The use of digital technologies by financial institutions to offer personalised offerings and bespoke customer experience in Gauteng.

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KEYWORDS

- Customer Experience – customer interactions with a service provider during a customer journey.
- Digital technologies – software systems and resources that facilitate the creation, storage, and management of data.
- Fourth Industrial Revolution – a fundamental change in the way we live, work, and relate to one another.
- Hyper-Personalisation – the process of using AI and real-time data to display curated products and content to customers.

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I am beyond grateful to have reached this point, and I know that it is only through God's infinite mercies that I have made it here. It is truly humbling. I want to extend a huge thank you to my mother, Ruth Kojane, for her unwavering prayers. She is a true example of a praying woman. Moreover, of course, I cannot forget my family, who has supported me every step of the way. I also want to express my heartfelt thanks to my husband, Bongani, for his unwavering perseverance throughout the entire process. To my two sons, Bongani jnr and Bonginkosi, you were born to shine, so do not let your light dim. Finally, I want to thank my supervisor, Dr Euphemia Godspower-Akpomiemie, for her unwavering support.

ABSTRACT

Personalisation has become a crucial marketing strategy in the digital age. As a result, companies need to quickly adapt their tactics to include hyper-personalization and customer experience metrics. The use of digital technologies, such as Big Data Analytics and AI, ultimately determines the success of personalisation efforts. This study aims to outline how banks use these digital technologies to map out customer journeys and personas, allowing them to deliver personalised messages to customers.

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- 3D Printing – Additive Manufacturing
- AI – Artificial Intelligence
- BD – Big Data
- CC – Cloud Computing
- CX – Customer Experience
- ML – Machine Learning
- 4IR – Fourth Industrial Revolution
- IoT – Internet of Things
- RPA – Robotic Process Automation
- VR/AR/XR – Virtual/Augmented/Mixed Reality

CHAPTER ONE: INTRODUCTION

1.1 Statement of Purpose

The study utilised a qualitative research approach to investigate how financial institutions in Gauteng used a range of advanced digital technologies to provide personalised banking customer experiences. The goal was to improve their client value proposition while also increasing the client's lifetime value. The study focused on financial institutions, particularly banks, to uncover how they leverage data to personalise their products and services.

1.2 Background of the Study

Digitalisation has brought about an array of new ways of doing things, especially in the service environment. Numerous tools enable service providers to offer bespoke, informed, and personalised products and services to their existing customers. These Fourth Industrial Revolution (4IR) digital technologies also provide new ways of reaching out to potential target markets and enticing them with a personalised message (Kibble et al. 2020). This is not only a superior marketing message, but it also shows the customer that the bank took its time to study the customer and has sufficient information and interest to retain that customer by pre-empting their needs and wants based on historical transactions (Rizzi et al. 2018).

The digital technologies that are available today include Big Data (BD), Artificial Intelligence (AI), Internet of Things (IoT), Cloud Computing (CC), Robotic Process Automation (RPA), Machine Learning (ML), Virtual/Augmented/Mixed Reality (VR/AR/XR), Additive Manufacturing (3D Printing), Neurotechnology and BlockChain (Armstrong & Lee, 2021). This study mainly focussed on how BD, AI, IoT, CC, ML and RPA are used in a banking service environment to predict transacting needs based on historical transactional information. These platforms are used to pattern customer behaviour. This data is then analysed to formulate a transaction digital footprint such as geolocation; service providers utilised, the

amount spent, times of most transactions within a specific timeframe and other valuable personal data (Rizzi et al. 2018).

1.3 Research Problem

The advent and advancement of digital technologies in the twenty-first century provide various ways to offer superior customer experience. However, there has not been a clear outline of how these digital technologies are efficiently and effectively used to customise the bespoke customer offering. This research seeks to investigate if these technologies are optimally used to analyse and profile customer trends and behaviour and how this data is then used to offer a state-of-the-art customer experience.

1.4 Research Objectives

The objective of this study is to:

- Investigate how banks use digital technologies to offer bespoke products and services.
- Investigate how the data mined from digital technologies are used to enhance the customer experience.

1.5 Rationale

Currently, most financial institutions use mass marketing messages to reach their clientele, even if it is irrelevant to them, thereby missing an opportunity to maximise the uptake of their products and services. This study aimed to show how the use of the 4IR digital technologies in a banking environment can help to offer a bespoke customer experience by tailor-making its client value proposition. The study unpacked how the data provided by various digital platforms can be used to deliver targeted products and services as opposed to mass offerings. It further posited how the interconnectivity of these digital platforms can be optimised by using the complex analysis of big data to realise a unique customer lifetime value.

1.6 Delimitations of the Study

The scope of this study is focussed on:

a. The use of the relevant digital technologies in a banking environment.
b. The sample size was limited to the bank employees who use digital technologies for customer behavioural analysis.
c. The bank customer profile was that of an individual banking client, not a business client.
d. The geolocation was limited to Johannesburg.

1.7 Definition of Terms

According to Armstrong & Lee (2021), the following terms are defined as follows:

- Artificial Intelligence (AI) – computer algorithms that can learn and change.
- Big Data – any data that, by its characteristics, cannot be treated traditionally regarding collection, storage, processing, or analysis.
- Cloud Computing – a pool of computer infrastructure that is abstracted, highly scalable, managed, capable of hosting end-customer applications and billed by consumption.
- Fourth Industrial Revolution – rapid change and advancement of technology.
- Internet of Things – a network of connected, smart devices that use digital systems to measure and potentially manage these devices in increasingly intelligent and seamless ways.
- Machine Learning – a branch of AI that imitates the way humans learn and improves its accuracy.
- Robotic Process Automation – software tool that mimics and replicates manual and repetitive human actions in software space to automatically fulfil a process or part of a process, with the ability to work with and between multiple programs and the ability to either include human intervention or be completely automated.

1.8 Assumptions

The following assumptions were made for this study:

- The digital technologies analysis provided the data used. However, there is a human element which enables cognitive skills for decision-making.
- The customer profile for this study was that of a wealth client segment where it was efficient to track trends and offer a bespoke service, as opposed to a mass of individual clients with no differentiator in place.

1.9 Research Outline

In chapter one, this research outlined the purpose and background of the study. This led to the articulation of the research problem under investigation together with the research objectives. This chapter further explained the rationale behind the study and defined keywords and assumptions around the research.

Chapter two of this research explored and explained how banks used digital technologies to map out customer behavioural trends and how this data targets a specific market segment with relevant and bespoke products and services. This chapter further outlined the benefits of this endeavour and how it increases customer lifetime value and filters its message to be more client-centric.

Chapter three outlines the research methods used, including research design, approach, strategies, data collection, instrument, and way of analysis deployed. Chapter four presents the findings of the research, while chapter five discusses the results and links them to the research objectives and existing literature. Lastly, Chapter Six presents the conclusion and policy recommendations based on the research findings and provides recommendations for further research.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

Over the years, the banking industry has experienced a revolutionary change in how business transactions are carried out. The availability of systems and their interconnectivity has elevated the sophistication of banking. In the twenty-first century, this has been further exacerbated by digital technologies. The rapid and advanced nature of such has seen the banking industry competing in offering personalised solutions to bank clients. This contrasts with the traditional mass offering that was fragmented and did not resonate with a large segment of the clientele but cost a fortune to get across.

2.2 Hyper-Personalised Banking Experience

A hyper-personalised banking experience refers to a valued and customised product and service offering to the customer (Kransbuhler et al. 2018). A superior and bespoke customer experience includes the usage of existing and historic customer transaction prints to detect the possible and future transactional requirements of the customer. This provides the bank with an avenue to deliver solutions before the customer realises that they need a particular product or service (Kransbühler et al., 2018). The start of the 4IR necessitated the banking industry to move from physical branch network transacting to online platforms like the Internet, cell phone banking, and mobile apps, which facilitated the use of customer information to produce personalised products and services. This process requires the user to have a smart device and a secure internet connection. This also brought about a considerable upgrade and IT spending on the banking system and IT infrastructure. These systems had to be always online. Therefore, the technology had to be fast, efficient, and integrated. In the past decade, this advancement has been further improved to use big data, AI, and RPA, amongst others, in offering superior service. As part of this excellent service, banks are finding ways to study Big Data Analysis (BDA) using AI and predictive behaviour to personalise the client experience. BDA uses advanced

analytics to extract meaningful insights into patterns, trends, and preferences. It involves complex applications powered by predictive models, statistical algorithms, and analytics systems (Market Trends, 2021).

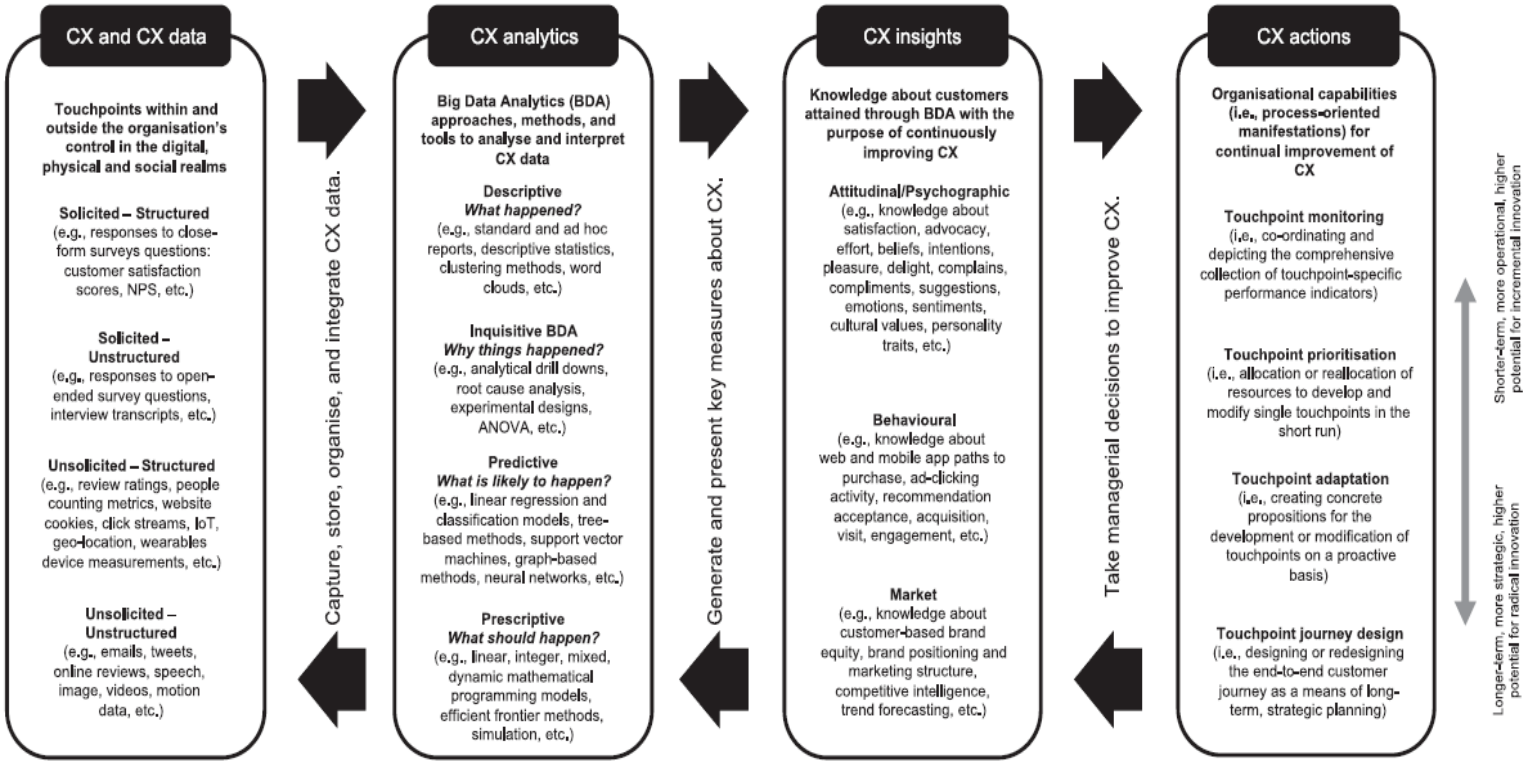

Figure 1: Strategic Framework for CX based on Big Data Analytics

Source: Holmlund et al. (2020)

In Figure 1, Holmlund et al. (2020) illustrate which data can be mined and provide valuable analytics to generate actionable CX insights. These are based on the customers' interaction with the bank. Holmlund et al. (2020) unpacked how these digital technologies are used to mine customer information and analyse client behaviour to offer personalised and relevant products and services. This was aimed at retaining the customer whilst increasing the client's lifetime value for the bank. Figure 1 provides a cornerstone framework for how BDA is used to map out CX.

2.3 Digital Technologies Used to Offer Bespoke Products and Services

Banks use digital technology to mine and analyse customer data to enable the provision of bespoke products and services. Amongst the many digital technologies available, the banking industry uses two critical tools to mine and analyse customer data. The two essential tools are BD and AI. BD are massive files of customer information and all the transactions carried out. The second technology is AI, which intelligently analyses the data by picking up trends and specific transaction behaviours.

2.3.1 The Use of Big Data and AI

Lanier (2013) had insights on the usefulness of BD when he posited that it must be mastered for it to be valuable. BD provides management with an overview of opportunities and future research guides on customer behaviour and transactions. This ultimately provides a platform to pre-empt the customers' future behaviour based on history. BD plots the customer journey map, which comprises a multitude of touchpoints (Kuehnl et al. 2019). These analytics provide the potential to have holistic insight into the customer journey and improve the bank's decision-making. Whilst research studies by Pantouvakis and Gerou (2022) echo the importance of customer journey mapping, superior insights could be mined in BD that allow banks to offer bespoke customer experience management by using predictive behaviour tools. The first step is to mine the data, followed by the data analytics.

2.3.2 Customer Experience and Customer Experience Data

The first platform to mine customer interaction data is the various touchpoints that the customer engages in with the bank, which could be digital and physical interactions. The touchpoints are categorised into four main segments as below.

Solicited – Structured

Structured data is gathered using the customer satisfaction index, net promoter score metrics and other enquiries like questionnaires or surveys (Kransbuhler et al. 2018). This active solicitation of data requires the bank to develop a structured method of data collection which is aimed at addressing the critical service issues that are lagging, or they want to improve or to get a feel for how the customers will respond to a particular new product or service offering before being rolled out and implemented. This method uses descriptive and regression analysis, and most banks use market research agencies, which could be costly (Lanier, 2013). Therefore, it is essential to position the tool and segment accurately.

Solicited – Unstructured

Unstructured data sources include open-ended survey questions and in-depth interviews, which allow for follow-up or clarity questioning lines or focus groups. This method of data collection is more multifaceted as it can be analysed by using semantics, syntax, or pragmatic approaches (Balducci & Marinova, 2018). Full customer participation is required in this form as the system is text-based, and data is transcribed in speech or video format, making it more of a qualitative research method. Analysing the data can be cumbersome if a large sample is used or multiple focus groups participate in the study.

Unsolicited – Structured

This is the data that the bank customers provide out of their cognisance using review initiatives or the tracking of data traffic and information by a bank from its online sources. Website analytic tools like Google Analytics track metrics like the number of clicks per webpage, how long a user stays on the website/page, cookie tracking, and the use of IoT, which tracks multiple devices used to connect to the bank's platforms. These include mobile and wearable devices (Bradley & James,

2019). Most of the banks' websites are being manned by chatbots that provide initial high-level assistance or query analysis and try to re-route it to the relevant department. Furthermore, unsolicited and structured data is also gathered using foot flow traffic counting devices that count the number of customers that enter a bank. These counting devices, together with IoT, can ultimately pinpoint a range of possible transactions that each customer who entered the bank at a particular time (Wedel & Kannan, 2016). This is how digital technologies can be interconnectedly used to track customer transaction trends.

Unsolicited – Unstructured

In this digital and social media age, this is the most common means to gather customer data, including reviews, online presence, and comments. Customers usually use social media platforms like Twitter to vent their frustration or make an Instagram video, which ultimately becomes a trending meme to visualise their experience (Balducci & Marinova, 2018). These also include YouTube videos, vlogs, and blogs. Unfortunately, often these are negative customer experiences that end up trending on social media (Balducci & Marinova, 2018). Other forms of unsolicited and unstructured data are emails, online reviews on platforms like Hellopeter and, to a lesser extent, in this digital age, telephone call centres. One of the initial digital solutions for call centres was the introduction of chatbots, which directed customer queries to relevant departments after the initial screening.

2.3.3 Customer Experience Analytics

Once the bank has gathered information from different platforms, it starts to analyse the big data. This analysis provides the bank with the decision-making data that will build customer loyalty. It also positions the banks not just as a reactive service provider but as a partner who translates customer trends to better offerings, thereby improving CX. BDA unpacks hidden patterns that allow banks to know their customers and effectively transform customer relations. BDA can be categorised into four broad types.

Descriptive Big Data Analytics

Descriptive BDA explains ‘what happened’ as it describes actions and events for analysis of the current status quo (Lanier, 2013). For example, what causes the banking system to go offline, and a client could not pay at a petrol station after the fuel was poured into their car? The response from a customer on their bank experience daily. Descriptive analysis can be quantitative after the data has been gathered and uses charts, graphs, numbers, and cross-tabulation. It is also qualitative by using word clouds that give visual summaries of descriptive words (Kransbuhler et al. 2018).

Inquisitive Big Data Analytics

Inquisitive BDA probes the status quo as to ‘why did it happen’ by getting to the cause of the action or event. This provides tools that help to identify scenarios that can be changed to get a different and preferably positive outcome (Bradley & James, 2019). For example, what caused our systems to fail? This analysis diagnoses the problem, and results are presented in experimental designs and component analysis (Kransbuhler et al. 2018). This becomes an informed approach as the bank can troubleshoot problem areas using digital tools that constantly map and geo-track digital footprints instead of historical systems. This exercise was a ‘trial and error’ exercise and cumbersome in effort and timeline.

Predictive Big Data Analytics

Predictive BDA is where the bank focuses as it looks to improve its customer experience. The predictive analysis forecasts future scenarios that provide the bank with tools and methods of future trends and possible and favourable outcomes. This analysis is done using time-series models and prediction of categorical outcomes to indicate what is likely to happen (Balducci & Marinova, 2018). This is where AI becomes a valuable tool for providing invaluable data for decision-making.

Prescriptive Big Data Analytics

Once the bank has multiple possible outcome models of a potential solution to improve customer experience, prescriptive analysis zooms in to determine ‘what should happen’. This becomes the blueprint for enhancing the customer experience with an obvious benefit to the bank's profit margins. Prescriptive BDA is done by ascertaining which tasks should be improved to get optimum performance from the bank's systems and determining the area for budget allocation that will achieve this goal. These tasks include optimising systems and discrete event simulations at frequent intervals to ensure that all possible outcomes are continuously pre-empted (Bradley & James, 2019). Again, AI plays a crucial role in prescriptive analytics.

2.4 Insights Gathered from Big Data Analytics Used to Enhance Customer Experience

BDA provides an avenue to re-imagine the bank's offering to its clients using different scenarios and business models. The goal is to anticipate and pre-empt the customers’ needs, provide real-time and relevant recommendations, and offer credible and superior alternatives. This moves the bank from being product-focused towards being customer-centric, which builds and retains brand equity. The combined use of digital technologies such as AI facilitates all this insightful intel.

2.4.1 Customer Experience Insights

Holmlund et al. (2020) classify CX insight as attitude/psychography, behaviour and market insights. These insights track voice commands, touchpoints, click tracking and many other ways that are recorded as customers go about their lives. These profiles contain thousands of customer data points.

Attitude and Psychography

This refers to the passionate sentiments of how the interaction, engagement and the whole transactional experience made the customer feel. This includes the need to be pleased efficiently (Bottomley & Doyle, 1996). Customers link their service experience to how they are perceived as a person. In the banking environment, this state is heightened, primarily if the customer is being serviced from a branch network where there is a personal and physical interaction. The client links the service as unique as the bank teller is privy to their confidential and sensitive information. Therefore, they expect to be treated with a certain level of respect and even superiority if they command an affluent financial status (Bottomley & Doyle, 1996).

In this digital age, banks use BDA to gain insight into customer behaviour by monitoring online platform discussions where their brand, products and services are tagged. This provides an emotional insight into the customer's experience by a particular touchpoint. Online platforms provide instant insight to detect a dissatisfied customer as, more often, a customer will instantly detail the experience (Villarroel Ordenes et al. 2017). However, some other scholars posit that this differs based on the customer's personality. Some customers are open and extroverted, while others are shy and introverted, and these traits drive their behaviour and relationship with social media. Therefore, a customer's neuroticism is somewhat linked to their relationship with social media, and this will, to some extent, dictate their digital footprint (Villarroel Ordenes et al. 2017). This is especially true in social media interactions like Twitter, Instagram, and other blogs used to express an experience with a service provider.

Further insights can be harvested from what the customers post online. For example, pictures of places they visit, whether for business or leisure, as this means they will be transacting in one form or another in those places. Experts link this information to what is important and worth sharing in a customer's life. Therefore, this can assist in mapping out a customer profile based on their interests (Wedel & Kannan, 2016). This intuitive BDA provides the bank with 'factorial experimental designs' and can be used to have effective ways to

position a customised message to that client. Unique and repetitive experiences denote a strong affiliation and can further enhance the customisation of the marketing message.

Behavioural Insights

This relates to how customers act and make decisions as a consequence of their historic engagement and experience. It also detects how that customer will make future decisions about the brand and its products and services (Wedel & Kannan, 2016). Google Analytics is a real-time tool that provides the bank with a digital footprint of how customers interact with the bank's digital touchpoints by tracking trends, frequency, and changes. These insights allow banks to use both descriptive and intuitive BDA to gather customer knowledge, preferences, and actual behaviour (Vaganova et al. 2019). Further to this, Google Analytics provides information on where the bank's customers are searching, ad-clicking frequency, keywords that are searched for and other related searches that the bank customers are making enquiries on (Vaganova et al. 2019).

Omni-channel tracking provides banks with further insights from various devices such as clickstreams, which are data collected from a user whilst navigating a website or browser and scroll-tracking, which monitors the users' movements on a webpage (Vaganova et al. 2019). These provide insights as to what the customer interests are, what they are enquiring about, and what options, products or services they are clicking on and using. This data allows the bank to have a view of which services are most used and relevant to the customer and which ones are minimally used or not used at all (Verhoef et al. 2015). Appropriate decision-making can be made from the data mined from these omni-channel platforms. The use of omni-channels includes logins from different devices such as mobile phones, tablets, laptops, and desktops. All these devices have tracking abilities via geolocation and timestamps that can help the bank track where and how its services are mainly used.

Market Insights

Market insights help the bank to evaluate and monitor its performance against other banks and how a competitive advantage can be attained and maintained.

Brand equity and loyalty are crucial to market insights and how other banks are capitalising on brand equity (Kibble et al. 2020). Banks use data from social tagging to track how customers experience their services in comparison to other banks' offerings. This sharing of info by customers who use different banking platforms provides comparative intel on how the customers experience other banks. Usually, customers are very assertive, expressive, and directive when they criticise a service on these online platforms, thus providing management with helpful info on how customers perceive the bank and its brand (Villarroel Ordenes et al. 2017). However, other scholars are quick to argue that this is usually a dynamic reaction based on the immediate experience, like a customer venting on Twitter after they were not able to pay for their petrol because the banks' systems were offline. This, however, is based on how the customer experiences the bank's services at that time (Wedel & Kannan, 2016). Therefore, it is still a warranted and valid experience for that customer. These experiences are highly bespoke based on the current status quo of the customer.

It is also worth noting that, on the flip side, not many customers will enthusiastically take onto Twitter after a successful payment at the petrol station or readily complement a bank for doing what they expect it to do.

Customer Experience Personae

An integral part of any organisation is to understand the target market and the attributes of that character. This helps to figure out how to position the products and services to meet the needs of the target market. If a bank wants to grow and maintain its competitive advantage in the digital era, the likely personae for a targeted offering could be depicted in Figure 2.

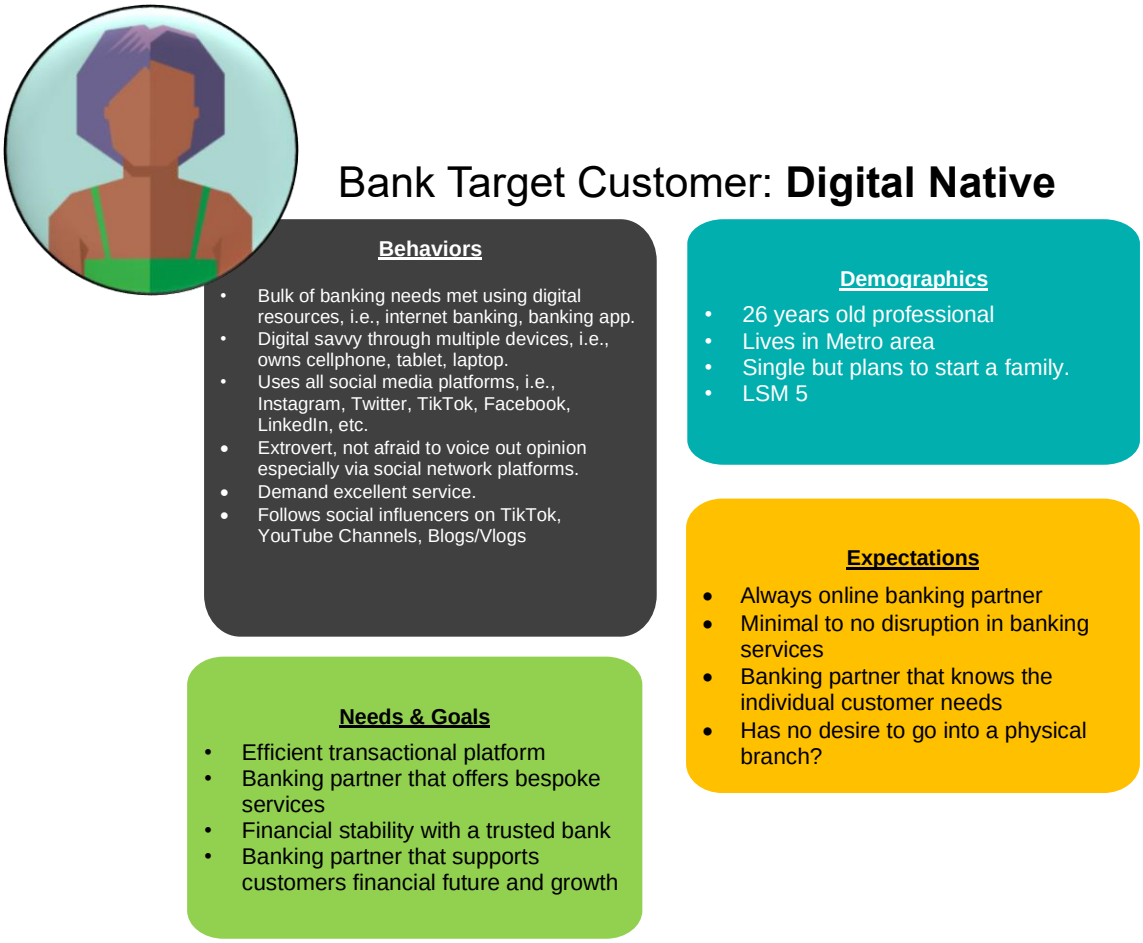

Figure 2: Marketing Persona

Source: Blomkvist (2002)

A marketing persona provides the bank with a blueprint of a potential customer. It details the customer profile, demographics, interests, likes, dislikes, and expectations (Blomkvist, 2002). Other marketing experts define a marketing persona as the ‘composite sketch of a key segment of your audience’ (Crystal, 2010). For a bank customer persona based on customer experience management, the above unpacks the digital touchpoints that the customer uses and is exposed to. This becomes the foundation of customer-centricity, which eventually leads to a hyper-personalised experience (Crystal, 2010). The bank uses all available sources of information and insights embedded in digital technologies to create this profile. These include the use of website analytics. This analysis provides information such as links used to access the website,

keywords used to find the website and time spent on the site. Essentially, this allows the bank to profile what led the customer to access the site and what tools, especially digital tools, were used to access the site (Lee, 2018).

Besides the information gleaned from digital touchpoints, Lee (2018) further posits that good old human interactions are valuable as well. This collaboration of digital and human interfaces ensures a holistic 360° view of the customer. To this end, this author recommends human engagement with customers on service. This could be enhanced by social media research where e-surveys to gauge user sentiment (Lee, 2018). Blomkvist (2002) posits an exciting dimension that the bank should not be looking only for customer persona. He advocates for the creation of detractors, influencers, and anti-personas. These give the bank a 'blind spot' view of potential negative sentiments so that they can proactively manage that narrative.

2.4.2 Customer Experience Actions

CX actions require the organisation to have dynamic systems to map out the process orientation of a typical customer experience journey. This requires a data-rich environment which will enable the capabilities of BDA and AI for the mapping (Bradley & James, 2019).

A typical bank customer journey can be depicted in the map below.

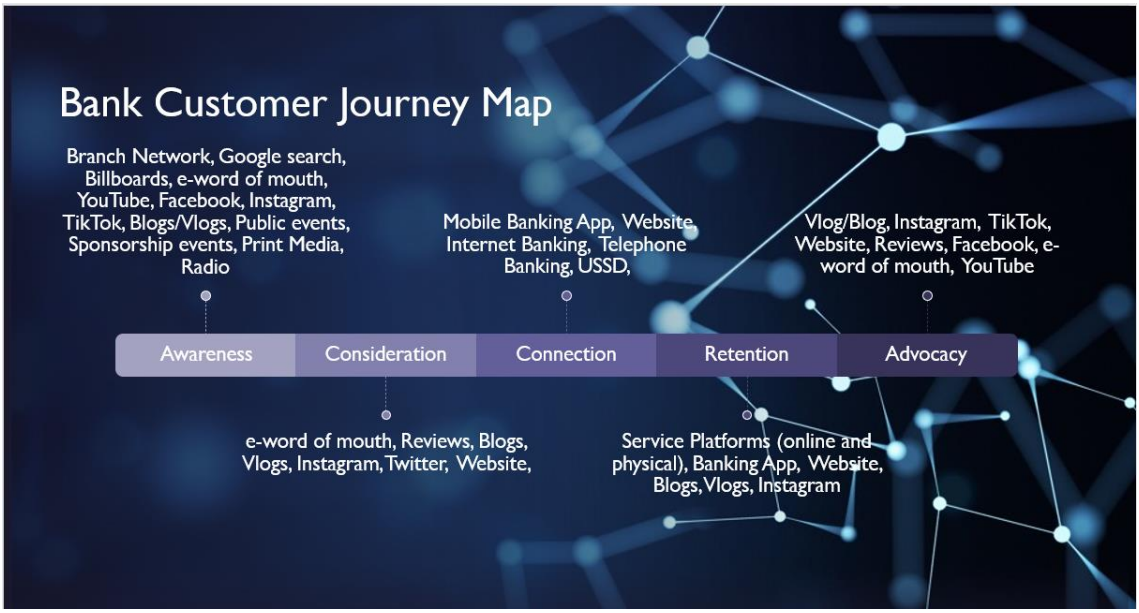

Figure 3: Customer Journey Map

Source: Lay (2020)

The journey map depicts a collection of touchpoints where the customer interacts and has a footprint; again, it encompasses both digital and physical touchpoints. The bank can use these platforms to connect with its customer personae, as depicted in the previous section. It is important to note that all these touchpoints are interconnected, and the customer views them as an essential and integrated platform (Homburg et al. 2017). Therefore, the bank needs to be visible in these areas if it wants to attract and retain this persona. Even more beneficial for the bank is the amount of valuable data gathered from the analysis of these touchpoints that will allow management to make impactful decisions which will benefit the bank's revenue (Blomkvist, 2002).

These platforms should be consistently monitored not only to pick up the usage rate and geo-tracking but also to glean valuable data from the comments, complaints, reviews, and compliments. This is in line with Lee's (2018) theory of having sight of detractors, influencers, and anti-personas. This feedback is crucial for the bank to know what the customers' likes and dislikes are and what could be improved. Efficient monitoring along a customer journey provides insight that could be actioned to improve the customer experience (Homburg et al. 2017).

Coupled with the insights on platform feedback, the customer journey provides the bank with insights into what area to prioritise budget allocation on and even to apply a strategic change on a particular product or service (Dawood et al. 2019). For example, suppose BDA depicts that most of the customers use online transactional platforms to send money at month's end to rural areas. In that case, management might need to ensure that ATMs and retail partner services in the peri-urban areas are working during those times to enable the recipients to draw money or make purchases on retail partner networks. BDA maximises the opportunity to plan based on specific customer interests, touchpoints, and trends. Data-driven customer experience improves customer retention, engagement, and growth. This, in turn, increases the customer's lifetime value whilst increasing brand equity as well (Market Trends, 2021).

2.5 Digital Technologies Integration with Legacy Systems

Over time, the banks have become more transactional using new technologies, and this has changed the traditional way of doing banking. There has been a significant shift to on-the-go mobile, online, real-time and DIY transactions in comparison with physical branch network usage. This has not only resulted in a significant exodus of branch foot flow, but it has also necessitated a re-engineering of the bank's IT systems to cater for the advancement in technology. This section presented how a bank can create an end-to-end customer experience that integrates fragmented customer data from all approaches, i.e., branch networks, applications, call centres and data centres. A seamless flow using Application Programming Interface (API) and other digital and system links to existing infrastructure like Customer Relationship Management (CRM) is critical to data integration (Riemer et al. 2021).

2.5.1 Use of Artificial Intelligence and Internet of Things

The marketplace is abuzz with automation, robotics, chatbots and other technologies which are augmenting human touchpoints in banking transacting. Artificial Intelligence (AI), Human Intelligence (HI), Machine Learning (ML), and Deep Learning (DL) are all but a few keywords that come to mind in BDA and

customer experience (Huang & Rust, 2018). Many experts have concurred that the use of AI, and what is now termed Deep AI, enables hyper-personalisation, which is estimated to increase a customer's lifetime value by 40% (BCG, 2022).

This integration is not only limited to online platforms but is used in branch networks as well. For example, voice command interfaces are used for customer greetings as they enter the banks instead of a human receptionist or queue controller inside the bank (Chiu et al. 2015). These voice prompts extend to pointing the customer to the relevant service area depending on their service request for the visit. Other banks also use service selector consoles at the entrance of the banking hall. This console allows a customer to select a service requirement and then pops out a number and service area where the customer can wait. Once there is an available service consultant, a voice command will notify customers waiting in the banking hall.

The most significant impact of digital technologies on the bank's IT infrastructure is the connectivity of communication platforms as opposed to individual machines (Huang & Rust, 2018). This is the ability of the entire banking network to remain online and up to date using collective data from all platforms, ATMs, physical branch networks and mobile devices. It is worth noting that mobile networks are omni-channels, which include transacting on the internet, telephone, USSD and applications. This omnichannel approach breaks down silos and creates synergies in customer service (Chiu et al. 2015).

2.5.2 Integration of Systems

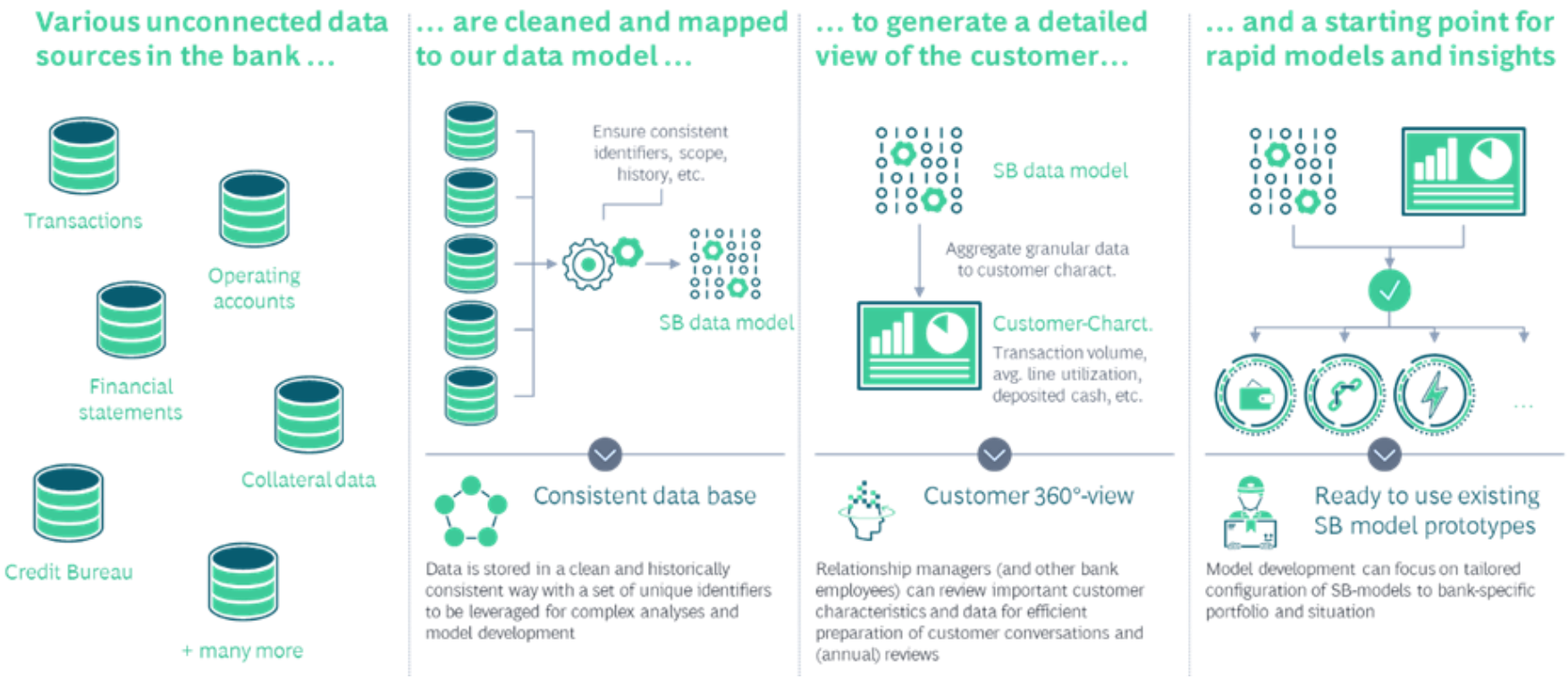

Figure 4: Integration of Banking Systems

Source: BCG (2022)

Figure 4 depicts how data from various banks' repositories is collected and analysed to provide a consolidated view. This provides a starting point for BDA. This collective integration in Figure 4 is enabled by AI and IoT, which allows intelligent service-based sensors to pull data from all collaborative networks to an integrative platform (Huang & Rust, 2018). IoT further enables the geo-tracking of these interconnected devices and transactional platforms. For example, a bank customer receives a message to confirm a transaction that has taken place in Namibia because the customer usually transacts within South Africa.

AI and IoT provide a further layer of data analytics and customer experience. Edelman and Singer (2015) posit that these technologies offer a 'contextual interaction' with the customer. They use a great example of how a hotel group can use technology to provide a seamless check-in for its guests. Using a hotel app that tracks geolocation when the guests are in the vicinity of the hotel and sends them their room number on the app, limited reception interaction and loads the room virtual key to the app together with suggested local activities.

In what Boston Consulting Group (BCG) has termed as SmartBanking AI (BCG, 2022), they outline how the consolidation into a central repository enables hyper-personalisation. This provides data on changes in patterns that can signal a specific event or lifestyle change in a customer. For example, a credit record query can signal the potential need for a lending product, or a customer might be looking at getting a better interest rate from a competitor. This info allows the bank to offer that customer a suitable product since they have the history of a client or a better rate to retain the customer.

On a more granular basis, the data in historic CRMs, which stored customer leads, attrition alerts and credit risk warnings, can now be used to respond with foresight and precision (BCG, 2022). These 'libraries' of information repositories can directly be overlayed with algorithms which provide 'modular building blocks' for a bespoke customer offering (BCG, 2022). This Analytics-as-a-Service (AaaS) tool develops, maintains, operates, validates, and recalibrates front-end applications to customise CRM (Riemer et al. 2021).

Given the size of a bank's customer base, it might seem like a daunting task to hyper-personalise. However, the Deep AI algorithms have the capabilities to transform BDA for one-on-one relationship-managed clientele into a mass-market campaign (BCG, 2022); over and above the digital technologies used in personalisation, it is the value of data, insights and actions harvested from the information that these technologies avail to the bank that enables customer lifetime value. This involves the creation and use of customer persona profiles and customer journey maps. This, on its own, shows the broad scale of what digital technologies can achieve if optimally utilised (Riemer et al. 2021).

2.6 Further Use of Digital Technologies to Retain Customer Lifetime Value

After exploring how the banks use digital technologies for customised customer experience, this paper seeks to further report on other use cases that could be beneficial for the bank. Following on BCG's Smart Banking AI that provides a 360° customer view, they further posit these three use cases.

2.6.1 Next Best Solution

This entails the identification of a particular 'cluster' of customers who will be linked to an appropriate relationship manager based on their 'common' trends and behavioural outcomes (Riemer et al. 2021). Using the BDA outcomes, explanatory variables are calibrated in order of probability, and the most likely to occur is presented to the customer as a lead.

2.6.2 Customer Retention

Customer retention looks at early possible actions and reasons a client might contemplate changing banks and seeks to provide the 'stickiness' that will retain the customer. Machine learning is used to track the attrition rate by observing changes in transactions and interactions with the bank (BCG, 2022). This includes, for example, a decrease in the number of deposits a customer used to make whilst there might be an increase in funds withdrawals and purchases,

which inadvertently reduces the bank balance, indicating a possible closure of the bank account once the balance is zero (Kibble et al. 2020).

2.6.3 Automated Risk Monitoring

A vital part of a banking customer profile is a clean credit record and a high credit score, as it allows the bank to offer more lending products, which generate income for the bank and inadvertently locks in the customer with the bank, at least in the short term whilst the lending facility is in place. A deteriorating credit rating signals a change in the customer's lifestyle or an unexpected adverse event or lapse in financial acumen. This can lead to a high probability of default and, ultimately, loss of a client as they will be unable to service their debt or cannot take any more obligations. As depicted in Figure 4, credit bureau data is part of the value chain systems that the bank uses, but most credit bureau houses issue annual reports. A bank can use its' current BDA to track monthly risk scores that are driven by account usage and issue alerts for out-of-the-norm activities and other profile enquiries instead of waiting for an annual review (Riemer et al. 2021). This allows the relationship manager to investigate potential issues before the situation gets severe and put mechanisms and options in place to mitigate and repudiate the risk. It is vital to note that if a bank can assist a customer to get out of financial distress, there is an enhanced likelihood to retain that customer for a lifetime.

2.7 Analytical Framework

2.7.1 Theoretical Framework

The breakthrough in digital technologies has opened an avenue for banks to unpack customer behaviour and use this data to make informed assumptions about future patterns in transactions. Researchers, scholars, and industry experts have all agreed about the vital role these digital technologies play in customer centricity. Scholars further posit that digital technologies have enabled the bank to have a '360° view' mindset of the customer journey in one central repository as opposed to the traditional 'silo' mentality. They have effectively required not only an integrative approach but also systems that allow for a

consolidated and holistic customer view that encompasses all the customer touchpoints. This is not only based on historic customer activity, but digital technologies enable the modelling of future scenarios that lead to the profiling of customer personas and customer journey maps. The integration and adoption of advanced digital technologies purely enable these customer experience management frameworks.

The Smart Banking AI is one such tool that integrates the existing CRM with advanced tools like BDA, IoT and AI. The consolidation of these systems provides invaluable information about the customer that facilitates the formulation of a relevant marketing strategy and decision-making. If optimally used, it becomes a bedrock of an enhanced and superior customer value proposition, which leads to a lifetime retainment strategy. It is vital to note further that these frameworks are forever evolving as they use rapidly evolving and advancing technologies. Therefore, frequent review and adoption of further theories and frameworks in CX are critical for the bank to retain its competitive advantage in hyper-personalisation.

2.7.2 Conceptual Framework

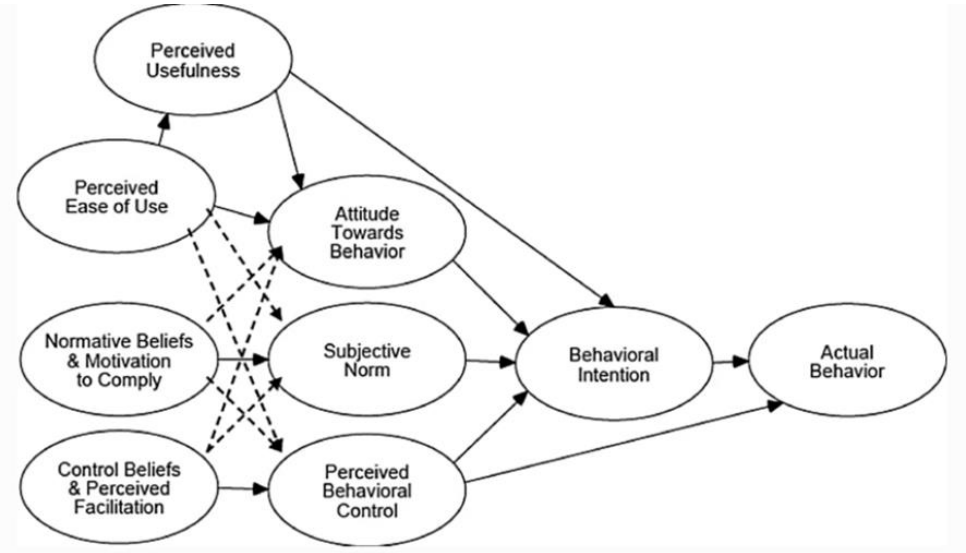

Figure 5: Combined Model of Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB)

Source: Khan & Qudrat-Ullah, (2020)

The integrated theory of TRA and TPB in Figure 5, which were initially developed by Fishbein and Ajzen in 1980, shows how the digital omnichannel customer touchpoints, as depicted in the over-arching model in 2.3 and 2.4, are used to mine data that offer insights about the customer perception, attitude, beliefs, and interest which ultimately informs the customer action and behaviour. This data-rich information is what allows the bank to craft a hyper-personalisation strategy and for the customer to experience the bank as a partner rather than an impersonal service provider. This study used the theory in Figure 5 to explore how the banks were using digital technologies to offer hyper-personalisation in the bespoke customer journey by using TRA and TPB. The views elaborated on how the data can be beneficial across the bank's systems and deployed coherently with existing networks. The synced integration ensures minimal disruption in customer service whilst providing a dynamic platform for customer experience on a real-time basis. It concluded by exploring additional use cases and new insights that can be uncovered in the long term by the continued usage of these digital technologies and the further adoption of new and improved add-ons. It is essential to bear in mind that the digital arena is rapidly changing with new, advanced, and enhanced technologies. Therefore, this cycle is bound to repeat and improve as new platforms are introduced into the banks' ecosystem.

2.8 Conclusion of Literature Review

This chapter reviewed the hyper-personalisation by banks using the existing information they have on clients. This information is turned into valuable data and analysed using advanced digital technologies. Using predictive behaviour trends, the bank can pre-empt the customer's future needs. This results in a bespoke and customised offering of products and services to the customer. The enhanced customer experience creates value and develops trust between the bank and the customer. It goes beyond getting to know the customer and brings about new digital ways of work. Digital technologies allow the bank to have a holistic and intimate view of the client. Ultimately, this embeds the customer as a lifetime client, thus increasing the bank's customer lifetime value. The chapter also

reviewed how digital tools were used and the theories that support the beneficial adoption of digital technologies.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlined the research methods used during the research process. It covered the approach, design, and data collection methods, which included the sample and data collection instrument used. It also outlined ethical consideration which pertains to the care and due diligence of the research process where participants were involved.

3.2 Research Approach

This study deployed a qualitative research approach that explained how banks use digital technologies to customise the customer experience. This approach is the most relevant to gather data from the bank personnel who apply digital technologies to mine the relevant customer data (Coghlan & Shani, 2016). The nature of a qualitative study allows for detailed questions to be asked with a view to gathering elaborate answers that fully explain the research objectives under study (Coghlan & Shani, 2016).

Furthermore, the qualitative research method provides a broad and comprehensive view of the phenomena under study (Naderifar et al. 2017), as opposed to a quantitative approach. In this research study, the phenomenon being explored is the use of digital technologies by South African banks in their customer lifetime journey. Therefore, qualitative responses were relevant to get deep insights and perspectives on how the data is used for hyper-personalisation. This included insights like how the technology can alert the bank that the customer has enquired with another financial institution for a particular product. The bank can then use that information to offer the client a similar or better product.

3.3 Research Design

Research design is a plan of how the research objectives will be achieved and how the research process will be conducted (Sekeran & Bougie, 2016). This qualitative research followed an exploratory research design. This approach explored the use of digital technologies within a banking structure. It further explained how these technologies benefit the bank by enhancing the customer experience offered. The significant advantage of open-ended questions is that it helps the researcher to probe more into the questions and allow participants to express more profound views into their understanding of the question being asked. This is the accurate methodology for this study as it explains the research objectives in detail as opposed to, for example, surveys and case studies, which would not have provided a piece of the technologies used.

The conceptual framework was used to design the research questions, which were linked to the research objectives. These explored how helpful were the digital technologies to map customer journeys, which led to hyper-personalisation.

3.4 Data Collection Methods

The data for this study was collected using open-ended interview questions with the research participants. This was the convenient collection method to be used as it allowed the researcher the opportunity to clarify the questions for the participants. It also gave a chance for follow-up questions or clarity points. The open-ended nature of the questions also facilitated a detailed response from the participants. It allowed them to explain further and offer details, where necessary, without the limitations of pre-selected, pre-defined responses. The interview nature of the session ensured that all the reactions were captured accurately and entirely and stored securely in an electronic format.

3.5 Population and Sample

3.5.1 Population

A population refers to the total group available for the researcher to draw any conclusions on (Sekeran & Bougie, 2016). For this research, the people for this study are the banks that operate within South Africa. Within these banks, the population target is the employees in the business units who use digital technologies for customer service, product development, and customisation.

3.5.2 Sample and Sampling Method

A sample is a specific group that is targeted for data collection (Sekeran & Bougie, 2016). The questions were administered to three employees from each of the four central banks operating in South Africa, which are Standard Bank, ABSA, FNB and Nedbank. Therefore, the total number of participants was twelve. This sample was broad enough to provide the researcher with sufficient research responses to analyse findings and make relevant conclusions which can be relied on (Naderifar et al. 2017). This research used a purposive sampling method. This was based on the research being specific to a particular department within the bank that uses digital technologies for customer experience. These bank's employees were based in Gauteng as this is the Head Offices of the different banks used. It is where the relevant departments for innovation and customer experience are found and strategies formulated. The interviews were conducted on an online platform.

3.6 The Research Instrument

This research used an open-ended question approach to facilitate a detailed and thought-provoking response from the participants. The questions are in line with the research objectives and are designed to provide the appropriate details in explaining the goals. For anonymous purposes, the linkage between the participants and the banks they work for was not provided during the presentation and interpretation of results.

3.7 Procedure for Data Collection

Interview sessions were arranged with the participants. In these sessions, the researcher asked the questions and recorded the responses. This interaction allowed for any additional follow-up questions to be asked, which helped both the researcher and participant to engage comprehensively. The interview questions comprised eight sets of open-ended questions, which are. in line with the research objectives.

3.8 Data Analysis Strategies and Interpretation

The data collected from the research was analysed using NVIVO qualitative analytic software. This provided a thematic analysis of the responses. The data was coded into themes and grouped by question numbers. The articles, similar reactions, distinct relations, and different ideas were identified. This allowed the data to be further grouped into word trees, frequency maps and word clouds. The coding connected themes and gained analytical insight from the responses.

3.9 Possible Limitations and Challenges of the Study

The following limitations and challenges were anticipated in the study:

- The research objectives under study might be regarded as Intellectual Property (IP) material by the banks, therefore limiting information that might be shared with the researcher.
- This study was conducted in Gauteng, which is viewed as the economic and innovation hub of South Africa.
- Only three participants were required from each bank. This limited the scope of getting varied viewpoints and ways of using digital technologies.

3.10 Quality Assurance

3.10.1 Transferability

Transferability refers to the scope of the research findings and how they can be applicable in other settings (Coghlan & Shani, 2016). Although the research was limited to three participants from each bank, the questions were based on the wide use of digital technologies by the bank. The responses encapsulated a trend

that is used by the bank based on the relevant strategy. Therefore, this is a blueprint policy for the bank and is used uniformly throughout the bank. Hence, the findings can be applied to other similar environments and research.

3.10.2 Credibility

To ensure credibility, the research process was conducted effectively, efficiently, and reliably to have confidence in the research outcome (Saunders et al. 2016). The research respondents were personnel employed in the relevant department that uses digital technologies for customer experience. Therefore, this was a first-hand insight into a day-to-day use experience. Hence, the research outcomes can be relied on.

3.10.3 Dependability

The research process was executed according to the highest research standard for it to be depended on and relied on (Sekeran & Bougie, 2016). The research process was fair and in line with ethical research standards. The big four banks in South Africa were used to conduct the research. The findings were analysed using qualitative analytic software, which provided quality analysis and assurance.

3.10.4 Confirmability

Confirmability refers to the research if independent and external sources can verify it. This is aimed at measuring that the research outcomes are accurate and not biased (Saunders et al. 2016). The research findings are reported to highlight similarities and logical differences in the use of digital technologies within banking institutions. However, though digital innovation is a new and rapidly changing space, unique and varied methodologies are still being discovered and implemented for different uses and outcomes. Therefore, usability varies from bank to bank, but the basics are similar.

3.11 Ethical Consideration

All ethical considerations pertaining to the research process and participants' consent were adhered to. The Wits Business School ethical guidelines were followed. These included the ethics clearance certificate from the ethics committee. Prior engagement about the objectives of the research was communicated, and consent was obtained from all potential participants. This outlined the aim and purpose of the study, how the research was conducted, the anticipated duration of the research process and all necessary ethical considerations that were in place to protect the participants and any other sensitive and confidential customer and bank information. No harm or discomfort was imposed on the participant. Furthermore, participants had the right to end their participation at any time should they have felt uncomfortable. Relevant approvals were obtained from the management of the banks' business unit where the research was undertaken.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the findings from the semi-structured interviews conducted with the employees from the four big banks operating in South Africa, which are Standard Bank of South Africa (SBSA), ABSA, Nedbank and FNB in Gauteng Province. Analysis of data was carried out using thematic analysis, and themes were identified from the responses that relate to the use of digital technologies by financial institutions to offer personalised offerings and bespoke customer service experiences. The research questions that this study seeks to address are how the banks use digital technologies to offer customised products and services and how the data mined from the analysis provided by digital technologies is used to enhance the customer experience.

4.2 Characteristics of the Sample

Demographic characteristics of the participants help to establish if there is no bias towards the selected participants and that primary data was obtained from participants who had the information required to answer the research questions. The demographic data analysed was based on the role of the participants at the bank.

4.2.1 Roles of the Participants

The roles of the participants are shown in Table 4.1.

Table 4.1: Roles of the Participants and Main Responsibilities

Participants	Age	Years of Experience	Role	MAIN RESPONSIBILITY
P1	38	9	Service Manager	Handling all customer service reports and analysing data to improve business decisions.

P2	28	3	Digital Marketing and Media Lead	Ensure customer satisfaction by applying a customer-centric and hyper-personalised approach.
P3	37	6	Data Base Administrator	Designing and creating a rational database, data modelling and maintaining data integrity
P4	35	7	User Experience (UX) Designer	Make products or services offered usable and accessible by customers. Deciding on new features to add to mobile applications to make the bank applications enjoyable and more user-friendly.
P5	34	6	Analytics Head	Gathering relevant data, analysing the data, and presenting the results of the data to the management and the board to improve internal processes.
P6	46	12	Private Wealth Advisor	Provide banking and financial solutions that are appropriate across an allocated portfolio of clients.
P7	48	16	Product Manager	Developing and implementing effective banking products for their organisation. In charge of creating banking service and product initiatives that can increase company profitability, as well as building customer satisfaction and brand loyalty

P8	39	13	Head of Technology Development	Enabling the use of data by the internal teams and customers through developing and testing technologies used in the bank
P9	42	16	Relationship Manager	Involved in customers' investments and financial planning. Primary point of contact for the client.
P10	37	10	Relationship Managers	Involved in customers' investments and financial planning. Primary point of contact for the client.
P11	32	6	Innovation Manager	Coming up with new models for internal operations, managing innovation teams, and leading projects.
P12	25	2	Data Scientist	Develop strategies that produce insights using BDA, data modelling and mining techniques.

The results show that two participants were aged 30 years and below, seven participants were aged between 31 and 40 years, and three participants were 41 years and above. The roles of the participants indicate that all participants use digital technologies to analyse data for customer service, product development, and customisation in the banks and, therefore, had the information to answer the research questions. The results show that none of the participants had spent less than one year in the bank, and two participants had work experience of between 1 and 5 years. Out of the twelve participants, six had work experience of between 6 and 10 years, and two had work experience of between 11 and 15 years. Two participants had spent 16 years and above working in the bank. It can be concluded that all participants had been working in a bank for more than a year, and this means that the study obtained information from participants who knew how digital technologies have been used in the banks to offer customers bespoke products and how the data that is mined from digital technology analysis is used to enhance the experience of customers.

4.3 Themes Identified

The themes that were identified from the comprehensive responses given to the questions asked that aimed to answer the research question are cloud computing, data analytics, technology, legacy systems, hyper-personalisation, customer profiling and customer mapping.

4.4 Presentation of Findings

4.4.1 The Use of Digital Technologies in Banks to Offer Bespoke Products and Services

This section presents the responses of the participants on the integration of legacy systems with digital technologies and how digital technologies gather information for bank use. The participants were asked to highlight different digital technologies they use in the banks to offer bespoke products and services.

4.4.1.1 Different Digital Technologies Used by Banks

The participants were asked about the digital technologies that are used in their organisation to automate all financial operations and improve the existing applications to give their customers a more personalised banking and investment experience. The responses are as detailed as follows:

Participant 1 said,

> *"Let me start by saying I never thought it would be this easy to provide bespoke products and services to our customers. What we do is use statistical techniques and algorithms to extract useful data that will help us improve our service and offerings to customers by getting to know exactly what their needs are. We are still perfecting our technology, but we have come a long way."*

Participant 2 affirmed the use of data analytics as the process of examining, cleaning, and modelling data with the aim of extracting useful information that improves decision-making. To give customers bespoke products and services,

there is a need to learn about them and be able to make predictions and plan products to offer.

Participant 3 said,

> *"We use cloud computing because it is a key enabler of our key strategic focus, which is digitisation and integration of Africa-wide service, putting our clients at the centre of everything. I know that cloud computing provides the infrastructure that we require to deploy our large-scale ML models. Even though cloud computing is the key enabler of our strategy, we also use it for our ML models, which enable us to deliver advanced AI capabilities."*

Again, Participant 4 said that in their line of work, they mostly use diagnostics analytics to try and identify the cause of a particular problem and come up with solutions to address the problem identified. They use ML, which is a subset of AI. ML enables the use of algorithms and statistical models that will allow a system to learn from collected data and make decisions and predictions without being programmed to do that. Learning from the data means making better strategic decisions to meet the needs of customers.

Participant 5 said,

> *"We use cloud computing, HTML platform, Power BI App among other technologies…."*

Participant 6 said,

> *"I can say we are big on using big data and analytics. The aim is to understand our customers better, segment them and give them products that suit their profile and needs. Other digital technologies we use here include AI, Data encryption, robotic process automation...I might be forgetting some, but we have invested in several digital technologies."*

Participant 7 further outlined that, amongst other things, they had created a super app that is the integration of many apps to enable customers to manage their daily lives through one app. This is made possible because they used powerful artificial intelligence. There are also other systems and programs, such as SAS and SQL, which integrate big data to be able to understand better and develop solutions for clients.

Participant 8 said,

> *"We make use of chatbot to give our customers real-time help that is AI. How it works is that our routines and tasks are automated, for example, giving out account balances, outstanding amounts, information on how to reset account passwords, etc. Our customers do not have to wait for human responses."*

In simple terms, Participant 9 also confirmed the collection of large sets of data that are examined and used in the decision-making process.

Participant 10 said,

> *"Process automation is one of the technologies. We have not entirely replaced human contribution to our processes, but most simple tasks are automated. We automate processes to avoid human errors and save time for us and our customers."*

The same view was shared by Participant 11 of developing data-led insights to ensure an improved customer experience. These data analytics include credit scores.

Participant 12 said,

> *"Machine learning applications such as risk management, fraud detection and customer support. The use of machine learning keeps evolving at this institution and in the finance world.''*

4.4.1.2 Integration of Digital Technologies

The participants were asked questions on legacy systems in digital technologies to offer bespoke products. The existence of legacy systems, the integration of legacy systems in digital technologies, the value that legacy systems bring when using digital technologies and the challenges in using legacy systems are highlighted in the participants' responses.

Existence of Legacy Systems

Participants were asked if legacy systems existed in their organisation. Most of the participants indicated that there is still the existence of legacy systems in the banks. Some of the responses are as follows:

Participant 1 said,

> *"Yes, we still use legacy systems, and by this, I mean we still have older computer systems and software that we still use, and this is because they are cost-saving and reliable since they have been around for a long time. However, we are trying to move towards modern systems to take advantage of new technologies that can further improve our services. Therefore, in South Africa, we won the 2022 Best Consumer Digital Bank."*

Participant 2 said,

> *"Absolutely. Due to the size of the bank, legacy systems still exist."*

Participant 6 highlighted that the legacy system is being gradually replaced. However, there are still traces of legacy systems, as the mainframe is still the primary source of data storage for business processes and procedures. Participant 4 concurred with Participant 6 and said,'' It is difficult to replace legacy systems completely because legacy systems handle critical functions, and there has been a large amount of data and customisations that were built up over time *using the legacy system. With that said, we still have legacy systems.*''

Participant 7 said,

> *“There are still legacy systems being used; however, from a data perspective, the bank had undertaken a mass migration of client data onto Core Banking/SAP.”*

Participant 11 concurred around the use of legacy systems *by* saying the legacy core banking systems that support the institution’s back-end operations across core functions are crucial, for example, opening and setting up of accounts, processing of transactions, deposits and many more.

Modernisation of Legacy Systems

Participants were asked how legacy systems are integrated into digital technologies, and the responses of the participants indicated that, to some extent, they use a process called modernisation to integrate legacy systems into digital technologies. The use of modernisation is tailor-made to suit the needs and the legacy systems of each bank. Some of the responses are as follows:

Participant 2 affirmed that the bank undertakes several and frequent journeys to renew, maintain or even migrate from legacy systems. This keeps the entire chain of processing relevant and usable.

Participant 3 uses developers to rewrite the existing apps using modern architecture, frameworks, and languages to improve beloved functionalities and add new features. It is what is called rebuilding. However, legacy systems are often complex and have been built up over time, making it difficult to understand their full functionality and dependencies. This complexity can make it challenging to update or replace individual components without disrupting the entire system.’’

Participant 4 said,

> *“The approach that we use in modernising is called wrapper. What it means basically is that the legacy system is wrapped in a layer of modern technology, such as a web or mobile interface, to make it easily accessible and user-friendly. It is like covering an old sweet with new paper wrapping that is easier to open.’’*

Participant 5 said,

> *“We use a process called modernisation to integrate legacy systems into digital technologies. What this means is that we update our existing systems and make them compatible with newer technologies like cloud computing and mobile devices. However, it is sometimes difficult to add new functionalities.’’*

Participant 11 elaborated on the integration from legacy systems to a modern platform, such as cloud computing, without changing the system architecture by using re-platforming. Legacy systems may not be designed to integrate with modern technologies or third-party systems, which can make it challenging to add new functionalities or connect with external partners.

Participant 12 mentioned that they use an approach which is called re-architecting. The process was described as re-designing the legacy system to take advantage of new technology, such as microservices, to make the legacy system more scalable, flexible, and easier to maintain. On the other hand, participant 10 said*, ‘’We have modernised part of the legacy system by completely building a new system from scratch. This is to replace the system completely with new technology. I should say this can be expensive, requiring significant investments in time, money, and resources, but after the initial costs, it will be less costly in the long run.’’*

Value of Legacy Systems

Participants were asked about the value that legacy systems bring when using digital technologies. Their responses indicated that legacy systems bring stability and cost-effectiveness. Some of the reactions are as follows:

Participant 1 said,

> *“When we modernise legacy systems, we must fulfil the regulatory requirements and security protocols that must be maintained during the modernisation process. This ensures we remain compliant. Compliance is good for us.’’*

Participant 2 said,

> *“Although not necessarily falling under the categories provided, the legacy systems are still sources of automated, digital feeds of data. They provide necessary information for calculations.’’*

Participant 3 mentioned that they had relied on legacy systems for many years before new technologies came into the picture. The bank has existed for nearly 200 years, and this shows that the legacy systems are reliable and stable.’’

Participant 4 said,

> *“Legacy systems offer value because we can modernise them in a way that does not require us to build from scratch. This means it becomes cost-effective because we are not replacing them with an entirely new system but enhancing the old.’’*

Participant 6 alluded to the reduction in costs and risks associated with large-scale replacements by integrating legacy systems with digital technologies.

Participant 8 said,

> *“Legacy systems contain a wealth of business knowledge that was acquired over the years, and this is valuable to our organisation. Integration with digital technologies helps us to preserve this valuable knowledge and make it accessible to new technologies, which improve our operations.’’*

Participant 9 said affirmed that legacy systems enable them to take advantage of new capabilities by leveraging the already established banking processes.
Participant 11 further highlighted the benefits of integrating legacy systems with digital technologies to ensure the maintenance of the security of sensitive financial data because of meeting the integration requirements.

Legacy Systems Challenges/Hindrances

Participants were asked if there are challenges caused by legacy systems in the banks; their responses revealed that all four banks experienced limitations and hindrances of legacy systems. From the reactions, it was noted that legacy systems are inflexible, offer poor user experience and have a maintenance challenge. Some of the responses are as follows:

Participant 2 said,

> *"Newer systems are harder to integrate into legacy systems. Expertise gets lost over time, making it harder to maintain/update legacy systems."*

Participant 5 highlighted the difficulties in modifying and customising the legacy systems, which makes the bank's response to changing business requirements and new technologies slower.

Participant 6 said,

> *"People are looking for the latest security features and protocols when using the banking services or applications, and legacy systems may not have the latest security features. They may leave the bank customers vulnerable to cyber security threats."*

Participant 7 said the lack of most current techniques reduces potential competitiveness. *"I say potential because a working older process is better than a broken or insignificant new one."*

Participant 9 said,

> *"Our legacy systems are soiled and do not always integrate well with other systems and technologies, which may result in data loss or inconsistencies."*

Participant 10 said,

> *"Honestly, legacy systems are outdated and may not offer the modern user experience that our customers expect, making it hard for us to retain or attract new customers."*

4.4.1.3 Gathering of Information Using Digital Technologies to Offer Bespoke Products

Participants were asked how the different digital technologies in the banks are used to gather information about customers to offer bespoke products. The responses of the participants indicated that information is collected through data mining, third-party providers, and internal bank databases across all banks. Some of the reactions are as follows:

Participant 1 said,

> *"Through our various transaction data, demographic information, and credit history, Machine Learning algorithms can gather information. We have other data points that the Machine Learning algorithms gather information of our clients through our online forms or surveys, interactions that we have with customers and third-party data."*

According to Participant 2, BD or rather the Enterprise Warehouse (in various shapes and forms), is used to house information from all source systems that the bank employs. These monitor customer transactions, demographics, and derived data.

Participant 3 said,

> *"We do mass marketing, and it is more effective if we can narrow down marketing for a specific product to clients that may need it. Demographic information that is gathered and analysed through Machine Learning algorithms is used to segment customers into different groups to gain a better understanding of their specific needs. The insights that we gain from this data are used to offer personalised products and services for our customers."*

This notion was confirmed by Participant 4, who said they ask clients to sometimes input their information directly on a secure web portal. This information is then stored in the cloud and only accessible to authorised banking personnel.

Participant 5 said,

> *“Transaction data is used to determine the spending of a customer and credit rating history is used to assess the customer’s creditworthiness. This means that we will have the information needed to offer unique products and services to unique clients.*’’

Participant 7 also mentioned that cloud computing is used in their bank through data synchronisation with other systems such as the bank’s internal database, core banking system and any other third-party sources. Participant 8 concurred with Participant 7 by highlighting that cloud computing is used for data mining to gather information from the various available sources, such as the bank’s internal database, which contains customer interactions, transaction history and demographic data.

Participant 9 mentioned that AI is used to gather information by analysing what our customers post on social media. It analyses the presence and activity of our customers on social media to see the type of content being posted, interests and activities. This helps us to know our customers better. The use of AI to gather information from customers is compliant with privacy and data protection regulations.

Participant 10 highlighted the meaningful and valuable data gathered after the Machine Learning algorithms had processed and analysed all information that the bank collected through different transactions. Machine Learning then creates a deeper understanding of customers’ financial behaviour, preferences, and risk profiles; these insights are used to offer bespoke products.

Participant 11 said,

> *“We conduct surveys mostly online to gather information, which is analysed using AI algorithms to understand the customer's preferences and needs. Once we understand, we know exactly what to offer them. However, you know this data provided on surveys is not always accurate as some clients are not truthful in the surveys.’’*

Participant 12 said,

> *“Data mining through AI of the data that we collect as a bank from transaction data, demographic data, loan applications, and account information is done to gather information. We then create a profile of each customer and better understand their financial behaviour. If there is any fraudulent financial reporting, then the mined data might not give a true customer profile, and this has happened before, so we are not sure that all information is correct.’’*

4.4.2 Use of Mined Data Mined from the Digital Technologies to Enhance Customer Experience

The participants were asked how the data that is mined from the analysis offered by digital technologies is used to enhance CX. This is the second research question of this study. The responses from the participants indicated that data mined from the digital technologies analysis is used to enhance CX through hyper-personalisation, customer mapping and customer profiling.

4.4.2.1 Hyper-personalisation

Several responses revealed that to enhance CX, the banks need to tailor banking products and services to meet each customer's specific or unique needs by using the digital technologies analysed information. Some of the participants had the following to say:

According to Participant 1, through predictive analysis, they can analyse customer data and predict their behaviour and preferences, which can then be used to personalise their experiences. However, the accuracy of the predictive analysis data is limited by the completeness and accuracy of the data used.

Participant 2 had this to say,

> “*Realtime actions/reactions have been the talk of the town for several years, yet implementation is quite hard and oddly not as always as crucial as everyone would believe. Regardless, it is a handy functionality in hyper-personalisation.’’*

Similar sentiments were shared by Participant 5, who said that digital technologies segment customers based on their demographics and behavioural and psychographic data, and this allows the bank to personalise experiences and offers to specific groups.

Participant 7 said,

> *"AI/ML has yet to achieve its optimal contribution in hyper-personalisation. The reason for this is data: garbage in, garbage out. However, to get data in the required volume and format for optimal AI/ML delivery is a mammoth task."*

Participant 8 further provided insights, as mentioned earlier, that they use digital technologies such as chatbots and virtual assistants, which engage with customers in real time and provide personalised support and recommendations based on their profiles and data. Offering this fast query support enhances CX.

Participant 9 mentioned that the analysis offered by digital technologies helps with contextual targeting and multi-channel personalisation. Participant 10 said, "*Digital technologies help us to personalise interactions with our customers through communication across different platforms such as email, mobile and web. This provides a consistent and seamless experience. However, we might not really know which platform a customer uses most, so we end up sharing information on all platforms, and this is costly."*

4.4.2.2 Customer Journey Mapping

The responses of the participants showed that customer journey mapping is a process that aims to visualise and analyse the interactions of the customers with the banks over time. Some of the responses were as follows:

Participant 2 said,

> *"More data means the ability to derive better insights into our customers and serve them more appropriately. Advances in AI means we can*

automate more functions, monitor more subtle trends, and derive more complicated results from data that we have.''

Participant 4 explained that to enhance customer experience, they must improve the understanding of the customer. Therefore, customer journey mapping provides a comprehensive view of the customer, and this includes their goals and emotions at every stage of their transactional journey and interaction with the bank. The aim is to map the client's digital print and then identify opportunities for improvement in their experience.

Participant 5 said, *"The information provides bankers with the current as in position in terms of current entrenchment whilst also allowing bankers' the opportunities to identify other solutions to create a personalised client experience.''*

Participant 10 said,

"The analysis offered by digital technologies helps us to enhance our engagement with our customers. We can identify touch points where we can engage with customers and improve the experience. For example, sometimes we find that we can offer recommendations for our client at the point of purchase. However, some customers might not be receptive. Just because we identified a touch point does not mean the customer will take the advice. It might not be a good time for them.''

According to Participant 12, customer journey mapping helps to streamline processes. It is essential to be able to identify inefficiencies and pain points in the banking processes and facilitate them. This leads to more efficient CX and customer satisfaction. Of course, there might be shortfalls in pinpointing all inefficiencies and streamlining them in the time that customers expect.

4.4.2.3 Customer Profiling

The responses of the participants indicate that another way to enhance CX is through customer profiling; this means building a comprehensive profile of customers based on their behaviour, preferences, and demographics. Some of the responses from the participants are quoted as follows:

Participant 2 said,

> *"Historical information is used to develop customer profiles and expected behaviours. These behaviours are used to guide the bank's actions, e.g., who to target with certain products by considering appetite or need for a product, customer's ability to afford the product."*

Participant 3 said,

> *"Data is used as an asset to paint a complete picture of the client and their present state to pre-empt their needs. All dimensions of a client are explored and consolidated to get a thorough understanding. Data is collated and aggregated, and machine learning helps to segment clients or put them in clusters to solve for the specific needs."*

Participant 4 said,

> *"Customer profiling helps us to improve our customer service. The whole banking experience of our customers is made better if we can understand their needs and preferences. For example, a customer who uses online banking frequently might prefer to receive support through a chatbot or virtual assistant, and we make sure they get assistance through a platform that works best for them."*

Participant 7 said,

> *"This will create a more bespoke view in terms of understanding the client within their respective segment, sector, or industry."*

Participant 8 said,

> *“Customer profiling helps us to be more effective in our marketing campaign. We can develop targeted marketing campaigns that resonate with our customers. For our retirement planning services, we already know the customer's demographics, so we target those approaching retirement. This helps us not to do mass marketing of retirement services, including customers who might not need the specific service. This way, our customers can always look up to our ads knowing that it is relevant information.’’*

Participant 11 said,

> *“What we aim to do is to make sure we meet our customers at their point of need. For example, if we note under a customer profile that they like travelling abroad, we then offer them travel insurance or a multi-currency credit card. This will be convenient for this specific customer.’’*

4.5 Chapter Summary

This chapter presented the findings from primary data that was collected through semi-structured interviews with the employees from the four big banks operating in South Africa. The sample size was twelve participants, and the response rate was 100%. The verbatim quotes from the interview participants were explicitly presented in this chapter.

The next chapter presents the discussion and interpretation of the findings of the study.

CHAPTER FIVE: DISCUSSION AND INTERPRETATION OF FINDINGS

5.1 Introduction

This chapter discusses and interprets the results presented in Chapter Four. The main findings of the research are discussed and linked to existing literature.

5.2 Characteristics of the Sample

The results of the study show that twelve people (bank staff) participated in this study, which shows that the research sample was broad enough to provide sufficient research responses to analyse findings and make relevant conclusions which can be relied on (Sekeran & Bougie, 2016). The participants of this study were selected from the four big banks in South Africa, namely SBSA, ABSA, FNB and Nedbank, that have made significant investments in modernising their technology infrastructure to meet the needs of their customers. The results revealed that the research sample had the information to answer the research questions because the participants work in the departments that use digital technologies for customer service, product development, and customisation of products and services.

5.3 The Use of Digital Technologies in Banks to Offer Bespoke Products and Services

The results from the study show that all participants knew digital technologies and the different technologies used in their banks. The results reveal that the big four banks in South Africa have made investments in digital technologies to try and offer bespoke products and services to their customers. The results also revealed that the legacy systems of the banks are integrated with digital technologies, and there are challenges and benefits which the participants highlighted.

5.3.1 Types of Digital Technologies

The results revealed that the different types of technologies used in the four banks are AI, ML, CC, RPA, BDA and chatbot. The four big banks in South Africa use similar digital technologies, as highlighted by the participants in their responses, with the leading technological tools being BDA and AI. The digital technologies used aim to gather and analyse data and make meaningful decisions to improve customer experience and to improve the efficiency of the services; for example, using a chatbot, which gives customers real-time responses to queries.

In line with this research finding, Vaganova et al. (2019) found that banks use BDA in their day-to-day operations, amongst other technologies. This research finding also justifies the report of IMF (2021), where IMF specified that cloud, AI, BDA, ML blockchain and robotic advisors are some of the most popular technologies used by the banks to offer bespoke products and enhance customer experience. IMF (2021) further specified that these technologies help with payments, communication and management of assets that are crediting or leasing, which makes decision-making more accessible, and this agrees with this research findings.

5.3.2 Integration of Legacy Systems with Digital Technologies

The results show that all the banks still have legacy systems in use for their operations and offering of services. Also, there is still the existence of institutional knowledge and software in all banks. However, the results indicate that FNB has been leading in taking advantage of new technologies to improve their services, as they won the 2022 Best Consumer Digital Bank in South Africa. It is also found that all banks have been gradually replacing legacy systems but have not been able to remove the plans because of institutional history completely. However, all banks use a process called modernisation to integrate legacy systems into digital technologies. Moreover, it was found that the different methods of modernisation, including re-platforming, wrapping, and rebuilding, are deployed by banks to integrate legacy systems into digitisation.

The success rate was not clearly highlighted in the responses. Still, the responses revealed that it is not easy to carry out the modernisation process due to the high costs involved and the complexity of legacy systems, which makes it challenging to add new functionalities. The results show that legacy systems are still beneficial to the banks as they bring stability and durability, together with immersing historical data which spans different economic cycles. Interestingly, it is also found that banks have existed for decades and have relied on legacy systems, which means there is institutional memory that is valuable and useful to the banks.

A report by the IMF (2021) is in line with this finding of this research. In the report, it is reported that half-century-old technologies are still used in banks on a broader scale. Vahromovs (2021) found that the cost of maintaining the legacy systems holds the banks back from developing and integrating all digital technologies at their disposal, and this agrees with this research finding. In line with the result that legacy systems are beneficial as they bring stability and durability, BCG (2021) found that institutional memory, such as customer leads, attrition alerts and credit risk, is used to respond with foresight and precision, which improves organisational alignment and agility.

5.3.3 How Information is Gathered Using Digital Technologies to Offer Bespoke Products

The participants mentioned that banks' digital technologies gather information that is used to offer bespoke products and services through data mining, third-party providers and internal bank databases. The results show that banks collect transactional data, demographic data, and credit history, which are processed and analysed by digital technologies to create meaningful data. Banks also gather some unstructured data from several sources, including social media, which are analysed using AI algorithms to understand customer behaviour, preferences and needs.

This research finding is in line with Holmlund et al. (2020), who mentions that different touchpoints and omni channels that customers engage on are used to mine data. Bradley and James (2019) also supported this finding because they highlight that digital technologies such as Google Analytics are used to collect data on customer preferences. This finding justifies the study by Balducci and Marinova (2018), where they established that in this digital age, it is easy to gather information from social media platforms such as Twitter and Instagram.

5.4 How Data Mined from the Digital Technologies Analysis is Used to Enhance Customer Experience

This study established that data mined from digital technologies are used to enhance CX in South African banks. This is proved by the participants' responses, which indicate that hyper-personalisation, customer mapping and customer profiling are used to improve CX through data mined from digital technologies.

5.4.1 Hyper-personalisation

This study revealed that the employees of the banks are aware of how data mined are utilised in CX enhancement. The responses indicated that all banks aim to understand customer preferences through hyper-personalisation by understanding their specific needs to configure products and services accordingly. All customers demand some level of personalisation because it is imperative. This study revealed that all banks are currently able to analyse customer data and predict customer behaviour and patterns. However, hyper-personalisation is limited by the completeness and accuracy of data that are used. It was also revealed that some customers are yet not to embrace digital technologies because some customers may be reluctant to provide information via online platforms, which makes hyper-personalisation information incomplete. Based on such challenges, CX may not be enhanced by digital technologies in such instances.

This finding is supported by Villarroel Ordenes et al. (2017), who highlighted that for an organisation to know how to meet unique customer needs, it needs to understand the target market and attribute its character by using digital technologies such as big data analytics. Villarroel Ordenes et al. (2017) mentioned that some customers happen to be introverted and do not share enough information to analyse and predict customer behaviour and patterns. This is in line with the findings of this study.

5.4.2 Customer Journey Mapping

To improve CX through data mining using digital technologies, banks should follow a process that aims to visualise and analyse the interactions of their customers. The participants mentioned that all banks need to understand their customer's journey to be able to have a comprehensive view of their CX and find ways to improve it. Digital technologies enable the banks to identify touch points where customers can be engaged. The participants also mentioned that customer journey mapping helps to identify any inefficiencies and pain points in the customer journey. Once identification is achieved, the banks then streamline the inefficiencies and pain points. It was also revealed that customer mapping is not an easy process as there may be system failures to pinpoint all inefficiencies.

The participants' views are aligned with some findings in the literature, where CX actions require the organisation to have dynamic systems to map out the process orientation of a typical customer experience journey. This requires a data-rich environment which will enable the capabilities of BDA and AI for the mapping (Holmlund et al. 2020). According to Homburg et al. (2017), a customer journey map depicts a collection of touchpoints where the customer interacts and has a footprint on; again, it encompasses both digital and physical touchpoints. The bank can use these platforms to connect with its customers. It is also beneficial for the banks to use the information identified from the touchpoints in management decision-making making, which will positively impact banks' revenue. In trying to enhance CX, the profitability of the business is also improved (Kibble et al. 2020).

5.4.3 Customer Profiling

This study also found that digital technologies are used for customer profiling, which enhances CX. Customer profiling means building a comprehensive profile of customers based on their behaviour, preferences, and demographics. Customers must be met at their point of need. Only relevant information and marketing must be provided to the unique customers. Resonating with customers is vital to enhance CX. Improving customer services through proactive engagement improves CX. Customer profiling enables all banks to educate customers and notify customers immediately on specific matters that relate to them. Offering live assistance like chatbots and virtual assistants helps to improve customer resolution. It was established that during a customer journey, it is essential to discover customer complaints that are common and gain insights to improve the customer journey.

Aligned with the findings of this research, Kranzbühler et al. (2018) concurred that ML approaches enable businesses to gather information about customers to define and profile them. He further highlights that a customer profile helps to predict the purchasing preferences of the customer, which shows that comprehensive information is used in creating a customer profile. In line with this study, Kranzbühler et al. (2018) found that businesses can customise marketing and customer service to different customer groups because of customer profiling. The study by Chen et al. (2021) concluded against this study and found that reminding customers of the products they could prefer can bring a negative feeling rather than enhancing CX because the customers feel an intrusion in their personal lives.

5.5 Conclusion

The discussion and interpretation of the results presented in Chapter 4 are explained in this chapter. This study found that all four banks are currently using digital technologies to offer bespoke products and services, and there are different ways in which data mined from digital technologies is used to enhance CX.

The next chapter presents the conclusion and recommendations of the study.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This study aimed to investigate how digital technologies are used by SBSA, FNB, Nedbank and ABSA to offer personalised offering and bespoke customer experience in Gauteng, South Africa. The conclusions of the findings of this study are presented in this chapter. Recommendations on how the four banks in South Africa, Gauteng Province, can improve the use of digital technologies to offer bespoke products and services and to enhance CX are presented in this chapter.

6.2 Conclusions

Based on the findings of this study, it can be concluded that the four big banks in South Africa, namely ABSA, FNB, SBSA and Nedbank, have all made significant investments in digital technologies. From the findings, it can be concluded that the banks are using AI, BD, CC, Process Automation, and ML, among other technologies. However, it can be supposed that FNB has a strong focus on digital innovation, as it won the 2022 Best Consumer Digital Bank in South Africa. While FNB might have a more substantial reputation for innovation in digital technologies, the other three banks have also made significant investments in digital technologies to improve their offering through the modernisation of technology and infrastructure. The changing banking sector that is challenged by the new entrants that are entirely digital is challenging the status quo; hence, the four big banks are also investing in digital technologies with the aim of improving their offerings and CX.

This study concluded that the use of digital technologies by the four banks is an ongoing process as they are continuously investing in available technologies. It can be supposed that the banks are threatened by the new entrants that are digital banks since they are still trying to integrate digital technologies with the old banking way. However, the four big banks have an advantage in that they are

already established with a good number of customers that they serve in the market. The findings indicate that the four banks still have legacy systems due to institutional memory. Legacy systems can pose challenges, but at the same time, they are beneficial. It is concluded that it is costly to integrate legacy systems into digital technologies. The legacy systems may not accommodate new functions, and there is a risk of losing institutional data that is valuable to the banks. However, the banks are aware of the need to consider the safety of the data. The legacy systems bring stability, and they are durable as they were built for maximum capacity and can still be efficient for many specific tasks.

From the findings, it can be concluded that all banks are able to analyse customer data from the big data sets to make meaning of the data. All banks can identify customer preferences, common complaints, means of communication with the customers, behaviours, and number of interactions with the bank. The banks can customise products through hyper-personalisation, customer journey mapping and profiling. There are bespoke investments that are offered, different loan options, different marketing messages to other customers, and appropriate relationship managers are assigned because of the ability of banks to differentiate their customers using digital technologies. However, the study indicates that the power of the banks to analyse and profile customer trends and behaviours optimally depends on the quality of data that is used. It was noted that there could be deficiencies in the data that is analysed, and there may be system failures that fail to pinpoint all efficiencies. It can be concluded that not all customers embrace digital technologies; therefore, their CX may not be improved using digital technologies in the banks to offer bespoke products and services.

6.3 Managerial Implications of Using Digital Technologies

The managers of the banks must ensure that the overall business strategy is aligned with the adoption of digital technologies. In their role, managers should identify how best digital technology can support the organisational goals, that is, profitability, customer satisfaction, risk management and innovation. The understanding of data management managers is essential, and this includes the

collection, storage, and data analysis. Digital technology requires managers to promote agility and adaptability in the banks to make sure new opportunities are capitalised. The use of digital technology requires managers to stay updated with all regulations that relate to digital technologies and, more importantly, the protection of data and privacy.

6.4 Recommendations

From the findings of this research, it is recommended that the banks should continuously develop clear innovation strategies and improve their operating models to match the competition in the banking sector, which is slowly moving to complete digitalisation. This study established that the banking sector is changing due to the introduction of many digital technologies that the banks can use in their operations. The banks should invest in continuous research and development of digital technologies that best suit their offerings. There should be an intentional strategy around digital innovation and adoption. Management should allow the bank employees to drive the incubation of ideas as they are the ones who use digital technologies on a day-to-day basis.

The banks should engage with the stakeholders and even the general public to get ideas and perspectives that are diverse and foster innovation through open dialogue. It is essential that while the banks are continuously innovative, robust risk management practices should be implemented to assess and mitigate risks that come with innovations and technology.

The banks are encouraged to put in place strategies that are aimed at educating their customers on the importance of digital technologies to improve offerings and CX. This study established that for some customers, CX is not enhanced by digital technologies due to resistance to digital technologies. Creating awareness of the value that digital technologies bring to institutions and customers will assist in changing the attitude and perception of customers towards technology advancement. To educate customers, the banks can communicate the benefits on multiple channels. This will enhance the optimal use of digital technologies to

analyse and profile customer trends and behaviour, as the customers will not be reluctant to provide information to the bank upon request.

This study established that there are still legacy systems that are used in the banks even though they are being modernised, and it is not a cheap process. It is recommended that the banks partner with fintech companies to get assistance in optimising the use of digital technologies. Since it is not easy to find tech talent, the fintech companies will bring the resources needed. Fintechs can innovate faster than traditional banks; hence, partnering with them would ensure that they prevent system failures to pinpoint all customer data inefficiencies since the banks rely on the data to offer bespoke products and enhance CX.

Since there are legacy systems that are still in use in the banks, it is recommended that the banks do internal training and reskilling of existing employees that are used to legacy systems to ensure a smooth transition and mitigate the resistance to change risk. Reskilling existing employees will help employees to be more versatile in the company roles and save money in attracting new tech talent, which is not easy to find. Reskilling employees will mean employee retention, and this is beneficial to the banks as some employees possess institutional memory that can assist in decision-making processes. This will foster innovative mindsets within the organisation.

6.5 Recommendation for Further Research

The focus of this study was exploring how financial institutions are using an array of advanced digital technologies to offer personalised banking customer experience in Gauteng Province only. The qualitative research approach was used. In future research, a study on the same topic can be conducted, but the focus should be on more than one province, and a quantitative research approach can be used. This means the research can use a larger sample to obtain a wide variety of views, and the results of the study can be generalised to a larger population. The practical relevance of the results will be enhanced, and they can be more beneficial to financial institutions.

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APPENDIX

RESEARCH QUESTIONS

Research Study Questionnaire

The use of digital technologies by financial institutions to offer personalised offering and bespoke customer experience in Gauteng

Name of Bank:
Role Held:

Please answer the questions below as comprehensively as possible to enable for adequate analysis.

1. What digital technologies does your bank use in the customer experience department?

2. How are these technologies used to gather information?

3. How is the information used to map a customised customer journey ?

4. Are there any legacy systems still being used? How are they integrated into digital technologies?

5. How do legacy systems offer value when using digital technologies?

6. What limitations and hindrances are caused by legacy systems?

7. What value do digital technologies bring to customer profiling and mapping?

8. What other ways can digital technologies be used in hyper-personalisation?

ETHICS CLEARANCE CERTIFICATE

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/DB2624947/873

This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

Project title	The use of digital technologies by financial institutions to offer personalised products
Investigator / Researcher	Ms Zanele Mgoza
Nature of Project	MM (Digital Business)
Decision of the Committee	Approved, provided stakeholders and participants are guaranteed confidentialty.
Issue Date of Certificate	2023-02-22
Expiry date	Date of submission of the project / research report
Chairperson	Dr Pius Oba ☎ +27 11 717 3976 +27 82 733 6587 pius.oba@wits.ac.za

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Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

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

ZandeMgoza
Signature

22 February 2023
Date: