the definition of decision making is either a “rational process consisting of several sequential steps or a more chaotic process consisting of dynamic linkages viewed as interwoven network of issues”. According Côte-Real et al. (2016) and Li et al. (2022) using BD for decision making will make an SMME to become an agility organisation when using its current knowledge, results in becoming a more competitive organisation and lead SMMEs to make better decisions to improve profits. SMMEs can utilise BD to predict hardware failures, ensure data integrity to improve risks versus rewards and also improve their current positions on determining potential risks and incidents (Rajapakse & Kiran, 2019).

SMMEs in the financial institutions can use BD to support their core businesses by analysing all the transactions to detect if there was any fraudulent transactions or money laundering (Frisk & Bannister, 2017; Shamim et al., 2019). SMMEs operating in the sector for example financial institutes (FSPs) can also share their client's claims and use BD to detect patterns which can point to the same fraudulent activities among each other (Trabucchi & Buganza, 2018). According to Frisk and Bannister (2017) decision making is made up of three phases namely intelligence, design and choice. Furthermore Frisk and Bannister (2017:2077) described these phases as follows:

- i) Intelligence as a logic of gathering decision relevant data and information.

- ii) Design as a scrutinising the options to determine the expected results and also analyse how these results will meet the actual goals.
- iii) Choice is about making a selection between the expected results.

SMMEs can use BD to understand which organisational policy or policies would fail when a certain decision has been taken by its decision maker(s) and also identify policy or polices that will suffer under a range of scenarios (Foley, 2018; Shamim et al., 2019). According to Lamba and Singh (2018) SMMEs can use BD to enhance inventory and productivity, shorter cycle times, increase customer satisfaction, and use it to make real decision to faster resolution for customer issues. Intezari and Gressel (2019:75) categorise organisational decisions into two different angles namely i) structured and ii) unstructured decision making.

2.12.1 Structured decision making

Structured decision making is a defined as a common mathematical models (statistical methods and linear programming), with no standards and overall method to gain the best solution to address the unstructured decision problems and can help in assisting decisions that lead to action (Krell et al., 2017; Robinson et al., 2019). Deciding on whether to carry on or discontinue on a particular product based on its stock price movement over the period of its previous six months is considered by Intezari and Gressel (2019) as a structured decision making. Windheim (2020:99) claims that any effective decision made by SMME's executives has been considered through a systematic process with a strong defined elements in the following diverse order of steps:

- i) Problem classification
- ii) Problem definition
- iii) Specifications satisfying the answer of the problem
- iv) Decision considered to be right, rather than being acceptable to meet all conditions
- v) All the action plans for the decisions
- vi) Results supporting the validity and effectiveness of the decision against the actual problems

BD knowledge management systems are considered by He et al., (2017) and Angelis and Phillips (2021) as the embracing tools for better decision making and quantitative decision analysis. Therefore SMMEs can start investing on BD knowledge management systems initiatives in order to improve their business performance, grow their innovation capabilities, and attain better competitive advantage (Pauleen & Wang, 2017; Angelis & Phillips, 2021).

According to Norman et al. (2018:3590) there are four key functional areas for KM, namely:

- i) Collecting data into KM systems.
- ii) Storing the data into the warehouse for a certain period of time while furthermore allowing users to use it when its required.
- iii) Offering capabilities for analysing and analysis tools such as BDA.

iv) Provide visualisation and reporting.

SMMES must make sure their KM system are compatible to meet system's wide requirements such as security, reliability, manageability, scalability, redundancy and usability before implementing them (Norman et al., 2018). Furthermore KM system must provide easy to setup and easy to use configurations and must be easily managed without excessive any cost (Shinde et al., 2017; Angelis & Phillips, 2021).

2.12.2 Unstructured decision making

Unstructured decision making do not follow a set of order task, therefore they heavily depended on human judgment, experience, previous knowledge and analysis of the decision context and alternatives (Intezari & Gressel, 2019). Business Intelligence (BI) tools are considered important and very useful in making unstructured decision making because they have a reliable and fast reporting mechanisms (Lugmayr et al., 2017; Lucena & Popadiuk, 2020). According to La Torre et al. (2018) Mark Zuckerberg's decision on purchasing WhatsApp for \$19 billion is an example of an unstructured decision making.

The decision was based from the available data, during that time there were about 450 million active users in December 2013 and with an increase of 1 million users joining WhatsApp every day (La Torre et al., 2018). When making unstructured decisions, business reporting tool such as the balance scorecard can be used by SMMES to visualise their business performance metrics (Lucena & Popadiuk, 2020).

2.13 The role of BD in customer segmentation

Segmentation has been defined by Thoeni et al. (2016:2195) as the "process of dividing the total market into a number of smaller, more homogeneous submarkets and termed market segments". Customer segmentation is defined by Munusamy and Murugesan (2020:1922) as a "process of dividing a broad customer base into manageable sub-groups of customers". Furthermore Thoeni et al. (2016) and Munusamy and Murugesan (2020) considered segmentation as the most important and broadly practised marketing approach SMMES can apply to understand their customer's needs. Segmentation can help SMMES to target customer based on which customer attraction and retention strategies are framed.

Munusamy and Murugesan (2020) argue that segmentation is a process of grouping together similar types of customers with a common characteristics such as buying same items, same values and same demography. SMMES can use BD to customise their products to fit a distinct demographic, psychographic, geographic group or use BD to understand customer's behaviour towards that specific product (Nguyen, 2021). SMMES can utilise BD to boost their profits, nurture and strengthens customer relationships and also provide a seamless experience across all channels (Pozza et al., 2018; Nguyen, 2021). Customers have different preferences, some prefer different attributes from the same product or service, therefore

SMMEs can utilise BD to create business experience which fulfils and exceeds all the customer expectations (Guillet & Kucukusta, 2016; Nguyen, 2021).

2.14 The role of BD in innovation

Innovation has been indicated Sun et al. (2018) and Ghasemaghaei and Calic (2020) as the most vital driving forces to support economic growth and organisations are investing on BD to discover innovative ways to differentiate themselves from competitors. According to Esterhuizen et al. (2017) and Ghasemaghaei and Calic (2020), innovation is a fundamental requirement SMMEs can utilise to achieve competitiveness. BD is the next stronghold for innovation, competition and productivity. BD can help SMMEs to reduce inefficiencies in product delivery, improve marketing and access on products and services, increase qualities on products and services, and make more personalised products and services for new and existing customers (Hao et al., 2019). Calder et al., (2016) and Hao et al. (2019) emphasised that if SMMEs and their customers are involved in product innovation, both parties will gain value from pricing structures and distribution channels.

Utilising BD during innovation life cycles will help SMMEs to gain better lessons throughout all the phases and at the end of each phase they are opportunities SMMEs can learn from the successes and failures of it (Fortunato et al., 2017; Ghasemaghaei & Calic, 2020). Using BD for digital marketing will allow SMMEs to receive a real time feedback on their marketing difficulties and help SMMEs to manage all the risks efficiently (Kunz et al., 2017; Arthur & Owen, 2019). This approach (digital marketing) will help SMMEs to capture results from customer behaviours, advance SMME's competences and help SMMEs to sustain their establishment over long time (Kunz et al., 2017; Hao et al., 2019). BD will help SMMEs to increase the usage or improve the usage of the existing assets (Trabucchi et al., 2018; Arthur & Owen, 2019).

During product innovation SMMEs can utilise BD in order to get quick answers to achieve the following: reduce costs, reduce time spent for product innovation, helps them to develop products faster and improve their offerings, and help SMMEs to make smarter decisions (Androniceanu, 2019). Furthermore, SMMEs can use and re-use data at any given time to enlarge company's operating domain, increase their level of personalizing services and leverage data as a paradigm (Nunes, 2017; Androniceanu, 2019). Researchers have recently started to point out key success factors (Table 2.3) of BD in innovation (Zhan et al., 2019).

Table 0.3: Key success factors (Zhan et al., 2019:522)

Key success factors	Essential elements
Pre development research	Idea generation Initial screening Preliminary market assessment Detailed market study Financial analysis Well defined product
Accelerated innovation process	Systematic innovation process Autonomy management Cross functions teams Simultaneous development
Customer connection	Market orientation Customer communication Understanding of customers Good relationship with customers
Ecosystem of innovation	Connection with customers and partners Proficiency of marketing test Fast development and launch Quick response to market Market and partner tests

Zhan et al. (2019) emphasised if SMMEs fail to implement these key success factors, they will have an unsuccessful results for their organisations. According to Del-Vecchio et al. (2018) BD will help SMMEs to create value on effective decision making, improves organisational performance, position them better in their industries, achieve high customer satisfaction, produce more innovative products and create innovate business models.

2.15 Big data and cloud computing for SMMEs

Cloud computing is one of the fundamental components for implementing BD in the industrial process and facilities, which can be effective used by SMMEs to monitor all their applications and are capable of providing SMMEs an ability to analyse and store data economically and efficiently (Terezinho, 2017; Bakhouya et al., 2020). However, SMMEs must first collect their raw data, push the data to the cloud, then store the data and analyse it in order to create functional information (Terezinho, 2017; Bakhouya et al., 2020). According to Stergiou and Psannis (2017) and Aceto et al., (2020) SMMEs can utilise cloud computing to provide accessibility to their data from anywhere at any given time with no need for hardware equipment and allow pay-per use billing on a short term basis without any upfront commitment. Cloud computing has been defined by Aceto et al. (2020:03) as a “paradigm that enables utility computing, for example the leasing of computing resources in real time, with minimal interaction with the provider”. According to Sutaj (2017:299) cloud computing is a “model in

which computer processing, storage software, software and other services are supplied as a set of virtualised resources over the internet". Xiao et al. (2019) have defined cloud computing as a public computing which is accessible over the internet and offers users a global and suitable access to a shared pool of computing resources consisting of networked servers, storage and software application. The National Institute of Standards and Technology (NIST) has defined cloud computing as a "model for enabling ubiquitous, convenient, on demand network access to a shared pool of configurable computing resource (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Yamin & Makrami, 2015:854). According Al-sharafi et al. (2017) and Aceto et al. (2020) implementing cloud computing services will enable SMMEs to avoid high cost on setting up ICT infrastructure, high fees on servicing and maintaining these infrastructures and enable pay-per use billing strategy.

Cloud computing has been argued by Huang et al. (2018) and Bakhouya et al. (2020) as a cost efficient solution to store data economically and efficiently. It has an ability of providing low cost storage solution to cover massive storage requirement for BD data storage. According to Norman et al. (2018) cloud computing is more reliable, more scalable, and more secured than any other local storage system. Furthermore Andrade and Torres (2018) states that cloud computing has an advantage to provide great user management flexibility, maximise speed processing and provide great visualisation of BD.

SMMEs are faced with lower adoption rate of IT innovation compared to large organisation, cloud services has a potential of reducing some challenges (Salleh et al., 2018). The following are some of the challenges faced by SMMEs that can be reduced by cloud service (Gao et al., 2020:203): i) bridging limited funds to employ a skilled technical personnel for information systems, ii) develop a management tasks from information systems and iii) restrictions to invest the capital on information and communication technology. SMMEs can give their service providers an authority to manage cloud services for them on a pay as you use paying terms (Paramita & Wiradinata, 2016; Aceto et al., 2020). According Paramita and Wiradinata (2016) and Gao et al. (2020), SMMEs which are current using cloud services have an additional benefits on focusing on their businesses, their infrastructure is more cost-effective and they have a shared service for problem solving.

Researchers across different industries have concluded that the cost savings and cost reduction are not the most key factors for SMMEs to adopt cloud computing (Xiong et al., 2016; Aceto et al., 2020). Furthermore Xiong et al. (2016) and Bakhouya et al. (2020) mention that ease to use, reliability, security and privacy are the most top priorities for SMMEs to adopt cloud computing followed by cost savings.

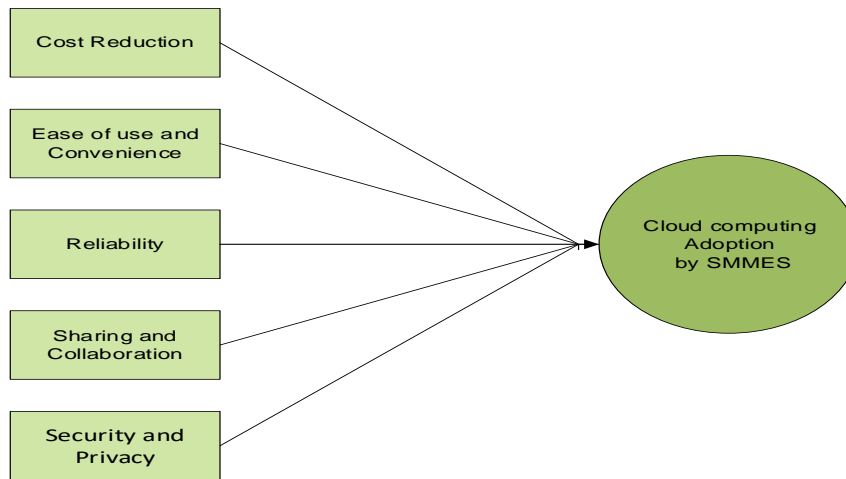


Figure 0.5: Factors that influence SMMEs to adopt cloud computing (Suryaputra & Wiradinata, 2016:152)

Figure 2.5 illustrates some of the factors that influence the adoption of cloud computing by SMMEs (Paramita & Wiradinata, 2016). Cloud computing has the potential to help SMMEs in achieving their organisational goals and objectives, to gain competitive advantage and to provide better services to their customers (Sutaj, 2019). Some of the main benefits of cloud computing for SMMEs as indicated by Sutaj (2019:300) are listed in Table 2.4.

Table 0.4: The main benefits of cloud computing for SMMEs (Sutaj, 2019:300)

Benefit	Detail
Storage	They are no physical limits on data storage from the cloud-based networks. SMMEs can easily increase the storage plan without the need of further investing on the hardware.
Cost	SMMEs can negotiate with cloud providers to deliver an enterprise class technology at a very low cost. This service will enable SMMEs to become more active than their competitors and will also enable SMMEs to minimize their IT and server licensing fees.
Secured and protected data	The data stored at the cloud is mostly encrypted to avoid online criminals in detecting it. To prevent widespread infecting on the network, infected files are normally not stored and archived.
Disaster proof	Cloud computing will help SMMEs to reduce data loss because their data will be stored and backup everywhere and SMMEs will be able to retrieve their data within a short period of time in the event of disaster.
Reliability and availability	During the event of server outage SMME's IT resources will be reinstated quickly because their data will be stored offsite and backed to other locations.
Focus on core competency	SMMEs will not be required to employ any IT expert to their organisations because every aspect of their data will be taken care of by the service providers and that will give SMMEs an opportunity to focus more on their core competency.
Flexibility and Remoteness	Cloud computing services only allow an authorised person to access the resource they need using a secured internet connection and a well-suited device without having to be at the SMME's premises.

Benefit	Detail
Use of updated software	SMMEs will always have the latest software version because all the software installation, updates and licensing will be managed by the cloud service providers.

According to Al-sharafi et al. (2017) and Gai et al. (2017) in the developed countries businesses and governments are using cloud computing to enhance their service delivery, performance, reduce start-up cost for SMMEs and enhance business competitiveness. Furthermore a study conducted by Srinuan (2018) suggests that the fastest growing small business from five European countries are strongly using cloud technology to deliver their products and services globally. The use of cloud computing by SMMEs will strength SMME's capabilities to deliver products and service that are only delivered by large enterprise in the past, and will flatten the competitive arena (Alshamaila et al. 2017; Gai et al., 2017). According Kumar et al. (2017) and Das et al. (2018) various software applications like Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM) can be utilised by SMMEs at a low cost using cloud computing. Furthermore SMMEs can use cloud computing without worrying about the challenges of installation and maintenance (Kumar et al., 2017; Das et al., 2018). In summary cloud computing for SMMEs is now available, matured, can be used comprehensively and does not only offers storage at a good rate, it also offers infrastructure and services (Basahel et al., 2016; Bakhouya et al., 2020).

2.16 Big data analytics

SMMEs have identify the importance of BD analytics to change the competitive landscape and extract value insights from BD (Sharma et al., 2016; Datta et al., 2021). Many SMMEs do not want to just collect data, they want to understand its meaning and the importance of it so that they can make better decisions (Elgendy & Elragal, 2016; Liu et al., 2021). Big Data Analytics (BDA) provides SMMEs with techniques of getting hidden information within their organisations and provide it to their analysts and program managers (Norman et al., 2018). According to Durhin (2019) more than 50 percent of SMMEs are currently using some form of BD analytics to prevent fraud, forensics and analyse their network traffic. Furthermore, less than 20 percent of SMMEs are currently using BD analytics to detect their information, predict possible hardware failures, confirm data integrity and verify their data classification. However, SMMEs can enhance their balance of risk compared to reward and can be in a better position to prevent possible risks and incidents (Durhin, 2019).

Research conducted by Wamba et al. (2017) and Liu et al. (2021) suggest that 87 percent of the organisations consider BD analytics to change their competitive landscape. However, 89 percent of the enterprises believe that if SMMEs do not include BD analytics in their strategies. As a result they are at high risk of losing their current market share and momentum (Buhalis

& Volchek, 2021). But investing on BD is still a challenge for SMMEs because SMMEs are struggling to understand the link between BD analytics competencies and their organisation's performance (Dubey et al., 2019).

SMMEs must consider on selecting appropriate BDA technologies if they want to benefit from the scalability of increase volume, velocity and variety of their collected BD (Buhalis & Volchek, 2021). BDA technology has a potential of helping SMMEs to manage their entire data management cycle technically and economically from collection prospective and storing of their entire datasets to analysing data so as to provide new and valuable information for decision making (Sekhar & Sekhar 2017; Dubey et al., 2019).

2.17 The competitive advantage of using BD analytics

A competitive firm is a firm or organisation having a greater success compared to its current or potential competitors (Peteraf & Barney, 2003; Côte-Real et al., 2016; Akter et al., 2020). According to Akter et al. (2020) BD analytics has been seen a game changer to improve efficiency and effectiveness of SMMEs because it has high strategic and operational potential. Small enterprises can create a competitive advantage through the understanding of information and the prediction of the evolution of facts based on the data they collect.

Organisations such as Amazon are currently using BD to monitor, track or secure more than one billion items from their inventory located in more than two hundred locations globally (Clark, 2016; Aceto et al., 2020). They rely on projecting analytics to anticipate shipment by forecasting customer's next purchase so as to pre-ship the item on the nearest depot closer to the customer (Jha et al., 2020). Amazon has been seen as BD's biggest player because they have engineered their e-commerce channel with a personalised recommendation system that has been built from customer's transactional data when they purchase (Al-Emadi et al., 2015; Jha et al., 2020).

Various industries are expecting BD to have a huge impact on their businesses. For example, the retail industry is expecting BD to reduce their fraudulent activities, to provide them with the better customer experience and also assist them in making real-time decisions (Wamba et al., 2017; Line et al., 2020). In the health sector, BD analytics is expected in provide better quality in life, in reducing all the operation costs (Fan et al., 2014; Akter et al., 2016; Faroukhi et al., 2020). According to Fox (2015:89), "the vast quantities of data generated every year provide enormous opportunities for retail businesses to gain from BDA". BDA helps SMMEs in making intelligence business decision which results in identifying new business opportunities to gain a revenue, provide better quality service and also in job creation (Allen, 2016; Faroukhi et al., 2020). SMMEs can use BD to position themselves in their markets (Alsooj, 2015; Line et al., 2020).

2.18 Big data management

Big Data Management (BDM) has been defined by Alhaji et al. (2020:05) as “a vital requirement to secure data while also allowing users to query and retrieve the data”. BDM can be defined as “the organisation, administration, storage and management of large volumes of structured and unstructured data sets” (Ghavami, 2020:04). Furthermore BDM refers to data collection which helps to ensure best quality of data is collected and accessible for business intelligence and data analytics (Beri & Ojha, 2016; Ghavami, 2020). According to Nda and Tasmin (2019), for any SMME adopting BD, BDM is a real challenge because the majority of SMME’s are facing challenges of performing BD modelling, BD storing, BD retrieving, BD analysing and BD visualisation.

As indicated by Nda and Tasmin (2019), SMMEs can benefit from BDM with proficiently managing BD’s characteristics, keep their data so as to improve their customer segmentation, develop better retentions strategies. SMMEs can use BDM to clean data coming from different sources (both structured and unstructured) and to encrypt their data for security and privacy drives. Furthermore, BDM has a responsibility in collecting and understanding organisational data, with a goal to confirm data reliability for SMMEs (Zhu et al., 2018; Kaufmann, 2019).

BD’s architecture must be aligned with the organisation’s support infrastructure and business services model in order to improve performance, facilities innovative products and assist in quality decision making (Khan et al., 2014; Alzahrani & Sadaoui, 2020). According to Gupta and Rohil (2020) the main objective of BD technology is to reduce the cost of hardware and processing and also examine the data value before committing to any company resource. BD that has been properly managed is easily accessible, very reliable and secure, and also easily manageable (Khan et al., 2014; Paré et al., 2020).

Preparing data for analytics takes time and require highly skilled resource when doing an analytics on large data amounts as it requires an ability to store, filter, transform and to access it (Assuncao et al., 2019). Deploying BDM tools on the cloud environment and also the solutions on performing analytics have been identified as a major challenge on the cloud (Assuncao et al., 2019). Assuncao et al. (2019:129) further define various models for cloud deployment when adopting it to the enterprise cloud analytics as:

- i) **Private:** A private cloud is suitable for businesses that require the highest level of control of security and data privacy and in such conditions this type of cloud infrastructure can be used to share the services and data more efficiency across the different departments of a larger enterprise”.
- ii) **Public:** Public cloud offers high efficiency and shared resources with low cost. The analytics services and data management are handled by the provider and the equality of services is specified in a contract. organisations can leverage these clouds to carry out analytics with a reduced cost or share insights of public analytics results.

- iii) **Hybrid:** Hybrid combines both (private and public). Customers can develop and deploy analytics applications using a private environment, thus reaping benefits from elasticity and a higher degree of security than using only a public cloud”.

2.19 Big data management tools

As indicated by Roy et al. (2018) BD optimisation is an essential feature for managing a database and warehouse. BD optimization are used for fetching data from several sources so that it can be used for multiple purpose (Shalaginov et al., 2017; Aswale & Mukul, 2020).

The rising of computing technology has made huge volumes of data manageable without requiring supercomputers and high cost (Khan et al., 2014; Yadav, et al., 2020). There are many tools and techniques currently available to manage data. However, each organisation needs to identify its unique tools and techniques for storing, accessing and analysing organisation's data because BD cannot be stored in a single machine as it is different from traditional data (Khan et al., 2014; Ghavami, 2020). The most common tools and techniques for BD are:

- i) **Hadoop:** Baskaran (2019:15) has defined Hadoop as an “open source framework which permits substantial sets of data to be prepared to utilise hardware system”. Sekhar and Sekhar (2017) and Dubey et al. (2019) state that it is a java based free programming system that can used to store wide range of information in a group. The data structure for group is running parallel has an ability to allow users to process information across all hubs.
- ii) **Map Reduce:** According to Katal et al. (2013:404) Map Reduce is a “programming model that is appropriate for parallel handling of enormous data dispersed over an extended number of machines backed Hadoop.
- iii) **Microsoft HDInsight:** According to Sekhar and Sekhar (2017) and Ghavami (2020) Microsoft HDInsight has been defined as a data management tool controlled by Apache Hadoop and act as an administration in the cloud. Microsoft HDInsight uses windows Azure Blob stockpiling as a default framework for documentation to gain high accessibility with minimal effort (Jahanshahi & Bhattacharjee, 2020).
- iv) **NoSQL:** Since normal SQL are used to deal with extensive organised information, NoSQL (Not Only SQL) are mandatory to deal with unstructured information (Nagar et al., 2016; Ghavami, 2020). The unstructured data stored in NoSQL databases have no particular mapping, each line item has its own specific arrangement of sector qualities. NoSQL have functionality to provide better execution on removing away huge measure of information (Sekhar & Sekhar, 2017; Ghavami, 2020).
- v) **Hive:** Hive are defined as a transporter of information for Hadoop. They are used for data mining and are always kept running on top of the Hadoop (Mercier et al., 2017; Ghavami, 2020).

- vi) **SQOOP**: This is a technical equipment used by Hadoop to connect with different social databases in order to exchange information (Mercier et al., 2017; Yadav et al., 2020). According to Yadav et al. (2020) SQOOP are usable to exchange structured information into Hadoop or Hive.

2.20 Big data and SMMEs

Technology and Innovation has been indicated by Sen et al. (2016) and Matt et al. (2020) as a right of way for SMME's growth and BD is one of the fundamental key drivers for it. Producing products faster, cheaper, and with higher quality than the competitors, is no longer enough for SMMEs to achieve competitive advantage. SMMEs can use BD to predict their markets and scrutinize their customer behaviour in order to increase organisation's flexibility, productivity, quick responsiveness to meet customer's needs and sustain long term risk analyses (Soroka et al., 2017; Wang & Wang, 2020). Sen et al. (2016) and Saleem et al. (2020) state that innovation will increase the opportunity of SMME's growth because SMMEs have the potential to create the knowledge from new technology when using BD as it is a contributing factor to have a competitive advantage and can transform their traditional business into a modern innovative business. Therefore, SMMEs must take the business risk of adopting BD without any fear of failure for innovations towards the future.

Senarathna et al. (2018) and Datta et al. (2021) suggest that SMMEs must consider implementing cost effective software and hardware solution such as cloud technology and open source Hadoop systems if they want to process and analyse structured and unstructured data cheaper. The implementation of cloud computing can also reduce their total number of IT employees within their organisation. Collecting more and detailed data will boost SMME's performance and adopting BD will improve SMME's capability to narrow their customer segmentation and will furthermore enhances SMMEs creativity in tailoring products and services to their customers.

Coleman et al. (2019:14) have proposed that 30.6 percent of SMMEs are currently producing innovative new products, 36.19 percent are producing innovation for marketing, 28.68 percent are innovating in-house, 10.32 percent are collaborating their innovative with others, 14.61 percent are selling their products online, and 22.01 percent are purchasing their products online. Although SMMEs have a huge potential using BD, they also have a fear for data security and privacy (Shah et al., 2017; Coleman et al., 2019).

According to Shah et al. (2017) and Wu and Guan (2018) BD have a potential to help SMMEs in making more competent demand forecasting, supply planning, sensor data driven operations analytics and simultaneous engineering. SMMEs can use BD to create new business opportunities, increase competence and innovation (Sen et al., 2016; Datta et al., 2021). BD will help SMMEs to prevent potential fraud activities within their organisations and helps SMMEs to gain forensics from previous occurred fraudulent activities. The development

of BD and BD analytics infrastructure will help SMMEs to enrich their customer's engagements and furthermore helps SMMEs to improve operational efficiency, innovate or improve their business model. BD will enable an SMME to outperform their competitors and also help SMMEs to improve their businesses by saving cost for them (Nda & Tasmin, 2019).

2.21 Adoption of BD by SMMEs

2.21.1 Introduction

A large number of theories of adopting and diffusion of IT-based innovations have been proposed and tested. Adoption of IT innovation has been proven as a complex process which can be better understood by using multiple models (Shrouf & Miragliotta, 2015). According to Verma and Bhattacharyya (2017) there are number of key theories which need to be considered when adopting IT innovations. Some of the theories are, i) theory of planned behaviour (Ajzen, 1991:190), ii) theory of reasoned action (Karahanna et al., 1999:200), iii) Technology Acceptance Model (TAM) (Davis, 1989:330), iv) unified theory of acceptance and use of technology (Venkatesh et al. 2003:468), v) Technology Organisation Environment (TOE) framework (Tornatzky et al. 1990:25) and vi) the diffusion of innovation (DOI) (Rogers, 2003:26). For the purpose of this research the following three adoption frameworks namely TOE, TAM and DOI are discussed in more detail.

2.21.2 Technology Organisation Environment (TOE) Framework

TOE has been proposed by Tornatzky et al. (1990) and has been tested and validated by many researchers to determine factors that have influence in adopting a new technology by enterprises (Awa et al., 2015; Ogwang, 2016; Malik et al., 2021). These researchers have commonly presented that various technologies, organisational and environmental factors contribute or stop the adoption of new technology in enterprises (Verma & Bhattacharyya, 2017; Malik et al., 2021).

Ogwang (2016) and Na et al. (2022) use TOE to understand the factors that influence the adoption of BDA in the telecommunication industry, and report that there are a significant number of factors which influence the adoption of BDA in telecommunication based on the following:

Based on the relative advantage of the technology, readiness of the technology and competence of the technology. Also based on the organisation's awareness of the technology, innovativeness, human resources expertise, support from top management and IT competence. Based on environmental regulatory support, compliance regulatory, privacy protection and security, fair competition, satisfactory from the customers trust from customers, business value and churn from customers.

According to Gani et al. (2015) and Na et al. (2022) TOE is used to identify organisation's features that influence the adoption or the implementation of an innovative technology. The TOE framework was used in this study to investigate all the factors which influence SMMEs

in adopting BD to meet their customer's needs and also become more competitive towards their competitors.

2.21.3 Technology Acceptance Model (TAM)

TAM is a concept used by many researchers in explaining IT adoption in various fields which also explains the acceptance of using a technology by the users (Ochieng, 2015; Simões et al., 2020). TAM is obtained from Theory of Reasoned Action known as TRA, which also suggests numerous factors in influencing decisions made by users in accepting and when and how to use a new technology (Gani et al., 2015; Malik et al., 2021). However, TAM has been improved by incorporating Roger (1995) DOI framework to include other factors which help in explaining and predicting the adoption of new technology (Na et al., 2022). TAM has been used successfully to predict the acceptance of new technologies by users (Yarbrough & Smith, 2007; Na et al., 2022). TAM is suggested to be used by SMMEs to monitor their employee's behaviour towards the acceptance of BD strategy within their organisation (Turan et al. 2015; Malik et al., 2021).

2.21.4 Diffusion of Innovation Theory (DOI)

Diffusion is a process used by members of the organisation to adopt an innovative initiative and explains organisational adoption and diffusion processes (Hashim, 2007; Simões et al., 2020). DOI is used by many researchers to describe all the factors which affect the spread of innovation in an organisation and is primarily based on technology characteristics and users perception on innovation (Ochieng, 2015; Simões et al., 2020). According to Rogers (1995:18) innovation is mostly determined by the following five elements to decide whether to adopt or not to adopt a new innovation within an organisation:

- i) **Relative advantage:** as defined by Sanson-Fisher (2004) and Rogers (1995) is when an idea has been seen as a new innovation to bring better benefits for an organisation.
- ii) **Trialability:** which is a degree whereby an innovation can be used for an experiment (Chen et al., 2012:1170).
- iii) **Complexity:** known as a degree whereby the results of innovation is very difficult to use (Rogers et al., 2005).
- iv) **Observability:** which is determined to a degree whereby the innovation results are openly accessed by other colleagues or peers in an organisation (Rogers, 2003).
- v) **Compatibility:** "is a measure of the degree to which an innovation is perceived as being compatible with existing values, past experiences and the needs of potential adopters" (Sanson-Fisher, 2004:555).

2.22 Summary

BD is one of the fastest growing development tools with the capability of changing the way SMMEs can use their customer behaviours to analyse and transform it into valuable insights. The use of BD by SMMEs will help them to enhance their existing operating process by

transmitting all their data generated from different sources into a single device and use that data to make better decision. Many researchers have confirmed that BD is the most powerful tool for SMMEs to create more and new business opportunities if it's being utilised to its potential capability. These SMMEs can utilise BD for making decisive informed decisions, improve our communities by providing better services and creates new business opportunities. This chapter has provided detailed summary on how SMMEs can utilise BD in this current 21st century. SMMEs are essential to our economic growth because they have an ability to create new job opportunities, and can address all the challenges of skills strategies which could assist in Gross Domestic Product (GDP) of the South African economy. Researchers across the globe have indicated BD as a core topic because it changes the way industries function by providing organisations with opportunities to collect, generate, analyse and process vast amount of data.

SMMEs can utilise BD to predict their markets and examine their customer's behaviour in order to increase organisation's flexibility, productivity, quick responsiveness to meet customer's needs. SMMEs can increase their profits, develop and strengthen customer relationship and provide seamless customer experience across all channels implementing BD strategies. Innovation has an ability to increase SMME's growth because SMMEs will have the potential to create the knowledge from new technology when using BD as it is a contributing factor to have a competitive advantage.

In the following chapter three (3) the research methodology used in this research is discussed.

CHAPTER THREE: RESEARCH METHODOLOGY

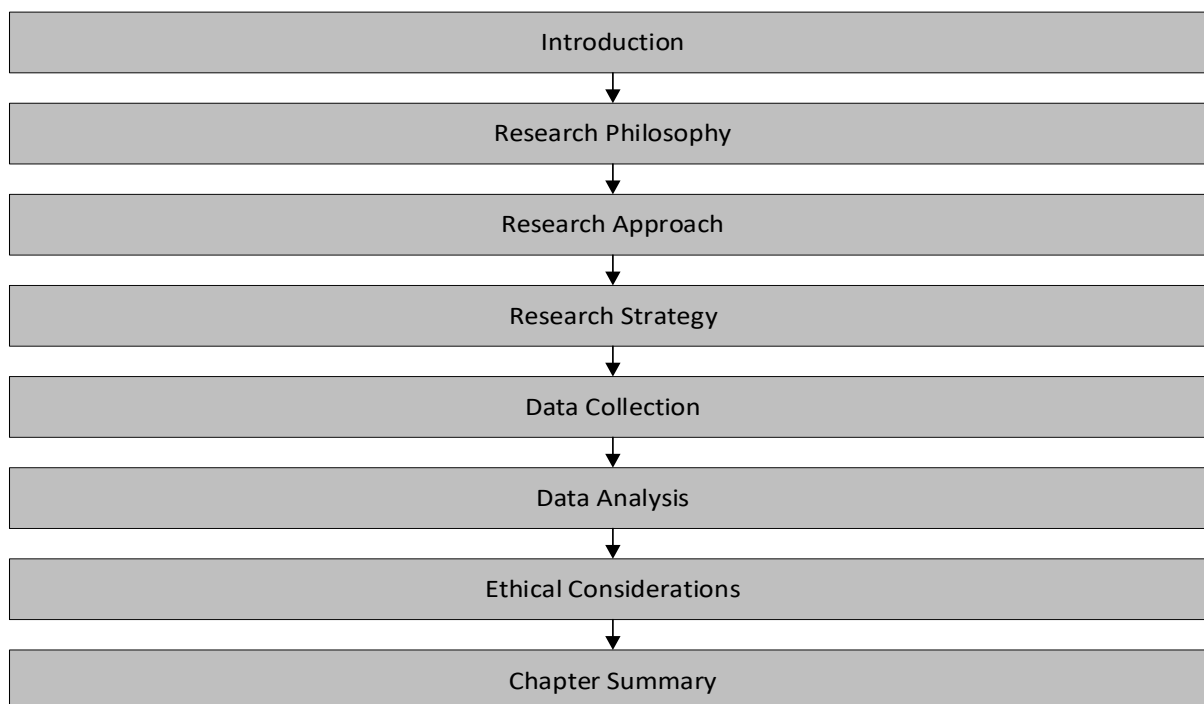


Figure 0.1: Layout of Chapter 3

3.1 Introduction

The aim of this study, as proposed in Chapter 1, section 1.5, is to explore how SMMEs can use BD to differentiate their customer segments and to create a competitive advantage. The objectives of the study is to i) determine if SMMEs see the value of BD for their businesses, ii) identify any challenges faced by SMMEs to include BD strategy to their businesses, iii) identify SMMEs strategy to meet their customer's needs and iv) examine the way SMMEs are measuring their success.

SMMEs do not use BD to differentiate their customer segments and are losing their competitive advantage resulting in market share as well as potential profit lose. The challenges face by SMMEs for not using BD are explored through the following research questions:

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

According to Doody and Bailey (2016:106), if the aim of the research is “to understand and explain, then the questions to ask are ‘How’ and ‘Why’. If the aim is to explore, then the questions to ask are ‘What’ and ‘How’”. In this study two questions (what and how) are asked. In this chapter the researcher provides an overview of a i) research philosophy, ii) research approach, iii) research strategy, iv) research aim, v) data collection, vi) data analysis techniques and vii) ethical considerations are presented.

3.2 Research philosophy

3.2.1 Introduction

Research methodology is defined by Jamshed (2017:87) as an “approach or architectural design by which a researcher outlines a proposal to the problem finding or problem solving”. According to Creswell and Miller (1997:36) research methodology is a “broad strategy that outlines our choice and use of specific methods relating them to the anticipated outcomes, but the choice of research methodology is based upon the type and features of the research problem”. Research philosophy is an explanation of frame of reference for knowledge development and theory against the same belief of knowledge (Cazeaux, 2017). Research philosophy commonly originates from theoretical backgrounds. Therefore conducting a research is a process which entails a substantial supervision from one stage to another but also following different procedures within the paradigms (Crotty, 2016:43).

Cazeaux (2017:82) defined philosophy as the “use of abstract ideas and beliefs that inform our research”. There are other philosophies such as pragmatism, positivism and realism. As stated by Vogl et al. (2019) phenomenological / interpretivist approach in research attempt to understand people’s views or practices using a qualitative methods such as observations, interviews and document analysis.

The philosophical stance of this study is influenced by Järvensivu and Törnroos (2010) who has recommended four paradigms of analysis of social theory as proposed by Burrell and Morgan (1979). Figure 3.2 illustrates the four paradigms of analysis of social theory for this study and also illustrates the research philosophies for this study namely: the ontology and epistemology approach.

Therefore the four paradigms are similar to a map showing one’s personal perception and comprehending of their social surroundings. Burrell and Morgan (2017) states that the four paradigms signify the intellectual territory of the theorist and as well as the meta theoretical expectations on how to consider the reality.

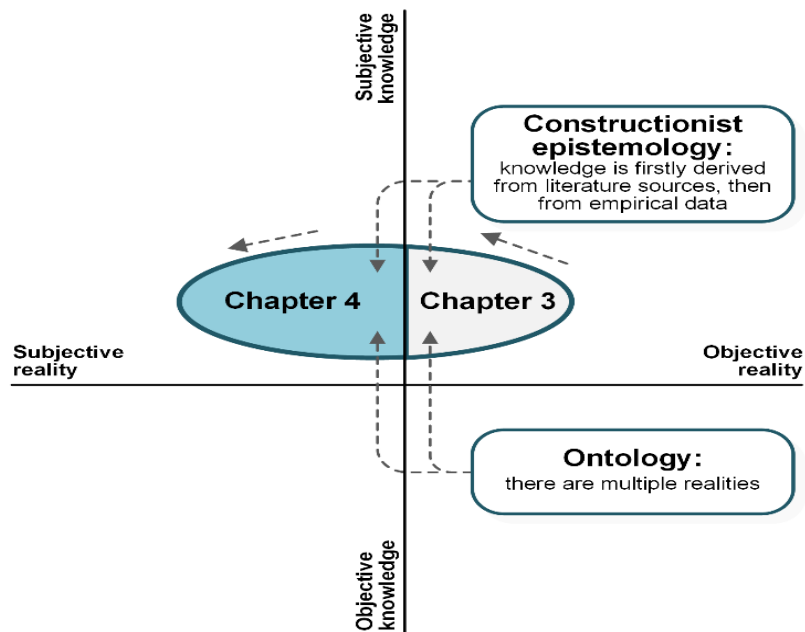


Figure 0.2: Four paradigms of analysis of social theory (adapted by Järvensivu & Törnroos, 2010:102)

The two main pillars or research philosophy namely ontology and epistemology are discussed in the following sub-sections.

3.2.2 Ontology

3.2.2.1 Introduction

Ontology is defined by Hathcoat et al. (2019:10) as “the study of existence, which talk about the nature of social objects and understanding of the nature of reality”. Ontology is the opinion of reality (Vogl et al., 2019:620). As stated by Zehnder and Riemer (2017:4869), ontology is influenced by two concepts namely: i) objectivism and ii) subjectivism. Objectivism debates that reality occurs without experience of it, while subjectivism debates that reality occurs only when there is experience (Vogl et al., 2019). The ontological paradigm is presented as the objectivist and subjectivist paradigm. These two paradigms are discussed in the following two sections.

3.2.2.2 Objectivism

According to Saunders et al. (2019:135) objectivism provides an “impression that the existence of social entities is independent and external to the social factors which result in such existence”. Objectivism declares that social phenomena and their meanings have a situation that is unrestrained of social actors. Objectivism indicates that social reality survives without the influence of individuals.

3.2.2.3 Subjectivism

Subjectivism is about “social phenomena which is created from the perceptions and consequent actions of those social actors concerned with existence” (Saunders et al.,

2019:135). This study adopted subjective ontological stance since the researcher sought to understand how FSPs can use BD to differentiate their customer segments and create a competitive advantage and the feedback was obtained from the participants. In order to fulfil the aim of this study a subjectivist approach was used to effectively develop best answers on participant experiences and interpretations. The participant answers were seen as a socially constructed and comprehended from the participant's truth points of views.

3.2.3 Epistemology

3.2.3.1 Introduction

Epistemology concerns questions such as "what fit as knowledge?", how are knowledge entitlements declared?" and "what is the connection between a researcher and what's being researched" (Saunders et al., 2019). According to Du Plooy-Cilliera et al. (2014:23) epistemology was initiated from Greek words: episteme which means "knowledge", logia or logos which means "the study or theory of". Wahyuni (2012) states that epistemology is the comprehending and information about the world and what is all about, and the reality developed from its essence.

Epistemology is concerned with methods of getting information in the world. According to Mirhosseini (2018:469) there are mainly three different epistemological types applied when conducting a research namely: i) interpretivism, ii) positivism and iii) critical realism. The epistemology of this research is aimed at exploring on how SMMEs can use BD to differentiate their customer segments and to create a competitive advantage. The researcher gathers qualitative information from respondents on the topic and recognises the different views from interviewees using the interpretive philosophy.

This research was based on an interpretivist principle because the research was conducted among people rather than the objects and the researcher acknowledged all the different views from all the interviewees. In the following sub-sections i) interpretivism, ii) positivism and iii) critical realism are discussed.

3.2.3.2 Interpretivism

According to Bernard and Harvey (2018:53) interpretivism is a "systematic analysis of social meaningful action through the direct detailed observation of people in natural settings in order to understand and interpret how people create and maintain their social world". Mangla (2020) argues that interpretivism is a method of knowing social constructs using ways aimed to understand human behaviour. Interpretivism starts by comprehending how respondents realise the world and then comprehends the reasoning after what was seemed as an extraordinary behaviours (Myers, 2013).

In this approach the importance is to place individual's ability to create a meaning (Burrell & Morgan, 2017). The researcher seeks reality from human knowledge by directly interacting with the participants in a research setting, the collaboration helps the researcher to acquire

detail information in a subjective context from the participants and the data collected is interpreted to formulate a theory (Hosseini et al., 2019). Walsham (2018) declares that an interpretive researchers begins with an assumption that formulates to reality occurs on social constructions such as language, consciousness and shared meaning.

According to Myers (2018:13), there are six principles of interpretive research that can be used to guide researchers on their studies. Table 3.1 illustrates the principles of interpretive research in the study.

Table 0.1: The principles of interpretive research in the study (Myers, 2018:13)

Principles of interpretive field research	Explanations
The essential principle of the hermeneutics circle	The principles propose that the understanding of human is accomplished by rehearsing between the independent meaning of parts and the whole that they practice.
The principle of contextualisation	Involves serious reflection of the community group and the past background of the research situation so that the future interviewer can see how the existing situation under investigation began.
The principle of interaction between researchers and subjects	Involves serious reflection on how the research resources or information were created as an idea by people through communication between the researchers and participants.
The principle of abstraction and generalisation	Involves connecting symbols to describe out information through the application of principles to the theoretical, general concepts that explains the understanding nature of human and social action.
The principle of dialogical reasoning	Involves sympathy to possible conflicts between the theoretical insights managing the research design and actual findings with subsequent cycles of revision.
The principle of multiple interpretations	Involves sympathy to possible dissimilarities in interpretations against participants as are usually expressed in multiple narratives.

Based on these principles as shown in Table 3.1 and from the perspective of the research using FSPs that have a formal structure where there is a potential of using BDA as a strategic tool in making decisions an interpretivist approach was followed.

3.2.3.3 Positivism

The Positivist approach is “when the reality has been established and can be experiential and defined from an unbiased point of view without interference from the occurrence of the study” (Sanfilippo et al., 2019:188). As stated by Abu-Alhaija (2019:126) the “systematisation of the knowledge generation process with the help of quantification and scientific methods are adopted by positivistic thinkers to enhance precision in the description of parameters and the relationship among them”. According to Welman et al. (2005) positivists attempt to find

relationships laws, which reflects to all the people during that particular time. The positivist approach significance is to place values of reasons, certainty and strength of measurements based on accurate information collected through direct observation and experience (Saunders et al., 2019). The approach consist of the influence of reality with differences of only a single independent variable so as to classify regularities and form a relationship between some of the components of the world (Klein & Myers, 1999).

As stated by O’Leary (2021), the positivist research stand accepts that reality is autonomous from the researcher and his / her tools used for this study and is commonly connected with quantitative theory testing research. The process of choosing a research design is very exciting due to the number of approaches currently available (O’Leary, 2021). Table 3.2 illustrates the differences between positivism and interpretivism.

Table 0.2: Illustrates positivist approach versus interpretive approach (Cepeda-Carrion & Ruiz, 2005:856)

Meta-theory assumptions of:	Positivism	Interpretivism
Ontology	Researcher and reality are different.	Researcher and reality are invisible.
Epistemology	Unbiased reality happens beyond the human mind.	Information of the world is deliberately created from a person’s life experience.
Research Object	Research object has built in qualities that occurs from the independently of the researcher.	Research object is clarified from the fundamental meaning of the person’s life experience.
Method	Analysis and statistics	Phenomenology, hermeneutics etc.
Theory of truth	Participants theory of their truth: One to one representing between the statement of the research and reality.	Truth is implemented: Analysis of the research object matches lived experience of the object.
Validity	Certainty: Reality is truly measured from data.	Defensible information claims.
Reliability	Replicability: Results for the research can be reproduced.	Interpretative awareness: researchers acknowledge and speak out about the implications of their subjectivity.

This study did not followed a positivist approach.

3.2.3.4 Critical realism

Critical realism is also known as realism paradigm and post positivism. Critical realism was recognised out of frustration with positivism’s non principles of humanistic, high focus and its importance on the unplanned nature of worldwide laws (Hoddy, 2019). According to Denzin and Lincoln (2018) critical theory is when a researcher embraces more transactional and subjectivist epistemology, where the researcher and the study of research are recognised to

be linked together with the principles of the researcher. Its main objective is to deliver resources to people that will assistance them to change and comprehend their world (Sanfilippo et al., 2019). According to Saunders et al. (2009) critical research emphases on the disagreements, conflicts and flaws in existing society.

The philosophy of realism as mention by Saunders et al. (2019) is to demonstrate that certainty is fairly independent of the mind. Furthermore, critical realist uphold that researchers are required to change social relations by assessing, showing and changing any unfair practices within the society (Du Plooy-Cilliera et al., 2014). The main aim for critical realism is to describe traditions, change society and free individuals from all forms of harassment and equip them in building a better world for themselves during the process (Kelemen & Rumens, 2008). Realism in its particular position is aware of the values of human systems, as it recognises that opinions have a certain gentleness and there are dissimilarities between a participant's perceptions of reality and the reality itself (Denzin & Lincoln, 2018). According to Saunders et al. (2009:119) "realism philosophy illustrates that reality is fairly independent of the mind". For these reasons critical realism was not followed as an epistemology.

3.3 Research approach

3.3.1 Introduction

The research approach is concerned about certain procedure followed while investigating a specific topic (Seijger et al., 2021). According to Saunders et al. (2019:152) the three types of approaches coordinating the research path to be followed are i) inductive, ii) deductive and ii) abductive approach (Table 3.3). An inductive approach is when the research starts by gathering data to explore an experience and build theory (Saunders et al., 2019). A deductive approach is when the research starts with the theory, often begin from reading academic literature and then design a research strategy to evaluate the theory (Kelemen & Rumens, 2008). An abductive approach is when a research collects data to investigate a phenomenon, discover themes and explain patterns, to create a new or modify an existing theory which is subsequently tested from data collection.

Table 0.3: Deduction, induction and abduction: From reason to research (Saunders et al., 2019:153)

	Deduction	Induction	Abduction
Logic	In a deductive reasoning, when the premises are true, the conclusion must also be true.	In an induction reasoning, studied premises are used to create untested conclusions.	In an abductive reasoning, studied premises are used to create testable conclusions.
Generalisability	Generalising from the general to the specific.	Generalising from the specific to the general.	Generalising from the interactions between the specific and the general
Use of data	Data collection is used to evaluate propositions or hypotheses related to an existing theory	Data collection is used to explore a phenomenon, identify themes and patterns and create a conceptual framework.	Data collection is used to explore phenomenon, identify themes and patterns, locate these in a conceptual framework and test this through subsequent data collection.
Theory	Theory falsification or verification.	Theory generation and building.	Theory generation or modification, incorporating existing theory where appropriate, to build new theory or modify existing theory.

3.3.2 Deductive approach

According to Saunders et al. (2019) deductive approach entails the development of a theory that is then put through to a rigorous test through a series of suggestions. A person can prepare a hypothesis to demonstrate or disprove a theory within the positivist philosophical paradigm (O’Leary, 2021). It is the ruling research approach in the natural sciences where laws present the basis of clarification, permit the anticipation of phenomena, forecast their occurrence and therefore allow them to be controlled.

3.3.3 Abductive approach

Abductive approach starts with the observation of an amazing fact, it then works out of reasonable theory of how it could have occurred. According to Van Maanen et al. (2007) reasonable theories can account for what is discovered better than others and it is these theories that will help uncover more amazing facts.

3.3.4 Inductive approach

To achieve all the objectives of this research, an inductive research approach was chosen. According to Seijger et al. (2021) a research approach give assistance to draw conclusions and to confirm the truth in the matter. Saunders et al. (2009:126) defines inductive approach as an “approach to get a feel of what is going on, so as to understand better the nature of the problem”.

Saunders et al. (2012) state that the research approach can be the inductive theory, which involves the development of a theory as a result of the observation of empirical data. The inductive approach’s advantage is that it allows implications to merge from the collected data

and authorises patterns to be recognised (Ishtiaq, 2019). Furthermore, inductive approach assists with the use of existing theoretical underpinnings to construct questions and objectives and to point out ideas that the researcher might discover during the research process. The inductive approach's advantage is to allow values to emerge from the collected data, to identify all the patterns and facilitates the existing use of theoretical underpinnings so as to develop research questions and objectives (Ishtiaq, 2019:36).

This research took an inductive approach to theory development.

3.4 Research strategy

3.4.1 Case study

A research strategy has been defined by Saunders et al. (2012:48) as an "objective to accomplish a specific goal". Research strategy helps the researcher to achieve or fulfil their aims and objectives of the study (Marshall & Rossman, 2016). Furthermore Marshall and Rossman (2016) argue that research strategy guides the researcher with directions to follow in answering all the research questions and guide the researcher with directions in gathering data to carry out the research. Research strategy has been stated by Saunders et al. (2012:173) as "scientifically techniques utilised during the research process to help the researcher in getting the answers to the research questions".

As stated by Yin (2003:25), the scope of a case study is an "empirical inquiry that investigates a contemporary phenomenon with its real life context, especially when the boundaries between phenomenon and context are not clearly evident". Walsham (2018:53) posits that a case study research is "most suitable for an information systems (IS) research since its main objective is to study of information system within the organisation rather than focusing on the technical problems within an organisation". According to Hartley (2019) a case study research is essential on assisting the understating of a difficult phenomenon and also contribute on adding value to the previous with the same issue.

A case study (multiple case study) has been adopted for this study because this research was conducted with multiple SMMEs using interviews with semi structured questionnaires. The research was based on interviewing fifteen (15) SMMEs within the Financial Institutions in the Western Cape and Gauteng region (Chapter 4, section 4.6).

3.4.2 Sampling

Ruxwana et al. (2010:17) describe a sample as "a process whereby certain part of the population is selected by the researcher using a specific technic to produce knowledge about the population and also to uncover multiple realities about such population". When targeting a diverse population using a correct sampling strategy is very necessary. Purposive, non-random and convenient sampling were used to sample the FSPs and participants in this study. Babbie (2013:1) defines purposive sampling as "a judgmental sampling which involves selection of objects or individuals with a purpose of a researcher to make his / her own

judgment about which sample will be useful or representative". As stated by Babbie (2015) to streamline a sampling process, the researcher must divide the research population into manageable groups and the study can be piloted on each group. Sampling techniques are divided into two types namely: i) probability sampling and ii) non-probability sampling. Some of the characteristics of a probability method as defined by Ishak and Abu-Bakar (2014:32) are: i) generalisations is allowed on the populations as it has been defined by the sampling frame, ii) parameters are used for estimating the population, iii) probability sampling reduces bias and iv) probability sampling applies randomly selection for units. Probability sampling refers to a method of knowing exactly the number and the location of the components of a research population, the research population can all be reached by the researcher, and where all the components of the research population can be selected equally or can be all disqualified from the sample research (Babbie, 2015).

The proposed study purposefully select South African FSPs in the Western Cape and Gauteng region that have a formal structure where there is a potential of using BDA as a strategic tool in making decisions.

3.4.3 Unit of analysis with the aim to explore

Fifteen (15) FSPs were selected as the unit of analysis (Chapter 4, section 4.4, Table 4.2) with the aim to explore how FSPs can use BD to differentiate their customer segments and create a competitive advantage.

3.4.4 Unit of observation

The unit of observation was the FSPs decision makers i.e. (Chief Information Officers, Chief Executive Officer, IT Managers and Program Managers). A snowball sampling technique was also used on this research to engage with all willing decision maker's. All the participants that were interviewed on this research were all issued with consent letters allowing them to agree on participating on this research.

As stated earlier the unit of observations were two (2) Chief Executive Officers (CEO), one (1) Head of Risk Compliance, one (1) Chief Financial Officer (CFO), two (2) Managing Directors, one (1) Fund Manager, one (1) Financial Advisor Category 2, two (2) Chief Operating Officers, one (1) Head of business / Chief Operating Officer, two (2) Owners and key Individuals, one (1) IT Manager and one (1) Principal Owner of the Business.

3.5 Data collection

3.5.1 Introduction

Interviews were selected as a primary data collection method for this research and were conducted using semi-structured interview questionnaire (Appendix A). The initial intention was to do all interviews face-to-face at the offices of the FSPs. On Monday the 23rd March 2020, our South African President Cyril Ramaphosa made an announcement that people

across South Africa had to go on a 21 days lockdown and extended it to nationwide lockdown for two weeks. The researcher mitigated this change of the environment risk by doing the remaining interviews (5) using MS Teams and Google Meet.

3.5.2 Permission

Acquiring permission from the participants to carry out the research is an essential requirement. The researcher used an email to send out invitations to all the selected SMMEs (Chapter 4, section 4.4; Appendix B). Electronic follow-ups using email were done before interviews took place. During the interview process all the participants were asked to freely accept and signed the consent letter to participate of the research. All the participants signed a letter of consent to allow for the data collection.

3.5.3 Interview process

The method of collecting data and analysing it forms part of the scientific research design. In this study, semi-structured questionnaires were used for data collection. All interviews were guided by an interview guide (Appendix A). All interviews were recorded, and participants were asked before the interview started to grant the interviewer the permission to record the interview. The recordings from the interviews were transcribed and text analysed for additional analysis using the inductive approach. The transcriptions were mailed to the participants to verify and validate the correctness and content of the transcription.

3.6 Data analysis

The main objective for data analysis is to discover meanings from the data (Hartley, 2019). Data analysis in any research is largely depended on the i) research approach, ii) research methods, iii) methods used to collect the data, and iv) instruments utilised to collect the data (Edwards & Talbot, 2014:57). Pandey and Pandey (2015:70) define data analysis as “the introduction of information by carry out a study on a structured material, from a different point of views”. Furthermore Hartley (2019:62) defined data analysis as “a research method that defines the collected content in a comprehensive and brief manner.”

After the validation of the transcripts keywords were identified, summarised and then categorised (Chapter 4, section 4.12). For further classification a thematic analysis was done, and themes develop which were aligned to the research questions. This was done in an Excel spreadsheet (Appendix E).

3.7 Ethical considerations

Cooper and Schindler (2003), as well as Resnik (2015) define ethics as rules or behaviour standards which distinguish and guide moral principles that govern a person’s behaviour and the relationships with other people. According to Myers (2013:34) principles of ethics consist of the following elements: i) honesty, ii) plagiarism, iii) informed consent and iv) permission to publish. Resnik (2015:2) further defines the principles of ethics as:

- i) **Honestly:** All the finds must be reported by the researcher honestly without any made-up data. The transcriptions were mailed to the participant to verify and validate the correctness and content of the transcription.
- ii) **Integrity:** All promises and agreement made to the interviewees or participants must be followed.
- iii) **Openness:** A researchers must be open to the criticism or any ideas raised by the participants.
- iv) **Confidentiality:** The data must be protected and treated confidentially at all times by the researcher.

The study considered several ethical issues and the researcher made sure that all questions asked did not offend the participant in any way. All appointments for interview were made with informed consents. As stated by Welman et al. (2005) the researcher paid attention to the following ethical consideration:

- i) Permissions from the participants were obtained by the researcher and the researcher informed the participant in advance about the purpose of the research (Appendix A).
- ii) A researcher assured all the participants about the rights of their privacy.
- iii) Assurance has been given to the participants that there will be no physical or emotional harm.
- iv) Unethical tactics and techniques were not used by the researcher during the interviews. The study and all the collected data stayed ethical, the researcher's methodology was to put appropriate measures in place to alleviate any possible physical, psychological, cultural, social environmental and financial risk that will negatively impact all participants involved in this study. Sources of data collection was to interview business decision makers using semi-structured interviews which requires all the participants to signed the provided consent letter. From all the consent letters, participants were aware upfront about the nature of this research and the type of data that needs to be collected.

During this research study numerous ethical principles were well-thought-out and consent letters were forwarded and obtained from all FSP's representatives (Appendix B) for the purpose of data collection. Even though the researcher gained consent from all the FSPs representatives no data was circulated without any FSP's permission. All collected data during literature review, interviews, and recorded transcripts had not been counterfeit it's a true reflection of every participant that was interviewed.

3.7 Chapter summary

In this chapter the research methodology was explained on how the research process was accomplished, the methods used throughout the research process, and how the knowledge was obtained. The methodology was chosen based on the study objectives and aim.

Therefore, because of the study's objectives and aims a qualitative strategy was chosen. In order to support the selection of a qualitative strategy the research philosophy, research strategy, research aim, data collection methods, data analysis and ethical consideration for this research were discussed. Data was collected by means of semi-structured interview questionnaire.

The researcher selected a multiple (15) case strategy. Non-random and relevant samples were utilised, comprising of 15 participant from various FSPs in the Western Cape Province and Gauteng Province. Semi-structured questionnaire was used for data collection, all interviews were guided by an interview guide. In this study qualitative data analysis approach has been used to analyse all the interviews carried out and to further explore the phenomenon projected by the research questions. All recorded interviews were transcribed, this was the crucial step in this study and all keywords were grouped together and classified consequently. For classification thematic analysis was used, to bring together all the themes to the research questions. Therefore content analysis supported by thematic analysis technique were also used because they have helped the researcher to summarised, organised and categorised data into a comprehensible themes.

In this study, data was analysed to address the research questions and it has also helped the researcher to achieve the aim of study for this particular research. All the findings were interpreted to gain meanings from them. All data pattern were explained and contextualised in a meaningful context.

During interviews several ethical issues were considered and the researcher made sure that all questions asked don't offend the participant in any way. All appointments for qualitative interview were made upfront to secure informed consents. The study and all the collected data stayed ethical, the researcher's methodology was to put appropriate measures in place to alleviate any possible physical, psychological, cultural, social environmental and financial risk that will negatively impact all participants involved in this study.

CHAPTER FOUR: ANALYSIS AND FINDINGS

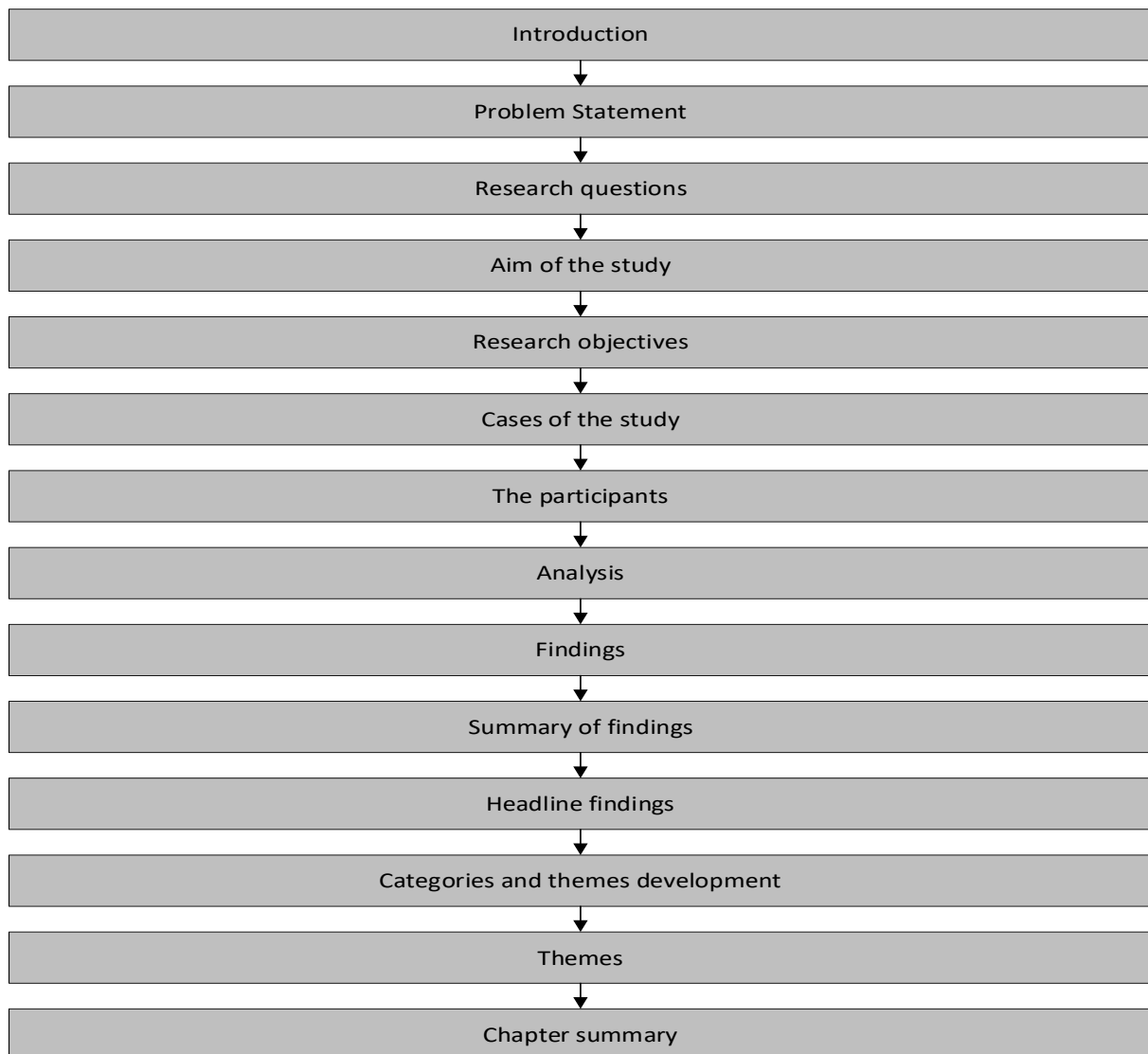


Figure 0.1: Layout of Chapter 4

4.1 Introduction

This chapter introduces the analysis and findings gained in the exploration study on how FSPs can use BD to create a competitive advantage. This chapter gives information on the context and respondents, and introduces an analysis of the data collected utilising the methodology defined in Chapter Three. The findings extracted and the interpretations are made from the analysis of data stipulated. The findings, categories and theme are presented along with the corresponding research sub-questions.

For benefit of reference, the problem statement, research questions, research, aim of the study and research objectives are once again stated (Table 1.1).

4.2 Problem statement

FSPs do not use BD to differentiate their customer segments and are losing their competitive advantage resulting in market share as well as potential profit losses.

4.3 Research questions

RQ1: What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

RSQ 1.1: What are the perceptions of FSPs towards the value of BD for their businesses?

RSQ 1.2: What are the factors affecting FSPs when adopting BD analytics for creating a competitive advantage?

RQ2: How can FSPs utilise BD analytics in order to create a competitive advantage?

RSQ 2.1: How do FSPs determine the needs of their customers?

RSQ 2.2: How can FSPs incorporate BD in their business strategies?

4.4 Aim of the study

The aim of this study is to explore how FSPs can use BD to differentiate their customer segments and to create a competitive advantage.

4.5 Research objectives

- i) Determine if FSPs sees the value of BD for their businesses.
- ii) Identify any challenges faced by FSPs to include BD strategy to their businesses.
- iii) Identify FSPs strategy to meet their customer's needs.
- iv) Examine the way FSPs are measuring their success.

4.6 Cases of the study

The research was conducted with fifteen (15) FSPs (Chapter 1, section 1.2) of Financial Institutions in the Western Cape and Gauteng provinces, which made up the units of analysis of the study. FSPs from other provinces were not considered due to time and financial constraints. Interviews were administered to the FSP's decision makers' i.e. (Chief Information Officers, Chief Executive Officer, IT Managers & Program Managers etc.), who comprised the units of observation. All names of the FSPs are omitted for privacy sake and replaced by letters in alphabetical order. The number of employees in each FSPs or whether its owner managed, services or products that are currently provided by the FSPs and FSP's background are presented in Table 4.1.

Table 0.1: Description of the FSPs who participated in the study

FSP Number	Number of employees in your organisation	Services or products provided by the SMME
1	150 full time employees and 120 contractors' employees (full time employees are compliance officers and contracting employees are invigilators for their exams).	Compliances Training Regulator Exams
2	30 Employees	All-in-one pension service – (From advice to pension administration and asset management).
3	55 Employees	Financial consultation – (Help clients to organise their finances so that they achieve their goals).
4	9 Employees	Financial advisors – (Provide advice and services across a broad range of financial products such as: pension funds, shares, medical aid, provident fund and group health care)
5	8 Employees	Financial advisor – (Provide advice on fund management).
6	3 Employees	Financial service advice – (Provide 13 of the 16 services that can be performed by a category two licence).
7	1 Employee	Manage Fund.
8	7 Employees	Capital Management Investment Management Unit Trust Pension Fund
9	37 Employees	Manage money and Portfolio on behalf of a lot of independent advisors.
10	6 Employees	Financial services Investments Medical Funds Risk and life Insurance Short-term insurance Strategic planning – (working with investment specialist based in the US).
11	9 Employees	Wealth Management Insurance Tax and Accounting solutions
12	105 Employees	Medical aid brokerage
13	6 Employees	Unit trust
14	1 Employee	Professional Accounting Auditing
15	14 Employees	Investment brokerage

*FSP = Financial Service Providers

The number of employees ranges from 1 to 150. These FSPs are providing various financial service ranging from investment to financial advising.

4.7 The participants

Fifteen (15) FSPs with fifteen (15) participants were interviewed in order to answer the research questions. Twelve (12) FSPs are based in the Western Cape Province between Cape Town and Worcester and three (3) are based in Gauteng Province between Johannesburg and Pretoria. The participant's role, number of years' experience and participant's highest level of education are presented below on Table 4.2.

For reasons of confidentiality, the names of the participant are not publicized. Codes have been used to reference the participants.

Table 0.2: Participant's role, number of years' experience and highest level of education

Code	Position / Role in the FSP	Years of Experience	Highest Level of Education
P1	Chief Executive Officer (CEO)	20 Years – (Previous was with Old Mutual, doing farming and was a Senior Agriculture Researcher)	Master's degree in Agriculture
P2	Head of risk compliance	4 Years – (Previous with Alexander Forbes for 15 years as Investment solutions)	LLB degree and a post diploma in Compliance Management
P3	Chief Financial Officer (CFO)	4 Years – (Previous with Old Mutual as a Quantitative Analyst)	Master's degree in Finance
P4	Managing Director	20 Years – (Previous with Liberty for 12 years)	Certified Financial Planner (CFP)
P5	Managing Director	10 years – (Previous with Old Mutual)	Certified Financial Planner (CFP)
P6	Fund Manager	14 Years	BCOM degree and Certified Financial Planner (CFP)
P7	Financial Advisor Category 2	10 Years	BCOM degree and Certified Financial Planner (CFP)
P8	Chief Operating Officer	8 Years	MSc degree and MBA specialising in Financial Risk Management
P9	Head of Business/ Chief Operating Officer	8 Years – (Previous with Helderburg Fruit Juice for 12 years and with Sanlam).	B.Com Accounting
P10	Owner and Key Individual	20 Years – (Previous with Old Mutual for 15 years).	Certified Financial Planner (CFP)
P11	Chief Operating Officer	11 Years	Chartered Accountant (SA) Post Graduate diploma in Financial Planning Masters in Financial Management Certified Financial Planner (CFP)
P12	IT Manger	8 Years – (Previous with Lomil Polymers for 3 years as an IT Manager)	B.Sc. (Hons) Computer Science and a degree in Business Science

Code	Position / Role in the FSP	Years of Experience	Highest Level of Education
P13	Chief Executive Officer (CEO).	8 Years – (Previous with Green Road Bank and as a CEO of Siphumelele Investment)	Chartered accountant
P14	Owner and Key Individual	3 Years	Bachelor degree in Internal Auditing and member of the South African Institution of Professional Accountant and South African Institution of Internal Auditors
P15	Principal owner of the business	37 Years	Three year Diploma in Management. Qualified Company Secretary FSP Certificate: Level 1

*FSP = Financial Service Provider, P = participant

4.8 Analysis

All the recorded interviews were transcribed and read several times. Table 4.3 is an example of an extract from the transcribed interviews.

Table 0.3: An example of a transcribed interview

Appendix : Interview Transcription 1		
RQ No.	Research Question	P1
RQ1:	What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?	
RSQ1.1	What are the perceptions of SMMEs towards the value of BD for their businesses?	
IQ1.1.1	To what extent does your organisation have experience with BD analytics?	We sit on a lot of different data sources, we have not really done anything with the data rather than maybe doing a demographic slicing and dicing getting to understand the trends who is moving in to the industry who is leaving the industry because we have access to that kind of information via the exams and registrations but we haven't really done anything in my view valuable with the datasets we have.
IQ1.1.2	What are the main obstacles that would prevent your organisation in using BD analytics?	There are no obstacles rather than resource and time. It is only now we are working with a team of data scientist where we are basic pulling all the different datasets together creating the links between individuals in different datasets so that we can start seeing a more comprehensive profile of individuals, people that we have been dealing and working with, so that is in progress as we speak. But the really problem over time we get busy and

Appendix : Interview Transcription 1		
		start doing urgent things and not looking at the important things
IQ1.1.3	How does your organisation categorise your existing customers?	For us as the business our customers has got a different views because we view our customers differently to that of a FSP, at the same time we need the same kind of information because I do believe that a FSP should understand what the customer value is, they should be able to understand enough about their customers to classify them and they should also start understanding enough about their customers to sort of classify them in terms of their personality standards because it's one of the things I do believe people do not focus enough about it, they look at numbers and they don't look at individuals they try to quantify things but they don't quantify and evaluate the fact that we are in a people's business not so much in numbers business. All my clients that I have deal with the compliance officer, so we transfer knowledge and the same thing happens with FSP, FSP value is the ability to transfer knowledge to you so that you give me information that I can use to help you to provide solutions.

*RQ = research question, IQ = Interview question and P = participant

After the interviews were transcribed and proofread, the key words and concepts were identified. Figure 4.1 is an examples of a summary from responses and extracting data from transcriptions based on phrases and keywords.

B	P1	C	P2	H	P3	Summary	
Research Question What are the challenges SH&Es face when using ED analytics in building and differentiation customer segmentation to create a competitive advantage? What are the perceptions of SH&Es towards the value of ED for their businesses?			Cost is their biggest obstacle. They have between 8000 and 10000 people. They have a relationship with, however, if they have a cheaper way to extract information and how to split therefore they can consider. They are currently contracted with almost a 100 of FSPs that outsource their client investment management of value. This is a big challenge for them. They are currently in the financial adviser field to learn about financial investment, fund cover, gap cover, medical cover and etc. It becomes more complicated such that the regulator keeps on changing the rules. As an information one needs to have a category 2 which is sub categorised in two where 2a requires you to have a fund that has a small amount of 3 000 000 (running from their account not the companies money) or fifteen weeks of working capital in their banking account at any stage of the financial year. This is to avoid any adverse risk such as FSPs scheme where clients has lost lots of money. In a nutshell they manage funds on behalf of the financial advisers. Scenario: if you have a million rand to invest and you approach Moni (Optimal checks, a record of advice will be written, is understood the source of fund, FICA requirements, proof of residence, identity verification and banking details as well as determination of the risk profile.				
What are the main obstacles that would prevent your organization in using big data analytics?			There are no obstacles rather than resource and time. It is only now we are working with a team of data scientist where we are basic pulling all the different datasets together creating the links between individuals in different datasets so that we can start seeing a more comprehensive profile of individuals, people that we have been dealing and working with, so that is in progress as we speak. But the really problem over time we get busy and start doing urgent things and not looking at the important things.				
How does your organization categorise your existing customers?			For us as the business our customers has got a different views because we view our customers differently to that of a FSP, at the same time we need the same kind of information because I do believe that a FSP should understand what the customer value is, they should be able to understand enough about their customers to classify them and they should also start understanding enough about their customers to sort of classify them in terms of their personality standards because it's one of the things I do believe people do not focus enough about it, they look at numbers and they don't look at individuals they try to quantify things but they don't quantify and evaluate the fact that we are in a people's business not so much in numbers business. All my clients that I have deal with the compliance officer, so we transfer knowledge and the same thing happens with FSP, FSP value is the ability to transfer knowledge to you so that you give me information that I can use to help you to provide solutions.				

Figure 0.2: Creating a summary from the responses

4.9 Findings

The findings were analysed and represented for each question asked during the interview. All interview answers were transcribed and coded, and as a result 26 findings were derived from the interviews. The participants expressed their views on how their organisation have experienced BD analytics.

4.9.1 Research question 1

RQ1: What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

4.9.1.1 RSQ 1.1: What are the perceptions of FSPs towards the value of BD for their businesses?

IQ 1.1.1: To what extent does your organisation have experience with BD analytics?

A number (8 out of 15) of the participants (P) (P1, P2, P3, P5, P8, P9, P11 & P15) confirm that their organisations either have huge data sources, sizeable enough to perform operations, or enough data for their organisations. However none of them use or analyse data for creating innovative opportunities, new businesses opportunities and intelligent business decisions.

P1 said that,

“We sit on a lot of different data sources, we have not really done anything with the data rather than maybe doing a demographic slicing and dicing getting to understand the trends who is moving in to the industry who is leaving the industry because we have access to that kind of information via the exams and registrations but we haven’t really done anything in my view valuable with the datasets we have” (Appendix D1).

This is supported by P11 who stated that,

“We have enough data that we can use to improve our client products and also we can use it to analyse our client needs but we have not done anything with the data. As much we have the data but the skill within the company to use the data is not available and also it hasn’t been our focus” (Appendix D11).

P6 and P7 mention that there are organisations who are aware of BD and are making use of their personal contacts or pay a third party companies to analyse data for them. P6 said that “we don’t have experienced with BD analytics. However we make use of personal connections and also we have a company that we pay between R10 000 to R20 000 a month to source information for us” (Appendix D6 & D7). Furthermore, P8 mentioned that “they have used BD to analyse their current stock (asset stock) on hand and have used data extensively on investments but haven’t used it to analyse their customer’s needs, however it is still a challenge for them because their data source is not always available” (Appendix D8).

Contrary to P6, P7 and P8, P10 argued that “there are small companies with no experience on BD analytics. Companies such as Discovery or Old Mutual assist them in any data analysis. Some of their data they get through connections. These contacts are also available for their future data needs. P11 confirmed that they do have enough data that they can use to improve their client’s products. They use the data to analyse their client’s needs. However, they don’t have the skills within their organisation to analyse or use the data and have not prioritise BD as focus point. P12 pointed out that “Their organisation are fully aware of BD but their only challenge is time, they have a list of an entire projects prioritised / scheduled for year 2020

and some of them have carried over from previous year (2019) and because of that BD hasn't been prioritized for this year" (Appendix D12).

In the case of P13, the organisation has started working with an organisation from Stellenbosch helping them to use BD to analyse, extract, and enhance their performance and to reduce the emotive elements on their selection and allocation. According to P14 their organisation have no real experience with BD analytics. Their data is stored electronically as they are a paperless environment. Currently they do not analyse their existing data, and only store it as per directive of the Financial Sector Conduct Authority (FSCA). The Protection of Personal Information Act (no.4 of 2013) (POPIA) in South Africa requires FSPs to safely store all their records (financial, administrative, communications and correspondence) for five years. P15 stated that,

"Their organisation have a sizeable experience on BD. To give an indication on what they do, they are an investment brokerage company and they specialize in investment and do not spend time on short-term insurance, medical aid and others, instead they have a specialised areas of where they do their operations. So what they have done per client: they have a whole variety of investment and obviously that comes in a form of a statistic data and from time to time analyse it and make it their business to ensure that all their clients various investments on their brokerage code. They enjoy analysing the data and segmenting it to various forms like investment, retirement annuity and etc. Yes, they have devoted a lot of time on analysing data and it has been working for them tremendously" (Appendix D15).

Finding 1: Most of the FSPs are aware of BD.

Finding 2: FSPs do not have the knowledge and experience to utilise BD for their organisations.

Finding 3: FSPs do not use BD to analyse client's needs.

Finding 4: FSPs lack time and reliable resources as a major constraints to implement BD.

Finding 5: FSPs have little or no experience with BD.

IQ 1.1.2: What are the main obstacles that would prevent your organisation using big data analytics?

This question was asked to determine the obstacles facing FSPs when considering BD strategies and implementation. Only P1 stated that they don't have any obstacles preventing their organisation using BDA other than time and resource. Furthermore, their organisation has started working with a team of data scientists who help them to pull the different datasets together. The data scientists also create the links between individuals in different datasets so that FSP can see a more comprehensive profile of individuals, as well as people they are dealing and working with.

P2 believed that cost and the skill to handle BD are the main obstacles preventing their organisation in using BD analytics, since their head office is situated outside South Africa.

Providing money to their South African branch has always been a major challenge. They don't have the necessary skills or understanding of BD and there is no specific focus for the skill. As a result they don't have the necessary systems or tools implemented.

P3 was of the opinion that collecting the right data from a reliable source has been identified as their major obstacle preventing their organisation from using BD analytics. Their organisational data is more about people's personal life which gets collected by their consultants and feeding their system. They look at various things about the person lives of their clients. The data is qualitative data in nature, getting it into the right structure to be usable is quite difficult for them. A further challenge is to get consistent data. P3 said that,

“I think here (Lifecheq) the main thing is collecting the right data and collecting it reliable. Our information for example is a lot about someone's personal life so our consultants feed that information in our system for example this is how much I earn, this is how much money I have left, this is how many people I am supporting in my family and we look at various things about the person and a lot of that is qualitative information getting that into the right structure and become usable is quite difficult for us at the moment and also getting that information from people in a consistency way is hard. For me getting the process to get that right is tricky” (Appendix D3).

P4 stated that they don't have any obstacle(s) that prevent their organisation from using BD analytics other than collecting and analysing data. P4 explained that “They don't know how to collect and analyse any data because according to them if they would like to use the BD, they have to source their own BD and they don't know how they would use that data to gain more clients and sell more products” (Appendix D4). P5 believes that they don't have any obstacle(s) that prevent their organisation from using BD analytics however in the same breath said that “They don't have time since their organisation is focusing more on making sales to keep the organisation moving” (Appendix D5).

P6 and P7 stated that their organisations are currently not using BD, but indicated that they recently attended a course on behavioural change in financial management. At the course it was pressed on the delegates that gone are the days where FSPs just sell products to clients. Instead of just selling FSPs need to provide services based on client's needs. P7 indicated that,

“The only obstacle they have is to segment the data to get correct information out of it. Furthermore, one of their organisation is running BD for them. Running the process to extract good data require about 6 hours to overnight to download such data from Bloomberg. Importantly they do see cost as an issue. They are willing to pay for quality data and have it analysed for them” (Appendix D7).

P8 did not mention any obstacle(s) preventing their organisation from using BDA. However, the P8 has indicated that they are in a big drive currently with ESG investment (Environmental, Social and Governance). According to P9 cost is their biggest obstacle. They have between

8 000 and 10 000 individual clients. If there was a cheaper way for them to extract information and better ways to apply BDA they would consider it. They are currently contracted with almost 100 FSPs to outsource their client's investment management for them. P9 stated that,

“Cost is our biggest obstacle. We have relationship of between 8 000 to 10 000 individual clients. However, if there was an easier and cheaper way to extract and utilise client's information then we can consider using BDA. We are currently contracted with almost 100 of FSPs that outsource client's investment management. We have employed a specialist in the financial advisor field to learn about financial investment, funeral cover, gap cover, and medical cover. It becomes more complicated such that the regulator keeps on changing the rules. One needs to have a category 2 which is sub categorised into two: where category 2a requires to run a fund with a minimum amount of 3 000 000 (running from their account not the companies money) or thirteen weeks of working capital in their banking account at any stage of the financial year. This is to avoid any adverse risk such as Ponzi scheme where clients lost lots of money. In a nutshell they manage funds on behalf of the financial advisors” (Appendix D9).

P10 mentioned that they haven't come across any obstacle and it is difficult for them to respond to this question. However, on further probing P10 said that the ease of getting access to BD and reliability of the data is an issue. According to P11 their organisation lacks the relevant skill and do not have the time to implement BD strategies such as collecting and analysing the data.

According to P12:

“Their main obstacles preventing them from using BDA are as follows: time and handling of an unstructured data. Talking about emails, they have thousands of emails that goes out of their server per day, under number of unstructured data sitting there and it is difficult to search. However they have a project setup for next year planning on making their emails far more structured so that they can have them system based, such that they can be able to search through them and indexed, and with the whole point of BD they can be able to get information that can assist their business” (Appendix D12).

P14 did not have any obstacle(s) preventing their organisation from using BDA. P14 said that they don't have time for it and it's not in a line of their profession. They had been approached by other insurers asking if they can provide them advises on the analysis to push or increase their business. The FSP did not do this as yet and doesn't think there is a current need for that beyond what their current business process which is data storage.

P15 indicates that their specific problem is to get information pertaining people which are retiring for an example at the University of Stellenbosch, furthermore that exercise to access that information of people retiring is an obstacle for them.

Finding 6: Time, cost, resources and skills are the main obstacles preventing FSPs from using BDA.

Finding 7: Collecting reliable data and analysing the data are seen as main challenges.

IQ 1.1.3: How does your organisation categorise your existing customers?

This question was asked to examine the challenges faced by FSPs when using BDA in building and differentiation customer segmentation to create a competitive advantage. P1 states that they view their customers differently compared to other FSPs. However, they need the same kind of information because a FSP must understand their customer's value, must understand enough to classify customers with their personality standards. P2 indicated that,

“We use a very simple model. We look at various types of products we sell or provide (A, B and C) and our existing customers. We arrange our products into different portfolios using the following criteria: how big the portfolio is and how long we have stored a customer in that portfolio before it gets matured. Eventually all of these criteria impact our bottom line eventually and our retention of existing customers. However, it is based on how long a customer has been paying premiums in order to retain them” (Appendix D2).

P3 mentioned that their customers are categorised based on location. P3 said that,

“Cape Town and Johannesburg clients are not the same. Johannesburg clients are more keen to try new things. When looking at their finances they often have side hustle, unlike Cape Town clients generally don't have any side hustle, very little on engaging and they don't have lot of questions compare to Johannesburg clients” (Appendix D3).

P4 stated that they categorise their client as good or bad customers. They regard as a good customer if the customer pays their product(s) or account and a bad customer doesn't pay their product(s) or account. P4 followed by saying that,

“We decide whether to sign up with a client based on the ease of doing business with the client. This was substantiated by an example of client A with 10 million rand as a difficult client to work with versus with client B who has 1 million rand as an easy client to do business with. Furthermore customers are also categories based on ease doing business with them” (Appendix D4).

P5 shared that they categorise customers based on the timeframe having business relationship and said that “Customers with less than five years relationship are categories as “Bronze” customers, customers with more than five years relationship but less than 10 years relationship are categories as ‘Gold’ customers and customers with more than 10 years relationship are all categories as ‘Platinum’ customers” (Appendix D5). P6 and P7 mention that ,

“Our clients are categorised as: ‘A’, ‘B’, and ‘C’ which is based on the income they generate. An ‘A’ client generates more than R30 000 a year for the organisation, a ‘B’ client generates more than R15 000 a year for the organisation and a ‘C’ client

generates any amount less than R15 000 a year for the organisation” (Appendix D6 & D7).

P9 indicated that they categorise their existing customers based on the timeframe they have a relationship with the customer and stated that,

“Our business started in 2001, we categorise our customers based on the number years with had relationship with them and also on the size of investment. For example, an R100 000 amount is regarded as a small investment and R10 000 000 amount is regarded as a big investment. We also value and manage a relationship of a customer who has an R10 000 000 amount, with a son saving R500 towards his retirement annuity, a wife with R30 000 tax free savings account” (Appendix D9).

P12 stated that they categories their customers based on the services they offer to them. P12 further said,

“They categories their customers based on services they offer versus what they can get in return from their customers. The complementary services are for specific customers but it boils down to the specific needs of the customer. For example, Medshield scheme have a lot of co-payment cost involved and their Gap cover product covers it. On the other hand you will find other medical scheme does not offer co-payment as much as Medshield does. Therefore, they are prime to market gap cover product with customers using Medshield scheme” (Appendix D12).

P15 said they sub-divide their clients as “A”, “B”, “C” and “D” in terms of the amount money that they have investment with them.

Finding 8: FSPs categorise their customers based on service they offer to the customers.

Finding 9: FSPs categorise their customers based on their age, affordability, location, timeframe they had business relationship with them and income they generate from them.

IQ 1.1.4: How do you manage your competitiveness against your competitors?

This question was asked to gain better understanding of any factors affecting SMMEs to adopt BDA for creating competitive advantages and to determine how FSPs can utilise BDA in order to create a competitive advantage. P1 stated that their customers are different from other FSPs. For them the more they understand FSPs the better they service their needs. P1 stated that,

“With all their competitors they have the most data about FSPs. They have the most data about FSP’s level of education, and number of years’ experience. They know in advance how long it takes for a FSP to be complaint or meet certain criteria for being complaint. They are aware that very few of their competitors will actually have that data, and even if they have, they wouldn't know about it or know how to utilise it. They are busy developing a software application that will calculates all the requirements a FSP needs to be compliant for example, number of experience, any short term training

required, qualifications and continuous professional development. The system will also provide a functionality to indicate what qualification a FSP would need and indicates when a FSP is required to start the qualification” (Appendix D1).

P2 said that managing competitiveness against their competitors is a big issue for them. They don't manage competitiveness against competitors because their company is huge at UAE, UK and US, which makes them unworried about South Africa market. P3 mentioned that they don't think there is another company in South Africa currently doing what they doing. P3 mentioned that they do have competitors because every company does have competitors. P3 preferred not to say much about their business since it's quite a key for them right now.

P5 stated that they use a pricing analyses model to manage competitiveness against their competitors. They strive to provide cheaper advice fees compared to their competitors.

P8 mentioned that on the institutional space they do not focus mainly on the competitiveness against their competitors saying that,

“They consider which asset classes is most effective to their business and focus mainly on the equity investor. They analyse the life style of the investor. In essence they are quality style investors, others focuses on value growth and momentum is more indexing and they compete among index investors. However, there is a limited data on various styles because everybody has their own interpretation and it is largely driven by the data provider body like MSCI who has defined indices based on various equity styles and as an organisation they have their own products, a quality investment fund, some competitors may define it differently but it all depends on what type of data it is in your disposal. For their funds they have done a research and valuation to package it to suite their style. It is difficult to do a comparison with other competitors because everybody wants to be unique in their styles” (Appendix D8).

P9 argued that everything in the world is competitive, but all depends on good services in the most realistic way. P9 stated that,

“Their business runs on 25 percent base the investment company makes annually. For every rand invested they got 0.25 return on investment. It takes time to build this kind of business and relationships as well. Performance is key, if you are sour in performance you run a risk to lose a customer the minute the market don't perform. Their priority is to be the best performing organisation, by taking a volatility risk and making it into a package that they can sell to advisors” (Appendix D9).

P11 argued that the more they know their customers the better they can service all their dissimilar needs. The service is based on the data they have about the customer. So, their best strategy for now is to collaborate with other organisations so that they can better service their customers. P12 stated that they manage their competitiveness against their competitors by comparing their services and products to similar competitive products and services to see

where a gap can be obtained. P12 mentioned that they certainly use their gap product cover and compare it with other gap products out there. P12 supported the argument by saying that, “They have their own gap cover and therefore they are in charge of its benefit and cost. Fundamentally they compare gap cover benefits yearly, with all types of claims came through, customer’s needs and compare it with their competitors gap cover in order to adjust their benefits accordingly. This is done yearly exercise to make their product competitive” (Appendix D12).

P13 mentioned that they outperform the competitors. It depends on how to they manage their performance and cost structure plays a role.

P14 stated that they believe in the way they do their business. The operation of their business is conducted electronically and overall they manage their competitiveness based on the service they provide. Their correspondence are mostly electronically and are on record. Sometimes they have brokers that go visit their customer and all engagements are well documented. P15 stated that this is something they don’t really have a problem with. The quality of advice they provide serve as a sort of a divider between them and their competitors.

Finding 10: Most of FSPs believe they don’t have competitors.

Finding 11: FSPs don’t manage competitiveness.

Finding 12: Some of the FSPs manage their competitors by: attending roadshows and presentations, lowering advisory fees and provide good quality services.

IQ 1.1.5: How would big data add value in the organisation?

This question was asked to determine if FSPs sees the value of BD for their businesses. P1 stated that BD would add an immense value to their business. P1 mentioned that,

“They know for instance by using BD they would be able to indicate how many repetitions or datasets they would need to improve their reliability scores in their predictive modelling or information management. They are keen to understand why a particular customer is battling with a qualification. They will be able to help and assist customers who are battling to finish any qualifications. Depending on what angle people are involved in their business, BD will help them to understand that person so well. They will be to manage and coach that person before that person realize his / her needs or problems” (Appendix D1).

BD adds value to both internal and external processes. Internal process means BD will bring more staff satisfaction, staff happiness and help them to retain their staff as P2 said, “BD will add value in their organisation by helping them to determine system and process upgrades, helping their employees to operate better, provide better services to their customers and help their organisation to keep their customers and be better competitive in their market” (Appendix D2).

P3 as well as P4 argued that BD adds value in their organisation because they are dealing with number of aspects on customer's financial life. They have an insurance product which requires lot of customer's personal medical history. P3 mentioned that,

“There are lot of BD applications in the market that contain customer's medical history that they can use upfront to determine customer's monthly premium. New start-up insurance companies will start using the medical aid data history to improve pricing. They know a start-up company who is going to use that data and they know a big insurance company who has been trying to use that data but unfortunately it's been struggling. They understand a good system interface will help them to collect data from their customers” (Appendix D3).

P5 and P13 said that BD adds an immense value in their organisation by identify new clients because according to them getting new clients and creates the potential to earn more revenue by increasing performance and profit margins. P8 mentioned that “The more they have good quality data access the better the analysis outcomes because it will be based on clean data. BD will add value in their organisation to perform risk analysis” (Appendix D8).

P9 stated that,

“They do not use BD since their main focus is on investment. They require an upfront fee to their customers but in most cases they do not want it. To operate a business the same way they operate, a FSP will require to have at least 10 years of relationship with its customers before it starts gaining a profit income. Online investment may be an approach but in South Africa is not yet forthcoming. Their approach was to then manage big pocket of fund online. They don't necessary develop a products, and most of the money they manage is discretionary fund, which different clients purchase in a form of unit trust, equity, commercial properties, bonds, money market what they blend into a package for a client. That is not really a product but investment money lying around from different companies e.g. Alan Grey, Investec. The only product that they have is retirement annuity and tax free savings other that they do see indulgent policies or trade indulgent products as products but those as well they do not create them but adopt them from big investment companies. They tailor-made these products according to the customer's need. Some of these products are showing profits, some are showing declines and loses. When they consult with a customer for advisory, they record all their sessions. After the session they conduct an objective analysis that determines the customer's appetite and benchmark for the portfolio investment. They measure their performance using rolling terms which is CPI +3 over a three year period” (Appendix D9).

P10 indicated that the more data they have the more they can do business. P11 further mentioned that BD will help their organisation to better understand their client needs and help them identify their peak periods so that they can sufficiently cater their services.

FSPs need to obtain information which they cannot just get it by looking at raw data. They need to analyse it and get trends from it. It became evident that there is a space for BDA to push/take their business to the next level. P14 is of the opinion that their FSP do not have the capacity at this moment to drive the BD opportunity. BD also provides FSPs to build a competitive services according to P15.

Finding 13: FSPs believe that BD will add value to their organisations.

Finding 14: FSPs have indicate that BD will add value by:

- i) Improve their reliability score in predictive modelling.
- ii) Bring more happiness and satisfaction to their internal staff.
- iii) Identify customer's assets and income in order to get new customers.
- iv) Identify customer's needs and help them to provide better services.
- v) Identify any gaps in their current products.
- vi) Increase FSP's performance and profit margins.

4.9.1.2 RSQ 1.2: What are the factors affecting FSPs when adopting BD analytics for creating a competitive advantage?

IQ 1.2.1: Do you think FSPs are having challenges in adopting BD?

This question was asked to determine if FSPs are having any challenges in adopting BD.

P1 stated that FSPs are experiencing huge challenges in adopting big data. P1 mentions that, "Some of the FSPs don't have data. Some of the FSPs do have data but they don't realize they have it. Some of FSPs have a diverse set of data which has become meaningless to them unless they go the BD process or program. Very few of the FSPs really understand the bigger picture of what data can do for them" (Appendix D1).

P2 argued that FSPs haven't really explore BD however they think there is a lot of data floating around which gets used on an unstructured basis.

P3 mentioned that FSPs are having challenges in adopting big data and said that,

"When they want to record data, they don't know how clean the data is and that is the hardest part for them. They always think it's their systems. If their system can perform or behave like most website, provides customers a functionality to review their medical aid for example that would be great and easy. The challenge is they record a lot of customer's information manually. Customers sometimes capture their information on their system or our consultants call customers capture their information" (Appendix D3).

"FSPs don't understand BD, don't know how to use it or implement it to their advantage and to them BD is foreign" according to P4 (Appendix D4). P5 mentioned that collecting the right data is one of their biggest challenge FSPs are having in adopting BD and their organisation does not understand BD or have no any experience dealing with BD. P6, P7 and P10 were of the opinion that no they don't have any challenges in adopting BD and are currently storing

most of their data in files and backup system. P8 stated that accessing good quality data it's an obstacle for FSPs and good quality data comes at a ridiculous price. P9 mentions that FSPs don't have enough data and said that,

"They have started the business in 2001 and they might be sitting with lots of information or trends that they do not realise that they have or in a position to extract them. At the moment they are using three various systems, for different purposes: for reporting, fees, and CRM perspective and the systems don't necessary talk to each other" (Appendix D9).

P11, P12, P13 and P14 mentioned that they are having challenges in adopting BD because they do not understand BD and they are only aware of it. FSPs are spending large amounts of money in updating their computers and systems specifically their databases.

Finding 15: Most of the FSPs have a huge challenges in adopting BD.

Finding 16: The following are some of the challenges faced by FSPs in adopting BD:

- i) FSPs don't have any data or are not aware if they have it.
- ii) FSPs haven't really explore BD and don't know how to use it or implement it to their advantage.
- iii) FSPs are having challenges in collecting good quality data.

IQ 1.2.2: Do you think FSPs have the right analytical tools or skills to handle unstructured data?

This question was asked to explore if FSPs have the right analytical skills and tools to handle BD. P1 stated that,

"Very few of FSPs are really focusing on BD. They are focusing more on the client's needs or client's solutions without understanding the value of BD. FSPs don't have systems, they have lot of information with them and the information is stored in the spreadsheets. Some of the FSPs have a lot of data however they don't necessary see the value of it because they don't understand BD" (Appendix D1).

P2 mentioned that their organisations doesn't have the right analytical tools or skills to handle unstructured data. P2 said that "They will have to employee or get the external people to assist them with BD. They need both the skills and tools to handle unstructured data" (Appendix D2).

P3 stated that in their organisation they do have people with experience to handle unstructured data and have experience to analyse data because they have done it before.

P4, P5, P6, P7, P11, P12, P13 and P14 indicated that they don't have the right analytical tools or skills to handle unstructured data. For example, P8 mentions that in this industry FSPs use excel, stating that,

"Some of the FSPs have internally systems. Other FSPS use python data set. Access to the tools is too much of an obstacle for FSPs unless if there are tools out there that they are not aware of. The challenge FSPs are facing they don't have a skilled personae to analyse the data and use it meaningful for them. There is always a

shortage of skills when it comes to that. They do have some guys with the right skills however they still need to train them and they have hired some graduates which they will train them to do data analysis. Most of their employees have skills in data management, quantitative management and mathematical skills BDA. It is a matter of bringing those skills together” (Appendix D8).

P9 indicated that they have the right analytical tools or skills to handle unstructured data. However, they don't think their employee's skills are being used appropriately to generate more investment and more income at the end they need to make money. P12 stated that currently as it stands they do have analytical tools to handle unstructured data. P12 mentioned that,

“They haven't or decided to have analytical tools or systems. However if they decided to have analytic tools or systems, they will make it as project so that they can put more time and focus on it. They will definitely do through research on it to understand all the different tools that are out there in the market and choose specific the one that is tailored or carted to kind of product and services offered by the company” (Appendix D12).

Finding 17: Many FSPs (9) don't have the right analytical tools or skills to handle unstructured data.

Finding 18: Some FSPs (4) do have the right analytical tools or skills to handle unstructured data.

Finding 19: Two FSPs do not focus on BD.

IQ 1.2.3: Do they have a desire to know about big data?

This question was asked to determine if FSPs are willing to understand and know more about BD. P1 mentioned that all the FSPs have a desire to know about big data. P1 claims that “All FSPs think they want more data. They want more knowledge about their current customers. Very few of FSPs would say they don't want more data about their customers, they always want more data about them but they do necessary understands what to do with that data” (Appendix D1). P2 mentioned that their current management do have the desire to know about BD. Their model is more on selling their products. P5 states that FSPs have a huge desire to know about BD and they think it will help them a lot to gain more new customers. P10, P11, P12, P13, P14 and P15 were also of the opinion that FSPs wants to know more about BD. Contrary to P2 and P5, P3 stated that FSPs don't really have a desire to know about BD because the majority of their employees know BD and have dealt with it. P4 mentioned that majority of their employees are on average 50's years of age and stated,

“FSPs are comfortable with operating model and their business going is going well. They don't see the need to expand further. However, they do have younger generation which needs to pursue and make use of BD to grow the business. The younger generation is much isolated and unlike the older generation whom grew their business

from social contacts and activities such as playing golf. They need to look into other ways to find customers” (Appendix D4).

FSPs do not know where to start as it probably seems it is something complex and needs more time. No one is ever willing to spend time and money on something they do not know how it will help them. More especially when they don't even know the problem is going to solve.

Finding 20: Some FSPs (4 out of 15) don't have the desire to know about BD.

Finding 21: FSPs have a desire to know about BD.

4.9.2 Research Question 2

RQ2: How can FSPs utilise BD analytics in order to create a competitive advantage?

4.9.2.1 RSQ 2.1: How do FSPs determine the needs of their customers?

IQ 2.1.1: Do you see any benefit in using big data to create competitive advantage in your organisation?

This question was asked to determine if FSPs can use BD to create competitive advantage.

Eight FSPs (P1, P2, P4, P8, P9, P10, P12 and p14) perceived some benefit in relation to the benefits that can be realised when using BD. P5 and P11 stated that there is a huge benefit in using BD to create competitive advantage in their organisation. This is because the more they understand their clients the better the service they provide to them. P13 was of the opinion that BD definitely yield to performance. P15 concluded by saying that if FSPs can use BD positively it will enhance growth of their companies. However, P3, P6 and P7 did not see any short-term benefit on using BD to create a competitive advantage to their organisation.

Findings 22: FSPs are seeing benefits in BD to create competitive advantages for their organisations.

IQ 2.1.2: In your own view, what can BD analytics do to improve your customer's needs?

This question was asked to determine if FSPs are seeing the value in using BD.

P1 stated that,

“BDA can improve customer's needs by improving their set of solutions noting that products being developed in South Africa becomes extremely complex with multiple numbers of variations. If machines can be in a better position to ultimately match a product, combines it with the customer's needs and be able to put a solution together. Advisors within the FSPs belief that they understand all the products very well. 95 percent of the products they understand very well but there is still a 5 percent of products that are extremely hidden or complex for them, especially if they start looking on things like disability cover, income replacement they are so many implementations that they can actually look at” (Appendix D1).

P2 stated that BDA may help FSPs to be able to identify and allocate tailor made products to their customers and also help them to measure customers' needs accordingly. P3, P5 and P11

mentioned that BDA can be used on product pricing, which will result in cheaper products for customers. P4 stated that in answering this question from the time point of view they do not waste their time to market the unnecessary services. P6 and P7 indicated that BDA may not be used for profiling. P6 was of the opinion that,

“BDA can be used to advise or notify customers with the new products and services, noting that FSPs need to have the latest knowledge on the international markets trends and that information is retrieved on the internet through Bloomberg. Example was also provided on how Discovery analyse the national needs and identify the gaps and capitalise on it by developing a product that they make money out of it. But it is a little different in the financial industry based on the regulations” (Appendix D6).

P8 opined that BD analytics maybe used to determine the customers really needs as well as customised solutions noting that not all 25 years old have the same objectives or act in the same manner and BD will identify the real nuance of every customer segment. P9 mentioned that a happy customer is for life. Getting more information from customers will be of good advantage, for example what are FSP doing well, where to improve, and identify all the unnecessary things. P10, P12, P14 and P15 responded in agreement to the fact that BDA can improve their customer's needs, determine customer's needs to improve services. P13 said that customers come to FSPs because they want performance. What basically happens is that, FSP sells to friends or families therefore they have to deliver performance. As long as they perform their customers are happy.

Finding 23: FSPs agreed that BDA can help them to improve in identifying their customers' needs.

Finding 24: FSPs mentioned that BDA can be used to identify gaps, assist in terms of identifying customers' needs and also help them to inform and price product to remove redundancy on products markets.

4.9.2.2 RSQ 2.2: How can FSPs incorporate BD in their business strategies?

IQ 2.2.1: Does your organisation have a strategy on big data or data analytics?

This question was asked to identify any challenges faced by FSPs to include BD strategies into their organisations. P1 mentioned that they do have a strategy which they are busy working on it. P1 further stated that “There is a different strategy used by their organisation to understand the diversity of the information they had on customers in different datasets and they also understand the value of combining those datasets and start finding information about their customers that they normally won't make leads on them” (Appendix D1). P15 indicated that they do have a strategy on BDA and mentioned that they analyse all the information that they have and devote a lot of time on the information to ensure that whatever the customers' investments they are would be under their management.

FSPs have a premature BD strategy since they are mostly using CRM systems. P2 stated that “They got a system which store all their customers’ data on it. All the documentations are stored on it for the purpose of registration and FICA. They also keep their policy documents, variations and personal data” (Appendix D2). P4, P5, P6, P7, P10, P12 and P13 have on the other hand indicated that they do not have BD strategy or BDA strategy. P8 and P9 mentioned that although they do not have a clear defined strategy at this moment. They would like to move towards a centralised data hub, to access more sensible data. P11 and P14 state that they don’t have a strategy yet but considering it because technology advances every day and as an organisation they would not want to be left behind in the technology evolution.

Finding 25: FSPs do not have a strategies on BD.

Finding 26: FSPs want to use BD strategy in developing a systems based approach to enhance their growth.

IQ 2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

This question was asked to determine the perceptive view of FSPs towards Strength, Weakness, Opportunity and Threats (SWOT) approach and how the FSPs asses SWOT analysis in order to understand their business climate. FSPs do in some way or another do SWOT analysis at least once a year. It may differ from every three months (P1, P3 & P4). P1 indicated that they assess their SWOT every three months. P2, P8 and P9 said that they do the analysis twice a year. P9, P12 and P15 stated that they conduct their SWOT analysis at an annual basis which is convened every year towards the middle of January and they also have a strategic session.

P6 and P7 mentioned that their SWOT analysis is not based on BD. They do conduct personal introspection. They’ve indicated that to understand the current business climate they attend webinars with international role players. P10 didn’t provide periodicity in terms of conducting their SWOT analysis saying “They do know number of customers they are losing and tare trying to find out why these customers are cancelling their services with them. For any service provided to the customer they always seek for feedback from the customer. All the feedbacks are consolidated and discussed on their meetings” (Appendix D10). P11 mentioned that they do conduct SWOT analysis and it is a continuous assessment they do weekly as things change frequently. They considers this as a less costly approach because they address situation before it expands or becomes costly.

Finding 27: FSPs do perform SWOT analysis.

IQ 2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

This question asked to see how FSPs look at their competition and to see where they need to improve. FSPs evaluate on a regular basis their competition (P1, P2, P3, P5, P6, P7, P9, P10,

P11, P12, P13, & P15). P4 mentioned that they don't have much involvement with other colleagues in the same industry. However, periodically they look at the outputs from other financial advisors and compares it with their own. In 90 percent of the cases they offer better services and are confident on that. P8 said that they don't put their focus too much on the competition side but on their own offering, stating that it may be a draw back. P14 on the other hand felt that there is no need to assess competitiveness because there are not many financial consultancy out there.

Finding 28: FSPs frequently analyse competition and have demonstrate varies approach to the process with some doing it often depending on the organisation.

4.10 Summary of findings

All the findings listed below have been extracted from the research questions and themes are obtained from the findings.

4.10.1 Findings RQ1:RSQ 1.1

Table 4.4: Shows fourteen (14) findings from the RSQ 1.1.

Table 0.4: Findings for RSQ 1.1

Finding No.	Description
Finding 1	Most of the FSPs are aware of BD.
Finding 2	FSPs do not have the knowledge and experience to utilise BD for their organisations.
Finding 3	FSPs do not use BD to analyse customer's needs.
Finding 4	FSPs lack time and reliable resources as a major constraints to implement BD.
Finding 5	FSPs have little or no experience with BD.
Finding 6	Time, cost, resources and skills are the main obstacles preventing FSPs from using BDA.
Finding 7	Collecting reliable data and analysing the data are seen as main challenges.
Finding 8	FSPs categorise their customers based on service they offer to the customers.
Finding 9	FSPs categorise their customers based on their age, affordability, location, timeframe they had business relationship with them and income they generate from them.
Finding 10	Most of FSPs believe they don't have competitors.
Finding 11	FSPs don't manage competitiveness.
Finding 12	Some of the FSPs manage their competitors by: attending roadshows and presentations, lowering advisory fees and provide good quality services.
Finding 13	FSPs believe that BD will add enormous value to their organisations.
Finding 14	FSPs have indicate that BD will add value by helping them to: Improve their reliability score in predictive modelling. Bring more happiness and satisfaction to their internal staff. Identify customer's assets and income in order to get new customers. Identify customer's needs and help them to provide better services. Identify any gaps in their current products. Increase FSP's performance and profit margins.

*RSQ = research sub-question

4.10.2 Findings RQ1: RSQ 1.2

Table 4.5: Shows seven (7) findings from the RSQ 1.2.

Table 0.5: Findings for RSQ 1.2

Finding No.	Description
Finding 15	Most of the FSPs have a huge challenges in adopting BD.
Finding 16	The following are some of the challenges faced by FSPs in adopting BD: FSPs don't have any data or are not aware if they have it. FSPs haven't really explore BD and don't know how to use it or implement it to their advantage. FSPs are having challenges in collecting good quality data.
Finding 17	Many FSPs (9) don't have the right analytical tools or skills to handle unstructured data
Finding 18	Some FSPs (4) have indicated that they do have the right analytical tools or skills to handle unstructured data.
Finding 19	Two FSPs do not focus on BD.
Finding 20	Some FSPs (4 out of 15) don't have the desire to know about BD.
Finding 21	FSPs have a desire to know about BD.

*RSQ = research sub-question

4.10.3 Findings RQ2: RSQ 2.1

Table 4.6 shows three (3) findings from the RSQ 2.1.

Table 0.6: Findings for RSQ 2.1

Finding Number	Description
Finding 22	FSPs are seeing benefits in BD to create competitive advantages for their organisations.
Finding 23	FSPs agreed that BDA can help them to improve in identifying their customers' needs.
Finding 24	FSPs mentioned that BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform and price product to remove redundancy on products markets.

*RSQ=research sub-question

RSQ 2.2: How can FSPs incorporate BD in their business strategies?

Table 4.7 shows here findings of RSQ 2.2.

Table 0.7: The findings for RSQ 2.2

Finding No.	Description
Finding 22	FSPs are seeing benefits in BD to create competitive advantages for their organisations.
Finding 23	FSP agreed that BDA can help them to improve in identifying their customers' needs.
Finding 24	FSPs mentioned that BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform and price product to remove redundancy on products markets.

*RSQ = research sub-question

4.10.4 Findings RQ 2: RSQ 2.2

Table 4.7 shows the findings of RQ2: RSQ 2.2.

Table 0.8: The findings for RSQ 2.2

Finding No.	Description
Finding 25	FSPs do not have a strategies on BD.
Finding 26	FSPs want to use BD strategy in developing a systems based approach to enhance their growth.
Finding 27	FSPs do perform SWOT analysis.
Finding 28	FSPs frequently analyse competition and have demonstrate varies approach to the process with some doing it often depending on the organisation.

*RSQ = research sub-question

4.11 Headline findings

From a total of twenty-eight (28) findings, five (5) headline findings were identified.

The following headline findings have been identified from the findings;

Headline finding 1: Most of the FSPs are aware of BD

Headline finding 2: FSPS have challenges in adopting BD, namely:
the lack of Knowledge and experience
the lack of time and reliable resources

Headline finding 3: FSPs are seeing benefits in BD to create competitive advantages for their organisations

Headline finding 4: FSPs mentioned that BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform a specific product

Headline finding 5: FSPs do not have a strategy on BD

4.12 Categories and themes development

Twenty-eight (28) findings were derived from the interviews. These findings were summarised and then categories were developed on Table 4.9.

Table 4.9 illustrates the findings, and categories and themes. Findings are grouped together and therefore arranged into themes.

Table 0.9: Summary of RSQs, 28 findings (28), categories (11) and themes (5)

RSQ	Finding No.	Finding	Categories	Themes
RSQ 1.1	Finding 1	Most of the FSPs are aware of BD	Adoption	Management
RSQ 1.1	Finding 2	FSPs do not have the knowledge and experience to utilise BD for their organisations	Lack of skill	Training
RSQ 1.1	Finding 3	FSPs do not use BD to analyse client's needs.	Lack of Skill	Training

RSQ	Finding No.	Finding	Categories	Themes
RSQ 1.1	Finding 4	FSPs lack time and reliable resources as a major constraints to implement	Reliable data source and insufficient time	Data Management
RSQ 1.1	Finding 5	FSPs have little or no experience with BD.	Lack of skill	Training
RSQ 1.1	Finding 6	Time, cost, resources and skills are the main obstacles preventing FSPs from using BDA.	Insufficient time, cost effectiveness and lack of skill	Data management, Finance and Training
RSQ 1.1	Finding 7	Collecting reliable data and analysing the data are seen as main challenges.	Reliable data source and lack of skill	Data management and Training
RSQ 1.1	Finding 8	FSPs categorise their customers based on service they offer to the customers.	Customer experience	Marketing
RSQ 1.1	Finding 9	FSPs categorise their customers based on their age, affordability, location, timeframe they had business relationship with them and income they generate from them.	Customer experience	Marketing
RSQ 1.1	Finding 10	Most of FSPs believe they don't have competitors.	Strategic analysis	Management
RSQ 1.1	Finding 11	FSPs don't manage competitiveness.	Strategic analysis	Management
RSQ 1.1	Finding 12	Some of the FSPs manage their competitors by: attending roadshows and presentations, lowering advisory fees and provide good quality services.	Strategic analysis	Management
RSQ 1.1	Finding 13	FSPs believe that BD will add enormous value to their organisations	Adoption	Management
RSQ 1.1	Finding 14	FSPs have indicate that BD will add value by helping them to: Improve their reliability score in predictive modelling. Bring more happiness and satisfaction to their internal staff. Identify customer's assets and income in order to get new customers. Identify customer's needs and help them to provide better services. Identify any gaps in their current products. Increase FSP's performance and profit margins.	Adoption	Management
RSQ 1.2	Finding 15	Most of the FSP have a huge challenges in adopting BD.	Adoption	Management

RSQ	Finding No.	Finding	Categories	Themes
RSQ 1.2	Finding 16	The following are some of the challenges faced by FSPs in adopting BD: FSPs don't have any data or are not aware if they have it. FSPs haven't really explore BD and don't know how to use it or implement it to their advantage. FSPs are having challenges in collecting good quality data.	Adoption	Management
RSQ 1.2	Finding 17	Many FSPs (9) don't have the right analytical tools or skills to handle unstructured data	Lack of skill	Training
RSQ 1.2	Finding 18	Some FSPs (4) have indicated that they do have the right analytical tools or skills to handle unstructured data.	Skilled Personnel	Training
RSQ 1.2	Finding 19	Two FSPs do not focus on BD.	Adoption	Management
RSQ 1.2	Finding 20	Some FSPs (4 out of 15) don't have the desire to know about BD.	Adoption	Management
RSQ 1.2	Finding 21	FSPs have a desire to know about BD.	Adoption	Management
RSQ 2.1	Finding 22	FSP are seeing benefits in BD to create competitive advantages for their organisations.	Strategic analysis	Management
RSQ 2.1	Finding 23	FSPs agreed that BDA can help them to improve in identifying their customer's needs.	Strategic analysis	Management
RSQ 2.1	Finding 24	FSPs mentioned that BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform and price product to remove redundancy on products markets.	Customer experience	Marketing
RSQ 2.1	Finding 25	FSPs do not have strategies on BD.	Strategic analysis	Management
RSQ 2.1	Finding 26	FSPs want to use BD strategy in developing a systems based approach to enhance their growth.	Strategic analysis	Management
RSQ 2.2	Finding 27	FSPs do perform SWOT analysis.	Strategic analysis	Management
RSQ 2.2	Finding 28	FSPs frequently analyse competition and have demonstrate varies approach to the process with some doing it often depending on the organisation.	Market research	Marketing

*RSQ = research sub-question

4.13 Themes

Data collected from fifteen (15) participants that were interviewed have been analysed, which resulted in a summary of twenty-eight (28) findings, eleven (11) categories and five (5) themes. Table 4.10 represents the link between RQs and the themes developed.

Table 0.10: Represents the link between research questions and the themes developed

Research Questions	Themes
RSQ 1.1, RSQ 1.2, RSQ 2.1 and RSQ 2.2	Management
RSQ 1.1, and RSQ 1.2	Training
RSQ 1.1	Data Management
RSQ 1.1	Finance
RSQ 1.1, RSQ 2.1 and RSQ 2.2	Marketing

*RSQ = research sub-question

The above mentioned five themes represented in Table 4.10 will be discussed furthermore in the next coming chapter (Chapter 5). The five themes are: i) Management, ii) Training, iii) Data Management, iv) Finance and v) Marketing.

4.14 Chapter summary

This chapter supports a background of the BD on how FSP can utilise it to differentiate their customer segments and use it to create competitive advantage. The chapter represents all the interviewee responses and findings of the research study. All the findings are linked to the research questions and are grouped together in a tabulated form.

The participants included are: two Chief Executive Officers (CEO), Head of Risk Compliance, Chief Financial Officer (CFO), two Managing Directors, Fund Manager, Financial Advisor Category 2, two Chief Operating Officers, Head of business / Chief Operating Officer, two Owners and key Individuals, IT Manager and Principal Owner of the Business.

This chapter concludes with information from 15 participants' responses, 14 interview questions, a summary of 28 findings, 11 categories and five themes and seven headline findings.

Themes are: Management, Training, Data Management, Finance and Marketing.

The headline findings are:

Headline finding 1: Most of the FSPs are aware of BD.

Headline finding 2: FSPs have challenges in adopting BD, namely:

- i) Lack of Knowledge and experience
- ii) Lack of time and reliable resources

Headline finding 3: FSPs are seeing benefits in BD to create competitive advantages for their organisations.

Headline finding 4: FSPs mentioned that BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform a specific product.

Headline finding 5: FSPs do not have a strategy on BD.

The next chapter five (5) discusses the findings in terms of the themes developed.

CHAPTER FIVE: DISCUSSION

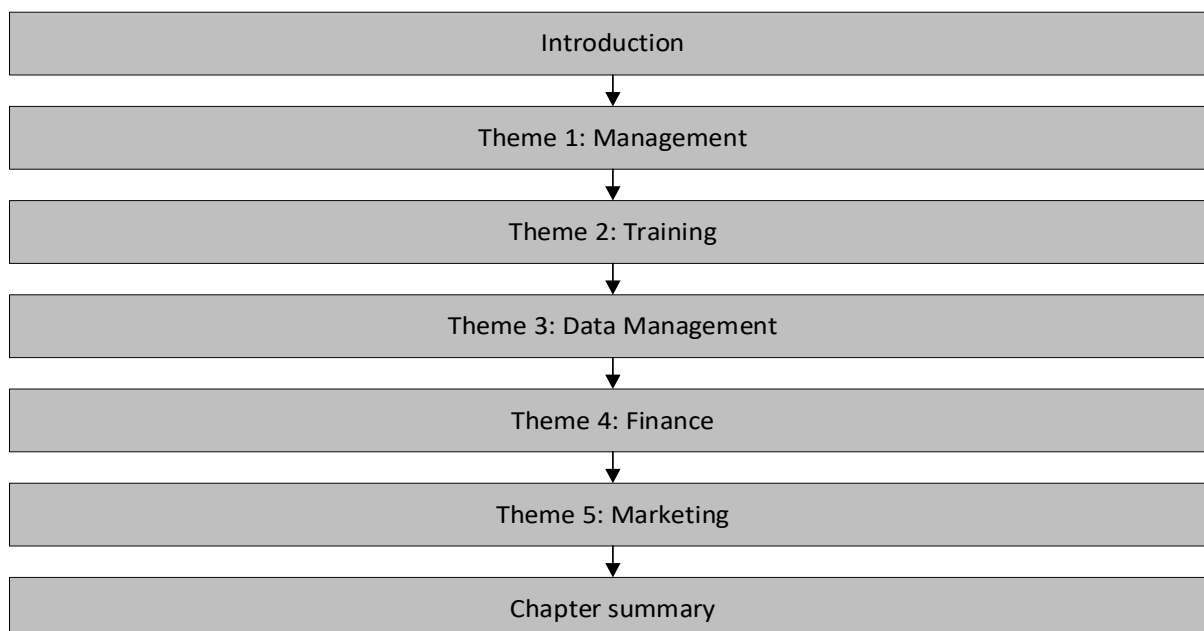


Figure 0.1: Layout of Chapter 5

5.1 Introduction

The chapter discusses the themes developed from the findings and linked to the research questions. The discussion arises against the background of the aim of the study, namely to explore how FSPs can use BD to differentiate their customer segments and to create a competitive advantage. Research questions together with the sub-questions are addressed within each theme. Themes are addressed and considered in the following order: i) management, ii) training, iii) data management, iv) finance and finally, v) marketing. The chapter ends with a summary.

5.2 Theme 1: Management

Management is an earliest practice in governmental, religious, military and other types of early organisations (Bowden et al., 2020). Wang (2020:38) defines management as “planning, organising, leading and controlling”. For this study the definition of management include four characteristics as mentioned by Bowden et al. (2020:33) namely:

- i) It pays attention to costs and labour value.
- ii) Management includes maximising competitive advantage.
- iii) Focuses towards numerous competitive markets for sustainability.
- iv) Management is supported by legal frameworks that guarantee contracts and protect property and individual rights.

Theme 1 relates to the following research questions and research sub questions: RQ1: “What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?”, RSQ 1.1: “What are the perceptions of

FSPs towards the value of BD for their businesses?”, RSQ 1.2: “What are the factors affecting FSPs when adopting BD analytics for creating a competitive advantage?”, RQ2: “How can FSPs utilise BD analytics in order to create a competitive advantage?”, RSQ 2.1: “How do FSPs determine the needs of their customers?” and RSQ 2.2: “How can FSPs incorporate BD in their business strategies?”

Finding 1 indicates that most of the FSPs are aware of BD. IT provides extensive opportunities to FSPs for automating, informing and business transformation (Paré et al., 2020). Endorsed by the increasing importance of IT to business performance, literature has been mainly done on management practices that affect the quality and range of IT’s impact (Rahimi et al., 2016). When attempting to deliver value from the organisation’s IT investment, it is a must to comprehend top management’s perceptions of the centrality or strategic significance of IT in their organisation (Paré et al., 2020). According to Paré et al. (2020:01), IT centrality refers to “the idea that IT assets might not be viewed as strategic by top executive’s goals and implementing its strategies”.

A positive outcome of this study is that FSPs are aware of BD. BD offers significant advantages for FSPs in order to gain competitive advantages and assist FSPs in making better recommendations and decisions for the customers. FSPs can utilise BD to analyse customer’s needs and help in developing products that meet customers’ needs. BD can be utilised by FSPs to seek innovative opportunities and new business opportunities. BD has been identified by Rahman (2017) as powerful competitive tool for FSPs to become more competitive and making better decisions. BD will not just bring opportunities for FSPs but will address challenges faced by FSPs to acquire knowledge in creating and implementing BD strategies. FSPs can utilise BD to differentiate their customer segmentation in order to customise their products and services offering.

IT management is recognised by Alt et al. (2020:610) as an enterprise function for planning, organising, and controlling IT resources such as people, processes, technology and data. Furthermore, Alt et al. (2020) state that software and IT services are the most important areas with IT management, and have a fundamental responsibilities for development, operations and managing third party software providers. In order for management to be fully functional, managers must step up, lead their teams efficiently with lot of confidence and maintain motivation (Ng et al., 2020). Finding 10 states that “most of FSPs believe they don’t have competitors” (Appendix D3). IT management can assist FSPs to be more competitive in a more demanding institutional environment that is both service based and knowledge based (Paré et al., 2020). According to Bowden et al. (2020) management entails maximising competitive advantage. To be the best and the most successful FSPs, FSPs must assess competitors from all angles and use different types of resources and capabilities to create competitive advantage (Jahanshahi & Bhattacharjee, 2020).

In today's evolving and competitive world, most organisations strive towards better ways to increase their competitiveness and leadership compared with their competitors (Jahanshahi & Bhattacharjee, 2020). According Mukunthan and Selvakumar (2019) FSPs ability to succeed over the competitors is a way to describe why some of the FSPs are more successful than others, and it is fundamental important to the survival in a highly competitive business world. There are positive results in better performance than competitors, if FSPs can identify and analyse their competitors. Finding 11 states that "FSPs don't manage competitiveness" (Appendix D8). Findings 12, 22, 23, 25, 26 and 27 indicate that BD can create competitive advantage for FSPs. The disadvantage of not managing competitiveness against competitors may results in FSPs lacking competitiveness improvement. Jahanshahi and Bhattacharjee (2020:04) have identified the advantages of competitiveness improvement namely:

- i) FSPs can provide better quality of products or services compared to their competitor's products and services.
- ii) FSP's managerial capability will be much better than their competitors.
- iii) FSP's profitability is better.
- iv) FSP's company image is better than that of the competitors.
- v) The competitors are struggling to take the place of the FSP's competitive advantage.

Enhancing competitiveness empowers FSPs to produce some superior services and products to their customers (Rahimi et al., 2016). Rahimi et al. (2016) refer to enhancing competitiveness as a degree to which FSPs can deduct cost, exploit opportunities and manage threats.

Finding 13 and Finding 14 state that FSPs believe that BD will add enormous value to their organisations. BD has been identified by Kaisler et al. (2020) as a developing phenomenon with a huge implications and effects on business strategy, profitability and process improvements. According to Faroukhi et al. (2020) value is the coherent goal of any organisation. BD can add value to FSPs by identifying potential competitive advantage and organise processes to create added value in breaking down strategically importance activities to comprehend all the impacts (Faroukhi et al., 2020). Line et al. (2020) mention that FSPs can utilise BD to generate an extra value from advertising, customer relationship management, marketing research, resale and trading of their products. Furthermore BD can be utilised to develop or improve the efficiency of loyalty program platforms and BD has value when utilised to improve advertising from targeted customers (Line et al., 2020).

Findings 15, 16, 19, 20 and 21 indicate challenges in adopting BD by FSPs. Chuah and Thurusamry (2021) note that data protection and data privacy are the biggest challenges faced by FSPs when adopting BD. The protection of data and security issues are lowering BD adoption. Another challenge with BD adoption by FSPs is organisational culture. FSPs do not want to share information towards each other but they need to start building a non-hierarchical culture of trust (Walker & Brown, 2019). Another challenge faced by FSPs with BD adoption

is infrastructure. FSPs must start investing in proper server equipment, high processors or middleware in order to manage BD (Chuah & Thurusamry, 2021).

Furthermore Chuah and Thurusamry (2021) mention that FSPs are struggling to interpret data quickly enough due to improper infrastructure and are faced with challenges on responding to complex queries with immense columns of data. According to Faroukhi et al. (2020) another challenge faced by FSPs is the limited existence of analytical software tools on the market. This leads to a struggle to discover analytical solutions with powerful and friendly interactive analytical competences tools. IT management and a complete execution of BD also need a team effort that entails lean and agile practices (Ghavami, 2020). A team effort is needed because no vendor solution, individual employee fulfils all the BD analytics requirements of the organisation and learn approach must be implemented to avoid duplication of work, process waste and discordant systems (Ghavami, 2020).

5.3 Theme 2: Training

Training is regularly linked with large effect sizes for outcomes in the areas of knowledge, skills and behaviours (Cooper et al., 2021). Sicari (2021:56) defines training as “key word and learned personnel keep learning from the way they shape the exam on the basis of a tailored approach to clinical non-invasive diagnosis”. According to Cooper et al. (2021) training is used to improve individual competence and improved team’s performance. For this study the definition of training is a technique designed to make a measurable difference to the employee performance and the entire business success.

Theme 2 relates to the following research questions and research sub questions: RQ1: “What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?”, RSQ 1.1: “What are the perceptions of FSPs towards the value of BD for their businesses?”, RSQ 1.2: “What are the factors affecting FSPs when adopting BD analytics for creating a competitive advantage?”.

Finding 2 has indicated that FSPs do not have the knowledge and experience to utilise BD for their organisations, and Finding 5 FSPs have little or no experience with BD. However, in order for FSPs to gain knowledge and experience in utilising BD, FSPs must start investing in BD trainings to gain knowledge and develops talents for their organisations. FSPs must start recruiting fresh people or graduates and provide them with experience, training, skills and knowledge. Having experience and knowledge on BD will results in FSPs becoming a more competitive advantage organisation. Furthermore FSPs will improve their business performance, grow their innovation capabilities and achieve better competitive advantage. Gaining knowledge and experience in BD will assist FSPs to identify systems compatible with the following requirements such as security, reliability, manageability, scalability, redundancy and usability before implementing them.

An appropriate BD training for FSP's employees provide them with a horizontal skill set while also providing them the soft skills associated with the current business changes (Solé-Beteta et al., 2021). Furthermore Solé-Beteta et al. (2021) mention that training of FSP's employees on BD, calls attention to the importance of encouraging the ability of their employees to perform core delivery objectives. According to Line et al. (2020) providing training to employees is all about educating employees to achieve better performance, empower employees to prepare for promotion and enable them to improve performance and productivity. Rothwell et al. (2020) distinguish training to be a push strategy meant to improve job performance and upturn production with a problem-centred strategy.

FSPs do not use BD to analyse client's needs, FSPs must start implementing BD strategies. If they don't, FSPs are facing a high risk of not be able to identify fraudulent activities within their organisations. BD will assist FSPs to customise their products and services. FSPs can utilise BD to improve their reliability. Furthermore BD can assist FSPs with effective marketing of their products. FSPs can utilise BD to identify any trends of their customer's needs and assist them to provide products and services suitable for their customer's needs. Using BD will assists FSPs to predict the potential churns from their existing customers.

Time, cost, resources and skills are the main obstacles preventing FSPs from using BDA. FSPs are looking for better ways to make organisational sponsored training programmes more attractive to their employees (Rothwell et al., 2020). In order to achieve this, FSPs must pursue accreditation equivalent to some training initiatives for university credit and make sure that their training are provided with highest standards of quality (Cooper et al., 2021). For better preparation on accreditation, FSPs must establish number of policies and procedures to administrate their training functions (Rothwell et al., 2020). According to Solé-Beteta et al. (2021) accreditation means that training and development programs are meeting the research based standards and are provided in good quality. Furthermore Rothwell et al. (2020:02) defined accreditation as a "process of independent attestation to the adherence of standards that meet the requirements of a profession".

Collecting reliable data and analysing the data are seen as main challenges. Finding 17 indicates that many FSPs (9) don't have the right analytical tools or skills to handle unstructured data. Finding 18 has indicated that some FSPs (4) do have the right analytical tools or skills to handle unstructured data. Buying data from other organisations can lower the cost of collecting data and FSPs can utilise that data to achieve their business objective. FSPs can collect data from various sources, use it to improve their capability to narrow their customer segmentation and also use it to tailor down products and services to their customers. The challenge faced by FSPs is that they don't have skilled personae to analyse the data and utilise it meaningful. FSPs must train their existing employee to do data analysis. An accredited training instils and prepares employees for future marketplace requirements, and builds a competent talents by setting learning goals for their performance (Sicari, 2021). The constantly

increasing amount and fast development of tools, techniques and technologies linked to BD require a wide skill set and training in order to deep understand BD domains ranging from engineering to business (Solé-Beteta et al., 2021).

According to Line et al. (2020) providing training to BD professionals is a way of equipping them with horizontal skill set and providing them with soft skills linked to the current society. Overall, training employees in the organisation to accept and solve complex problems or encounters in a multidisciplinary situation utilising collaborative strategies encompasses a wide skill set which results of broad interest in the field of developing technologies such BD (Solé-Beteta et al., 2021). Education innovation has been mentioned by various researchers as an efficient, effective and successful way to solve teaching and learning challenges in the modern education (Kaufmann, 2019; Sicari, 2021; Solé-Beteta et al., 2021). According to Cooper et al. (2021) there is a growing interest in FSPs to explore and consider new strategies to effectively train and shape its employees to master inaccurately connected disciplines, add value to their evolution industry and interact with different radically different profiles. On the other hand providing training to your employees, even utilising modern active learning strategies and project based training might take a considerable amount of time off for employees, which is typically not available from FSPs (Chuah & Thurusamry, 2021). When FSPs consider training of employees, it is necessary to consider training environments that best fit the needs of their employees. The environment should be open to the presence of all kinds of innovative technologies, methodologies and have a capacity to adapt employees coming from technologically, social, and physical perspective (Paré et al., 2020).

FSPs that provide regular quality training to their employees are naturally more scalable than FSPs that do not (Rothwell et al., 2020). As a result, FSPs that provide quality training to their employees become more attractive employer of choice because training practices have definable and lifelong benefits (Bowden et al., 2020). Training guarantees an investment which signifies the value proposition for an employee, an organisation and a customer (Kaufmann, 2019). It is important for FSPs managers to make sure the employee's training is fundamental aligned with the organisation's strategic goals, by doing so FSP will challenge its competitors and succeed its mission (Wang, 2020). Therefore, training plans that are aligned to the organisational strategies guide managers to design training modules that are beneficial to their employees (Rothwell et al., 2020).

For better operational compliance achievement FSPs must incorporate training (Hosseini et al., 2019). Furthermore Hosseini et al. (2019) state that training employees is regarded as mandatory educational exercise which must be conducted in order for an organisation to be compliant. FSPs must utilise training as an opportunity to improve and gain knowledge and talents essential in the people presently employed in the industry (Rothwell et al., 2020). FSPs must use training as a method to maintain and develop talents within their organisations (Paré et al., 2020). According to Cooper et al. (2021) training helps employees to meet organisation's

performance requirements, help them to continue meet requirements as work conditions keep on changing and prepare them for to meet requirements for future higher levels of responsibility.

In executing of strategy, offering training assists employees to be ready for tomorrow's jobs and to predict a new future (Hosseini et al., 2019). According to Rothwell et al. (2020:38) training can be structure using three basic models namely:

- i) **Centralised training organisation:** Where all programs, resources and professionals are housed as one unit, and all curriculum training decisions, programs and methods of delivering trainings are made.
- ii) **Decentralised training organisation:** Where all learning and training methods are housed from different operating departments throughout the organisation.
- iii) **Embedded training organisation:** Distinguish by organisational strategic alignment of learning, either some of training are housed centralised or decentralised.

Therefore organisational success is depend on having structured training department that is accountable for both internal and external training efforts (Solé-Beteta et al., 2021).

5.4 Theme 3: Data Management

DM defined by Alhajj et al. (2020:05) as “a vital requirement to secure data while also allowing users to query and retrieve the data”. Nda and Tasmin (2019:5009) describe DM as a “reality that represents a set of challenges involving BD modelling, storage, retrieval analysis and visualisation for several areas in organisations”. Several techniques has been suggested in the literature about BD management, analysis and data representation but very few articles are dealing with unstructured data in FSP (Kaufmann, 2019). FSPs can utilise DM to comprehend valuable information in BD set that are both structured and semi-structured coming from different sources (Kaufmann, 2019).

Theme 3 relates to the following research questions and research sub-questions: RQ1: “What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?” and RSQ 1.1: “What are the perceptions of FSPs towards the value of BD for their businesses?”.

FSPs lack time and reliable resources as a major constraints to implement. Finding 7 states that collecting reliable data and analysing the data are seen as main challenges. DM is used to manage and store massive amounts of heterogeneous data coming from multiple sources, analysed and served to end users and external applications (Davoudian & Liu, 2020). The growing number of BD technologies and affordable infrastructures have encouraged FSPs to strengthen their business value by launching BD systems (Kalra & Ranjan, 2021). The widespread adoption of smartphones, social media platforms and wearable technologies does not only increase the amount of available data but multiplying new data sources for FSPs (Horita et al., 2020). According to Horita et al. (2020) BD can be utilised by FSPs to transform

the entire business process and assist them to provide greater support for decision making in different contexts such as business management and marketing. Figure 5.1: are some of data sources for BD adopted by (Emrouznejad & Charles, 2019).

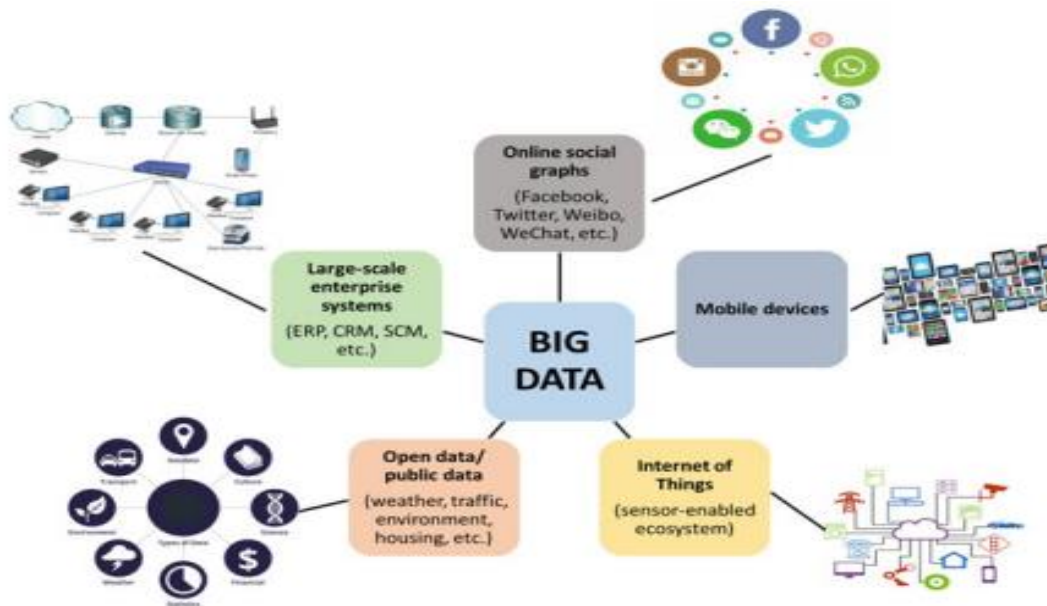


Figure 0.2: Sources of BD (Emrouznejad & Charles, 2019:02)

The range of valuable data coming from different veracity can be easily collected at a high speed in numerous real-life application (Mai et al., 2020). Social networking sites (e.g., Twitter, Facebook & LinkedIn) are identified by Mai et al. (2020) as rich source of complex BD. Conducting manual analysis on data can be time consuming, impractical in the widespread of BD source and computerised data analytics tools are desirable (Kalra & Ranjan, 2021:12221). There is a need to highlight some of the data science solution for BDA, namely:

- i) **Data extraction:** FSPs can utilise a standard-tier search API platform to search all social networks published over a certain period and then collect that data. Alternatively FSPs can utilise the below enterprise-tier API platform for collecting any published data:
- ii) **Amazon Web Services (AWS):** which is an online server that gives cloud computing with numerous CPU's memory, storage and networking ability.
- iii) **RStudio:** is an open source programming software used for statistical computing and graphics.
- iv) **Data filtering:** FSPs can utilise any preference to filter their data. For better filtering and reduction on workloads, data science solution are providing the following features:
- v) **Generating acronyms:** e.g., "Doctor" can be generating into "Dr".
- vi) **Enumerating variants:** "Doctors" enumerated as a plural form of "Doctor".
- vii) **Generating synonyms:** e.g., "GP" generated as a "General practitioner".
- viii) **Data analysis:** Once FSPs have collected and filtered their data, they can analyse their filtered data in order to extract interesting knowledge and valuable information

that was previous unknown by the organisation. FSP can utilised the following techniques:

- ix) **Data mining**
- x) **Sentimental analysis**
- xi) **Data and result visualisation**

BD processing require data collection, management, analysis and display (Gupta & Rohil, 2020). BD processing can be utilised to gather data from the data source and pre-process it to produce high quality data set for successive processes (Alzahrani & Sadaoui, 2020). Since there are different data source for BD, there may be different models contradicting to each other, therefore it is fundamental important to clean the data when performing data integration process (Gupta & Rohil, 2020). Figure 5.2 is an example of BD technology architecture.

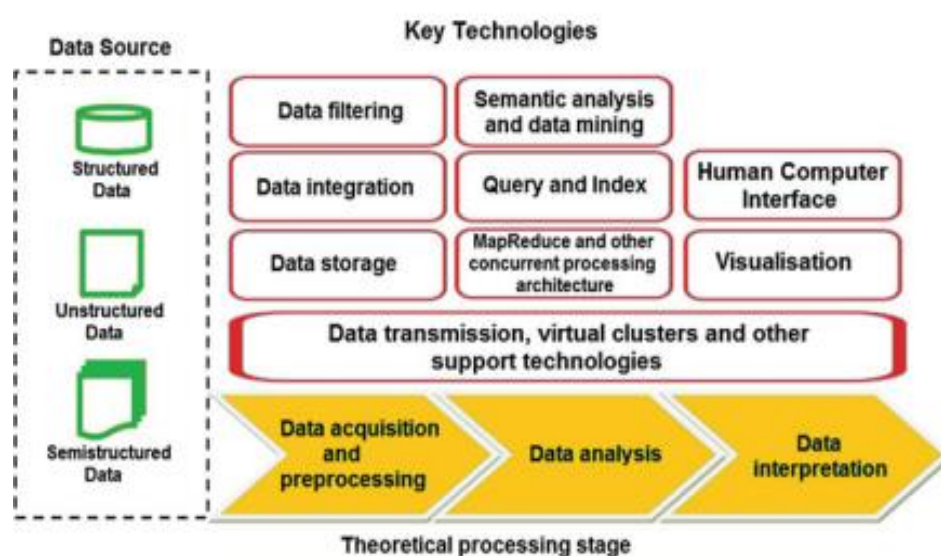


Figure 0.3: BD technology architecture (Gupta & Rohil, 2020:288)

Finding 6 state that time, cost, resources and skills are the main obstacles preventing FSPs from using BDA. BD require real-time applications with strong computational functionality so that FSPs can process large amount of data in less than amount of time (Alzahrani & Sadaoui, 2020). Therefore stream processing mode are appropriate for real-time applications (Mai et al., 2020). When using distributed architecture the cost of storage gets reduced and there is an increase on data quantity (Paré et al., 2020). FSPs can lower their processing cost by implementing virtual clusters since they have an advantage of low cost, flexible construction, easy to manage and are more convenient for completing various processing tasks when performing BD analysis (Adnan et al., 2020). FSP are faced with a challenge of BD scarce skilled resources to meet their business needs and these challenges have an indirect or direct impact on one or more factors in their organisations (Yadav et al., 2020). In order for FSPs to overcome this change they must recruit fresh people and provide them experience, skills, knowledge and train them for their future needs (Aswale & Mukul, 2020).

5.5 Theme 4: Finance

The term finance is mostly used in boardrooms, and FSPs managers' needs to understand the subject and finance language if they want to communicate with authorities within their businesses (Anurag, 2020). Purcell et al. (2020:444) define finance as "ways of breaking down physical basis of earnings that become central to securitised flows of funds generated from different asset classes". For this study it is imperative to also define accounting since finance is interrelated to accounting. Accounting is defined as "a system to document all the information about the business transactions and events" (Chen et al., 2020:1197). Furthermore, Chen et al. (2020) indicate that accounting can be utilised by FSPs to breakdown their life into arbitrary periods (quarters and years), summarise the statements of the organisation's financial position and provide performance statements to their stakeholders.

This theme relates to the following research questions and research sub questions: RQ1: "What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?" and RSQ 1.1: "What are the perceptions of FSPs towards the value of BD for their businesses?".

According to Anurag (2020:65) financial statements consist of three key components, namely:

- i) They assist on getting standardised reports for external stakeholders.
- ii) Are used for tax accounting in compliance with Internal Revenue Service (IRS) rules for computing taxes payable.
- iii) Are utilised for managerial accounting to provide custom reports for internal decision making.

Financial statements have a major role of providing information about the organisation's economic events ranging from acquiring funds from investors to run business operations in order to generate profit which can be either reinvested to the business or distributed to the investors as dividends (Purcell et al., 2020). On the other hand, financial analysis assists organisations to take investments and management decisions (Anurag, 2020). According to Yadav et al. (2020) both financial statements and financial analysis have a common goal of identifying organisations strengths and weaknesses. For decision making and decision taking processes organisations are using management accounts, it helps in management record, plan and control the activities of the business (Castelli et al., 2021).

Time, cost, resources and skills are the main obstacles preventing FSPs from using BDA. FSPs must face their current substantial challenges when using data and must be aware of them before BD can be utilised to produce cost effectiveness in their organisations (Wordsworth et al., 2018). BD generated from different sources can be utilised by FSPs to provide evidence, benefits of decision making and can be utilised to produce cost-effective models on detailed analysis (Wordsworth et al., 2018). Moving data to the cloud for operational processing should guarantee performance and availability from various locations while minimizing the cost (Xiao et al., 2019). Cloud technologies provide powerful and cost-effective

solutions to handle the increasingly high velocity of BD generated from various data sources (Castelli et al., 2021). FSPs can rent the storage from public cloud while taking advantage of cloud computing benefits such flexibility and pay-as-you go model (Xiao et al., 2019). According to Huang et al. (2018) Cloud computing has an ability of providing low cost storage solution to cover massive storage requirement for BD data storage. FSPs can lower their cost of collecting data if they buy the existing data from other organisations and use it to achieve their business objective or if they can obtain their available data sets.

5.6 Theme 5: Marketing

Using data to gain insights for marketing is not a new concepts, for more than 20 years database marketing and analytical CRM has been existing (Gentsch, 2019). According to Steinhoff et al. (2019) marketing is a learning technique for keeping certain ideas and concepts in mind continually and by asking certain dynamic questions regularly. Lamb et al. (2020:04) define marketing as “an activity, set of institutions, and process for creating, communicating, delivering and exchanging offerings that have value for customers, clients, partners and society at large”. Furthermore, majority of people thinks marketing is all about making products available in shops, arranging the display of products and maintaining inventories for future sales, therefore marketing means expecting and sustaining customer’s needs by means of mutually beneficial exchange processes, and gaining profit margins and becoming more effectively than competitors by means of efficient managerial process (Lamb et al., 2020).

This theme relates to the following research questions and research sub questions: RQ1: “What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?”, RSQ 1.1: “What are the perceptions of FSPs towards the value of BD for their businesses?”, RQ2: “How can FSPs utilise BD analytics in order to create a competitive advantage?”, RSQ: 2.1: “How do FSPs determine the needs of their customers?” and RSQ 2.2: “How can FSPs incorporate BD in their business strategies?”.

According to Andronie et al. (2019) FSPs are always looking forward to improve their service offerings, and majority of these FSPs do know data driven marketing technologies are vital to make it happen. Furthermore, Andronie et al. (2019) state that 78 percent of marketers are working under pressure to become more data driven. There is a huge need for FSPs to start working on data driven strategies and FSPs must invest more on IT technologies because marketing is becoming technology based and mastering BD is vital for FSPs if they want to achieve competitive advantage (Liu et al., 2021). However it is important for FSPs to comprehend how they can utilise social media to market their products, connect to their consumers and how they can benefit from utilising social media to obtain more understanding on customer engagement (Liu et al., 2021). FSPs need to start identifying sustainable

marketing strategies that will result them to generate a competitive advantage and innovation in all their products (Gentsch, 2019).

FSPs can customised marketing by offering services to individual customers or by direct sending products to only targeted customers (Lies, 2019). For better implementing marketing strategies the use of marketing intelligence must be adopted by FSPs, this can assist FSPs to develop all the insights gained from data for use of marketing decision (Lisa, 2021). According to Buhalis and Volchek (2021) integrating technology into FSP's strategy increase marketing communications and organisation performance. Marketing performance analytics need a comprehensive approach to identify customer's decision making changes which are influenced by marketing communication (Buhalis & Volchek, 2021). Collecting data from various sources have developed substantial opportunities for FSPs to utilise BDA in developing programmatic marketing techniques for online displays of their products and services (Jabbar et al., 2020).

To challenge the current expectations of BD and programmatic marketing FSPs must use an approach known as problematisation (Buhalis & Volchek, 2021). Problematisation is described by Jabbar et al. (2020:560) as "a considered calculated approach to communicate existing assumptions and test them with unique ideas". FSPs can implement the problematisation approach to challenge the current marketing things and create new ways marketing thinking. Furthermore, FSPs can utilise problematisation approach to spot the gaps for BD and programmatic marketing in their organisations.

Finding 8 states that FSPs categorise their customers based on service they offer to the customers. FSPs categorise their customers based on their age, affordability, location, timeframe they had business relationship with them and income they generate from them. In this research, FSPs are segmenting their customers based on the service they offer to them which propose a good quality of clustering analysis. Clustering is a group of algorithms utilised to divide records in a database according to an extent similarities (Collica, 2019). Clustering analysis is utilised by most researchers to segment the customer markets, and it is conducted and the influencing elements, with subjective norm, attitudes, face consciousness, brand extension and observed risks are categorised into isolated groups (Zhang et al., 2020). Utilising clustering analysis FSPs can gain better return on investment because they can tailor their services to customers that are mostly likely to purchase the offered service (Yang et al., 2019). To achieve a better return on investment, FSPs need to start mass customisation than mass marketing. Customisation is commonly known as one to one marketing, whereby each single customer, product offering and service offering is tailored to a specific customer's needs (Yang et al., 2019).

The question FSPs might be asking themselves is, how to define similar customers? They are various ways to define similar customers in an organisations, FSPs can define similar customers based of the type of services purchased by customers, numbers of policies have

taken by customer or the amount of revenue generated from the customer (Zhang et al., 2020). Other metrics can be, the number responds made by a customer to a specific marketing campaign over a time period, offers they purchased on their Web site, amount customers spent on their online platform and the number of information search made by the customer about their services or products (Collica, 2019).

BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform and price product to remove redundancy on products markets. Mining and analysing BD can give FSPs a better understanding of their business patterns and developments, this can help them to drive operations efficiently and gain competitive advantage across their different departments such as sales and marketing, product designs and IT (Schosser, 2020). The 3V's are most commonly characteristics of BD and FSPs can utilised them to develop marketing strategies.

5.6.1 Volume

Volume is the amount of data and it contains data from traditional and non-traditional sources. FSPs must analysis all their transactional data for example the products purchased by their customers, the frequency of each product sale and all of that is BD. Then FSPs can couple their traditional data with the digital data from marketing platforms, add them all and that will results to amount of data that can be used for marketing.

5.6.2 Velocity

Velocity is the speed of purchase information generated and the flow of data into the FSPs sales journeys. FSPs can analysis the growth of data coming to their organisation. Driven data marketing can be utilised by FSPs to collect, analyse and process insights from BD and also drive customer engagement to improve marketing (Schosser, 2020).

5.6.3 Variety

Variety will be the amount of data currently available for FSPs to utilise it for marketing. Marketing strategies can be implemented for both end user and data sources. FSPs must combine both their transactional data and unstructured data coming from different sources so that marketing can use them effectively. For better customer engagement FSPs need to connect both their analytics analysis and marketing communication features in return they will gain more profitable, satisfying and long lasting relationship with their customers (Zhang et al., 2020).

FSPs frequently analyse competition and have demonstrate varies approach to the process with some doing it often depending on the organisation. BD has been identified by researchers as one of the breakthrough technological developments, techniques such as text analytics, machine learning, predictive analytics and data mining can be utilised by FSPs to gain new insights resulting in better and quicker decisions, and yield to both economic and social value

(Emrouznejad & Charles, 2019). By using BD FSPs will gain a better impact on employment growth, productivity, and development of new products and services (Lamb et al., 2020).

5.7 Chapter Summary

The themes are discussed in perspective of the findings and categories derived from the study. Five themes emerged on this study, along with references from numerous sources and some these references are participants interviewed for this study. As per the findings and categories, all themes have been mapped per research question. The following are all the themes discussed on this chapter: i) management, ii) training, iii) data management, iv) finance and finally, v) marketing. The respective themes had a significant role in addressing the research questions. Theme 1 (Management) revealed that IT management can assist FSPs to be more competitive in a more demanding institutional environment that is both service based and knowledge based. Theme 2 (Training) shows that providing training to employees is all about educating employees to achieve better performance, empower employees to prepare for promotion and enable them to improve performance and productivity. Theme 3 (Data Management) indicates that BD can be utilised by FSPs to transform the entire business process and assist them to provide greater support for decision making in different contexts such as business management and marketing. Theme 4 (Finance) reveals that BD generated from different sources can be utilised by FSPs to provide evidence, benefits of decision making and can be utilised to produce cost-effective models on detailed analysis. Furthermore Theme 5 (Marketing) revealed that FSPs must start working on data driven strategies and FSPs must invest more on IT technologies because marketing is becoming technology based and mastering BD is vital for FSPs if they want to achieve competitive advantage.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

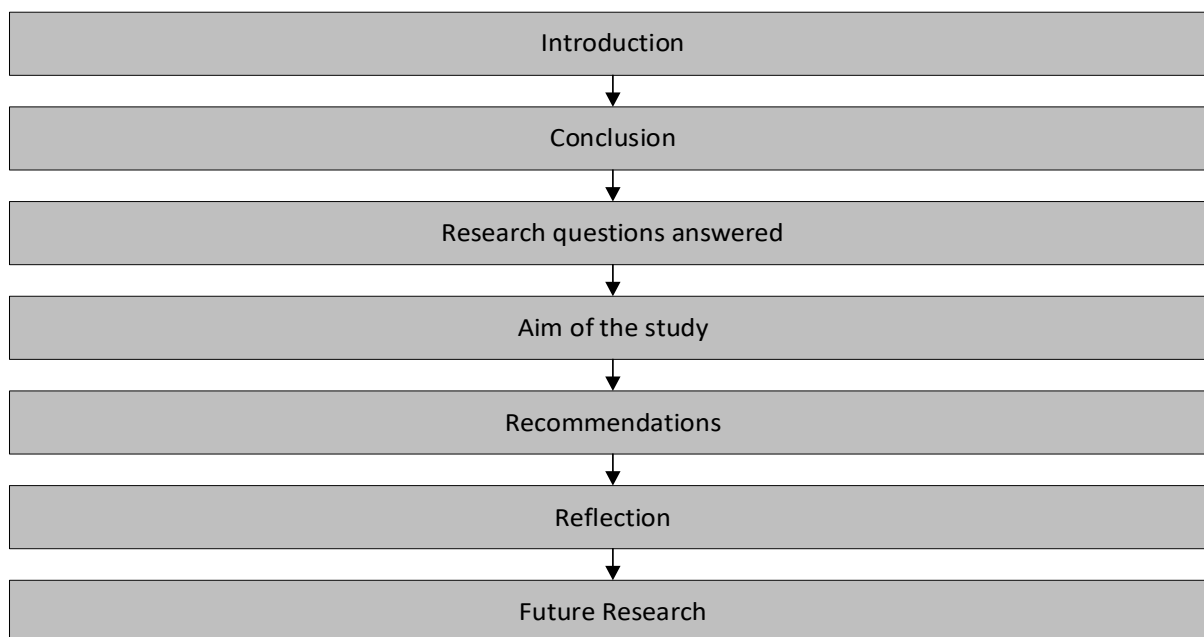


Figure 0.1: Layout of Chapter 6

6.1 Introduction

Chapter six (Figure 6.1) gives a i) conclusion, ii) addresses the research questions, iii) suggests recommendations, iv) addresses research reflections and v) consider future research.

6.2 Conclusion

FSPs are mostly aware of BD. BD offers a significant advantages for FSPs in order to gain competitive advantages and assist FSPs in making better recommendations and decisions for the customers. Collecting more and detailed data can boost FSP's performance and adopting BD can improve FSP's capability to narrow their customer segmentation and can furthermore enhance FSP's creativity in tailoring products and services to their customers. FSPs can benefit from BD to develop better retentions strategies and assist in quality decision making. Utilising BD during innovation life cycles can assist FSPs to gain better lessons throughout all the phases. Furthermore at the end of each phase FSPs can utilise opportunities learn from the successes and failures of it.

BD is the next stronghold for innovation, competition and productivity. BD can help FSPs to reduce inefficiencies in product delivery, improve marketing and access on products and services, increase qualities on products and services, and make more personalised products and services for new and existing customers. FSPs can use BD to support their core businesses by analysing all the transactions to detect if there was any fraudulent transactions or money laundering. BD can have a substantial influence on value creation and competitive

advantage for SMMEs. This can be done by improving or creating new ways on interacting with customers or developing new products and services strategies to raise profits.

6.3 Research questions answered

6.3.1 RQ1: What are the challenges FSPs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

The challenges faced by FSPs when using BD analytics in building and differentiation customer segmentation to create a competitive advantage are listed below:

- i) FSPs do not have knowledge and experience to utilise BD for their organisations.
- ii) FSPs do not use BD to analyse client's needs.
- iii) FSPs lack time and reliable resources as major constraints to implement BD.
- iv) FSPs have little or no experience with BD.
- v) Time, cost, resources and skills are the main obstacles preventing FSPs from using BDA.
- vi) Collecting reliable data and analysing the data are seen as main challenges.
- vii) FSPs don't manage competitiveness.
- viii) Most of the FSPs have a huge challenges in adopting BD.
- ix) The following are some of the challenges faced by FSPs in adopting BD:
 - x) FSPs don't have any data or are not aware if they have it.
 - xi) FSPs haven't really explore BD and don't know how to use it or implement it to their advantage.
 - xii) FSPs are having challenges in collecting good quality data.
 - xiii) Many FSPs (9) don't have the right analytical tools or skills to handle unstructured data.

6.3.2 RQ2: How can FSPs utilise BD analytics in order to create a competitive advantage?

FSPS can utilise BD analytics to create a competitive advantage by following the below considerations:

- i) FSPs agreed that BDA can help them to improve in identifying their customers' needs.
- ii) FSPs mentioned that BDA can be used to identify gaps, assist in terms of identify customers' needs and also help them to inform and price product to remove redundancy on products markets.
- iii) FSPs want to use BD strategy in developing a systems based approach to enhance their growth.
- iv) FSPs frequently analyse competition and have demonstrate varies approach to the process with some doing it often depending on the organisation.

In conclusion, there is a need for FSPs to be innovative, create new business opportunities and business models to be competitive since most corporates have already adopted

digitisation strategies in their quest to create a competitive advantage in the industry they are functioning in. BD is a powerful competitive tool for any organisation to become more competitive and for better decision making.

6.4 Aim of the study

The aim of this study was to explore how FSPs can use BD to differentiate their customer segments and to create a competitive advantage. During the data collection and analysis it was identified that FSPs don't have BD knowledge, experience and are lacking time, cost and reliable resources to implement BD. BD can help FSP's to narrow their customer segmentation and enhances FSP's creativity in tailoring products and services to their customers. This was achieved by answering the two main research questions stated in section 6.2.

6.5 Recommendations

Literature reporting on BD has primarily focused on larger businesses. FSPs are lacking the financial strength to invest in technology. However, the critical role of FSPs in the local and national economic development means that FSPs also need to understand and implement BD strategies into their businesses. Implementation of BD strategies by FSPs can revolutionise management. With BD dominate FSPs can take advantage on the market share, customers and profits away from those that are not utilising BD. FSPs will gain a competitive advantage, make more driven BD decisions making.

To manage BD, FSPs must establish a strategic plan for computing infrastructure, organisational procedures, policies and rules relevant or related to BD. FSPs must construct innovative solutions for BD rapidly. The study outcomes have pointed various opportunities and challenges FSPs can use BD to differentiate their customer segments and to create a competitive advantage. Therefore recommendations for creating a competitive advantage are summarised as follows:

- i) FSPs can improve their customer services through customer's purchase analyses.
- ii) FSPs can reduce costs and increase profit through cost and profit analyses.
- iii) FSPs can enhance marketing strategies through marketing campaign analyses.
- iv) FSPs can achieve sustainability through long term risk analyses.

6.6 Reflection

Fifteen (15) SMMEs (Chapter 1, section 1.2) of Financial Institutions in the Western Cape and Gauteng were interviewed. Twelve (12) FSPs are based in the Western Cape Province between Cape Town and Worcester and three (3) are based in Gauteng Province between Johannesburg and Pretoria. FSPs from other provinces were not considered due to time and financial constraints. Interviews were administered to the FSP's decision makers' i.e. (Chief Information Officers, Chief Executive Officer, IT Managers & Program Managers etc.).

Acquiring permission from the participants to carry out the research was an essential requirement. The researcher used an email to send out invitations to all the FSPs (Appendix B) but in most times physical visits to the FSPs was vital. Electronic follow-ups via the use of email were done before interviews took place. During the interview process all the participants were asked to freely accept and signed the consent letter to participate of the research. All the participants signed a letter of consent to participant on the research. In this study, semi-structured questionnaire was used for data collection, all interviews were guided by an interview guide (Appendix A). Some of the participants requested interview questions prior to interview so answers may have been thought out which may have mitigated the richness of answers ascertained. All interviews were recorded, and participants were asked upfront before the interview starts to grant the interviewer the permission to record the interview. The records taken from the interviews were transcribed and texted analysed for additional analysis using inductive approach.

Preliminary to the interview process, some challenges were encountered such as participants cancelling the interviews at the last minute after months of effort to secure interview with them. Zoom Meeting technology was utilised for all the 3 participant based in Gauteng, since interview couldn't be conducted in person due to some financial constraints and COVID-19 restrictions rules. In general this was a good phase of the project, it has taught the researcher the following principles accountability, drive and commitment. Some aspects that could have been executed better include improving more on time management and multi-tasking skill, this would have assisted the turnaround time of this study. The researcher have achieved hands on experience in the field of study and stronger with more confidant on the subject matter.

6.7 Future research

Since the research was only limited to 15 FSPs around Western Cape and Gauteng provinces, further research need to be conducted for large sample size and potential FSPs operating in other provinces. The outcomes of this study has indicated that FSPs are lacking the financial strength to invest in technology, future research could be conducted on addressing factors faced by FSP on adopting BD technology. Furthermore, future research can be conducted in addressing strategic plans for computing infrastructure, organisational procedures, policies and rules relevant or related to BD.

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APPENDIX A: INTERVIEW GUIDE QUESTIONS

Section A: participant's details

Personal Details:

What is your Name?
Name of your Company?
Your role in your Company (Job Title)?
How long have been working in this organisation?
What does your company do?
What is your highest level of education?
Do you have any employees working in your organisation, if yes how many?
Can you tells us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

RSQ 1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

IQ1.1.3: How does your organisation categorise your existing customers?

IQ1.1.4: How do you manage your competitiveness against your competitors?

IQ1.1.5: How would big data add value in the organisation?

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

IQ1.2.3 Do they have a desire to know about big data?

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

RSQ 2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

RSQ 2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

APPENDIX B: CONSENT LETTER

<<On company letterhead>>

I, Andrew Lamb, in my capacity as Director at Moore Cape Town give consent in principle to allow Luyanda Lincoln Swartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Alamb
 <<Signature >>
Andrew Lamb

17/12/2014
 <<insert date>>

<<<<Insert name>>>>

<<On company letterhead>>

I, SJA Vander, in my capacity as MD at Brite Advisers SA give consent in principle to allow Luyanda Lincoln Swaartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes				
No	✓	✓	✓	✓

[Signature]
<<Signature >>

12/12/2019
<<insert date>>

<<<<Insert name>>>>

<<On company letterhead>>

I, DEON ENGELKE, in my capacity as HEAD OF BUSINESS at MITO4OPTIMAL give consent in principle to allow Luyanda Lincoln Swaartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓	✓	✓	✓
No				

[Signature]
<<Signature >>

<<insert date>>

<<<<Insert name>>>>

<<On company letterhead>>

I, John de Vries, in my capacity as Key Individual at Wathys and Simphiwe give consent in principle to allow Luyanda Lincoln Swartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes				
No				

<<Signature >>

John de Vries

<<<Insert name>>>>

12/12/2019

<<insert date>>

<<On company letterhead>>

I, HJALMAN DERRIKER, in my capacity as CEO at ARONGSTONE give consent in principle to allow Luyanda Lincoln Swartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	X	X	X	X
No				

<<Signature >>

H.F.O. DERRIKER

<<<Insert name>>>>

12/12/2019

<<insert date>>

<<On company letterhead>>

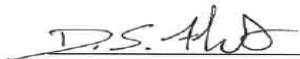
I DYLAN FLINT, in my capacity as DIRECTOR at LIFECHED give consent in principle to allow Luyanda Lincoln Swartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓	✓		
No			✓	✓



<<Signature >>

DYLAN FLINT

<<<<Insert name>>>>

13-12-2019

<<insert date>>

<<On company letterhead>>

I MARTIN KLOPP, in my capacity as Owner at M.K.F.D. give consent in principle to allow Luyanda Lincoln Swartbooi, a student at the Cape Peninsula University of Technology, to collect data in this company as part of his Mtech (BIS) research. The student has explained to me the nature of his/her research and the nature of the data to be collected.

This consent in no way commits any individual staff member to participate in the research, and it is expected that the student will get explicit consent from any participants. I reserve the right to withdraw this permission at some future time.

Research will be done on the time and dates as agreed with the student.

In addition, the company's name may or may not be used as indicated below. (Tick as appropriate.)

	Thesis	Conference paper	Journal article	Research poster
Yes	✓	✓	✓	✓
No				



<<Signature >>

MARTIN KLOPP

<<<<Insert name>>>>

11/12/19

<<insert date>>

Appendix D1-D14: INTERVIEW TRANSCRIPTION P1-15

APPENDIX D1: INTERVIEW TRANSCRIPTION P1

Section A: participant's details

Personally Details:

What is your Name?

Name of your Company?

Your role in your Company (Job Title)?

Chief Executive Officer (CEO).

How long have been working in this organisation?

20 years, before that was with Old Mutual, before that was in Farming and before that was a Senior Agriculture Researcher.

What does your company do?

Primary we do few things:

Compliances,

Training

And Regulator Exams.

What is your highest level of education?

Master's degree in Agriculture.

Do you have any employees working in your organisation, if yes how many?

Yes, 150 full time staffs, and also use plus minus 120 contractors - Lot of these full time employees are compliance officers and on the contracting side lot of the contractors are being used as invigilators for the exams.

Can you tells us about your background of your organisation?

When we started our business 20 years ago, people didn't understand anything about information refinery because our business was talking about machine learning and artificial neural networks. At that time our business saw the value of big data and combination of individual data sources that would necessary benefit individuals with new information that they wouldn't been necessary got from their own datasets. We started the process called client value management (CVM), the purpose of CVM was to pull information from FSP and then to find information or gather information and to profile those clients, but typically one FSP wouldn't have enough data from a decent client profile exercise but if you combine them with many more your pull of information becomes a lot bigger and your learnings within basically becomes substantial better and more reliable because you gathering information across much large universe and so your repetitions / ends become much more. That was

an originally idea for us to open our organisation, over above the fact that we wanted to do compliance. We wanted to provide people which deals with us as a compliance business with information about their own clients that they couldn't gather from their information they typically had. That was 20 years ago.

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

RSQ 1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

We sit on a lot of different data sources, we have not really done anything with the data rather than maybe doing a demographic slicing and dicing getting to understand the trends who is moving in to the industry who is leaving the industry because we have access to that kind of information via the exams and registrations but we haven't really done anything in my view valuable with the datasets we have.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

There are no obstacles rather than resource and time. It is only now we are working with a team of data scientist where we are basic pulling all the different datasets together creating the links between individuals in different datasets so that we can start seeing a more comprehensive profile of individuals, people that we have been dealing and working with, so that is in progress as we speak. But the really problem over time we get busy and start doing urgent things and not looking at the important things.

IQ1.1.3: How does your organisation categorise your existing customers?

For us as the business our customers has got a different views because we view our customers differently to that of a FSP, at the same time we need the same kind of information because I do believe that a FSP should understand what the customer value is, they should be able to understand enough about their customers to classify them and they should also start understanding enough about their customers to sort of classify them in terms of their personality standards because it's one of the things I do believe people do not focus enough about it, they look at numbers and they don't look at individuals they try to quantify things but they don't quantify and evaluate the fact that we are in a people's business not so much in numbers business. All my clients that I have deal with the compliance officer, so we transfer knowledge and the same thing happens with FSP, FSP value is the ability to transfer knowledge to you so that you give me information that I can use to help you to provide solutions.

IQ1.1.4: How do you manage your competitiveness against your competitors?

The more you know about your clients in this case as I said our clients are slightly different to what a FSP client would be because my clients are FSP so it's quite different. But the more I

understand my FSP clients the better I can service my clients and service all their different needs. I do believe that of all the competitors on this space we have the most information about our FSPs, we also have most information about the level of education, the number of years' experience and we understand more about themselves as many other people know about themselves. If I can explain we know in advance at this stage how long a person got before they meet a certain criteria to be complained, very few of our competitors will actually have that data, they would have that data but they wouldn't know about them and they wouldn't have that data in their databases which you can basic use them for other purposes. We busy developing a software application, where a solution calculates all the requirements that you would need in terms of experience and in terms of short term training, qualifications and continuous professional development. We also know from that system what kind of professional development you would need, also know from that system what qualifications you would need and also know from the system by when you should start your qualifications.

IQ1.1.5: How would big data add value in the organisation?

Immensely because we know for instance by using big data, how many repetitions or datasets you would need to improve your reliability scores in your predictive modelling or information management. But for us what we would like to start getting into, is to start understanding when a client is getting to leave the industry, we would like to know when a client is not going to complete the qualification, we would like to know why a client is battling with a qualification, so all of that information helps us assisting and managing the outcomes of the people we view them as our clients. So depending on what angle people are involved in my business I need to understand that person so well, that person is almost well managed and coached before that person realize that these are my needs or my problems.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

Yes huge because some of the SMMEs don't have data, some of them do have data but they don't realise it, it is data, some of them actually have such a diverse set of data that it becomes almost meaningless unless you go the big data process or program. But very few FSPs that are work with or deal with really understands the bigger picture of what data can do for them.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Very few of them are really focusing on big data, they focusing more on the client's needs or client's solutions without understanding the value of what they have in terms of big data. The other problem they sitting with is a lot of these guys don't have systems, they are having information, a lot of pieces of information stored in spreadsheets but it would be your data in that spreadsheet, it wouldn't be a spreadsheet combined with all the data and all the clients they have for that FSP. Some of the guys have a lot of data but because they have little

understanding of data management they don't necessary see the value of what they have within their datasets. I think there is a lot of potential but not necessary in understanding on what they can do with it.

IQ1.2.3 Do they have a desire to know about big data?

They all have a desire to know about big data, they all think they want more information, they want more knowledge about their client based. Very few people that I speak to or that I deal with would say I don't want more information about my clients, they always want more information about their clients but they do necessary understands what to do with it.

Furthermore question asked by the interviewer was, It seems that there is a really and serious need on how do I manage data in my business, and how do I know if it will give me value without being charge a fortune, without it costing me time, and without me putting a lot of effort?

That's very true, one of the things that we picked up as an organisation is that FSP will do basic data manipulations, but very basic they will say "they would select maybe group of same age, they would do selection on gender, they would do selection on maybe on occupation", but when it starts getting more complex when you used multiple factors to start selecting clients they just don't have the skills, lot of them have excellent excel skills in terms of doing spreadsheets, manipulating numbers and creating formulas. But when you getting to the statistics components of the excel abilities they do not have those skills. It's very difficult for them to find new clients from their existing client base because for them it will is very hard to say we will find new clients that don't know our product who are within this age group, with this gender, with these qualifications and who have these occupations and they don't use that information.

Furthermore question was how do you see that can change or what can we do to make that easier for them?

Other than developing short course interventions that can be provided electronically, eLearning or inviting people to have face to face discussions showing them using a small sub set of data how much information they can actual get that will give them insights and allow them to focus more on marketing, focus more and better on products solutions. The more you start inviting them the more they start understanding the value of big data, from them talking about data means complexity it doesn't necessary mean insight.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

RSQ 2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Absolutely because if you look the way we are going with the fourth industrial revolution, the person who will not be using data, is going to be probably obsolete in the next five years from financial service industry. I am saying that because it will take a while before we had enough

data and enough individuals and people who will sit down and start managing data to the benefits of the SMMEs but in time the value of an advisor is going to be redundancy as more and more data are available and more self-service applications and solutions are developed.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs? There is a set of solutions and another issue that these advisors believe they have is that they think they understand the product and product outcomes better than anyone else, but products that are being developed in South Africa become extremely complex with multiple numbers of variations, if a machine will be in a much better position to ultimately match a product combination to the client's needs about the individual's ability to select or put that solution together, advisors do not understand that they still believe because they know that particular product well, I can confirm that the basic 95 percent of the products they understand very well but there is still a 5 percent of products that are extremely hidden and complex and especially if you start looking at things like disability cover, income replacement they are so many implementations that you can actually look at where an individual just cannot make those combinations work. I mean anybody who's seen the big breakthrough with the go game where people believe that it's impossible to beat an individual after doing a bit of machine learning, the system learned enough about the problem and the solution, so if you have half million problems and solutions the ultimate combination of solutions probably be a lot better predicted by the machine than an individual. So to satisfy the need of the client you will need to know so much about the client, so much the client's circumstances around or surrounding the client. But also understand so much about the products that you can actually provide unique solution to that client, which is very difficult for an individual. So you be probably satisfying 95 percent of the client's needs but not the full 100 percent.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

Yes we have a strategy and we are busy working on that strategy, is it fully operational at this particular stage no. But there is a different strategy because we understand the diversity of the information we had on individual in different datasets and we also understand the value of combining those datasets and starts finding information about people that we normally won't make leads on them.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

Probably every three months we have strategic session, we won't go in depicts about things but most about red flags, problem areas are looked at and once a year we had a depicts strategic session which is about two days we would look at different aspects about things that will influence our business.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

It's an ongoing process, we continuously look at what our competitors are doing. I can give you an example some of the compliance work is very repetitive, we're looking in ways of how can we take a repetitive component and start using online solutions to take repetitive component out of the time the individual is spending with my client, so that the individual can almost start doing repetitive work rather than my compliance officer because my compliance officer is quite an expensive resource. And the compliance officer really starts adding value where the valuable contribution to my client would be sharing knowledge, skills upliftment and development rather than sitting and doing something a less skilled person can do, it's like taking a file and checking that all the information is in a file and not doing any interpretative work with that information itself, that's a very repetitive process. So in our view no other compliance officer solution is looking at that as part of their long term strategy, but I believe we have to start using time a lot more effectively so that the value we provide our clients is a lot more than merely just spending a lot of hours with the client where 30 percent of that time is being used for meaningless tasks rather than 100 percent of the time actually value adding with our client base. So things that a machine can't do that's where we should be adding value where we ask you a number of questions and that information is logged, we can write algorithms with datasets to say this is a red flag this is a green flag this is an amber and manage that almost from that point without intervention with any of our expensive resources.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

No I don't think you have missed anything or there are things to add but I think the environment you are conducting these interviews within, unfortunately the skills these people have is to deal with people that's their skills, it is not the knowledge about financial products, it is not about the ability to identify needs and provide even solutions. The skills that these people all have collectively, it is an ability to interact, to keep people, to build relationship and to build loyalty. Unfortunately the people that you have interviewed going on through this process are not well informed, they will tell you about data, and they will tell you they have data but they are not really focusing on managing data and optimizing data, just some of the comments you made earlier they will tell you I am unique and my offers are unique it proves to you that they are not focusing a lot more than looking at what competitive information they gather, every client they gather they have a client information sheet and that is such repetitive. And they still believe they are unique. So what the problem is there is so much work needed to uplift them from their level of understanding big data so that they can really value, ask the correct questions and get the right information their clients to enable them automatically to provide the utmost value solutions for their clients. For me knowing that I have got the right solution is

more important than to have individual gathered information. The most important thing within the financial institutions is trustworthiness. People need to trust them because they are dealing with the most important information about people, they are given this piece of information hoping they have enough integrity, hope they have enough understanding to build or provide solutions to clients which will ultimately benefit the clients and their families. Another problem they don't understand is that clients are putting their families' wellbeing in their hands. They think about a client as person who provides income for them, not so much a client who they serve, who rely on them and trust on them to ultimately sure when a client cannot longer work or earn income, whatever they earn is in such a good environment that their future life or future life of their families is so well looked after at the way they don't run out of money or hardship. I don't think these people understand how important their job is, they get involved in financial services because they are told is easy money.

APPENDIX D2: INTERVIEW TRANSCRIPTION P2

Section A: participant's details

Personally Details:

What is your Name?

Name of your Company?

Your role in your Company (Job Title)?

Head of risk compliance

How long have been working in this organisation?

4 years, previous I was with Alexander Forbes group for 15 years as investment solutions , I started five years as a legally advisor, another five years as a head of compliance and another five years as a head of risk and compliance.

What does your company do?

We aim to help people all over the world reconnect with and maximise their UK pensions and explain things in straight forward language.

We constantly advise clients not to ignore the growth potential of their existing funds. A big drag on pension performance can be high charges. That's why we combine world class pension advice with low fees so you keep more of your money.

What is your highest level of education?

LLB degree plus a post diploma in compliance management.

Do you have any employees working in your organisation, if yes how many?

Yes we have about 30 employees working for our organisation.

Can you tells us about your background of your organisation?

Up to the 26 November 2019, we were Devere Acuma which is Devere internationally financial service provider. Based in Dubai, has got 53 offices around the world. Recently the

company has been taken over by Brite advisors who is mainly located in Hong Kong and Sydney and it's completely 100% shareholder.

We all want a brighter future, especially when we stop working. We believe we can grow your wealth so you can have a retirement to look forward to.

Brite Advisors offer you an all-in-one pension service – from advice to transfers to pension administration and asset management. This means we don't use middle men or third parties – so we keep control of costs and you keep more of your retirement money.

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

Very little, it's something that was always highlighted at but not by the name of data and analytics because the management structure in the Devere domain was very much more sales driven, less driven on software, data, analytics or academia which was more my passion so I brought it in because I chair most of the times in the exco meetings. We talked about it but we never put it under the umbrella of big data. It was always about what our competitors were doing, we didn't have formal tools and skills to manage data.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

This is my personal view on how I have experience at the management level, because our head office is outside the country the cost to provide money to the South African branch was always and is always a big problem to the guys, I think skills and understanding of big data and there is no specific focus personae for the skill, someone who could promote it. I don't think we have the necessary systems or tools and implementation and change management for me I saw that throughout South Africa even at Alexander Forbes when something new was brought to the organisation there was always a huge push back and at Alexander Forbes they used to brought in change management people to assist us with rolling out things and I assume that's the thing FSPs will need to implement when rolling out big data.

I think the biggest two things I could foresee will we be struggling with is what are we going to do with this big data once we have applied or use it, then it's a complete new thing, new process, new functionality and training that we will need to roll it out and there other thing I foresee we will struggle about it is the continuity of it.

IQ1.1.3: How does your organisation categorise your existing customers?

Very simple model, you look at your types of products you sell or provide (e.g. A, B and C) and your existing clients. Under A, B and C you got 1, 2 and 3, this is how big their portfolios are and then how long you have stored client B in your available product(s) before it matures.

And all of those things impact your bottom line eventually and in retention of the client. That's how simple it is.

Further question was asked to the participant "Is it based on the affordability or just how long they have been paying their premiums?"

It is based on how long they have been paying their premiums that also have an impact when you retain them because we look at the coming fees consistency and the reinvestment.

IQ1.1.4: How do you manage your competitiveness against your competitors?

Big issue for me we don't manage it because Devere was so big and they were so big in UAE, UK and US and they didn't worry they would say this our model and this our products then go. We are number one, never thought they are no longer number one because they have closed over 30 offices in the past four years. But overall they were doing well but not doing well in South Africa, for them I think they never understood South African market very well and also not huge on regulations and it's a company that they are very innovative but innovation comes with less regulations.

IQ1.1.5: How would big data add value in the organisation?

I think it's an internal and external leg for me, internal you will have more staff satisfaction, keep your staff happy and retain your staff. You can upgrade your systems and processes to me its systems and processes, you can do better for your employees to operate better and clients will benefit better services, keeping of clients and be better competitive to your market out there.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

We haven't really explore but I think there is a lot of data floating around but it gets used on an unstructured basis.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

No we will have to employ or get the external people to assist us with it. It will be the skills and tools that will have to get it in, get trained up and then roll it out. There is definitely will be people in the system that we can utilise or be interested in it to take it forward.

IQ1.2.3 Do they have a desire to know about big data?

I think the current management they are, I must say the bright model is also more on products.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes definitely it will make our organisation competitive, we will be able to identify short or long term clients or customers' needs and real needs, and also maybe how to assist them to identify

their needs. We will be develop products for our customers and release them better with a more positive intake of them.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

I think once we are able to identify our clients in the right product that suits them and also I think your competitiveness, you will be able to measure it because in some instances you will be able to say I can't provide this products because not all the companies are the same, but at least you will know what you dealing with, currently you working in the dark and you think you are the best and maybe you are not the best.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

Unfairly because we are using CRM, we got a system that aligns with it called Core, we store all our clients data / information on it first and mostly all the documentations which is required in terms of various pieces of registration information like FICA, and then we keep our policy documents, we keep the variations and personal data.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

We got exco's at least two times a year, in these exco's I prepare a pack and also managers prepare some packs and if you look through our reports you will see a SWOT analyses but we don't call it that and I don't think they always realize they doing it but we do it in an unstructured way and still we have the same problems there that you would have had it, but I think what you do with the SWOT analyses outcomes if you don't put actions against it there is no gain for you. But I might say from 2017 and 2018 I think we got some traction on it, so I think it can be always better if we got the right tools and skills.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

I think not in this office per say, it happens often but when we get in the past when the CEO travelled down here, he is looking more with an eagle eye on the business and he comes with the say, did you see how our competitors doing that, they are offering this and did you know they brought down their fees but once again it doesn't really impact because the guys are very stuck in their model as it works because it makes money for them, it is so much better on compliance and as I said earlier the idea is that we are the better don't fix something that is not broken.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

I think for an academic point of view you have covered everything but if you were a consultant you would probably provide us guidance on how we should go about or what first steps to take if you are interested to bring big data in your organisation.

APPENDIX D3: INTERVIEW TRANSCRIPTION P3

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

LifeCheq

Your role in your Company (Job Title)?

CFO and look after the advisors

How long have been working in this organisation?

Since the start of the organisation, we are 4 years old, before that I was at Old Mutual and at Old Mutual I was quantitative analyst. Basically doing financial Maths that was more in big data than this role I am doing at LifeCheq.

What does your company do?

We are financial consultants, what we do is we help our clients organise their finances so that they can achieve their goals. We are independent and we work with 29 different insurance, investments and other companies.

What is your highest level of education?

Masters in Finance.

Do you have any employees working in your organisation, if yes how many?

We have around 55 employees.

Can you tell us about your background of your organisation?

Our founding team of highly qualified individuals spent years working for one of the largest financial services companies in South Africa, and are qualified across Finance, Actuarial science and Business science at UCT.

Collectively, this team has four decades of experience solving some of the financial industry's most challenging problems, and has now taken this experience and applied it to the personal finance sector.

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

RSQ 1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ 1.1.1: To what extent does your organisation have experience with big data analytics?

In Lifecheq simple gathering information is very difficult, so I think here we are not anywhere near to use big data, we collect lot of information but I think when you said big data is structured or unstructured we don't know how to use big data when it is not well reference somewhere and we are still building that. We are getting there but right now here we are not really using it that much, for us things around like clients emotional state for example is actually far bigger driver to the success of our business rather than how much information we had about the

client. So its little bit suckle in that way but we will get there I think that's like a revolution of the process but right now not that much. At my previous company Old Mutual we did evaluation of liabilities with hundreds of thousands of entries with each policy holder so there, there was a lot of analytics on information and a lot of them was about assumption based instead of being like factual based, its similar analytics skills and analytics programs that we use, but there we were determining the behaviour and patterns of which from that particular data the behaviour and patterns was based on assumptions, and from there the company had lot of millions policy holders with lot of information to build from there.

IQ 1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

I think here (Lifecheq) the main thing is collecting the right data and collecting it reliable. Our information for example is a lot about someone's personal life so our consultants feed that information in our system for example this is how much I earn, this is how much money I have left, this is how many people I am supporting in my family and we look at various things about the person and a lot of that is qualitative information getting that into the right structure and become usable is quite difficult for us at the moment and also getting that information from people in a consistency way is hard. For me getting the process to get that right is tricky.

IQ 1.1.3: How does your organisation categorise your existing customers?

There are different ways of categorising our customers, for example by location Cape Town's clients and Johannesburg clients are not the same, so Johannesburg clients are generally more kin to try new things, they are also in our world as we are giving financial plans like we looking at their finances they often like people who have side hustles, unlike Cape Town's clients generally don't have and they are little more engaging, and they ask lot of questions than Cape Town clients do. And our profitable because they want more investments plans for our business, although in terms of the fees we charge almost the same.

IQ 1.1.4: How do you manage your competitiveness against your competitors?

So I don't think there is another company in South Africa right now currently doing what we doing. We do have competitors because every company has competitors but not in the same way we do and for that one I will prefer not talking too much about it because that's quite a key for us right now like how we are positioned. You can go to our website we charge a fee for our service and they are people current doing that thing but they are rely offering the service to a very wealthy clients for them you need to have at least ten million rand to approach them otherwise they will not be willing to assist you. Us we are trying to bring that quality to the middle class.

IQ 1.1.5: How would big data add value in the organisation?

Yes definitely, because we deal with number of aspects on client's financial life one of them is an insurance that requires a lot of information about person's medical history and there is definitely a lot of applications on big data out there about client's medical history like what kind

of medication information that will actually lead to higher claims and I think there are some of new insurances that will be starting in the next coming year or years to do this kind of thing. They will try for example take the medical aid data and use it to improve their pricing.

Further question was asked: Do you think it's going to be big companies doing that or start-ups?

Answer: It's going to be start-ups, I know one that's going to do that, and I know one of the big insurance company that was trying to do that and they are struggling and I think Discovery are also trying to do that, although they saying customer's information are confidential. In theory they are not allowed to release client's medical history information to their own insurance company because they are setup as different companies but how much they are allowed and how much they are not allowed I am not entirely sure.

In our organisation I think big data and the use of data will probably coming from the user interfaces, from how people interact with our systems because more and more people would be interacting with our systems and website and it will be like a good way of designing a good interface because it will be good use of using big data. Financial recommendations I am not entirely sure how much it will be use there.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ 1.2.1: Do you think SMEs are having challenges in adopting BD?

Yes the recording and how clean the data is, is the hardest part. I think if it's a system, if it's like a website that can provide a functionality to our clients to review their medical aid for example that is easy because the system can record it but we are recording all lot of information directly from our clients. They are sometimes type their information on our system or our consultants called them and type their information on their behalf.

Furthermore question was asked to explain the recording more?

Response was: so when a client comes to us, the first meeting is just to gather their information, we don't give advice in the first meeting we just gather their information. We normally ask question like your family, your finances, what you want to do in life, things like do you want to travel and would you like to start a family. So turning those things which are like golden dreams into data that can be recorded and aggregate is difficult in a way you can still have a quality conversation with a client. And we can never take away that quality conversation with our clients because clients would think they are interacting with a robot and we can't afford to have that. Setting up that whole process is very difficult. Its kinder a process design on how to gather the information, the actual data at the back is sort of like this person wants to travel to Paris more than 3 times a year, that is very easy to structure, gathering I think that is a the hardest task to do because we dealing with people and people's goals and dreams.

IQ1.2.2: Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Yes, I think we have do people here and my experience and other people's experience, we all do have an experience to analyse data because we have done it before.

Furthermore question was asked: do you have statistics degree or its self-trained experience?

Response was: we have background degrees.

IQ1.2.3 Do they have a desire to know about big data?

Not really because most of us actually knows big data and have dealt with.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Not in the short term, I think for example if we were operating like a company called Hippo, I see us we will be doing more of big data because hippo is a website that compares a lot of insurance quotes from different organisations, there they have a lot direct comparisons and their website is a direct service essential and I can foresee in their world doing a lot of recording on how many visitors they have and where are these people clicking and how many people click through right to the end, where are they getting lot drop outs.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?
I think ultimately the use of information and statistics can be used a lot on the pricing of the product, which will results in cheaper products for the clients. Insurance companies will set rules on calculations premiums based on a gender, age and location and then offer a specific price for the customer, then a person can come along and notify them with his / her chronic disease and maybe the insurance will then decline / refuse to insure that person because of his / her medical risk.

Further question was: Do you see that one could use big data to manage the risks profile of clients and well as products?

Answer: I think in the pricing of the products you can use big data because there are lot of things you can pull from the customer's profile that will help you in identifying or answering some of the questions that you would have potential ask the client.

And in terms of the risk, yes you can use big data in identifying all the potential medical risk your clients might have before even offering the insurance because you can pull all the medical history of the customer and use that in identifying risks.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

No there is no strategy at the moment, just to elaborate we are only 4 years old operating, we are still very young, we are still looking at our five year strategy but in term of big data strategy

we first need to launch one or two services before implementing it and those services will probably be launched in the next coming year or next coming two years.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

APPENDIX D4: INTERVIEW TRANSCRIPTION P4

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

Moore Wealth Management

Your role in your Company (Job Title)?

Managing Director

How long have been working in this organisation?

20 years with company and before that he was with liberty life for 12 years.

What does your company do?

A composite financial advisors, they provide advice and services across a broad range of financial products such as services to individual planning; pension fund; shares; medical aid; provident fund, group health care and covers a full spectrum

What is your highest level of education?

Certified Financial Planner (CFP)

Do you have any employees working in your organisation, if yes how many?

9 employees

Can you tell us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

No experience, they are little bit comfortable, it is a people centred organisation with 120 employees, 110 are on the accounting side rendering service in auditing, tax, book keeping. Their nine employees engage with the accountants based at Moore, Cape Town who provides them with leads and referrals. They don't need to go and find new clients and the leads that they receive are in a simplified manner i.e. please call so and so... she has Million to invest. They do not analyse or search the database for information on who to approach. They have existing products and based on the client needs (what their circumstances are and would they want to achieve) then they match their services and products to suit the desire of the client.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

None, from theirs side is the collection and analysis of the information. How do we collect and analyse the information. If they would like to use the big data, they have to source their own BD, what would they look for in order to gain more clients and sell more products and that is the bit they don't know.

IQ1.1.3: How does your organisation categorise your existing customers?

They categories their client as good or bad clients, you are regarded as good if you pay and bad if u don't pay. The Moore Wealth Investment company is remunerated monthly the product provider companies in a form product advise fees provided the client has listed them as their service manager. They also decide whether to sign up with a client based on the ease of doing business with a client, this was substantiated by an example of A client with R10 000 000.00 and is difficult to work with and a client with a million rand which is easy to do business with. How much ease to deal with client i.e. customer satisfactory and ease of doing business.

IQ1.1.4: How do you manage your competitiveness against your competitors?

They improve their competitiveness by attending number of road shows and numerous roadshows, presentation and engaging with their peers in other organisation to find out what they are charging for an advisory fee. They normally charge halve of a percentage of their annual fees. Lot of the companies goes above 1% of their advice charge, and Moore Wealth Management do understand where they stand in that competitive profile and more recently and those percentages are coming down due to poor return on investment. The performance of investment are analysed through number of programmes and they contact the clients to give them a review once, twice or three times a year. If it is one a year they go into a profile and identify what types of portfolios that the client is exposed to and provide an opinion on the their portfolio performance which is based on relatives to the average fund on that sector, and advise if they should stay sell or move. The review is done every single year. For February 2020, they already have 15 clients that are due for review. These reviews varies depending on the client's need, some are informal and some more formal conducted in boardrooms in a structured format with presentations and minutes. However, all depend on trust.

IQ1.1.5: How would big data add value in the organisation?

It will add value if they can identify which client have got certain asset and income that will make them an attractive client that they would like to engage. In that there is also a risk profile which is already built in.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

They don't understand BD and how to use it or implement it to their advantage and to them BD is foreign. An additional question was asked if the interviewee has a desire to know more about BD? Responding to that they've indicated that they are at their 50s and comfortable, and have great business going and don't see the need to expand however, they have younger generation that needs to pursue and make use of BD to grow the business. The younger generation is much isolated and unlike the older generation who grew their business through social contacts and activities such as playing golf, they need to look into other ways to find clients.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

No they don't

IQ1.2.3 Do they have a desire to know about big data?

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes, if there is a way that the information at their disposal can be interpreted to their benefit so that it narrows down the field of the potential clients that they need to engage instead of knocking in every door, it then categorises the top 10 clients that they can engage, based on their high income, wealth, geographical residence and etc. rather than wasting time on 100 clients that they are not quite sure where they fit in.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

It will save a lot amount of time because they can target the best prospect for success and the product to the need. Therefore, they would not knock into a 65years old to offer a life policy.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

From time point of view that they do not waste their time to market the unnecessary services to them i.e. more Cape Town has 400 client and the other branch has 3000 it would be advantageous to find out more about the 3000 instead of bombarding them on things that are not of value or relevance. What are about the products i.e. Assets management side noting the things that are happening with the unit-trust. Is there no opportunity to make a tailor made Moore product for them? They have something similar to that, their own unit trust which works

in this way, a client have a million rand and they see them as a good investment for Allan Grey and they go ahead and invest.

But when you need, to do reviews and change underlining funds of 400 to 500 clients is time consuming and difficult to make a single transaction of each client. What they then do is to create a structural unit trust, but when you want to effect changes on the trust it affects all 500 clients. The challenges with this approach is the competitiveness and a bit costly there as extra fee from their side and the from assets management consultancy fees from where they get the information from. Therefore they have to pay 0,4% more to get someone in that structure, however, they are busy exploring ways to reduce the funds.

Follow up Question: Those asset manager do they detect to what is in the unit trust?

They do not dictate what they want but rather look for an asset manage who has what they want i.e. design a shared portfolio that has for instance 50 shares to suit their needs, but at this juncture they make a judgement on who they need to invest with based on the performance, are growth, value and how well do they correlate, in essence they mixed them up for example Investec correlates well with Alan Grey.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

No they don't have

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

They do it formally in January, thereafter quarterly and informally once a week, to reflect on new ideas and exposure that the can adopt for implementation.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

They don't have much involvement with other colleagues in the same industry so, periodically look at the outputs from other financial advisors and compares it with theirs and in 90%of the cases they offer better services and confident on that.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

Do they get the copy of the output of the research? They will get an executive summary.

Follow up on the BD presentation that was offered in London

APPENDIX D5: INTERVIEW TRANSCRIPTION P5

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

NFB Private Wealth Management

Your role in your Company (Job Title)?

Chief Executive Officer

How long have been working in this organisation?

15 years with current employment

9 years with Old Mutual

What does your company do?

The company provides highly specialised, fiercely independent financial advice, products and services.

What is your highest level of education?

National Certificate in Wealth Management and International Capital Markets Qualification.

Do you have any employees working in your organisation, if yes how many?

30 employees

Can you tell us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

They are a small company with no experience on BD analytics, but they do get their analysis from big companies like Discovery or Old Mutual which have one of the biggest databases in the country. He gets most of data through connection, attending meetings to meet the right people and introduces himself, should he need any information he will contact them later.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

He has not come across any obstacles and it is difficult to answer, however obstacle is basically how easy to get the data, how reliable is the data for example Statistics South Africa is highly politicised and they don't provide the real stats.

IQ1.1.3: How does your organisation categorise your existing customers?

On occupation, gender, age, affordability, health. You said 500 tax can't go to a risk person with a product with a product like life insurance services, but he can service his existing life insurance. If he has a different view in a client, you can't make changes because they can't buy again.

IQ1.1.4: How do you manage your competitiveness against your competitors?

He is trying to be a one stop business, and see to it that his clients' gets advice from experts. Because they cannot be experts from everything, short-term, long-term, life investments, I they are a lot of companies now about 900-1000 that you can invest only in unit trust. There for you cannot do business with all those company, but you need to choose one that you can

invest with. Currently they do most of their investment with Alan Greys because it is a company in the JSE and don't have to pay dividends to their clients. They have specialist that are always talking to the client, and always attend trainings. They are very good fund managers, always available even telephonically.

IQ1.1.5: How would big data add value in the organisation?

The more data you have the more business you can do, and focus on various things if for instance BD can tell him that company A, is looking for benefits for their people, you can approach them and sell services to them, inform them about your abilities, your experience, what you can do for them. On the computers or systems to make it easy, meet new client, retrieve data we need, currently of they go to someone they don't know they are just guessing and you don't know who you are walking to.

How is business, tough or easy?

Business is quite tough. He comes Worcester and has an ability to do work for the municipality but he does not have a BEE certificate, therefore he cannot provide services to them. The municipality gives business to others who resides a distance away from its vicinity while he is there and to provide personal services which is very important element of the business. It important to have personal relationship with your clients.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

No, they don't

Is this is something they are thinking of implementing?

They store most of their data in files and their backup system.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Yes they do, they belong to Moonstone in Stellenbosch a compliance officers, where they can source data in a certain way, their tools, electronics, internet are always 100% and if they can get big data they will be able to handle it.

But do they have necessary skills to handle the data?

Yes...

Is there any challenges that you think can affect SFPs to adopt BD, potentially?

Yes, they are being bullied by cooperates, which prefers people to work with them directly, they want people to do business through call centres, they do sponsorship, working with the politicians. They think private independents are taking away their business. For instance if you are looking for a quote of a short-term insurance and I give you a quote from 3-4 companies they fight like a dog over the bone. Mr Klopper tends not to like, but he gets a good rate for his client. He bullies them back, by saying that your client has been good paying you premiums for so long, small risk, and he can get a better rate for the client somewhere, if you still want

to keep the client reduce the rates. They don't like that at all. But hey need us for data i.e. information about marital status, number of kids, what kind of business he is in. it is difficult for them to get this information, hence the dependent on Mr Klopper.

IQ1.2.3 Do they have a desire to know about big data?

Yes

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes. There more you are informed the better the advice you give.

Coming from a semi-rural area do you think there is more opportunities to analyse this massive amount of data that is available for company to assist in improving your portfolio and offering?

Yes...

If there is an opportunity of having access to BD will utilise it?

Yes.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

They use in trauma instances e.g. in this case they can go to a client and say they are still insurable and they have data that shows that people of your age are still suitable for a retake, you are smoker and have data from a reliable good source. I think we can increase your trauma insurance that can do you well than a life insurance in this instance i.e. breast cancer in women, 70% cause of death in women and medical aids has removed post trauma treatment. In some cases it can result in the removal of the breast and most medical aids don't pay for a transplant and reconstructive procedures.

Do you think with BD can you be able to improve profit, grow your business in terms of number of people?

Yes, it can improve the quality of services you provide and increase number of customers, however, you need to service your existing clients well and acquire one or two client a month that is a good business.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

Yes definitely depending on what BD gives you, you can be able to categories clients based on their statuses and prioritise accordingly.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

No strategy at the moment, but uses some contacts to solicit data.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

We know how many client they are losing and also find out why they are losing them if a client walks in they always ask for feedback on the clients experience on their services. They always discuss the feedbacks from clients in meetings, and what the causes of losing clients, e.g. we lost client A and he said we take long to provide feedback. We got a phone in client that was referred in by Mr and Mrs Y and they do offer Mr or Mrs Y with compensate.

Opportunities they do sponsorship, they are going to sponsor women golf in Worcester, and they are going to get data through Lukey. During the golf event they are going to run a competition with a prize, and participants will be required to write in a card their name, email address and contact details. They will also ask if they can contact them to inform them of their services and products. That how they collate this data which they sit will all the data.

Do you know the potential base of clients in your area and their profiles?

Yes more or less, that's if BD plays a role.

The threats in their business is more of empathy, sympathy type of thing. Example: a client comes from Pretoria they have a deaf or blind child they give up their jobs in Pretoria and insurance is a good start of a business and they tend to sympathise with in that type of situation.

Do you have lot of those kind of clients?

Yes young people always do come for advices

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

Daily, they have a company Martin Optimum specialised Investment Company, takes our clients' money and put a bit with Investec, Alan Gray and other companies and we are analysing that all the time. They have got specialist analysing the market making projections and forecasting on what will happen in the market, and they advise client that they must not get out of the market. Markets are very cheap even when there is no growth.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

It is difficult, the big problem they have in Financial Service Board (FSB) we don't know where they stand with them, they policy them like hawks, they attack individuals.

APPENDIX D6 AND D7: INTERVIEW TRANSCRIPTION P6 AND P7

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

Wealth Growth Financial Services

Simplicity Asset Management

Your role in your Company (Job Title)?

Fund Manager

Financial advisor category 2

How long have been working in this organisation?

2004 14 years old

2009 10 years old

He has 32 year experience

What does your company do?

Financial services company provides financial service advice registered with the FSA. They provide 13 of the 16 services that can be performed by a category two licence, however, they do not provide services on funeral covers, short term insurance medical aids although they are registered for it. Deceptive financial services has to have a mandate of every client as they are authorised to sign on behalf of their clients if they change something on the client's portfolio the client don't have to sign but they can sign on the clients behalf. The category 1 have to go the client with three option that to choose on, owing to lack of knowledge from the client, often they seek advice from the financial advisor on the best option.

Simplicity Assets Management, operates on category 2, they don't have any client but manage fund. So Mr de Viliers' role is to manage the fund that wealth growth provide to their client. Simplicity operates similarly to Alan Grey, Investec and Coronation. It is the investment vehicle which has three fund: 1) income fund; 2) manage protector regulation 28 fund; and 3) international fund.

What is your highest level of education?

BCOM degree and CFP

Do you have any employees working in your organisation, if yes how many?

Three employees WG

One employee

Can you tells us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

Zero for company 1

Zero for company 2

However they make use of Personal connection and also they have a company that they pay between R10 000 to R20-000 a month to source information for them. Upon receipt of those

information they set a personal interview with the prospective client to sell their services to them. All their client data they source it directly from their clients.

Simplicity assets management: as aforementioned, they do not have a client but they make use of international data i.e. financial market data (Specialised strings of data) on a specific specialised level that runs through bloomberg, MSCI international sites. The company that they have contracted source data and analyse it for them and put the funds together noting that the market keeps on changing. They compile the fund composition form the data received from different sources. This data is analysed daily but actioned in a quarterly basis. If you manage the fund actively does not mean that you do not have to do anything to the fund. If something goes out of margins they need to effect changes. The difference between simplicity and Alan Grey is that Alan Grey is a big asset fund management company and their assets is more than all investment companies in South Africa combined and they cannot invest in small companies and they are investing into specific shares at the stock exchange. Simplicity then invest into Alan Grey assets management fund giving them 10% of their fund and also look into six other fund for a greater in return in investment. Therefore to achieve this they look into an equation that provides them a better income.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

They don't use big data, however to answer this he indicated that he just attended a course on behavioural change in financial management, gone are the days wherein you sell products to a client but you provide services based on client needs. Make use of artificial intelligence and advocate for the human intervention to build relation. A company may make use of BD to source clients and have over 2000 of them but profit less but have numbers to run.

Simplicity, is compiling funder fund and their mandate is on the fund and not client orientated. They have three funds amounting to R670 000 000 divided into three funds; one being income funds, of which their desire id to have this fund to be the best performing fund in the sector irrespective of who is the client, and used for those client that have a purpose for an income fund. The flexible fund which is their flagship fund they want it to be the best international fund accessible in the SA market which is more than the 18%. They benchmark the fund against the MSCI world index and strive to be the best. If the rand devalue the funds goes up because is a rand denominated value but all the funds are in dollar terms. This fund is good for a long term and not for short term because it has an average of between five to seven years investment term, however, this fund does not need to suit and individual but strive to be the best performing fund within its category.

The only obstacle is to segment the data to get the correct information out. The Fair trees asset management company is running big data and they need over 6 hours to overnight to download such data from Bloomberg. Is not a cost issues but for quality and they are paying

a company to download data and analyse. However, the cost of data is getting cheaper by day.

IQ1.1.3: How does your organisation categorise your existing customers?

They clients are categorised as A; B; and C based on the income they generate for them.

A client that is making them more than R30 000 a year

B client R15000 a year

C client making less

Simplicity don't have a client

IQ1.1.4: How do you manage your competitiveness against your competitors?

They believe that they do not have any competitors, there are 370 companies that operates similarly to Simplicity based on the client preferences to retain the clients.

Clarity question: Are your client relationship or performance driven, their relationship is built upon performance or perception of performance. They have lost some client based on poor market performance in the past and clients felt like it is the responsibility for the company to invest client funds appropriately and rather invest with Alan Grey directly rather going through them. Their income has lowered from as it was last ten years ago and their expenses are four times higher.

IQ1.1.5: How would big data add value in the organisation?

On Wealth growth uses specific data received form old mutual, Sanlam and etc. and pull the information into a spreadsheet and they do not use generic big data and on the other hand simplicity uses big data received from Bloomberg and other sources and allocate it for use in a particular fund of relevance to the information.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

They do not have any challenges,

As aforementioned, the Wealth growth they will not need BD for clients as they need to understand the client needs and provide the service. However, what they foresee is not a challenge but an obstacle that is to limit expenses because the moment you make use of BD, you need to appoint someone to analyse the data for you, and what you require is not data but a client information.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Wealth growth do not have analyst

Simplicity make use of the analytical tools but they have commissioned that service to a company to provide analytical services

IQ1.2.3 Do they have a desire to know about big data?

Not really for Wealth growth

For simplicity yes, but as soon as there is a new data the analyst will know about it, they have a Branch in Mauritius and also have people international that supply them with information daily. As soon as there is new information they will know about it and feed to simplicity.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

No they don't see any benefit in using big data to create competitive in Wealth Growth. With further clarity provided on this point the interviewee felt that they need BD to retain the client and also to provide tailor made products.

On Simplicity, yes they see benefit in using big data to create competitive.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

It is compulsory to use BD to retain the client, there is no rationale for the business effectiveness if you cannot use BD for both companies.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

Not for profiling. But they need to be on the highest knowledge based on the latest information on the international economy to advise the client. The client perceive the financial manager to be knowledgeable as well as the source of knowledge.

For simplicity, they need to have the latest knowledge on the international markets trends and that information is retrieved on the internet through Bloomberg. Discovery analyse the national needs and identify the gaps and capitalise on it by developing a product that they make money out of. But it is a little different in the financial industry based on the regulations. Whatever product they provide to the client they are responsible for the product and if it fails they should account for that unlike big companies.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

Not really

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

Not through BD but personal introspection, however they are continuously on the learning path through courses and attending webinars with international role players.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

It is a continuous process which is performed daily by visiting financial markets and products but done regularly for both companies.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

Yes, we cannot leave without BD any more but the cost is not to get it but by getting relevant data to add more value. Big companies like Discovery they have 10-20 people analysing data to develop a good product to sell to their client but a SMME can't do it. For example Sanlam legal team is 10x bigger because of compliance litigation on them and small companies cannot do that. As an SMME you cannot invest in a company which have under 3-5 years of existence and do not have over 100 000 000 rand in asset management if not they have to do a due diligence to them in a regular basis. This apply in both companies.

APPENDIX D8: INTERVIEW TRANSCRIPTION P8

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

First Avenue Investment Management

Your role in your Company (Job Title)?

Chief Operating Officer

How long have been working in this organisation?

Seven to Eight years

What does your company do?

Nedbank Capital

What is your highest level of education?

Investment management, pension fund for government, individual and companies as well as unit trust funds

Do you have any employees working in your organisation, if yes how many?

Seven employees

Can you tells us about your background of your organisation?

M.Sc. MBA, other people have different specialities such as engineering. His MBA focused on financial risk management and derivatives.

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

They have generally used BD on company information to analyse their stocks, not so much on customer needs, but on investment side and they have used data extensively. However, it is a challenge because the sources of data is not always available.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

There is a big drive currently for ESG investment and all that information is not available because data regarding how companies are impacting the environment and not everybody is disclosing how companies are using “x” as amount of money, who record all the governance issues around it. If there is that kind of data available it is probable expensive and there might be a company that is making lot of business out of it. There is a limited data available e.g. you have a retailer that focuses on fashion, fashion has a lot of economic problems or environmental problems rather that is how much water is Mr Price is wasting on manufacturing of their garments rather. It is access and the quality of the data that is the main obstacle.

IQ1.1.3: How does your organisation categorise your existing customers?

You need to go back and determine what type of business it is or SFPs.

Some FSPs will focus on the retail market and will segment their clients based on high net income individuals and low income. Them specifically they specialise on institutional market, that is pension fund directly or as a consultant who advise the pension fund or alternatively institutional customer will be a multi manager and their clients are identified in a market as registered entities. But it is in a retail entities who interface with their customers and can be able to categories them accordingly.

IQ1.1.4: How do you manage your competitiveness against your competitors?

On the institutional space they do not focus mainly on the competitiveness against their competitors but theirs is to consider which asset classes is most effective to their business, their main focus is in equity focus on investor and analysing them in terms of style and that where they need to find their niche, whereas other managers may focus on equity property investor. In essence they are quality style investors, others focuses on value growth and momentum is more indexing and they compete among index investors.

Going back to BD, there is a limited data on various styles because everybody has their own interpretation and it is largely driven by the data provider body like MSCI who has defined indices based on various equity styles.

Do they develop their own suite of products?

They do have their own products, a quality investment fund, some competitors may define it differently but it all depend on what type of data it is in your disposal and also using your own discretion on what type of information you need, that also inform what is meant by “quality” which may vary with companies. For their fund they have done research and valuation on it to package it to suite their style. It is however, difficult to do a comparison with other competitors because everybody wants to be unique in their styles.

Do they frequently develop this fund?

They don't really develop the fund frequently but always update their datasets that they have done the analysis on to make sure that the investment cases are still applicable and also

update with more recent data as well as analysing where they are in the cycle, if they analyse the fund they need to go back to where the expected outcome needs to be. They don't necessarily create too much products as they focus on equity and the product stays and more refining the product outcomes. There is most financial data.

IQ1.1.5: How would big data add value in the organisation?

The more access you have in good quality data the better outcome you can create in terms of making sure that your analysis is based on clean data i.e. when you have a sort of investment process like the shortage of data e.g. the ESG data, some data providers do not have data that can add value and some data is difficult to obtain, how do you manage data e.g. you have a fraudulent financial statement that you can have a few built in characters but if governance is the problem from bad management it is difficult to track those data points and having it reversed. People can say if they have better governance they could have been able to pick up Steinhoff early, because it may have a little bit of dubious financial statement but the problem being the management have a governance problem, how would you have indicated data points allocated to that and that it becomes much more important in the investment world as they see the cooperate scandals evolving.

Do you think that the overall BD in the largest possible sense in the financial industry what could have been done better, and one would have picked up that Steinhoff are busy with dubious dealings or Elleries?

If you have an adequate measuring tool one would say it is possible. They have already begun to develop tools from their side for certain various indicators, there are textbooks on fraudulent accounting and indicators that you can build from your data to give you a warning sign as the account becomes less reliable, but there are some indicators that you can develop that relates to people as such how do you define that. They had a concern about African Bank when it occurred and they didn't invest in it and also they didn't invest in Steinhoff but EoH is one other type, they don't know what type of data is there in the market or is data related to how much is the contract the company have with government. When you look back is more related to certain business dealings, maybe there is more transparency in companies or government dealing in the economy will give you some information on that.

It seems that you can use BD for Risk Analysis?

Yes to avoid risk in the investment.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

Access to quality data it sometimes becomes an obstacle, and sometimes good quality data comes at a ridiculous price. Sometimes you just need data related to indices and non-indices data is freely available. Such data comes in dollars most of it and you need dedicated

resources to analyse data like having a dedicated data manager. At this juncture they are a bit small but overtime they need to have this services.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

In this industry people use excel and some of the systems that they have internally because they have Bloomberg other use python data set. Access to tools is not too much of an obstacle for them unless if there are tools out there that they are not aware of. The challenge is the people to analyse and use that data and get meaningful analysis from them. There is always a shortage of skills when it comes to that.

Do you guys have the skills?

They do have the some guys but they just need to train them, they have taken in some graduates that they have to train them in terms of analysing. Most people have skills in data management/ quantitative management/ mathematical skills and not on the subject matter in terms of finance or stocks. It is a matter of bringing those skills together.

The data that they have is it structured or non-structured? Does it comes in different sources and different format?

It depend on the vender, but it is not structured and becomes a challenge when you use more than one source, and you need to spend time cleaning the data.

Do they have the right tools to structure the unstructured data?

They don't have and it is done manually. As a small company they don't have resources unlike the large cooperate they do not have IT department that is dedicated to work on data

IQ1.2.3 Do they have a desire to know about big data?

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

There are benefits, and knowledge is power to have the data but it all depend on what you do with data matters at the end of the day. Data becomes more and more available but the challenge is the skills to analyse the data and applying it to your business or investment processes, finding a niche in your customer and developing the product that the customer wants.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

It will give you at least more topics to think about in terms of identifying blind spot because of the data is too much to process by individuals, it will give you areas to consider that you might have over looked before or develop products that you never considered or missed the opportunity that market certain types of product

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs? If you understand the customer's requirement or what the customer wants either be it a risk analysis on the customer needs or pick up trends on what the customers are doing even in terms of different age groups for example what type of investment do customers really need, provide customised solutions because not all 25 years old have the same objectives or act in the same manner and BD will identify the real nuisance of every customer segment.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

Not a clear defined strategy at this point of time but they would like to move towards a centralised data hub, to access more sensible data in the New Year. They do not use BD to a massive extent beside the financial risk management.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

Ongoing because they are a small team, at least once or twice per year, because the environment volatile changes regularly, regulations come and go and some are outside their area and they need to look at them at least.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

They don't focus too much on the competition side and focus on their own offering maybe that is a drawback. On a monthly basis they do get surveys from their industry from there that where they can gauge on where the competition is faring in terms of businesses, product offering and they try to look at that on a monthly basis in terms of how the competition is performing. But it can be improved in terms of Small Business

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

Yes you need to define some SFPs somewhere and what their focus areas is on about because some SFPs are client base, direct lines, some SFPs provide services to larger organisations and never deals with the client more like a business to business solution. If you want to look at data, define which type of client there is, if is in the selling side of the product, from their side is more on the underlining data for the actual investment that they look for, and the product side itself. And depending on how much data you need you can go to the underlining investment, fund level, customer level depending who you would want to services on this BD. Just get a sense of those SFPs that are out there in the market and you can decide whose part of BD you would want to solve.

APPENDIX D9: INTERVIEW TRANSCRIPTION P9

Section A: participant's details

Personally Details:

What is your Name?

Name of your Company?

Miton Optimal

Your role in your Company (Job Title)?

Head of Business/ Chief Operating Officer

How long have been working in this organisation?

8 years

Helderburg Fruit juice business for 12 years

Sanlam (years not specified)

What does your company do?

They manage money, portfolio management on behalf of a lot of independent advisers. Regulations are busy changing where an advisor can do a needs analysis for a client and, decide on the product but as far as regulation is concern they cannot choose fund for the client. They are not qualified to do so. They are considered as Cat2 FSPs service provider meaning that they sign a discretionary mandate with a client to manage that money according to asset classes, risk profile and award of information.

What is your highest level of education?

B.Com Accounting

Do you have any employees working in your organisation, if yes how many?

Worldwide is 62 employees

South Africa is 37 employees

They have a offices in UK, Grenze and SA from the tax point of view

Can you tells us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

Very little, they just recently appointed a business analyst nine month ago. Analysist has much to do with the systems that they have. Systems cost money, and the system that they have might not be exactly what they need but currently making use of the shelf products that they buy at a minimal cost. Those product provides 85% of what they require. The company is not prepared to spend 100 million to tick a box for the remaining 15%.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

Cost is their biggest obstacle. They have between 8000 and 10000 individual clients that they have a relationship with, however, if there was an easy and cheaper way to extract information and how to apply therefore they can consider. They are currently contracted with almost a 100 of FSPs that outsource their client investment management to Miton Optimal. That is what they did with Martin Klopper, who brought in a specialist in the financial advisor field to learn about financial investment, funeral cover, gap cover, medical cover and etc. It becomes more complicated such that the regulator keeps on changing the rules. As aforementioned one need to have a category 2 which is sub categorised in two where 2a requires you to run a fund that have a small of amount of 3 000 000 (running from their account not the companies money) or thirteen weeks of working capital in their banking account at any stage of the financial year. This is to avoid any adverse risk such as Ponzi scheme where clients has lost lots of money. In a nutshell they manage funds on behalf of the financial advisors. Scenario: if you have a million rand to invest and you approach Miton Optimal directly, a record of advice will be written, to understand the source of fund, fica requirements, proof of residence, identity verification and banking details as well as determination of the risk profile.

IQ1.1.3: How does your organisation categorise your existing customers?

Based on timeframe of relationship, their business started in 2001, old client based on the relation, client age and the size in investment (R100 000 is perceived as a small investment where as a R10 000 000 is a big investment). What they also do is if you have a R10 000 000, and you have a son that is saving R500 towards his retirement annuity, a wife with 30 000 tax free savings account they value the relationship (they manage relationship).

IQ1.1.4: How do you manage your competitiveness against your competitors?

Everything in the world is competitive, but all lies on good services, in the most realistic way. Their business runs on 25% base that company makes annually, that is for every Rand invested they got 0.25 return in investment and it takes time to build this kind of business and relationships as well.. Performance is key, if you are sour in performance you run a risk to lose a client the minute the market don't perform. Their priority is to be in the best performing, by taking a volatility risk and making it into a package that they can sell to advisors.

IQ1.1.5: How would big data add value in the organisation?

The business that they deal with does not use BD its focus is mainly on investment, they may require an upfront fee with the client but in most cases they do not require it. The only way that the business can be successful is to have a long term relationship with client for a period of 10years to make more profitable income. Online investment may be an approach but in South Africa is not yet forthcoming. Their approach was to then manage big pocket of fund online. They don't necessary develop a products, and most of the money they manage is discretionary fund, which different clients purchase in a form of unit trust, equity, commercial properties, bonds, money market what they blend into a package for a client. That is not really a product but investment money lying around different companies e.g. Alan grey, Investec.

The only product that they have is retirement annuity and tax free savings other that they do see indulgent policies or trade indulgent products as products but those as well they do not create them but adopt them from big investment companies, the tailor-made it according to the clients' need, some of them are great some poor based on the systems that they use. When they have a client the advisor will do record analysis but they conduct an objective analysis which is a needs analysis to determine the client's appetite and benchmark for the portfolio investment. They measure their performance using rolling terms which is CPI +3 over a three period.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

They don't have enough data. They have started the business in 2001 and they might be sitting with lots of information or trends that they do not realise that they have or in a position to extract them. At the moment they are using three various systems, for different purposes 1) for reporting, fees, and CRM perspective and the systems don't necessary talk to each other.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

They think so, however, they don't think their skills are being deployed appropriately to generate more investment and more income at the end is to make money.

IQ1.2.3 Do they have a desire to know about big data?

Yes, they don't lose a lot of client but it will be interesting to know there are opportunities it offers, is there any trend in clients that they have lost in the last 24months, is it just about performance or service related issue. Also to determine the risk profile i.e. is it is a small investment and above a certain number they run a bespoke portfolio that is in a normal circumstances if they have two individuals with same portfolios (e.g. platinum clients) that have big investment, if you lose that client, the business get hit harder and it is therefore important to determine what they did wrong and what can be avoided to lose the other client.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes they do.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

It goes back to knowing what to ask the client, in any area that they could be possible failing at the moment, perhaps their processes are wrong, and being in position of such information can put them in a position to be more competitive. Big Data can therefore be used to inform

new business processes. The data that they currently have can be analysed from BD perspective to identify trends, and also provide opportunities to be ahead of the competition.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

A happy customer is for life. In the book I was your customer there is a phrase which says that the most dangerous customer is the one that never complains. Perhaps getting more information from their client will be of good advantage, what are they doing well, where to improve, what things are unnecessary. They have a regulatory responsibility that once a quarter, they must furnish their clients with a financial report.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

No, to be consider in the New Year

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

In an annual basis, convened every year towards the middle of January, they also have a strategic session. The company do conduct, strategic asset management allocation that has to do with the investment side of things, they look at each of the asset classes and do research, forecasting and making prediction of how much they can get from the specific markets i.e. US equities the prediction are they will get 4%, bonds is 3% and based on that they put the whole things together. On the business side they have to look on compliance, accounting department, human resource, sales and etc., and determine what they are going to achieve in the next 12 months. With regard to compliance they have an in house compliance and have outsourced person that comes every second week.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

Every second week they have sales meeting, probably every second month they sit down analyse what their competitors are doing and what they are not doing. If there is something new they do consider if it is a necessity or not, does it add an additional responsibility.

How do you sell?

They don't really sell but they have business portfolio manager working closely with the Independent Advisor that have the relationship with the client and also understand what is happening in the ground. Their biggest responsibility as Miton Optimal is to convince the SFPs to invest with them. In future there is an ACT that has been brought up in the UK and Australia that is called the Retail Distribution Review (RDR), where SFPs Category 1 will be forced to outsource their investment to Category 2 companies. Therefore, all those companies that are still running funds by themselves they will have to partner with to category 2 companies.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

No, but require a transcript for preview purposes.

APPENDIX D10: INTERVIEW TRANSCRIPTION P10

Section A: participant's details

Personally Details:

What is your Name?

Name of your Company?

Martin Klopper Financial Services

Your role in your Company (Job Title)?

Owner and key individual

How long have been working in this organisation?

20 years with current employment

15 years with Old Mutual

What does your company do?

The company provides financial services, investments, medical funds, risk and life insurance, short-term insurance, strategic planning also working with investment specialist based in the US.

What is your highest level of education?

CFP-5; T2

Do you have any employees working in your organisation, if yes how many?

Six employees

Can you tell us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

They are a small company with no experience on BD analytics, but they do get their analysis from big companies like Discovery or old mutual which have one of the biggest database in the country. He gets most of data through connection, attending meeting to meet the right people and introduces himself, should he need any information he will contact them later.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

He has not come across any obstacles and it is difficult to answer, however obstacle is basically how easy to get the data, how reliable is the data for example Statistics South Africa is highly politicised and they don't provide the real stats.

IQ1.1.3: How does your organisation categorise your existing customers?

On occupation, gender, age, affordability, health. You said 500 tax cant go to a risk person with a product with a product like life insurance services, but he can service his existing life insurance. If he has a different view in a client, you can't make changes because they can't buy again.

IQ1.1.4: How do you manage your competitiveness against your competitors?

He is trying to be a one stop business, and see to it that his clients' gets advice from experts. Because they cannot be experts from everything, short-term, long-term, life investments, I they are a lot of companies now about 900-1000 that you can invest only in unit trust. There for you cannot do business with all those company, but you need to choose one that you can invest with. Currently they do most of their investment with Alan Greys because it is a company in the JSE and don't have to pay dividends to their clients. They have specialist that are always talking to the client, and always attend trainings. They are very good fund managers, always available even telephonically.

IQ1.1.5: How would big data add value in the organisation?

The more data you have the more business you can do, and focus on various things if for instance BD can tell him that company A, is looking for benefits for their people, you can approach them and sell services to them, inform them about your abilities, your experience, what you can do for them. On the computers or systems to make it easy, meet new client, retrieve data we need, currently of they go to someone they don't know they are just guessing and you don't know who you are walking to.

How is business, tough or easy?

Business is quite tough. He comes Worcester and has an ability to do work for the municipality but he does not have a BEE certificate, therefore he cannot provide services to them. The municipality gives business to others who resides a distance away from its vicinity while he is there and to provide personal services which is very important element of the business. It important to have personal relationship with your clients.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

No, they don't

Is this is something they are thinking of implementing?

They store most of their data in files and their backup system.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Yes they do, they belong to Moonstone in Stellenbosch a compliance officers, where they can source data in a certain way, their tools, electronics, internet are always 100% and if they can get big data they will be able to handle it.

But do they have necessary skills to handle the data?

Yes...

Is there any challenges that you think can affect SFPs to adopt BD, potentially?

Yes, they are being bullied by cooperates, which prefers people to work with them directly, they want people to do business through call centres, they do sponsorship, working with the politicians. They think private independents are taking away their business. For instance if you are looking for a quote of a short-term insurance and I give you a quote from 3-4 companies they fight like a dog over the bone. Mr Klopper tends not to like, but he gets a good rate for his client. He bullies them back, by saying that your client has been good paying you premiums for so long, small risk, and he can get a better rate for the client somewhere, if you still want to keep the client reduce the rates. They don't like that at all. But hey need us for data i.e. information about marital status, number of kids, what kind of business he is in. it is difficult for them to get this information, hence the dependent on Mr Klopper.

IQ1.2.3 Do they have a desire to know about big data?

Yes

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes. There more you are informed the better the advice you give.

Coming from a semi-rural area do you think there is more opportunities to analyse this massive amount of data that is available for company to assist in improving your portfolio and offering?

Yes...

If there is an opportunity of having access to BD will utilise it?

Yes.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

They use in trauma instances e.g. in this case they can go to a client and say they are still insurable and they have data that shows that people of your age are still suitable for a retake, you are smoker and have data from a reliable good source. I think we can increase your trauma insurance that can do you well than a life insurance in this instance i.e. breast cancer in women, 70% cause of death in women and medical aids has removed post trauma treatment. In some cases it can result in the removal of the breast and most medical aids don't pay for a transplant and reconstructive procedures.

Do you think with BD can you be able to improve profit, grow your business in terms of number of people?

Yes, it can improve the quality of services you provide and increase number of customers, however, you need to service your existing clients well and acquire one or two client a month that is a good business.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?
Yes definitely depending on what BD gives you, you can be able to categories clients based on their statuses and prioritise accordingly.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

No strategy at the moment, but uses some contacts to solicit data.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

We know how many client they are losing and also find out why they are losing them if a client walks in they always ask for feedback on the clients experience on their services. They always discuss the feedbacks from clients in meetings, and what the causes of losing clients, e.g. we lost client A and he said we take long to provide feedback. We got a phone in client that was referred in by Mr and Mrs Y and they do offer Mr or Mrs Y with compensate.

Opportunities they do sponsorship, they are going to sponsor women golf in Worcester, and they are going to get data through Lukey. During the golf event they are going to run a competition with a prize, and participants will be required to write in a card their name, email address and contact details. They will also ask if they can contact them to inform them of their services and products. That how they collate this data which they sit will all the data.

Do you know the potential base of clients in your area and their profiles?

Yes more or less, that's if BD plays a role.

The threats in their business is more of empathy, sympathy type of thing. Example: a client comes from Pretoria they have a deaf or blind child they give up their jobs in Pretoria and insurance is a good start of a business and they tend to sympathise with in that type of situation.

Do you have lot of those kind of clients?

Yes young people always do come for advices

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

Daily, they have a company Martin Optimum specialised Investment Company, takes our clients' money and put a bit with Investec, Alan Gray and other companies and we are analysing that all the time. They have got specialist analysing the market making projections and forecasting on what will happen in the market, and they advise client that they must not get out of the market. Markets are very cheap even when there is no growth.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

It is difficult, the big problem they have in Financial Service Board (FSB) we don't know where they stand with them, they policy them like hawks, they attack individuals.

APPENDIX D11: INTERVIEW TRANSCRIPTION P11

Section A: participant's details

Personally Details:

What is your Name?

Name of your Company?

FC Wealth and Investments

Your role in your Company (Job Title)?

How long have been working in this organisation?

Since the company opened in 2009, that's 11 years from now.

What does your company do: Agriculture

What is your highest level of education:

Chartered Accountant (SA)

Post Graduate diploma in Financial Planning

Masters in Financial Management

Certified Financial Planner (CFP)

Do you have any employees working in your organisation, if yes how many:

9 permanent employees

Can you tell us about your background of your organisation?

The FC Group is a well-established Financial Firm of Chartered Accountants and Certified Financial Advisors. We offer comprehensive Wealth Management, Insurance, Tax and Accounting Solutions.

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

We have enough data that we can use to improve our client products and also we can use it to analyse our client needs but we have not done anything with the data. As much we have the data but the skill within the company to use the data is not available and also it hasn't been our focus.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

We do not have the skill for data analytics within the organisation at the moment and it will take too much time to set it up.

IQ1.1.3: How does your organisation categorise your existing customers?

We start by understanding enough about their needs and therefore that helps us to classify them in terms of their requirements standards because it's one of the things I do believe people do not focus on. For example, for us, to be able to produce sufficiently and meet our customer needs, I do need to know more about the informal market and formal market clients so that I can be able to meet their demands. We look at the number of clients and the data we get for those clients at a specific period vs a specific period in the previous year and that influences our planting.

IQ1.1.4: How do you manage your competitiveness against your competitors?

The more we know about our clients the better we can service them and service all their dissimilar needs. We all have some information about our clients and we service them according to what we know about them. So, our best strategy for now is to collaborate with other organisations so we can better service our clients.

IQ1.1.5: How would big data add value in the organisation?

As mentioned previously, it would help me to better understand my client needs and the peak periods so I can sufficiently cater for their services.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

Yes because most SMMEs do not understand big data at all let alone that some of them do not have data nor even know that they do have data. Some of the data is even too complex for them to even understand which is why I say this requires a special skill and time to understand and implement it so the organisation can reap the good benefits it is meant to bring.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Personally, I do not think they do have the skill and even understanding the concept of big data. They mostly have the data but not knowing what to do with it and what it can also do for them.

IQ1.2.3 Do they have a desire to know about big data?

Maybe there is interest in knowing more about big data but they do not know where to start as it probably seems like it is something complex and probably need more time. No one is ever willing to spend time and money on something they do not know how it will help them. More especially when they even know what problem is this going to solve.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

We do not have a strategy yet but we are thinking about it because technology advances every day and as an organisation we would not want to be left behind in the technology evolution.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

Yes, we do and it is a continuous assessment that we do weekly as things change frequently. Any problem areas or issues, we talk about and address immediately. There is no better time to address a threat/risk than to address it instantly. And at most times that is a less costly approach as we are dealing with the situation before it expands or becomes costly.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

We constantly look at what can add value in contributing to our client. Looking at things that can be done e.g. Knowledge sharing, skills and development, reducing redundant tasks, etc.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

No, I still need to think what to add here

APPENDIX D12: INTERVIEW TRANSCRIPTION P12

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

Optiversal health services services

Your role in your Company (Job Title)?

IT Manger

How long have been working in this organisation?

8 years

Lomil polymers for three years as IT manager

What does your company do?

They are a medical aid brokerage, they are the fulfilment channel for the medical aids leads that are coming into the industry. They have three separate companies:

Med-quote aid lead generator, with all online webpages and platforms that you can fill in what you are interested in and it collate data which feed into optivest

Optivest fulfilment channel and authorised financial service provider and they also provide advices to clients

Insuremed is a complementary medical aid gap cover which you can get it if you are a member of a medical aid. This is a complementary services of group of companies that works together. They provide services to all open medical aid in the industry. They do not provide this services to close medical aids like GEMS as they are not allowed to have a broker linked to it. For individuals they always do a full need analysis and from there determine what is the best option.

What category are they on:

Category 3 commission based company from the medical aid rates.

The medical aid pays the commission to Optivest on the first payment they receive from the client. In terms of the medical aid Act, for them to receive the payment, there are certain requirements that they need to fulfilment like how they services the clients. Each company has its own webpage i.e. www.optivest.co.za; www.meqoute.co.za; and www.insuremed.co.za.

What is your highest level of education?

B.Sc. (Hons) Computer Science and a degree in business science

Do you have any employees working in your organisation, if yes how many?

Optivest 105 employees and quite few sales consultants starting next year

Can you tells us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

They are aware of BD and the only challenge is time constraints. I am sure you will get this with many companies that you have interviewed. He has an entire list of projects for 2020 that are in the pipeline and some of them are carried over from the 2019 because they didn't finish them, therefore at this current moment, his focus in BD and analysing it is not a big priority.

Will you consider outsourcing it?

They outsource very little and prefer keeping things in house. He has fulltime developers in his department; all server infrastructure; and the owner of the company likes to keep all the intellectual properties (IP). The owner of the company is Marcel du Toit. He is very sensitive to outsourcing, their databases are in house.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

Two things: Time constraints as aforementioned

Unstructured data, talking about emails they have thousands of emails that goes out of their server per day, under number of unstructured data sitting there and it is difficult to search. They do have some project for next year and without going into too much details, but they are planning on making their emails far more structured so that they can have them system based, such that they can be able to search through them and indexed, and with the whole point of BD they can be able to get information that can assist in making business that they cannot actually do in this as it currently stands with their emails. They currently have a data lake (vs data warehouse). They don't have a data warehouse and no analytics that is specifically being done. As it stands now their data is in a data lake coming as raw information and they query it as and when needed, if is requested from higher up. The developer has an experience with sequel database writing queries (the IT manager can still do it). They have an expertise and the challenge is just the time constraints

IQ1.1.3: How does your organisation categorise your existing customers?

The way they see their customers and how they categories them is based on the services and what are the complimentary services that they offers them. What they are offering vs what they can get from them. The complementary services are for specific clients but it boils down to need specific per client. For example, Medshield as a scheme have a lot of co-payment cost involved and their Gap cover product covers it. On the other hand you will find that another medical scheme does not offer co-payment as much as the Medishield therefore, you are prime to market the gap cover product is with the clients that are in the Medshield than the other ones. So in a nutshell is based on the customers' needs.

IQ1.1.4: How do you manage your competitiveness against your competitors?

By comparing our services and products to similar competitive products and services to see where a gap can be obtained, certainly they do this with their gap product cover as well annually and compare their products with other gap products out there. They have their own gap cover and therefore they are in charge of its benefit, check how much it cost, did it just get underwritten by another company. So the idea is to compare its benefit, what happen in the year, what types of claims did comes through, what were the needs of the client vs what other competitors are doing and adjust their benefits accordingly. This is a yearly exercise to try and make their product competitive.

IQ1.1.5: How would big data add value in the organisation?

The specific statistics that you can get especially from the data warehouse it will show us how many clients do they have, how many are in gap cover and how many will need gap-cover. It is mainly to obtain this kind of information that you cannot just get by looking at raw data, and it has to be analysed and to get trends and that is where they can draw that benefit from

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

As an organisation yes they are having challenges in adopting big data because they do not understand big data and are only aware about it.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Currently as it stands they do have analytical tools. As aforementioned, analytical systems is not something that they have looked at, but if they do obviously they will have to make it a project that they can focus in more time, and they will definitely do through research on it to understand all the different tools that are out there in the market and specific choose the one that is tailored or carted to the kind of product and services that they offered by the company.

Follow up question: Does your company has ability to handle unstructured data?

As aforementioned no, but they have a project to look into structuring their emails.

It seems though there is so much potential for big data but it gets to be re- reprioritised by other projects?

Yes

What is the benefits that you can get?

This is the battle that he has to fight for it to get higher priority, is for him to discuss the with the CEO BD benefits that the company can get out of it before tackling BD.

Does your organisation has necessary skills?

Yes, in his department he has people that have necessary experience to tackle that project. But just don't have the opportunity to do so, but he looks forward to it.

IQ1.2.3 Do they have a desire to know about big data?

Yes

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes they do,

Where do you see the benefits?

It is very much of what has been said, the analytics and the type of trends that you can pick out of it. That influences the decision making, of what offering you can give to your client, so that will give them competitive advantage.

Question: I have picked up two things that you have said: In the product development potential sale there is some benefit there and market hard-core market and market segment that you service in?

It is their servicing division which is a separate company called Medexpert which services all the clients that are already in their books and sales market intended for new clients.

Do they develop their own products?

Only from the gap cover side and from a service side they have a product that clients can opt to pay for and have separate contract with them, it has all lots of benefit that it comes with it. They could be some good opportunities coming from that poolside of the lake i.e. opportunities for new products development?

Not just for trends and the competitiveness of the product but from the employment side, shift kind, if we can start seeing quires coming to the client, what is the busiest time of the year. See time and day and turnaround time that client expect from them that will help them to deploy necessary resources from human point of view in a time of the day and the contractual point.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

It will put them in a position to identify gaps on products and services they provide to their client and allows them to get the benefits of the remaining loyalties. The loyalty of the client obviously depend on the gain to life. To run a risk to losing a client you need to offer them something that add to their life.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

It helps identify gaps in their service to their clients i.e. Customer segmentation...

How do you determine your customer needs so that you can improve their needs? This comes back to how do you categories your customers?

Obviously to them it depend on what scheme you are, what benefit does that scheme offers vs the complementary product, whether it add value, compared to what their gap cover is offering. It also has to do with clients that wants to pay for very less for their medical aid, and their gap cover is highly priced and goes for almost R220 per month. So people who are in a comprehensive skills are paying more for those services that they are not using and not taking in the kids or family into account. Those type of clients you can give them hospital plans and add on gap cover on it and they complement each other perfectly. They also have another product that they launched two months ago which is a health insurance product, it gives you all the day to day benefits such as dental and covers doctors visitation. The product is called Ubuntu-Med. If you add those three together gives you a good option. The product goes for R180 per month. If you add those three covers together with a hospital plan of R2000 and compare it to a comprehensive plan that a client pays between R6000-R7000 a month, you would have saved a client with almost R3000 a month. Clients don't know because medical aid are such a complex cell that they don't understand. They have a quoting system which they built years ago that you compares plans or schemes. Basically this system puts four schemes together and compares them and how do all the different schemes measures up to each other. It makes it easier and simpler for clients to understand, and that's where the lead comes from. You don't want on a website put lots of information because people are reluctant to put their personal information on a website and again you can't put long question. So on

the website is only information like name, telephone number and email and the consultant will call them and take them through all the process. So their services are telephonic based, recorded and stored in a telephone server. The telephonic data information is unstructured however, they have looked at software that they can tell you the words by listen to it but most of those software are oversea manufactured and they don't do well with the South Africa accent. They are also required by law that all conversation be recorded in case of investigation or the scheme can request the recording and a call can take about 45 minutes. Finding the recording is easy particularly if you know the number, date and the person but getting through the recording and trying to find what the people said is quite a challenge. Every consultant is unique, they do have a script but they don't have to follow the order. But from the compliance point of view they will have to reflect on everything required.

Information richness in those recording is huge?

Yes that where data security is very important especially with data encryption, offsite backups because of private information of clients that is recorded.

Do you do that on a cloud?

No they have server hosted in their company and external backup drivers done daily.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

They do not have it now, it is something that they need to structure into a project and need to discuss with the CEO and try to sell it. This will definitely come from him and also develop a business case.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

They assess it annually, they go through everything that they do and assess how to better it, by going through the products, benefits and see where they can add something that will add to the client.

Are you part of those meeting?

Yes, his part of the Senior Management, and thus an opportunity for him to bring new ideas.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

They do it annually and based on the fact that by law the products that they offer needs to be reviewed annually, it also coincides with the benefit reviews that we do with the medical schemes and the new products are always effected from 1 January, they also assess all the benefits from the product annually and makes changes as required.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

No, I am happy with all the questions.

APPENDIX D13: INTERVIEW TRANSCRIPTION P13

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

We Trade Global

Your role in your Company (Job Title)?

CEO

How long have been working in this organisation?

2012

Almost 8years

Before that he was with the Green Road Bank

CEO of Blank empowerment company called Siphumelele Investment

What does your company do?

They are product provide, they produce Unit Trust that are global property Unit Trust, they want to go to institution finance advisor and individuals to go into their global property products What is meant by global product is that they trade in stock exchange around the globe. They decide on the allocation in each of those fund but in South Africa terminology they've got Unit Trust both here, in Malta, Australia and other places in due course and all of them are portfolio of property vehicles and most of them are Real Estate Investment Trust (REIT). They focus on Property and they got REIT on the JSE growth point, Redefined, Vukile they decide on the universal of REIT, what goes into their portfolio is about 2000 of REIT Globally and they construct a portfolio that performance the average of about 40 and they increase, decrease and remove and add onto those portfolio for certain Unit Trust that they manage. This is done on a daily basis.

How does your portfolio perform against the others?

They run for the Raging bull award which is a top performance award, they are in the line to possible win again this year. There are 16 competitors here in South Africa that produce global property funds and they are always in the top six.

And against other types of funds?

Well, it is a niche and they believe that global property is a component of your portfolio so they outperform South African Unit Trust that are focusing on JSE by far. This year they have 25% in Rands, in dollar 23% and JSE is -3% but it does have its ups and downs. Last year they only comes out with 4%, it is not a straight line.

What do they mean by 4%?

4% in total returns. On an average for the past two years they had 15% of the returns.

What is your highest level of education?

Chartered accountant

Do you have any employees working in your organisation, if yes how many?

Six employees, the staff in the company are highly qualified, two employees with MBA, CA and CFA and Business administration

Can you tell us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

They are now starting to do it and they are working with an organisation in Stellenbosch for six months to use BD to analyse, extract, to enhance their performance and to reduce the emotive elements in their stock selection, allocation, which no matter how much you may want to avoid this but you cannot.

However, the crucial thing is they cannot totally depend on it because there is human intervention and BD cannot see certain things no matter how much of machine learning and BD that you have. For the next three months (end of March) what they have requested from their associates in Stellenbosch they must supply them with BD information so that they can clematises or adjust themselves and see if they will be able to use the data to enhance their performance because everything in investment is based on performance.

Will it be okay to give you a call in May/June to just get feedback on how it is going as he will be writing up his thesis?

They have their Portfolio and BD can give them a different portfolio which can throw them into a spin, they have a process to arrive at that and they are doing well and they suspect that BD will deliver something that is relatively close and they go and do it their way, actually they are now within days of getting it done.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

It comes with a cost and knowledge on how to use it. It has taken them a long time to understand property, REIT and process, and to go and develop skills now on how to access BD, it is a completely new different set of skills. They are working with people who has experience, right now if you ask me to go find data, I would know but this guys do and they got it and they have given them certain information. You need to negotiate contracts to get information and one wouldn't know who to call and request for BD. This organisation that they are working with specialises with financial BD, not marketing BD and that is so crucial. To arrive to them, they had to speak to different organisations and they listen in and could see that they were going to give the marketing BD whereas to them performance consist of probably 49% of the weight to success and it takes time and the other 51% you have to stand

in front of people to get it, you have to tell them what is all about, and they talk to other people. Right now they are in a process of developing a consumer product, identify that as well. The best way to answer is that there are some organisation that says that they have funds called X, Y and Z (artificial intelligent) and general equity funds, this funds are not growing and they have spoken to a number of people and they don't trust them, that is the marketing things and they go back to 2008 before the crush of things and they have blackbox and they were secretive on their dealings and they crashed and the public wanted to know what is going on and they said they are using AI. So there are a lot of scepticism about AI, not all of them are delivering magnificent results and this organisation in Stellenbosch they concentrate on information to enhance performance and they said it has to have human intervention. Human intervention is not just talking it, should also include explaining to the public what you are doing, if we say we have a process and we are using this to select components is a complete different story that they will just sit and push the button and generate results, nobody will go for it.

It seems that the context and the experience in the specific gain like property is very important in the analytics as well, one couldn't just go and do?

We use it to identify prospects and thereafter they go and do the work because is 2000 it goes and cuts down, that is the way they are going to use it. They are still going to do their own evaluation, assess management, also it will give them a guide of the allocations. Do you know that stock selection is secondary to performance and is very secondary because of the allocation, you may find a fantastic stock and you allocate too much to it and everything goes wrong, often when is a good prospects it comes with a risk and is a good prospects and put little into your portfolio. Allocation is a primary contributor to performance, the secondary one is your selection, whereas the public thinks that selection is the actual allocation and they will help us with the allocation (this is what we think you are doing), they also decide on the selection, they may know that there are some issues there that AI doesn't know and the machine learning doesn't know, and that how they are using it.

IQ1.1.3: How does your organisation categorise your existing customers?

They have got three categories:

Firstly direct as they call them, people comes to them. Do people call you? Generally they are peoples family and friends who then speck to other friends and family and see what is it and that's what they call direct customers. Lots of them referrals;

Financial advisor attached to them are discretionary fund managers who often provide advice to financial advisors on what they should do; and

Institution, they absolutely do not have institution because BEE blocks them no matter what they do. Even if it is small? Even if they performing is a frustrating thing. If they are out performing someone by 10%, the institutions are forced by legislation to the demand of South

Africa and the investor and they absolutely have no chance. The PIC has been producing 2% of compound growth for the last 10 -15 years and even if inflation is negative? He is also talking from being a CEO of a black empowerment company and there are whole lot of obstacles and institution like Sanlam are being forced to direct their investment to this underperforming ones because of race. Even if they can give away 90% of their shareholding and went and went as they are they wouldn't do it. It takes years to develop somebody. What they believe on is that sanity will prevail and continue to outperform. They are not an institution but is one of their prospects.

Do you look at high net worth?

Their minimum is 25 000 and they take the whole range

IQ1.1.4: How do you manage your competitiveness against your competitors?

We outperform them, that's how you manage performance and of course the cost structure plays a role, you can be beating someone by 5% but if they got higher than theirs the DFM will say is a cheaper cost and you can outperform them when your fund is low.

IQ1.1.5: How would big data add value in the organisation?

Performance, in due course like now they are doing work with ABSA bank now that are more consumer. Unit trust are sold on trust, where people knows us and tell each other (the directs), then the financial advisors and that is really the market whereas they will be doing products like the ETF exchange traded fund which is more consumer oriented. And in due course they will using marketing data to actual get to those people. It takes long time and money to set up but they will have an ETF up and going by the end of February and they can run for a while. Probably by 2021 they will use BD in marketing materials.

Do you use Centrex approach with your trust?

No, Centrex is an index exchange traded funds so you have two categories which are active managers, where you actively go and research and put forward a portfolio and you have an exchange traded fund that have got an index and they replicate and index. They got a bench mark that shows how they are performing relatively to their index but the down side of the ETF is that nobody has done any research of the underlining holding, nobody can tell you that they thinks there are enough spares or run out of steam or is time to go down. The two ETFs makes about 50% of the market that is active managers are 50%, in South Africa is only 5% point in time. What you can do is to blend the two, as aforementioned they are launching ETF in February, and what they did they took a component of their global ETF and source some behavioural things and created an index REIT way index that out performs the global property index. So don't start a product already there are two global property in SA and there is no need to start a new one because is going to be two so they have and index that outperforms the index, it will be with ABSA in February and we saw that behaviour and it will be a new fund REIT Way Global Property ETF which is partnership with their company and ABSA Bank.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

Yes, some of them don't not understand big data.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

Yes and No, they are taking the results of the analysis. You need to have the skills. They are running a system in which seven days later it comes out...

Can you handle unstructured data?

They are receiving structured data and they do not have necessary skills to handle data.

Do you want to or happy with outsourcing the skills?

His fanatical about outsourcing and stick to what he is good at for instances the administration of the unit trust fund they don't do it, they have a custodian that does the calculation, pricing, receives the cash, publishes the daily price but it is called the REIT Way Global property Fund. They do the buying and selling, certain organisation they do their own administration like Old Mutual.

IQ1.2.3 Do they have a desire to know about big data?

Definitely performance

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Definitely performance

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

Performance

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs?

Customers comes to them because they want performance. As aforementioned he sells to friend and families therefore he has to deliver performance. As long as you perform the customers are happy. There is a guy called Dave Ford, he delivers great performance and he has lost his way now he is very treacherous now and noxious and his underperforming and he should lose 20% of his assets under management. He is treacherous and inaccessible and lost 40% of his assets under management. You need to be a possible person.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

Yes, they will be outsourcing the BD to create structured data from the unstructured data. So they will be defining what they mean of structured data for their needs to people who provides.

You still need to define their structured data?

Yes we will tell them what they want and how they want it and they will deliver it accordingly. They know exactly what they want.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

All day every day but when they really put their heads together is at least once a month. 2020 will be Bloodbath in this industry and they have to prepare for it.

By saying it will be bloodbath do you mean that the industry is going to underperform or because of the difficulties for FSPs to perform?

ETFs goes for 5%-10% and in America is already 15%, so if they go up to 15% it is going to be a major disruption, internally people are going to be kicked out if you are not performing. With regard to the pensions, the challenge that is depriving South Africans is the regulation 28 which says that 70% can be invested in SA and 30% abroad. Their fund fits within the 30%, they've got their own retirement annuity that they put 15% of it to REIT Way Global and it has been the best performer. The 70% in the JSE and this is the government ideology at the end of the day and you have to invest in SA, the JSE floods when commodity and resources floods. It sucks oxygen when commodities and resources don't perform. Commodity and resources goes up and down and even when they construct their property funds they increase their exposures to Japan, and you can increase exposure to the US and so on. Commodity and resources are synchronised to different things you can go and buy Tesselar at the bottom, facebook and you don't want to be exposed to Naspers is too risk and you need to cut out emotion. They are actively making changes and that 70% of their portfolio was -5% and the 30% of which 15% is with REIT way is 25%. The net results is they are positive 5% or 6/7%. You go to explain this Gordan and Abraham Patel to trade and industry and of course they won't agree to offshore investment, but it is artificial and at the JSE you are buying Glencoe, Kumba and they are highly priced. As pensioner you need to reduce your exposure and requirement of Regulation 28 and put your money in the money market. Money market has done very well and is 3% but there is no globally property.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

Once a month and they put their heads together is at least once a month. There are newspapers and media publishes their performance in a daily basis, they have a thing called funds on Friday and they give performance of that week, and then you have for a month, three months, three years, five years and seven years performance. So they are seeing what their competitors are doing, and analyse them from the performance point of view weekly.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

The whole conversation about AI machine learning and BD are synonymous, the human element and how is going to take over our lives is over stated by small degree. It will take generation and people will go to tally machine generated investment decisions. Many years ago you had human stock brokers taking your orders and online was going to come along to replace those people, what happen is that they found their niche and that is there are brokers who still feels the market and they you have the online trading.

ETF vs Active Management, the power of active management is decreasing because ETFs are taking over and it won't be forever because you still have to allocate.

Robot advisors have been around for long, they are providing advises and they are getting more sophisticated, a small portion of investment that comes from robot advisors and it is going to grow.

BD is overstated, and it is going to make certain thing to be redundant.

People don't trust machine

SANLAM has got Eight Fund called AI general Equity funds, they are not growing.

APPENDIX D14: INTERVIEW TRANSCRIPTION P14

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

Reason Consulting

Your role in your Company (Job Title)?

Key individual for short-term insurance and representative on all the other line of business thus include providing advises on life insurance cover and medical schemes.

How long have been working in this organisation?

3 years

What does your company do?

8 years as a Professional accounting in an accounting and auditing firm in Pretoria

What is your highest level of education?

Bachelor degree in Internal Auditing and member of the South African Institution of Professional Accountant and South African Institution of Internal Auditors

Do you have any employees working in your organisation, if yes how many?

Yes, one employee who handles administration and some of the cases.

Can you tells us about your background of your organisation?

They are a financial service provider, and they are not linked to any insurer or investment house, they are independent. They have contract with different insurers, different investment houses and different medical schemes. Therefore, they are licenced to sell or to

consult regarding those products. In a nutshell they are financial service prodder, providing advices in different products.

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

Not really, the data that they have is for their clients which is confidential. The data is electronically and they do not work on paperwork. They do not analyse the data but just store it. According to the FSA which is a professional body that requires them to at least have records for five (5) years for all advice given and correspondence to clients before disposal.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

No, he doesn't think so.

Why are they not analysing data, is it shortage of skills or do not have time?

He doesn't think they have time for that or in a line of their profession nevertheless there is a benefit to analyse the data. Other insurers has approached them to provide with advises on the analysis to push/increase business however this is not done as yet. He doesn't think there is a need currently for that beyond what they are current business process which is data storage and so forth.

IQ1.1.3: How does your organisation categorise your existing customers?

Based on the four spectrum:

Young to old

Professional to non-professional

Basically there are two representatives in the company, the much older one is Ernest his about 64 years and look after the much older client and himself Johan who is 35years old n look after the younger clients' portfolio.

IQ1.1.4: How do you manage your competitiveness against your competitors?

He believes the way they do business, the operation of the business is conducted electronic and overall they manage their competitiveness based on the service they provide. Their correspondence are mostly electronically and on record, sometimes you have brokers that go visit the clients and their engagements are not well documented. So far 2/3 of their client haven't even met them.

IQ1.1.5: How would big data add value in the organisation?

He believe so, there is a space for BD analytics to push/take their business to the next level and he doesn't think they have the capacity at this moment to drive that.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

Yes, they SMMEs do have challenges in adopting BD. Big companies like Discovery the data that they have is incredible and they can use that data to improve their whole business model. He doesn't think that SMMEs has capacity since they are smaller than the cooperate front. When you need to employ people the business doesn't rectify that change.

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

No,

IQ1.2.3 Do they have a desire to know about big data?

Yes

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes. Obviously to come up with the whole spectrum to serve the client and BD analytics can give you that opportunity.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs? Improve service delivery, supplying the client with holistic service, covering all the needs of the client basically.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

No, currently with the service provider that they use, they sometimes have information of their clients. Basically all their clients that have Discovery, Discovery does have their information of that client, they give it to them when they submit all the information with application and Fica requirements documents. Discovery has approach them before with information to improve business. As aforementioned they don't have capacity for BD at the moment.

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

They receive that information in a weekly basis from their service providers informing them on what is going on in the world of investment and risk covers. They basically as part of their ongoing training they have to look at that information and sometimes do an assessment to make sure that they are constantly learning.

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

He doesn't think there is a big competition attitude among brokers or financial advisors. Therefore, there is not really a need to assess competitiveness because there is not a lot of

financial consultancy out there and lot of people out there. There is enough business for one out there without having a need to compete, you much just make sure that your business model, advises and knowledge is up to scratch.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

No.

APPENDIX D15: INTERVIEW TRANSCRIPTION P15

Section A: Participant's details

Personally Details:

What is your Name?

Name of your Company?

Broker-Fin Insurance solutions

Your role in your Company (Job Title)?

Principal owner of the business

How long have been working in this organisation?

37 years and they have 2600 clients all over SA and they manage 3billion in Rand

What does your company do?

They are an investment brokerage company and they specialise in investment.

What is your highest level of education?

Three year diploma in management and qualified company secretary, he also have all the FSP certificates. Level 1, they access level -2 through the other company they use.

Do you have any employees working in your organisation, if yes how many?

14 staff members

Can you tells us about your background of your organisation?

RQ1: What are the challenges SMMEs face when using BD analytics in building and differentiation customer segmentation to create a competitive advantage?

SQ1.1: What are the perceptions of SMMEs towards the value of BD for their businesses?

IQ1.1.1: To what extent does your organisation have experience with big data analytics?

They have a sizeable experience on BD. In the past they had experience and spent sometimes analysing client information. To give an indication on what they do, they are an investment brokerage company and they specialise in investment and do not spend time on short-term insurance, medical aid and others, instead they have a specialised areas of where they do their operations. So what they have done per client: they have a whole variety of investment and obviously that comes in a form of a statistic data and from time to time analyse it and

make it their business to ensure that all their clients various investments on their brokerage code. They enjoy analysing the data and segmenting it to various forms like investment, retirement annuity and etc.

Yes, they have devoted a lot of time on analysing data and it has been working for them tremendously.

IQ1.1.2: What are the main obstacles that would prevent your organisation in using big data analytics?

In their specific circumstances, what is a bit of a problem for them is to get information pertaining people that are retiring for an example at the University of Stellenbosch is not easy to access information of people that are retiring and it is an obstacle. If they would be availability of such specific data regarding people retiring they could obviously be pressurised to get to the people and convince them that they can be their broker concerned. To them is an obstacle because that data it is secured and they cannot get to it.

IQ1.1.3: How does your organisation categorise your existing customers?

They sub-divide their clients as a); b); c) and d) in terms of the amount money that they have investment with them.

IQ1.1.4: How do you manage your competitiveness against your competitors?

This is something that they don't really have a problem with in the market place based on the quality of advice that they give and that serve as a sort of a divider between them and the next person. For them is not really a problem in a marketplace.

IQ1.1.5: How would big data add value in the organisation?

It will add value if the data is specifically to help the source the people that they would work with and if is not that specifically it won't assist at all.

RSQ 1.2: What are the factors affecting SMMEs when adopting BD analytics for creating a competitive advantage?

IQ1.2.1 Do you think SMMEs are having challenges in adopting BD?

Yes, they spend lot of money updating their computer and systems specifically their databases (databases are so much expensive and it host a lot of information and it needs to be dealt with by specialised staff and it makes whole of life easily).

IQ1.2.2 Do you think SMMEs have the right analytical tools or skills to handle unstructured data?

They do not use unstructured data. If it is possible that it could add on what they are doing obviously they would like to investigate but at the moment it is not an issue at this stage.

IQ1.2.3 Do they have a desire to know about big data?

Yes, they have and as aforementioned, they have devoted a lot of time on specialised and training them first and those are in house people.

RQ2: How can SMMEs utilise BD analytics in order to create a competitive advantage?

SQ2.1: How do SMMEs determine the needs of their customers?

IQ2.1.1 Do you see any benefit in using big data to create competitive advantage in your organisation?

Yes, if you can use BD positively it will enhance growth of the company, the more clients they have the more money they have under management and the bigger the possibility of negotiating rates in the market. Therefore BD can create a competitive advantage from the administration and management point of view and within that you can save your clients lots of money.

IQ2.1.2 To what extent would big data analytics add to the competitive advantage of your company?

Only to the extent that they have lots of information or attain more information of people that are retiring it will obviously enhance what they do.

IQ2.1.3 In your own view, what can big data analytics do to improve your customer's needs? In their own fields there is little that can be done because they spend a lot of time per client identifying specific needs are in a variety of fields, so if it is not specifically same investments to your client it won't help much.

Obviously he doesn't know.

SQ2.2: How can SMMEs incorporate BD in their business strategies?

IQ2.2.1: Does your organisation have a strategy on big data or data analytics?

They do, basically they analyse all the information that they have and devote lot of time on the information to ensure that whatever the clients' investments they are, would be under their management

IQ2.2.2: How often does your organisation assess its strengths, weaknesses, opportunities and threats in order to understand the current business climate?

They do it annually, they have an annual planning session which last for three days, the meetings has a structured agenda and also consider the company's strategy amongst other things. The meeting also plan for the following year

IQ2.2.3: How often does your organisation analyse the competition in order to understand competitive advantages and disadvantages as well as identify areas for investment or needs for improvement?

They do it in a continuous bases. They are part of a big organisation called Finsonet, which is a group of 64 independent brokers. They have quarterly meetings which constantly analysing what the competitors are doing, with regard to strategies, investment, costing and etc. Basically it is an ongoing thing and gets a lot of attention.

IQ2.2.4: Is there anything you would like us to add or anything you feel we have missed asking?

It is difficult in the moment to provide an indication on that, however, he thinks that an attitude towards this is being confirmed in a questions above. This is so important particularly for new business and be incorporated into new business strategies for their benefits and it would also

be nice if they can have a system that could have a system in which they can use BD specifically in their fields of expertise.