The impact of the contemporary Open banking movement on the social construction of the banking industry

A thesis submitted to the graduate faculty of design and creative technologies
Auckland University of Technology
in fulfilment of the requirements for the degree of
Doctor of Philosophy

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2022

Declaration

I hereby declare that this submission is the result of my own work and that, to the best of my knowledge, contains no material previously published or written by another person, (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Hisham Alasad

Acknowledgements

Abstract

The banking industry comprises of licensed institutions that offer financial services. Traditionally the banking industry has retained tight control of all information, but the structure and practices have radically changed through Open banking adoption. The Open banking phenomena is a strategy enforced by regulators to re-define the conduct and behaviour of the traditional banking industry with the objectives of enhancing competition and enticing innovation. The principles for change are implemented by restructuring systems, standardising software services (e.g., Application Programming Interfaces APIs), forcing data sharing, and enabling a new banking context. The changes have rebalanced the power relationship between the banking industry and the customers so that customers now have greater access to information and the ability to autonomously transact their own information.

The technology driver enables social technologies and innovation for facilitating the use of digital products that influence a change in the nature and capabilities of social and behavioural interactions. Open banking innovation influences a change in the roles of customers and banks and constructs new realties between them. The focus of this research is to examine the change in the social construction and relationships between customers and banks to determine its degree of influence on the success or failure of the Open banking adoption.

This research is a theoretical socio-technical study within the banking industry under the overarching umbrella of the Information System field. It applies qualitative research methods against secondary datasets. Therefore, it addresses, examines, and theorises the impact of the newly emerged Open banking environment on the banking industry structure, the social construct of a customer's adaptation behaviour, and the social mechanism of the emergent relationship between customers and banks. The methodology construct comprises of integrating Case study method and Grounded theory method (*Straussian Approach*) in one framework. The Case study is used to collect and compile secondary datasets in accordance with a rigorous inclusion and exclusion criteria; and then the Grounded theory facilitates the data analysis.

The results show that Open banking drives changes across the banking industry by demanding new relationships between the industry and the customer. From a structural perspective, it creates an environment of opportunity for the social creation of new relationships. It also contributes to the development of the functional aspects

of the banking industry by allowing greater freedoms for technologies and the personalisation of banking services. Open Banking adoption intensifies the level of competition with fewer constraints to service and ease of service communication. For example, by rapid service product innovation, and by lowering the industry entry barriers. The new environment attracts new entrants including Financial Technology (FinTech) providers, third party developers, and outsourcing arrangements for information processing. The nature of competition changes from being closed, monopolistic, weak, and limited, to becoming open, competitive, intense, and widely sourced. The research finds a relationship between the emerging customer's privacy and security concerns, and the degree of competition motivation. From a social perspective, the social attitude of customers changes and their subsequent adaptation or rejection behaviours for new banking products and services, is less predictable.

The research shows that innovation drives the personalisation of new products and services, and an inverse relationship between age segment and positive adaptation behaviour. It finds a direct relationship between customers' technological literacy and their adaptation or rejection behaviour. It discovers a relationship between the degree of a customer's awareness and understating of Open banking function and rejection behaviour. From a relationship perspective, Open banking tips the power and control of the traditional relationship between customers and banks towards the customers' benefit. It removes the sense of loyalty towards original banks. It gives customers a transpired sense of freedom in product selection which changes the boundaries of existing relationships from One ➔ One to become One ➔ Many. The social construct changes from being transactional to a social banking experience. The research finds that the cultivation of social relationships improves customer retention and accelerates the transformation of banks towards becoming social and financial platforms.

This research develops an Open banking adoption model for managers which serves as a high-level planning, guidance, and reference tool for industry practitioners and banks in their Open banking adoption journeys (6.2.5). It puts forward a list of practical suggestions and mechanisms in managing the Open banking adoption. It contributes to the body of knowledge by joining the continuing discussions of demystifying the multifaceted impacts of Open banking adoption and providing starting points for further research. It contributes to the body of IS knowledge by constructing and validating twenty-one generated hypotheses (H1➔H21) and discovering twelve direct and inverse relationships (RE01➔RE12). The theory

generation actions remedy theoretical gaps and the identified issues and problems in the existing literature. The key areas for further research are the emerging privacy and security concerns, the pace of adoption, and determinants for the customers' adaptation and rejection behaviours.

Publications

Cusack, B. Alasad, H. (2022). The Impact of Open Banking Processes on Organizational Behavior. *Information and Organizational* (Submitted).

Cusack, B. Alasad, H. (2022). European Open Banking Deregulation Motivates Agile Management Strategies. *European Journal of Information Systems*. (Submitted).

Alasad, H. (2020). *The Impact of Agile Processes on Organisational Behaviour Within Current Banking Practice*. Auckland University of Technology.

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List of Abbreviations

IT	Information Technology
IS	Information Systems
FinTech	Financial Technologies
API	Application Programming Interfaces
NCF	Near Field Communication
AISP	Account Information Service Provider
PISP	Payment Initiation Service Provider
CMA	Competition and Market Authority
PSD	Payment Services Directive
PaaS	Platform as a Service
IaaS	Infrastructure as a Service
BaaP	Bank as a Platform
OBaaS	Open banking as a Service
BaaS	Backend as a Service
CDR	Consumer Data Rights
AML	Anti-Money Laundry
KYC	Know Your Customer
CFT	Countering the Financing of Terrorism
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
TAM	Technology Acceptance Model
GAFA	Google, Amazon, Facebook, and Apple
P2P	Peer to Peer
GT	Grounded Theory
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CCA	Constant Comparison Analysis

Chapter 1: Introduction

1.0   INTRODUCTION

Chapter one gives an overview of this research. It states the goals, objectives, value, and questions. It provides a brief background to the researched topic Open banking, and the examined study field which is the banking industry.

Chapter one has four sections. First, it describes the context of study in relation to the theoretical research topic and research field. Second, it describes the significance of the research, and highlights the contribution to the professional community of practitioners in banks. Also, academic communities are addressed in terms of generating theory to remedy detected gaps in the literature, and by solving identified issues and problems in the existing body of knowledge. Third, it explains the mechanism of developing the research problem statements, and the process of developing the research questions. Finally, it offers an organisational roadmap of subsequent chapters, and reports the objective for each.

1.1   CONTEXT OF STUDY

The banking industry is subject to a series of disruptive changes which are characterised by groups for regulatory, technological, competitive, and customer expectations. Banks are expected by the market to be dynamic in nature and robust in their responsiveness to changes (Bollard, 2003; Callaway & Hamilton, 2008; Hartlen, 2015; Shuttleworth, 2016). Furthermore, to ensure an adequate degree of dynamism and flexibility in responding swiftly, appropriately, and in a timely way to the changes in information systems, is essential to the continuity of bank operations (Joshi, 1991; Sia, Soh, & Weill, 2016). Failing to respond in a timely manner poses a degree of existential threat to banks, and the threat escalates to impact societies and the overall financial systems (Jeucken, 2001; Fiordelisi, Soana, & Schwizer, 2013). The traditional banking industry has claimed ownership over a customers' financial data, and it is perceived as bank property.

Subsequently, it has limited the access to data, and imposed restrictions on the sharing of data with other parties (Ghosh & Bhakta, 2018; Guida, 2020).

Three key factors have driven radical change in the banking industry. These are: the expansion of a customer-focused banking industry, the customer's desire to engage socially and behaviourally with new technology, and the constant stream of Financial Technology (FinTech) product innovation (Cornaggia, Mao, Tian, & Wolfe, 2015). In addition, there has been a shift in the industry's motivation for business opportunity which is driven by changes in market regulations. Thus, the action of withholding a customer's financial data is an impediment to business because it hinders both the level of competition and the necessary level of innovation within the banking industry (ACT, 2008; Cornaggia, Mao, Tian, & Wolfe, 2015; Whish & Bailey, 2015; Cornaggia, Mao, Tian, & Wolfe, 2015; Noonan, 2017).

Therefore, regulators have stepped in to enforce a correction within the banking industry by facilitating the enablement of an environment which requires innovation, opens competition, and enables the accessibility and sharing of a customer's financial data. The new services are secure and digitally connected via the use of standardised open Application Programming Interfaces (APIs) between banks and regulated Third Party Providers (TPPs). The transformed environment is called Open banking (Zachariadis & Ozcan, 2017; Brodsky & Oakes, 2017; Gozman, Hedman & Sylvest, 2018; Fingleton, 2019; Gozman, Hedman, & Olsen, 2018, p. 2). Ultimately, Open banking allows for new challengers to enter the market, and invites a customer focused and a technology driven environment for competition (Farrell, 2019; Fingleton, 2019). It also promotes social and behavioural changes by customers and alters the relationship between customers and banks (Ding, Chong, Chuen, & Cheng, 2018).

The technology driver for Open banking delivers social technologies and social innovation for facilitating the use of digital products. These influence customer changes in the nature and capabilities of social and behavioural interactions (Gozman, Hedman & Sylvest, 2018; Muningera, Hammedi, & Mahrc, 2019; Gartner, 2021). Open banking requires a change in the roles of customers and banks, and constructs new realties between

them (Ding, Chong, Chuen, & Cheng, 2018). The social construction of relationships between customers and banks influences the success or failure of the Open banking adoption (Latané, 1981; Becker, 1997; Barrow, 1997; Becker, 1997; Dopfer, Foster, & Potts, 2004). Subsequently, the change in social constructions effects the behaviour of customers for adaptation or rejection behaviour to Open banking products and services (Pousttchi & Schurig, 2004; Jones; Buttle, 2010; Jullien & Pardi, 2011; Olson, & Fazio, 2010; Lee & Raghu, 2014).

The customer's adaptation or rejection behaviour is constructed from the accumulative user experiences of engaging socially with multiple products and services. The outcome of a single user experience is determined from the likes or dislikes of interacting with each service (De Houwer, Thomas, & Baeyens, 2001; Fazio, Eiser, & Shook, 2004; Frijda, Manstead, & Bem, 2000; Jones, Olson, & Fazio, 2010). The analysis of relationship between Open banking technology and customer behaviour is a social construction. This research justifies the Technology Acceptance Model (TAM) for behavioural theory (rather than the more general UTAUT organisational model), to explain the customer's adaptation or rejection behaviour. TAM has the "*power to explain user behaviour*" (Davis, 1986; Davis, Bagozzi, & Warshaw, 1989, p. 997; Hu, Chau, Sheng, & Tam, 1999; Yaghoubi & Bahmani, 2010).

1.2   THE SIGNIFICANCE OF THE STUDY

This research contributes to professional and academic communities. First, it provides future researchers with a combined research methodology construction and systematic steps for studying emerging socio-technical phenomena. Second, it develops an Open banking adoption model for managers which serves as a high-level reference and guidance tool for industry practitioners in banks for the Open banking adoption journeys (see sub-section 6.2.5). Third, it puts forward a list of practical suggestions and mechanisms in managing the Open banking adoption. Fourth, it contributes to the body of knowledge by joining the continuing discussions of demystifying the multifaceted impacts of Open banking adoption. Specifically, it contributes to the body of Information

Systems (IS) knowledge by constructing and validating twenty-one generated hypotheses (H1➔H21) and discovering twelve direct and inverse relationships (RE01➔RE12) which facilitates theory generation to remedy detected gaps and identified issues and problems in the existing literature. The key contribution is the identification of emerging privacy and security concerns, adoption pace challenges, customer adaptation or rejection behavioural motivations, and the description of the social construction of new relationships between customers and banks. Finally, it identifies limitations in the research, and then proposes future research in relation to the practical applications of Open banking (e.g., fraud detection in a social welfare system, and the impact of super platforms on the level of innovation and productivity within the banking industry).

1.3 AIMS OF THE RESEARCH

The research goals and objectives are derived from the problem of socially constructed realities. A coherent problem statement, solution spaces, and reframing sub-problem statements are defined to ensure that the different perspectives of the problem are represented (Spradlin, 2016; Wedell-Wedellsborg, 2017).

This theoretical study examines the impact of the emerging Open banking environment; thus, the research is with exploration nature in the theory of IS field. According to Gregor (2006) research with such nature generates theory for explaining or understanding, she asserts that "*this type of theory explains primarily how and why some phenomena occur*" (Gregor, 2006, p.624).

This research presents an overarching general problem statement, then reframes it three times to define the aspects to be examined in this research. Table 1.1 shows the Open banking problem framing process. It has the general problem statement in addition to the three re-framed sub-problem statements, and suggested solution spaces.

Table 1.1 Open banking problem statement framing

Problem Statement	Solution Space
General problem statement	• Banks are to understand Open banking

Banks are facing unknown risks and changes because of Open banking introduction.	• Banks are to understand changes in the banking industry • Banks are to identify associated risks with their Open banking adoption • Banks are to develop strategies to manage and mitigate these identified risks
Re-framing problem 1 Will banks survive the Open banking fierce competition?	• Banks are to understand the banking industry's new structure and drivers of competition • Banks are to identify their strengths and weaknesses • Banks are to develop strategies incorporating key change catalysts • Banks are to develop adequate responsive mechanisms
Re-framing problem 2 Will customers adopt the Open banking new products and services?	• Banks are to understand the Open banking social impact • Banks are to understand the adaptation and rejection behaviour of customers • Banks are to develop products and services which entice a positive receptive attitude from customers
Re-framing problem 3 Will banks lose their current loyal customers to competitors?	• Banks are to understand the customer's views on the current business relationship • Banks are to understand the new relationship with customers • Banks are to develop strategies to incorporate social dimensions

The research is a theoretical socio-technical study within the banking industry under the overarching umbrella of the IS field. It applies qualitative research methods against selected secondary datasets. Therefore, it addresses, examines, and theorises the impact of a newly emerged Open banking environment on the traditional banking industry structure, the social construct of a customer's adaptation behaviour, and the social mechanism of the emergent relationship between customers and banks. Therefore, this research sets out to answer the following three research questions:

Research questions one: What is/are the impact of Open banking on the structure of banking industry?

Research question two: What is/are the impact of Open banking on the adaptation behaviour of customers?

Research question three: What is/are the impact of Open banking on the relationship between customers and banks?

1.4   ORGANISATION OF THE RESEARCH

This research adheres to the AUT university thesis structure. It comprises of seven chapters where each deliver to specific objectives, and each sequentially informs the argument for the chapter following. Table 1.2 shows the thesis organisation and highlights the objectives for each chapter.

Table 1.2 Thesis Organisation

Chapter	Objective
One - Introduction	To deliver the background, significance, and purpose of the research.
Two - Literature Review	To deliver the literature review for Open banking, detect the gaps in the existing body of knowledge, and identify associated issues and problems.
Three – Research Methodology	To deliver the design and construct of the combined research methodology for Case study and Grounded theory.
Four – Data Collection	To deliver the criteria, mechanism, and process of secondary data selection and collection via the use of Case study.
Five – Data Analysis	To deliver the data analysis process guided by Grounded theory procedures and techniques.
Six - Discussion	To deliver the core discussion, interpretation, and validation of hypotheses for theory generation.

Seven - Conclusion	To deliver a conclusion, and recommendations for future research in relation to Open banking.

Chapter 2 offers a systematic review of the existing body of knowledge including literature and industry publications with the aim of acquiring an in depth understanding of Open banking. Upon the completion of the literature review, the researcher finds gaps and identifies associated Open banking issues and problems. Chapter 3 defines the process of selecting the combined research methodology which integrates the two research methods of Case study and Grounded theory into one methodology framework. It offers a justification of this selection highlighting the compatibility between the two research methods and the suitability of this combined methodology to theoretical socio-technical research.

Chapter 4 demonstrates the use of Case methods to define the data search strategy and mechanism for identifying approved secondary datasets via the use of inclusion and exclusion criteria. Chapter 5 demonstrates the use of Grounded methods for the data analysis process of the selected secondary datasets. It applies sequential steps guided by the procedures and techniques of Grounded theory to deliver theory generation outcomes. Chapter 6 has discussion and interpretation of the emerging hypotheses and relationships. Importantly, it applies the Grounded processes to assert the validity and applicability of the hypotheses and the subsequent theory generation. It formulates the Open banking adoption model for managers which serves as a high-level planning, guidance, and reference tool for industry practitioners and banks in their Open banking adoption journeys (6.2.5). Chapter 7 concludes the study and proposes two sets of recommendations. First, it puts forward to the practitioners in the banking industry a list of practical recommendations for managing their Open banking adoption. Second, it suggests areas of significance arising from this research for future research to academic and professional communities.

Chapter 2: Literature Review

2.0   INTRODUCTION

Chapter two reviews the existing literature in relation to the researched topic of Open banking. The examined field of study is the banking industry, and the research is guided by the research questions from section 1.3. The Delphi method is used to select the relevant literature and theoretical foundation for this study. The objective of the literature review process is to detect gaps in the existing body of knowledge and to identify issues and problems relating to Open banking.

This chapter has seven sections. First, it explains the mechanism of the literature review process and the use of the Delphi framework for literature selection. Second, it discusses the key changes in the traditional banking industry, explains their degree of influence, and describes the response from the banking industry incumbents. Also, it addresses the emergence of Financial Technologies (FinTech) as a driver for change for the traditional banking industry. Third, it discusses the underlying philosophy of Open banking and the key drivers behind its emergence. It examines the Open banking technical layer of new services which are secure and digitally connected via the use of standardised open Application Programming Interfaces (APIs). APIs are used to exchange a customer's financial data between different parties within the Open banking environment. Fourth, it examines the Open banking adoption strategies and their implications for a bank's position and expected roles within the Open banking market. The adoption strategies are analysed by highlighting advantages and disadvantages in terms of operation continuity and competition resilience. Fifth, it discusses the impact of new technologies on the social construction of relationships, and then defines the influence of new technologies on consumer behaviour. Sixth, the chapter analyses the previous sections of the chapter and summarises detected gaps and identified issues and problems in relation to the banking industry and the research questions. Finally, the chapter recaps the outcomes and contribution to the research.

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2.0.1 LITERATURE SELECTION PROCESS

A structured literature review process assists the research goals and objectives by selecting a sample of relevant literature from the vast amount available (Rowley & Slack, 2004). In socio-technical research the literature review process is methodical and systematic with "*appropriate breadth and depth, rigour, and consistency*" (Rowley & Slack, 2004; Okoli & Schabram, 2010; Hart, 2018, p. 2). The process follows reasoning to deliver a manageable outcome (Bolderston, 2008) which logically communicates to the target audience "*what knowledge and ideas have been established on a topic, and what are their strengths and weaknesses*" (Taylor, 2016, p. 1).

The Delphi method (Schmidt, 1997) is adopted for this research as the guiding mechanism for the literature selection. The Delphi method is suitable for Information System (IS) research studies (Holsapple & Joshi, 2002; Okoli & Pawlowski, 2004). It implements a hierarchical mechanism for decision making and sorts through large volumes of content which allows reducing and focusing the literature review search (Schmidt, 1997; Ghazi Zadeh, 2018). This research adopts and populates an existing Delphi framework with the questions for this research as shown in Figure 2.1 (El-Gazzar, Hustad, & Olsen, 2016; Ghazi Zadeh, 2018).

The framework comprises of four distinct iterative rounds and aims to target, narrow down, and filter out irrelevant literature content. The method identifies four guiding questions to navigate the process for seeking the relevant literature. Table 2.1 lists the identifying questions for this research.

Table 2.1 Delphi method identifying questions

Identifier	Question
RQ1	What is Open Banking?
RQ2	What are the issues and challenges introduced and faced by Open Banking?
RQ3	Which of these issues has most importance to customers?
RQ3	Why are the identified issues important?
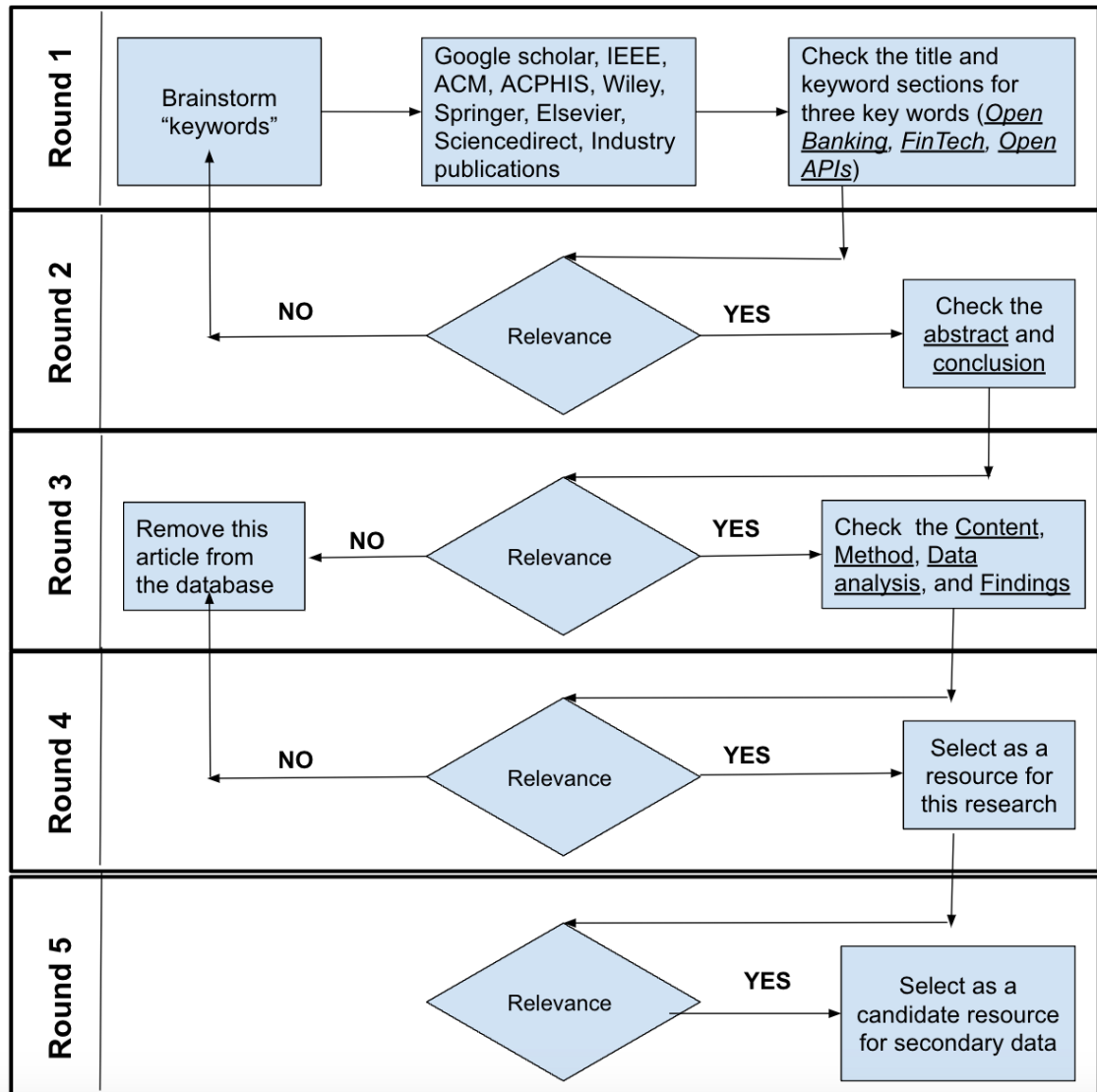
Figure 2.1 Delphi framework for literature selection

The iterative Round 1 identifies key search words. These are Open Banking, FinTech, and open APIs. A preliminarily search against the selected digital libraries of ACPHIS, ACM, IEEE, Google Scholar, Science Direct, Elsevier, and Springer publications is made. The iterative Round 2 verifies the quality and relevance of the search results from the previous step. The document abstract and conclusion is scanned for relevancy to the

questions RQ1, RQ2, RQ3, RQ4 of Table 2.1. The iterative Round 3 conducts relevancy matching and verification against the search results from the previous step. It examines the appropriacy of content, research method, data analysis, and findings against the requirements for this research. Finally, iterative Round 4 determines which content has relevancy to the research and selects the content as a source for literature review, and otherwise the content is not relevant and is discarded (El-Gazzar, Hustad, & Olsen, 2016). Figure 2.1 shows the application of Delphi framework for this research as adopted and used from El-Gazzar, Hustad, & Olsen (2016) and Ghazi Zadeh (2018).

Further, a Fifth round is added to the applied Delphi selection framework. This round represents an incremental advancement to the systematic process of identifying relevant literature content. It assists the process of secondary data selection by identifying appropriate candidate sources for secondary data which include textual interviews with participants in relation to the three research questions of this thesis. The resulted secondary data sources are used in Chapter four.

2.1 CHANGES IN BANKING

The banking industry is subject to a series of current disruptive changes. Banks are expected by the market to be dynamic in nature and robust in their responsiveness to these changes (Bollard, 2003; Callaway & Hamilton, 2008; Hartlen, 2015; Shuttleworth, 2016). Failing to respond in a timely manner poses a degree of existential threat to banks, and the threat escalates to impact societies and the overall financial systems (Jeucken, 2001; Fiordelisi, Soana, & Schwizer, 2013). Essential to the continuity of bank operations is appropriate response to the forces of change, and the new expectations for service system delivery (Joshi, 1991; Sia, Soh, & Weill, 2016). The response strategy has both tangible and intangible components. For example, upgrading technical infrastructure is tangible but a change in culture has intangible elements such as applying changes for social and behavioural expectations (RBNZ & FMA, 2018;).

The changes in the banking industry are grouped into regulatory, technological, and competitive clusters (Callaway & Hamilton, 2008). The regulatory changes are

mandated by regulators to sustain the continuity and performance of the financial systems (RBNZ & FMA, 2018). However, failing to comply with these regulations exposes banks to consequences including the suspension of practice licenses (Bollard, 2003). The technology change group introduces new technical capabilities. It offers positive outcomes when banks are agile, grow competences, and leverage the change by turning it into an opportunity. A negative outcome is delivered when banks are ridged and not able to keep pace with the stream of technological changes and subsequent unmanaged risks (Callaway & Hamilton, 2008; Shuttleworth, 2016). The competitional change is driven by market conditions and customer expectations. A customer-focused banking industry aims to enhance customer satisfaction. This is done by adopting customer centric strategies which includes a change in code and conduct to develop long-term, positive, and trust-driven relationships between customers and banks (Akinci, Aksoy, & Atilgan, 2004; Alt & Puschmann, 2012; Shuttleworth, 2016; Srinivas, Fromhart, Goradia, & Wadhwani, 2018).

2.2   FINANCIAL TECHNOLOGIES

Financial Technology (FinTech) merges enhanced financial services with disruptive technologies (Arner, Barberis, & Buckley, 2015). The philosophy behind FinTech is enabling new customer-friendly technologies to improve the quality of the financial service and customer experience (Chen, 2016; Panos & Wilson, 2020).

The concept of FinTech is traced to 150 years ago and again in the early 1980s (Arner, Barberis, & Buckley, 2015; Beeston, 2020). However, since the 2008-2009 Global Financial Crisis (GFC), FinTech adoption has accelerated (Erkens, Hung, & Matos, 2012; Chen, 2016; Arjunwadkar, 2018; Foster, 2019; Galiotto, 2020). Mention (2018, p.59) believes that "*fintech is here to stay, supported by emerging technologies*". FinTech providers are legally able to offer financial services without holding banking licences. This poses a threat for operating below market standards in terms of not adhering to certain policies or meeting specific expectations such as data management, security,

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and privacy (Bofondi & Gobbi, 2017; Alexander, Das, Ives, Jagadish, & Monteleoni, 2017; Mention, 2018; Das, 2019;).

FinTech triggers innovation and talent growth by using investment resources. FinTech allows exploring unconventional concepts which leads to a constant innovation of digital products (Bruene, 2015; Lacasse, et al., 2016; Arjunwadkar, 2018; Gomber, Kauffman, Parker, & Weber, 2018). FinTech disrupts the traditional competition and operation of the market. Its customer-centric digital focus enables customers to embrace the use of hand-held financial technology in and for their daily contextual tasks (Pollari, 2016; Blakstad & Allen, 2018). It uses the technical capabilities to transform collected customer data into meaningful behavioural insights. The insights are used to gain a competitive advantage by developing personalised relationships with customers (Vives, 2017).

2.3   OPEN BANKING

The traditional banking industry has claimed ownership over the customers' financial data which is perceived as bank property. Subsequently, the data has restricted access and restrictions on sharing with other parties (Ghosh & Bhakta, 2018; Guida, 2020). However, three key factors have driven radical change in the banking industry. These are: the expansion of a customer-focused banking industry, the customer's desire to engage socially and behaviourally through new technologies, and the constant stream of FinTech product innovation (Cornaggia, Mao, Tian, & Wolfe, 2015). In addition, there has been a shift in the industry's attitude and direction that has been enforced by changes in the market regulations. Thus, the action of withholding a customer's financial data is an impediment to the fair trade of information. It also hinders the level of competition and innovation within the banking industry (ACT, 2008; Cornaggia, Mao, Tian, & Wolfe, 2015; Whish & Bailey, 2015; Noonan, 2017).

The regulators have stepped in to enforce a correction within the banking industry by facilitating the enablement of an environment which seeds innovation, opens competition, and enables the accessibility and sharing of a customer's financial data. The

new services are secure and digitally connected via the use of standardised open Application Programming Interfaces (APIs) between banks and regulated Third Party Providers (TPPs). The transformed environment is called Open banking (Zachariadis & Ozcan, 2017; Brodsky & Oakes, 2017; Gozman, Hedman & Sylvest, 2018; Gozman, Hedman, & Olsen, 2018, p. 2; Fingleton, 2019).

Open banking allows for new challengers to enter the market, and invites customer focused and technology driven competition (Farrell, 2019; Fingleton, 2019). It also fosters social and behavioural changes and alters the relationship between customers and banks (Ding, Chong, Chuen, & Cheng, 2018). Thus, Gozman, Hedman & Sylvest (2018) offer a definition of Open banking which is derived from the Open banking initiative of 2017 (Fingleton, 2019) as follows:

> *"Open banking enables personal customers and small businesses to share their data securely with other banks and with third parties, allowing them to compare products on the basis of their own requirements and to manage their accounts without having to use their bank" (Gozman, Hedman, & Olsen, 2018, p. 2)*

Open banking grants customers the exclusive ownership, control, and consenting rights to their financial data (Gozman, Hedman & Sylvest, 2018; Fingleton, 2019).
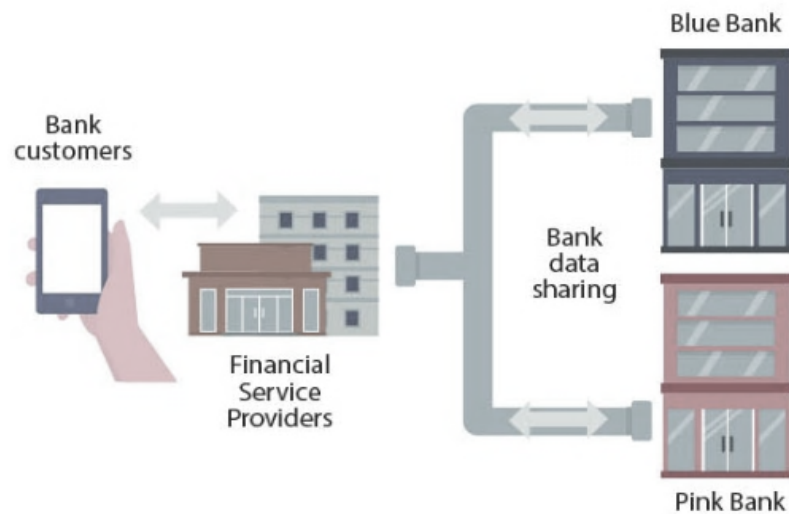
Figure 2.2 Data sharing via API in Open banking (RBNZ, 2018)

Upon a customer's consent, the data is shared securely and digitally via the use of standardised open APIs between banks and regulated TPPs (Zachariadis & Ozcan, 2017; Kröner, 2018). The set of standardised APIs services standardises and simplifies the integration within the banking industry which expands opportunities for innovation and competition (Guibaud, 2016; Gozman, Hedman, & Olsen, 2018). Figure 2.2 shows the mechanism of Open banking data sharing. It demonstrates how a regulated independent TPP utilises Open banking standardised APIs to aggregate the customer's financial data. The data is sourced from multiple accounts and hosted within different banks. It then presents the consolidated data in a single view using an interactive digital interface (RBNZ, 2018).

2.3.1   DEMOCRATISATION OF DATA

The underlying philosophy of Open banking is democratising the use of financial data (Radley, 2016; Upadhyay, 2019). Data democratisation in the banking industry is making data available for sharing to achieve a state of financial inclusion which allows customers to "*have access to useful and affordable financial products and services that meet their needs*" (Beck, 2016; Cable, 2019).

The data within the traditional banking industry is stored in a variety of separated data silos within three clusters. The first cluster comprises of the Business Units (BU) within each bank where each BU represents an independent silo of data. The second cluster comprises of banks where each bank represents a silo of data on its own; hence the bank silo is the aggregation of all business units within that bank. The third cluster comprises of industries where the banking industry represents a silo of data on its own; hence the banking industry silo is the aggregations of all banks.

An accurate image of the customer's financial behaviour requires data from multiple sources (Crosby & Johnson, 2001; Treuhaft, 2006). The traditional banking industry lacks the data-sharing mechanism between data silos within and across banks and industries to do this efficiently (Upadhyay, 2019). However, with data democratisation through Open banking the distinct set of borders between the data silos blurs and eventually diminishes in to a unified virtual digital world. This results in constant feeds of shared data between silos which creates beneficial opportunities to all participating parties (Hendricks, 2017; Upadhyay, 2019; Cable, 2019). Figure 2.3 shows the mechanism for data sharing between data silos.
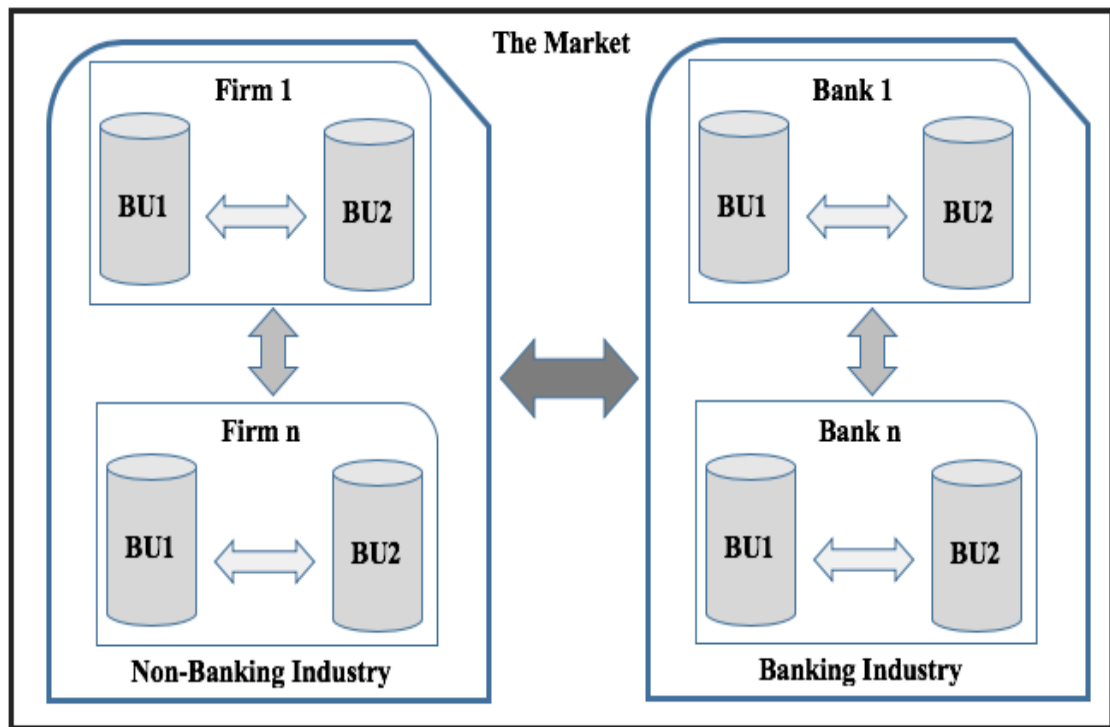
Figure 2.3 Silos of data sharing mechanisms

2.3.2 OPEN BANKING DRIVERS

The traditional banking industry is heavily regulated, slow in responding to changes, and risk-averse when it comes to innovation (Hoshi & Patrick, 2000). In such industries change is cumulative in nature. The impact does not come at once; however, it results from the aggregation of small changes over a long period of time (McKenney & Mason, 1995). Open banking is the result of multiple driving forces coming together and delivering an effect. The forces are regulations, technology, and the shift in customer behaviour (Scott & Bolotin, 2016).

2.3.2.1 REGULATIONS

The regulations driver is crucial force in bringing Open banking changes. Traditional banks hold tight to lucrative markets and resist change. Thus, regulators have stepped in to change the status quo (EBA, 2019). This is done by legislation in many jurisdictions

and setting measurable performance expectations. The target and focus for change is in the ownership and control of a customer's financial data (Premchand & Choudhry, 2018; Kröner, 2018).

For example, the European Union (EU) and the United Kingdom (UK) have adopted the Payment Services Directive (PSD) of 2007, and the revised Payment Services Directive (PSD2) of 2015 which are key driving regulations for Open banking (EUCommission, 2007; Cortet, Rijks, & Nijland, 2016; EUCommission, 2015; EBA, 2019). The PSD2 facilitates Open banking initiatives (Cortet, Rijks, & Nijland, 2016; Jackson, 2018). It enforces data sharing in financial services. It also legislates Third Party Providers (TPPs) to offer two main financial services. First, the Account Information Service Provider (AISP) service which allows TPPs to securely request, retrieve, and display the customer's account information held at different host banks. Second, the Payment Initiation Service Provider (PISP) service allows TPPs to initiate, authorize, and fulfil payments from a customer's accounts held in different host banks (Cortet, Rijks, & Nijland, 2016; Hellmann, 2017; Solodkiy, 2019; Farrow, 2020). Table 2.1 lists the major regulatory milestones of Open banking in the UK and the EU (Teilen, 2019; Fingleton, 2019).

Table 2.2 Regulation journey of Open banking

Year	Highlight	Description
2007	PSD1	The introduction of Payment Services Directive (EUCommission, 2007).
2011	Midata initiative	Midata is a voluntarily initiative launched in the UK which recommends giving the customer more access to their data in electronic formats (Fingleton, 2019; Shadbolt, 2013; Harrington, 2014).

2015	PSD2	The revised Payment Services Directive, directs the banking industry as explained above in section 2.4.1 (EUCommission, 2015).
2016	CMA	The Customer Market Authority (CMA) investigates the retail banking industry in the UK and concludes that there is a lack of competition in the industry (CMA, 2016)
2016	OBWG	The Open banking Working Group (OBWG) in the UK (which was formed in 2015) publishes the Open banking framework which sets the security standards and recommends the use of standardisation for APIs (OBWG, 2016; Fingleton, 2019).
2017	CMA	The CMA launches and enforces the technical specifications for AISP and PISP (CMA, 2017).
2018	GDPR	The implementation of General Data Protection Regulation (GDPR) in the EU and the UK which sets the standards of data collection by TPPs after customer consent (Mitchell, 2016; GDPR, 2018; Dorfleitner & Hornuf., 2019).

Australia adopted the cross-sectoral Consumer Data Right (CDR) Act of 2019 which provides customers "*greater access and control*" of their data, and to encourage innovation and competition within markets (Treasury, 2019). The CDR Act enables Open banking which gives customers exposure to a wider range of competitive products and services in terms of price and quality (ACCC, 2018). The CDR Act adopts a phase-timeline approach where specific sets of standardised APIs are expected to become available to TPPs at agreed dates (ACCC, 2018; OAIC, 2019).

In New Zealand the Open banking adoption is still not regulated, which makes it an industry-led Open banking initiative with the objective of bringing innovation to the industry "*more quickly and simply*" (Sieber, 2020). The initiative focuses on standardising the APIs for account access and payment initiation (Sieber, 2020). The

Reserve Bank of New Zealand (RBNZ) assesses the progress and speed of the initiative and is ready to intervene, and "*if necessary, will weigh in if it believes progress is too slow or the rules aren't working*" (Lemonade, 2019). Nonetheless, in July 2021 the New Zealand government agreed on adopting a cross-sectoral Consumer Data Rights Bill, which is comparable to the Australian one and aims to present the draft in Parliament in 2022 (MBIE, 2019; MBIE, 2020, MBIE, 2022).

2.3.2.2 TECHNOLOGY

Technological advancements in APIs, microservices architecture, and scalable infrastructure have made Open banking conceivable (Oostenrijk, 2004; Dholakia, 2006; Deloitte, 2017; Teilen, 2019; Fingleton, 2019). The APIs technology acts as an enabler of digitalisation within the banking industry, and functions as a bridge to the inhouse systems for the constant real-time flow of data (Marous, 2017; Brodsky & Oakes, 2017). It bundles and conceals the complexity of integration which allows banks to focus on business development and customer experience (Arner, Barberis, & Buckley, 2016; Soulé, 2017).

There are three types of APIs used within the banking industry that are private/internal, partner/shared, and public/open ones. The latter is the most active in deployment because those APIs are exposed to all participants within the banking industry; and this type of API is the backbone of Open banking (Petrosyan, Robillard, & Mori, 2015; Marous, 2017).

Responsive technology is proven challenging to implement with traditional infrastructure built on monolithic traditional architectural structures (Namiot & Sneps-Sneppe, 2014). The microservices architecture enables responsive technology to satisfy business needs and customer-focused strategies. It supports a robust and scalable infrastructure which allows banks to integrate and collaborate with TPPs (Harris, Ives, & Junglas, 2012; Cooper, Katsamakas, & Shaharia, 2013; Yanagawa, 2019). It arranges and re-arranges blocks of autonomous or loosely coupled services to build solutions "*with a balance of speed and safety at scale*" (Nadareishvili, Mitra, McLarty, & Amundsen, 2016,

p. 3). The migration from monolithic to microservices architecture simplifies processes and enables innovation for products and services development (Bucchiarone, Dragoni, Dustdar, Larsen, & Mazzara, 2018; Stoychev, 2019).

Scalable technology is a key for Open banking growth to avoid the "*Bitcoin Dilemma*" where the innovative technology is there; however, it does not scale adequality to many transactions due to its "*low capacity in transition throughout*" (Chuen, Lee, & Teo, 2015; Herrera-Joancomartí & Pérez-Solà, 2016). Scalability allows banks to tune infrastructure and applications resources to optimise the overall efficiency of business demand whether it is an upsurge or reduction in load (Hill, 1990; Vonnegut, 2017; Maida, 2019). The adoption of Cloud computing technology for Platform as a Service (PaaS), Infrastructure as a Service (IaaS), and with microservices architecture, enables the "*Next-Gen*" infrastructure for the Open banking environment. It has improved flexibility, rapid integration, and cost reduction (Chuen, Lee, & Teo, 2015; Daniel & Gogan, 2017; Riemer, et al., 2017; Deloitte, 2017).

Scalability is not only technology driver, but it is an opportunity for banks to rethink optimisation, hence it requires a change on three levels. First, a change in *principles* that allows reimagining the business operations, goals, and objectives in the from the view of a customer-focused Open banking environment. Second, a change in *practices*, where lightweight responsive delivery methodologies such as Agile in developing new products and services, is used. Third, a change in *culture*, where the existing methods of interactions and relationships between teams, management, and customers is reviewed (Hill, 1990; Nadareishvili, Mitra, McLarty, & Amundsen, 2016; Vonnegut, 2017; Maida, 2019).

2.3.2.3 CUSTOMER BEHAVIOUR

Social technology causes a shift in customer behaviour which results in new customer expectations. The customer expects to be digitally connected to financial services while engaging socially and behaviourally with the interactive technology (George & Kumar, 2014; Cornaggia, Mao, Tian, & Wolfe, 2015; Deloitte, 2017). The customer behaviour

influences the acceptation of Open banking which is linked to the adoption of its products and services (Húsek, Brich, & Procházka, 2016; Buckley & Webster, 2016).

The customer's adaptation or rejection behaviour is constructed from the accumulative user experiences of engaging socially with multiple products and services. The outcome of a single user experience is determined from the formed attitude after interacting with each service (Frijda, Manstead, & Bem, 2000; De Houwer, Thomas, & Baeyens, 2001; Fazio, Eiser, & Shook, 2004; Jones, Olson, & Fazio, 2010). The emerging attitude is constructed from the perceived values and risks. A positive user experience with perceived added value develops liking towards the service and instigates a receptive attitude (Hirschman, 1980; Littler & Melanthiou, 2006; Littler & Melanthiou, 2006). On the other hand, a negative customer experience with perceived risk develops a dislike towards the service and instigates a rejection attitude (Greatorex & Mitchell, 1994; Littler & Melanthiou, 2006; Weichert, 2017; Ryu, 2018).

2.3.3   OPEN BANKING APPROACHES

In Open banking adoption, banks are embracing reactive or proactive approaches (Jaja, 1991; Ho & Mallick, 2010; Tapiero, 2013; Chiu, 2016; Chiu, 2017; Anagnostopoulos, 2018; Heath, et al., 2018; Omarini, 2018). The decision for selecting an approach considers each bank's risk assessment of its position in the market, and the leadership mindset towards innovation (Klomp & Haan, 2011; Ogden, 2016; Folcia, Marcozzi, & Zanetti, 2018).

The proactive approach takes actions and invests in establishing a readiness state ahead of the Open banking enforcement by regulators. The reactive approach halts actions and takes the "*wait & see*" position until regulations are enforced. The latter approach exposes banks to the risk of being branded as "*exnovation*" (lack of innovation), which makes them less attractive to customers and threatens their position in the market (Chiu, 2017; Rohan, 2017; Heath, et al., 2018; Anagnostopoulos, 2018; Heath, et al., 2018; Telford, 2019). The proactive or "*visionary*" banks see the change that comes with Open banking and aim to achieve a state of readiness beforehand (Bilderbeek & Buitelaar,

1992; Telford, 2019; Sieber, 2020). The state of readiness is not exclusive to technology, but also develops other capabilities including data governance, operations, strategic partnerships, and relationship with customers (Weber, 2010; Giannakis-Bompolis & Boutsouki, 2014; Heath, et al., 2018; Telford, 2019; Beatty, 2019; Sieber, 2020).

2.3.4 STRATEGIES & ROLES

A strategy framework is required to manage the adoption of Open banking. It dictates the bank's targeted position and the role it is going to perform in the new Open banking market. It comprises of the bank's plans, positions, and perspectives. The plan refers to the bank's set of actions and tasks to achieve its goals and objectives. The position refers to the bank's targeted positioning within the Open banking market. The perspective refers to bank's vision in transforming its traditional banking services into innovative "*life-banking*" products and services (Mintzberg, 2000; Rohan, 2017; Heath, et al., 2018; Telford, 2019; Standaert, Muylle, & Cumps, 2020).

The Open banking environment allows banks to reposition themselves in the market, and to take a new position determined by the role that they strategise to perform. The taxonomy for potential roles under Open banking is constructed from the two dimensions of manufacturing and distribution. Manufacturing refers to the development of products and services, and distribution refers to sales channels of newly developed products and services to the market (Gozman, Hedman, & Olsen, 2018; Brkić, Sala, Guaus, & Rodriguez, 2018).

This taxonomy results in four roles under Open banking including integrator, manufacturer, distributer, and platform. Each role sets the bank's direction in terms of development or disribution which determins its position under Open banking (Gozman, Hedman, & Olsen, 2018). Figure 2.4 shows the roles of banks within Open banking environment as adopted and customised from Heath, et al., (2018), Brkić, Sala, Guaus, & Rodriguez (2018), and Gozman, and Hedman, & Olsen (2018).
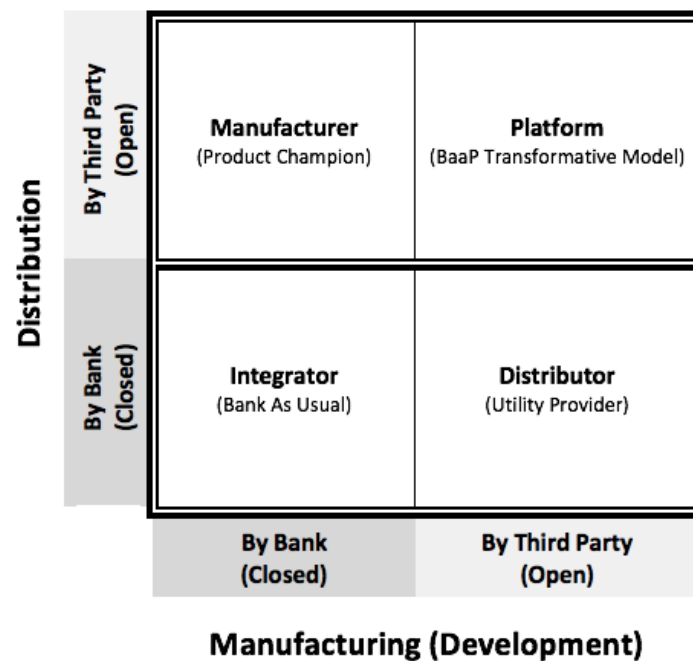
Figure 2.4 The roles of banks within Open banking (Gozman, Hedman, & Olsen, 2018, p. 7)

2.3.4.1 INTEGRATOR ROLE

The Integrator role is the status-quo role of traditional banking practice. The bank does not change its position. It develops its own products and services and distributes them only to its own customers. It uses its own distribution channels including online banking and mobile applications (Deloitte, 2017; Brkić, Sala, Guaus, & Rodriguez, 2018; Gozman, Hedman, & Olsen, 2018). This position lacks strategic vision for future opportunities and underestimates the risk of TPPs competition (Brkić, Sala, Guaus, & Rodriguez, 2018; Gozman, Hedman, & Olsen, 2018).

2.3.4.2 MANUFACTURER ROLE

The Manufacturer role offers a partnership between traditional banks and TPPs within Open banking environment. Under this role the bank focuses on the development of innovative products and services, however, it uses the TTPs sales channels for distribution (Brkić, Sala, Guaus, & Rodriguez, 2018; Omarini, 2018).

This role offers challenges and opportunities. In terms of challenges, it triggers a debate between banks and TPPs as to which party maintains full control and ownership over customers, product branding, and distribution channels (Gozman, Hedman, & Olsen, 2018). In terms of opportunities, it frees the bank's distribution resources to focus on innovation and development, extends the reach of the bank's services, and allows access to new segments of customers (Brkić, Sala, Guaus, & Rodriguez, 2018). For example, for mortgage products, the SEB and SBAB Swedish banks are cooperating with the same independent TPP called *Tink* as their distributor (Lewan, 2018). This example demonstrates a change in competition structure, where the bank with this role does not only compete in the broader banking industry, but also it competes on the same TPP distribution channels.

2.3.4.3 DISTRIBUTOR ROLE

The Distributor role offers a partnership between traditional banks and TPPs within the Open banking environment. Under this role the TPP focuses on the development of innovative products and services, however, the bank uses its own distribution channels to deliver these new products and services to its own customers (Brkić, Sala, Guaus, & Rodriguez, 2018; Omarini, 2018). This role allows banks to offer a wide range of innovative products and services to their customers without investing resources in development.

The Distributor role introduces the risk of "*product cannibalizing*" when the new TPP services supersede the bank's core services, leading to a loss in revenue. In addition, there is the same challenge between banks and TPPs as to which party maintains the full control and ownership over customers, product branding, and distribution channels (Brkić, Sala, Guaus, & Rodriguez, 2018; Gozman, Hedman, & Olsen, 2018). This role is suitable for *neo-banks* which are banks that strictly operate digitally with no physical presence (Ryan, 2019). For example, the *N26* German neo-bank collaborates with the TPP *TransferWise*; hence within the *N26* app, the user clicks on the embedded "*Powered*

by TransferWise" link to access the foreign money transfer service (Arslanian & Fischer, 2019; Mamonov, 2020).

2.3.4.4 PLATFORM ROLE

Under the Platform role, the bank removes its figurative walls and transforms its nature to become an open digital platform with capabilities to perform as 'Bank as a Platform' (BaaP) (Heath, et al., 2018; Realini, 2015; Fingleton, 2019). The platform hosts and integrates TPPs applications with the aim to establish a community platform based on Peer-To-Peer (P2P) business. It allows all parties to work collaboratively in one "*marketplace with a seamless exchange of resources*" and "*morphs financial technology into innovative and vibrant communities*" (Realini, 2015, p. 45; Heap & Pollar, 2015; Chishti, 2016; Flejterski & Labun, 2016; Marous, 2018; Ghanem, 2020).

Under a platform role the bank assumes multiple functions. It includes the function of an intermediary between TPPs and customers (Gozman, Hedman, & Olsen, 2018). Also, the function of a facilitator by extending traditional core banking services which only licensed banks can offer to TPPs. These core services are held tight with regulations including Know Your Customer (KYC), Anti Money Laundry (AML), and Countering the Financing of Terrorism (CFT) (Flejterski & Labun, 2016; Memminger, Baxter, & Lin, 2016; Das, 2019). The function of an information aggregator role is where customers are offered a bundle of interfaces that display aggregated views of comparable products and services on the bank platform. It also offers guidance to customers by displaying the rating, pricing, and quality of options (Brkić, Sala, Guaus, & Rodriguez, 2018; Ghanem, 2020). An example of BaaP is the *Fidor* German bank (Gozman, Hedman, & Olsen, 2018) which operates a platform called *FidorOS Platform* (Fidor, 2019), and the *BBVA* bank which operates a platform called "*BBVA Open Platform*" (BBVA, 2020; Realini, 2015).

2.3.5 OPEN BANKING CHALLENGES

Open banking introduces multiple challenges to traditional banks. This includes the disintermediation challenge which tests the ability of banks "*to retain its customers, since 3rd-parties have direct access to customers*" (Zwan, 2014; Chiu, 2016; Gozman, Hedman, & Olsen, 2018, p. 9). A reputational challenge also transpires from disputes between customers and TTPs. It impacts the banks brand and reputation because customers assume that banks are part of their financial dealings with TPPs even if banks are only acting as intermediaries (Novak, 2018; Gozman, Hedman, & Olsen, 2018).

The privacy challenge arises from the disparity in adherence between TTPs and banks to policies and regulations concerning privacy (Zetsche, Buckley, Arner, & Barberis, 2017; Lee & Shin, 2018; Premchand & Choudhry, 2018). The security challenge arises from targeted attacks and exploitation against APIs. A classic data attack attempts to gain digital access to platforms or infrastructure layers to exploit data. However, the socially engineered attack tends to target specific and vulnerable user groups. The objective is to gain access via exploiting the Open banking digital consenting mechanism, and then to get data for use in illicit activities such as identity theft and fraud (Johnson, 2008; Barbosa & Freire, 2010; OBWG, 2016; OBWG, 2016; Gallegos-Segovia, et al., 2017).

Sustaining the customer's interest is another challenge within the Open banking competitive environment. It is not enough to attract and capture customer interest in acquiring new products and services, because it is equally important to sustain that interest and to continuously grow it in everyday life (Dunphy & Herbig, 1995; Vasiljeva & Lukanova, 2016; Vasiljeva & Lukanova, 2016).

Open banking entices innovation; however, it also introduces two linked paradoxes. First, the IT and productivity paradox manifests when the bank invests heavily in innovative technology seeking improvements in efficiency and productivity. However, this focused and potentially disproportioned technology investment produces a counter effect that leads to capability change in operations and a drop in productivity

(Brynjolfsson, 1993; Olazabal, 2002; Casolaro & Gobbi, 2007). Second, the innovation paradox manifests when there is a crowded market space for innovations which decreases or delays the emergence of "large *breakthrough innovations*" (Haour, 2004; Davila & Epstein, 2014, p. 27; Cirera & Maloney, 2017). Also, there is the dilemma of how far banks are expected to keep investing in innovation, and "*does it mean they have to keep innovating with the risk of adding complexity*" (Davila & Epstein, 2014, p. 171; Frier, 2019).

2.4   TECHNOLOGY AND SOCIAL IMPACT

The technology driver of Open banking enables social technologies and innovation for facilitating the use of digital products and influences a change in the nature and capabilities of social and behavioural interactions (Gozman, Hedman & Sylvest, 2018; Muningera, Hammedi, & Mahrc, 2019; Gartner, 2021). Innovations in technology have social implications (Williams & Edge, 1996; Wyatt, 2008; Russell & Williams, 2002). Thus, social engineering uses technology to introduce specific tacit or explicit knowledge prerequisites for the construction of social and behavioural outcomes (Gault, 2011). The social impact of Open banking is principally on the banking industry. It is the process of "*identifying the future consequences of a current or proposed action which are related to individuals, organizations and social systems*". This results in amending behaviours and altering personas within that environment (Latané, 1981; Barrow, 1997; Becker, 1997; Becker, 2001, p. 312).

Technology influences social changes (Danziger, 1985; Senge, 1990; Stapleton, 2001; Anitha, 2014), and technology is not isolated from the surrounding societal forces (Howcroft, Mitev, & Wilson, 2004). The socio-technical environment comprises of technical and social clusters, where a change in one influence the other (Howcroft, Mitev, & Wilson, 2004; Cartelli, 2007). This environment offers "*reciprocal interrelationships between human and machines*" which "*foster the shaping of both technical and social conditions*" (Trist & Bamforth, 1951; Ropohl, 1999, p. 186; Miner, 2006). The technology social impact has three levels (Dopfer, Foster, & Potts, 2004). This includes

a micro-social impact which concerns individuals and their behaviour; a meso-social impact which concerns organisations, communities, and social networks; and a macro-social impact which concerns nations and worldwide influence (Becker, 2001; Dopfer, Foster, & Potts, 2004). However, there is a cross-influence flow between these three levels which facilities social innovation and complexity, simultaneously (Kolk, Dolen, & Vock, 2010; Wijk, Zietsma, Dorado, Bakker, & Martí, 2019).

2.4.1 TECHNOLOGY ACCEPTATION

New technology instigates social changes that alters the customer's attitude and introduces a positive or negative behaviour in terms of the acceptation or rejection of the technology (Davis, Bagozzi, & Warshaw, 1989). The positive behaviour is the outcome of fulfilling the customer's expectations, otherwise the outcome develops a negative behaviour (Durkin, Mulholland, & McCartan, 2015). The developed behaviour varies amongst customers (Kalakota & Whinston, 1997). The outcome of behaviour is not foisted upon customers; however, it is the conclusion of accumulative interactions with the proposed technology (Saga & Zmud, 1994; Yousafzai, Foxall, & Pallister, 2010; Yaghoubi & bahmani, 2010).

The use of behavioural theories in a socio-technical environment offers a framework to examine the user's acceptance decision making for technologies and provides insights to the behavioural intentions in making that decision (Hu, Chau, Sheng, & Tam, 1999; Yaghoubi & Bahmani, 2010). This research uses the Technology Acceptance Model (TAM) for behavioural theory (rather than the more general UTAUT model). The target is to explain the customer's adaptation or rejection behaviour from their perspective (Davis, 1986; Davis, Bagozzi, & Warshaw, 1989, p. 997; Hu, Chau, Sheng, & Tam, 1999; Yaghoubi & Bahmani, 2010).

An alternative user acceptance model is the Unified Theory of Acceptance and use of Technology (UTAUT) (Venkatesh et al., 2003; Venkatesh et al., 2012; Venkatesh et al., 2016; Tamilmani et al., 2021). It has four core elements performance expectancy, effort expectancy, social influence, and facilitating condition. The advantage of UTAUT

is that it incorporates a greater complexity and sensitivity to the general technology adoption environment, and in the second upgraded version attention to potential mediating and moderating variables (Venkatesh et al., 2003; Venkatesh et al., 2012). The focus of UTAUT is on the organisation. In this research the individual is the unit of analysis, and hence TAM has the capability to focus on the individual behaviour more concisely and focus a view from the customer perspective. In this way the research questions are better addressed, and the specific data identified for evaluation. Further research in a later study can explore the use of UTAUT in the Open banking context, and the contribution of each compared.

TAM explains that the customer's acceptance decision of a proposed technology is driven by the behavioural intention of willingness to use it which is developed from the emerged attitude of "*a person's favorable or unfavorable assessment*" (Yaghoubi & Bahmani, 2010, p. 160). The attitude is formed from pairing the technology's perceived *Usefulness* with the *Ease To Use* (Davis, Bagozzi, & Warshaw, 1989). The perceived Usefulness is "*the subjective probability that using a specific application system will increase his or her performance*" which directly influences the intention to use (Davis, Bagozzi, & Warshaw, 1989, p. 985; Yaghoubi & Bahmani, 2010). The perceived Ease To Use is "*the degree to which the user expects the target system to be free of efforts*" which indirectly influences the intention to use (Davis, Bagozzi, & Warshaw, 1989, p. 985; Yaghoubi & Bahmani, 2010). TAM also considers other external social variables including age, gender, and belief system which contribute to the acceptance or rejection decision of the proposed technology (Davis, 1986; Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Yousafzai, Foxall, & Pallister, 2010; Yaghoubi & bahmani, 2010). Figure 2.5 shows the flow of TAM in making the customer's acceptance or rejection decision as adopted from Davis (1986) and Yousafzai, Foxall, & Pallister (2010, p. 1177).
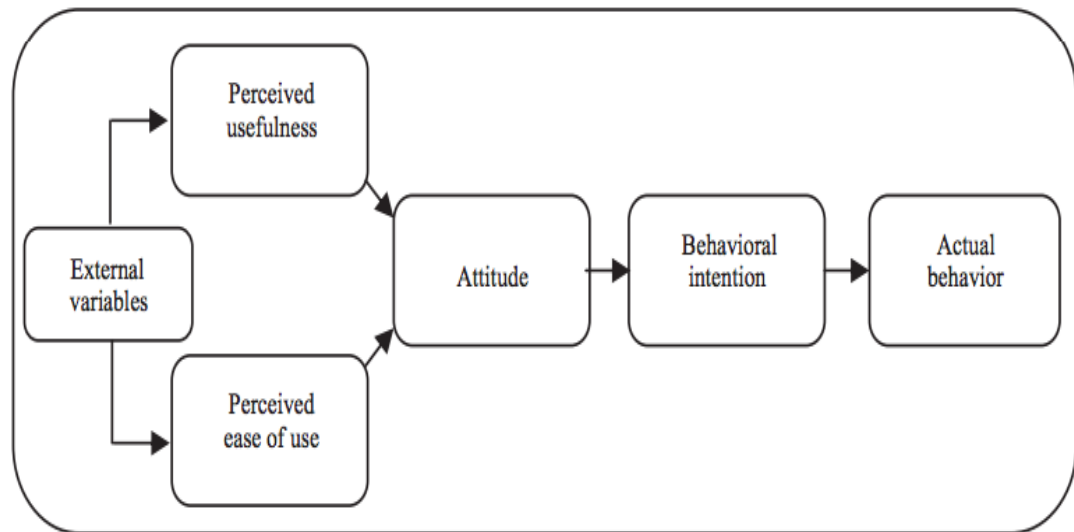
Figure 2.5 The Technology Acceptance Model (Davis, 1986; Yousafzai, Foxall, & Pallister, 2010, p. 1177)

Additionally, the social imitation contributes to the customer's acceptation behaviour, that is because individuals to various degrees, tend to emulate the behaviour of one another (Macdonald, 1990). Also, within communities, the behaviour is influenced by social leaders in addition to the mannerism, conformity, and specialties of incubated cultures (Becker, 1970; Chang, 2003). The segment of early adopters assumes the role of opinion leaders; however, their influence varies, and is linked to their "*position in the sociometric network*" and their socio-economic characteristics (Rogers, 1995; Chang, 2003, p. 7).

2.4.2   SOCIAL ACCEPTATION

Open banking aims to deliver a positive customer experience by developing seamless digital products and service interfaces to meet the customer's expectations with clarity and convenience (Pousttchi & Schurig, 2004; Lee & Raghu, 2014; Liu, et al., 2015; Kapoor & Vij, 2020; Noh & Lee, 2016). The outcome of customer experience determines the product or service adoption rate and popularity, and it also influences the customer's

perception towards the brands linked to the offered products (Bellman, Potter, Treleaven-Hassard, Robinson, & Varan, 2011; Lister, West, Cannon, Sax, & Brodegard, 2013; Salz, 2014; Flaherty, McCarthy, Collins, & McAuliffe, 2018).

A positive customer experience is driven by a positive customer attitude which is formed from the likes or dislikes towards the service in use. The attitude comprises of the customer's "*considerations and attributes*" towards that service and the developed satisfaction or dissatisfaction "*on the basis of the outcomes that we experience upon interaction with the attitude object*" (Fishbein, 1963; Fazio, Eiser, & Shook, 2004; Jones, Olson, & Fazio, 2010, p. 206). The shaped attitude develops an emotional valence which influences the decision-making process with positive/attractiveness or negative/aversiveness outcomes in relation to the associated stimulus (Frijda, Manstead, & Bem, 2000; De Houwer, Thomas, & Baeyens, 2001; Jones, Olson, & Fazio, 2010). The stimulus of Open banking is the customer's accumulative user experience while interacting with its products and services via the use of technology applications of mobile applications and digital interfaces.

The decisioning process towards the acceptation of Open banking involves the outcomes of three levels. This includes the acceptance of individual services within an application in a *micro-view*; the acceptance of a whole application in a *meso-view*, and the acceptance of the whole Open banking in a *macro-view*. The acceptation process commences with generating a stimulus which is the customer's accumulative user experience, where the stimulus triggers an emotional valence based on the acquired knowledge leading to forming an attitude. The emerged attitude influences positively or negatively the acceptance of these three levels of engagement (Frijda, Manstead, & Bem, 2000; De Houwer, Thomas, & Baeyens, 2001; Lister, West, Cannon, Sax, & Brodegard, 2013; Salz, 2014; Jones, Olson, & Fazio, 2010; Bellman, Potter, Treleaven-Hassard, Robinson, & Varan, 2011; Flaherty, McCarthy, Collins, & McAuliffe, 2018). Figure 2.6 shows the multi-level acceptation process of Open banking.
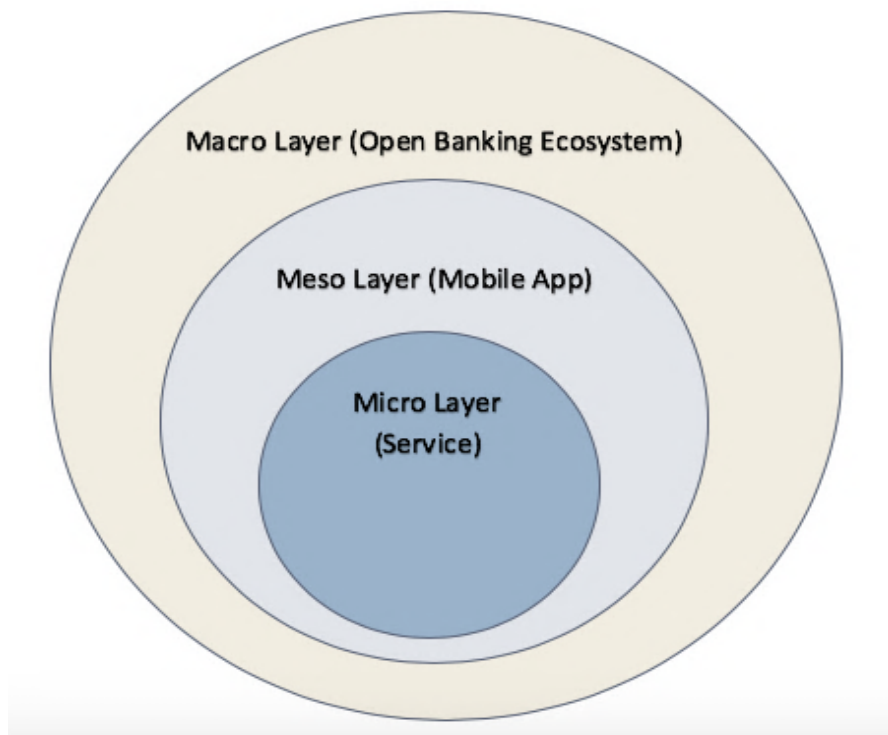
Figure 2.6 Open banking Multi-layered Acceptation Process

2.5   REVIEW OF ISSUES AND PROBLEMS

The literature review process identifies the issues and problems of the examined topic which is Open banking. It locates evidence in existing literature that there are matters worth researching (Bryman, 2007; Boudah, 2011; Kebritchi, 2017). In research "*without adequately defining the problem, researchers may find themselves going off on a "goose chase" to tackle a vague phenomenon*" (Boudah, 2011, p. 23). This research accepts that a problem is only deemed appropriate when "*it is supported by the literature, and considered significant, timely, novel, specific, and researchable*" (Kebritchi, 2017, p. 55; Huma, 2018). Accordingly, the research identifies the following issues and problems which are facing the adoption of Open banking, and the emerging challenges for the traditional banking industry.

2.5.1 COMPETITION

Open banking opens competition in the banking industry (Premchand & Choudhry, 2018; Gozman, Hedman, & Olsen, 2018; Moysan & Rudnicki, 2019). It allows for new challengers to enter the market for increased innovation-led competition (Farrell, 2019; Fingleton, 2019; Guibaud, 2016; Chaib, 2019).
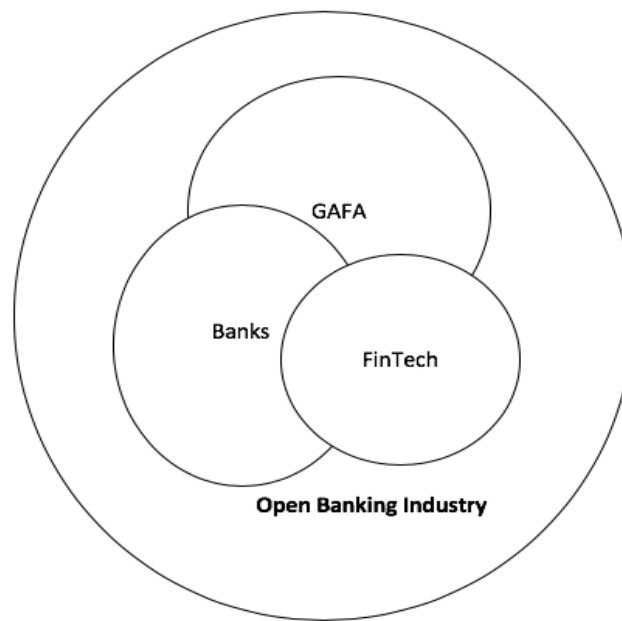
Figure 2.7 Competition layers under Open banking

The competition is between traditional banks and FinTech TPPs. Also, the new challengers of major technical platforms including Google, Amazon, Facebook, and Apple (GAFA) (PAC, 2015; Dermine, 2019; Podszun, 2019; Tyler, 2019; Khanboubi & Boulmakoul, 2019). The structure of competition within the Open banking environment is multi-layered where each layer overlaps and interacts with one another. The first layer represents the classic competition between traditional banks themselves. The second layer represents the competition between FinTech rivals and traditional banks. The third layer represents the competition between the GAFA segment, Fintech rivals, and traditional banks; and then there is the overall competition between all market players within the Open banking environment. Figure 2.7 shows the competition layers within the Open

banking environment and the overlap between layers. New competitors introduce a threat to traditional banks if they cannot keep pace with the market competition, and it exposes them to a loss in customer base and market share (Ho & Mallick, 2010; Fiordelisi, Soana, & Schwizer, 2013).

2.5.2   PRIVACY AND SECURITY

Open banking enables the sharing of a customer's financial data securely and digitally via open APIs (Cable, 2019; EUCommission, 2015; EBA, 2019; Kröner, 2018). The vast and constant flow of customer financial data across the industry instigates the risk of data loss and exploitation. The risk increases when TPPs vary their adherence to the strict banking regulations and standards (Zetsche, Buckley, Arner, & Barberis, 2017; Lee & Shin, 2018).

The potential vulnerabilities lead to privacy and security issues. These include mishandling a customer's personal and financial data, sharing without consent, improper authentication and consent mechanisms, fraud, sensitive data loss, identity theft and attacks on the open APIs as a new attack vector (Johnson, 2008; OBWG, 2016; Vasiljeva & Lukanova, 2016; Weichert, 2017; Mention, 2018).

Failing to remedy the privacy and security risks undermines the confidence in banks and damages the trust relationship between customers and banks. Also, it inflicts brand and reputation damages on banks (Vasiljeva & Lukanova, 2016; Gozman, Hedman, & Olsen, 2018; Mention, 2018).

2.5.3   ACCEPTATION

Open banking's major challenge is acceptation by customers. This is influenced by the change in the behavioural and social expectations for business, and the ability to capture and sustain the customer's interest in continuously using the new products and services (Dunphy & Herbig, 1995; Davis, Bagozzi, & Warshaw, 1989; Yousafzai, Foxall, & Pallister, 2010; Yaghoubi & bahmani, 2010).

Service acceptation includes the customer's acceptance of new products and services, the customer's acceptance of applications and service providers, and the customer's acceptance of the Open banking environment. The outcome is driven by formed perception towards the new products and services in terms of meeting the customers' expectations and continuous positive user experience (Pousttchi & Schurig, 2004; Liu, et al., 2015).

2.5.4 PACE OF ADOPTION

The adoption of Open banking requires a change in banks' codes, conduct, and processes (RBNZ & FMA, 2018; JPMC, 2018; Rolfe, 2019). The scale and timing of applying the adoption strategy is significant for banks. The inability to implement the required strategy exposes banks to major consequences including operations disruption, capital loss, and revenue loss (Zachariadis & Ozcan, 2017; Heath, et al., 2018; Brkić, Sala, Guaus, & Rodriguez, 2018; Gozman, Hedman, & Olsen, 2018; Rolfe, 2019).

The main predicament for the pace of adoption is linked to the timing of implementing Open banking adoption strategies (Remolina, 2019; Nair, 2020). Banks with early adoption strategy commence their Open banking investment ahead of the regulator. This approach sets them up with an adequate state of readiness which facilities customer attraction and opportunity gains. However, it exposes banks to the risk of capital exposure and loss of resources, especially if the regulations are delayed longer than expected (Remolina, 2019; Nair, 2020).

On the other hand, banks with late adoption strategy cease preparation and halt adoption plans until Open banking is fully enforced by the regulator. This approach avoids capital loss; however, it exposes banks to be overtaken by other competitors, and to be unattractive to customers. The result is a loss in revenue, customer base, and market share (Remolina, 2019; Nair, 2020).

2.5.5 CHANGE IN RELATIONSHIP

Under traditional banking systems, the relationship between customers and banks is unbalanced and beneficially skewed towards banks. It instigates a sense of loyalty in customers towards their original banks (Hendricks, 2017; Colbert, 2018). Banks benefit from the traditional relationship; however, they may not reciprocate benefits. Thus "*banks do not have to compete hard enough for customers' business*" (Gozman, Hedman, & Olsen, 2018, p. 4).

However, Open banking grants customers the ownership of their financial data (Gozman, Hedman & Sylvest, 2018; Gozman, Hedman, & Olsen, 2018; Fingleton, 2019). This results in a change in the nature of the relationship between customers and banks which exposes banks to the risk of customer attrition and a loss in revenue (Gozman, Hedman & Sylvest, 2018).

2.6 IDENTIFIED ISSUES AND PROBLEMS

Further to analysing Open banking challenges in section 2.3.5 and the identification of potential problems and issues in section 2.5, this section links these findings to the banking industry and summarises them in a practical manner. Table 2.3 lists a the identified of issues and problems for Open banking.

Table 2.3 Identified issues and problems identified

ID	Issue/Problem	Summary
IP1	Change in the banking industry structure and competition	Open banking changes the structure of the banking industry and allows new challengers to enter the market. This exposes traditional banks to complex competition vectors. This new reality pressures traditional banks for capital exposure to invest in developing new capabilities to keep pace with the innovation-led competition. However, the inability to compete leads traditional banks to a loss in revenue, customer base, and market share.

IP2	Privacy	There is the risk of noncompliance or breaching the privacy standards which leads to mishandling the shared customer's financial data. This exposes banks to legal actions, brand and reputational damage, and a loss in customer base and market share.
IP3	Security	There is the risk of security vector attack on the Open banking APIs to exploit a customer's shared financial data in illicit actions including fraud and identity theft. This exposes banks to legal actions, brand and reputational damage, and a loss in customer base and market share.
IP4	Acceptation/rejection	There is the risk of negative user experience which results in a negative customer's attitude towards the new products and services which amounts to a rejection behaviour towards the Open banking.
IP5	Pace of adoption	There is the challenge of selecting the optimal timing for commencing Open banking adoption strategies and investments. Late adoption strategy hinders banks capabilities to compete which leads to a loss in revenue and customer base. Early adoption strategy exposes banks to capital exposure and drainage of resources if regulations are delayed.
IP6	New relationship between customers and banks	Open banking creates new realities and changes the nature and mechanics of the traditional relationship between customers and banks. It gives customers the ownership and control over their data. This exposes banks to the risk of customer attrition a loss in revenue.

2.7 CONCLUSION

In summary, chapter two achieves two main goals. It serves as a discovery tool in reviewing the existing body of knowledge and scholarly work in relation to Open banking, and it also serves as a guiding tool to point the research towards gaps, issues, and problems where this research can have a contribution to theory.

Chapter two offers a comprehensive literature review of the topic Open banking based on the selection of literature using four rounds of the Delphi method and libraries described in section 1. The review tracks Open banking history and examines the surrounding factors and influential drivers behind its emergence in recent years and jurisdictions. The impact of Open banking on the traditional banking industry is described with the emerging changes in the structure, social construction, and relationships within the banking industry. It highlights that the Open banking changes are with positive or negative impacts, and the outcome depends on the bank's abilities to respond to these changes swiftly and appropriately. Having the required capabilities in place to respond effectively enhances the bank's opportunity to develop attractive and user-friendly new products and services.

The chapter also explains the bank's different strategies and approaches in their Open banking adoption. It explains the targeted roles and positions which banks are aiming to assume within the Open banking market, including being a manufacturer, an integrator, a distributor, or a platform. These roles and positions are discussed in sections 2.3.4, 2.3.4.1, 2.3.4.2, 2.3.4.3, and 2.3.4.4. The chapter addresses the technology social impact in section 2.5 then discusses the technology and social acceptation in sections 2.4.1 and 2.4.2. It explains the social construction of a customer's attitude and subsequent acceptation or rejection behaviour with the use of TAM model. It links the technology social impact to a behavioural acceptance process which is driven by the user experience while interacting with the new products and services using digital interfaces. The outcome of this behavioural process is a key in the acceptation or rejection decision. The chapter

discusses the Open banking challenges and emerging issues and problems in sections 2.3.5, and 2.5, and tabulates them in section 2.6.

Upon fulfilling the objectives of the literature review process in chapter two, the researcher is ready to commence chapter three activities. The objective of chapter three is to identify a suitable and compatible research methodology for this thesis. The research methodology considers the conditions of this research. This research is a socio-technical study within the banking industry under the overarching umbrella of the IS field. It applies qualitative research methods against secondary datasets for efficiency, insight, and relevancy. Accordingly, chapter three discusses the background, thought process, and rationale behind the selection of a combined research methodology. It highlights its strength, limitations, and the steps taken for the practical implementation.

Chapter 3: Research Methodology

3.0   INTRODUCTION

The research methodology serves as a medium to "*find out the truth which is hidden, and which has not been discovered yet*" (Kothari, 2004, p. 2). It offers a framework which allows for "*observing, exploring, then offering an evidence-based conclusion*" in relation to the topic of Open banking (Kumar, 2019, p.33).

The selection process for research methodology considers the research context, characteristics, conditions, and the current practices and trends within the examined research environment (Goddard & Melville, 2004; Flick, 2015; Scandura & Williams, 2017; Kumar, 2019). Figure 3.1 shows the roadmap of chapter three to select and design the research methodology.
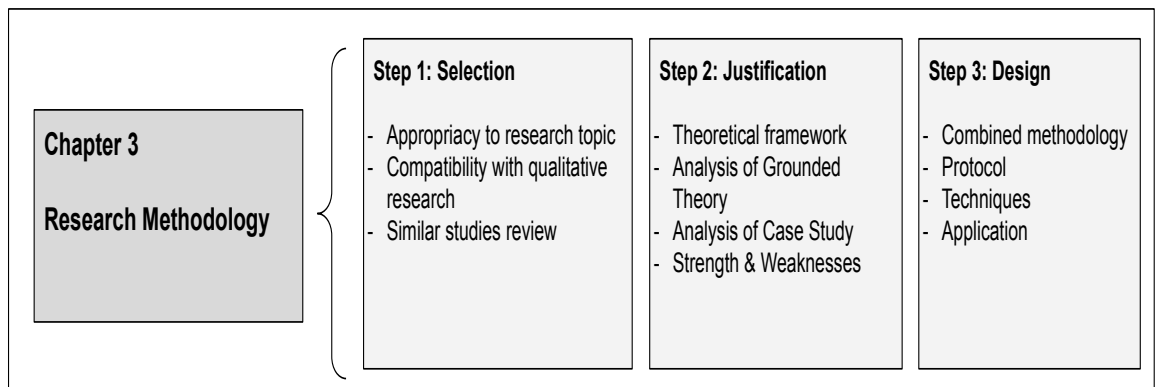
Figure 3.1 Chapter three pathway

This research adopts a combined research methodology. The methodological framework integrates the Case study method and Grounded theory method (*Straussian Approach*). It uses a systematic approach of applying successive phases and sequential steps which are guided by the procedures of the two research methods. The use of combined or mixed methods strengthens the research mechanisms, overcomes gaps, and enrichens the evidence for answering the research questions (Schoonenboom & Johnson, 2017).

Section 3.2 discusses the nature of this research and identifies its key characteristics. Section 3.3 reviews existing comparable studies which share the theme, nature, and research methodology with this research. The review offers a starting point, identifies sources, and presents a practical application of the combined research methodology (Boaz & Sidford, 2006). Section 3.4 constructs the theoretical framework; analyses the Case study method in section 3.5 and Grounded theory in section 3.6. The analysis highlights their compatibility, strengths, weaknesses, and applicability for this research. Section 3.7.1 justifies the selection of the combined research methodology.

Section 3.7.2 designs the research methodology and provides a complete application mandate in terms of protocol, procedures, workflows, techniques, and applied steps. Figure 3.3 shows the framework for the combined research methodology of Case study and Grounded theory. It shows the flow and mechanisms for its sequential steps and procedures. Section 3.8 explains the data analysis process and identifies the practical steps for implementation in the study field of the banking industry. The steps are detailed in section 3.8.6 and summarised in Table 3.6. Section 3.8.8 sets the reporting standards and guidelines and the validation criteria for the emerging outcomes. Section 3.9 declares the limitations of the adopted combined methodology and offers evidence-from literature for its remediation. Finally, section 3.9 has a conclusion which recaps the construction, design, and outcomes of chapter three.

3.1 RESEARCH CHARACTERISTICS

Section 3.1 identifies the research study field, environment, nature, and the type of adopted research methods used to guide the selection of an appropriate research methodology (Nunamaker, Chen, & Purdin, 1990; Levac, Colquhoun, & O'Brien, 2010; Kumar, 2019).

3.1.1 STUDY FIELD

The research is informed by the Information System (IS) field requirements and the AIS research literature. The research methodology is to fit IS expectations, and the technology,

management, social, and strategy contexts (Fernández & Lehmann, 2005; Kilani & Kobziev, 2016). A methodology collects and analyses data to achieve realistic results and answers to the research questions (Wedawatta, Ingirige, & Amaratunga, 2011; Kilani & Kobziev, 2016).

The availability of a wide range of research methods in the IS literature enhances choice, and the quality of applied techniques (Simula, Dyba, & Jorgensen, 2007). That is because a suitable research methodology "*clarifies and delineates the study aims and identifies the requirements to fit the research needs*" (Ziemba, Papaj, & Żelazny, 2013; Kilani & Kobziev, 2016, p. 1).

3.1.2 PERSPECTIVE OF STUDY

This research is a theoretical socio-technical study. It investigates the machine within its social context and the people's emerged behaviour after interacting with that machine (Cooper & Foster, 1971; Mumford, 1994; Love & Cooper, 2015; Trist , Murray, & Trist, 2016; Avgerou, 2018). The socio-technical research allows for "*explaining human behaviour in all its complexity*" (Ajzen, 1991, p. 179), and that is because the "*social context and technical artefacts dissolves in complex intertwining of socio-technical actors*" (Rodon & Pastor2, 2007, p. 72).

This research also has a qualitative perspective. The qualitative nature of research methods examines the relationship between people and technology and discovers subsequent changes in their social and behavioural cues (Alrawabdeh, 2014; Hoda, 2011; Adwan, 2017; Avgerou, 2018;). The research explains the relationship between the *system* in the form of banks, the *technical cues* in the form of Open banking experience, and the *social* cues in the form of the customer's emerging attitude (Adwan, 2017).

3.1.3 MIXED METHOD

This research adopts the approach of combining two research methods. The mixed method approach offers pragmatism and strengthens a research methodology with adequacy, robustness, and coherence; however, the selected methods must be in

alignment and compatible with the nature of the research context (Johnson & Onwuegbuzie, 2004; Schoonenboom & Johnson, 2017).

The research methodology for this research integrates the two research methods of Case study research method (Yin, 1994) and Grounded theory (Glaser & Strauss, 1967) by specifically adopting the *Straussian approach* (Strauss & Corbin, 1994). Each of the two methods have strengths and weaknesses, and the objective of combining them together is to remedy and overcome the weaknesses of each other (Johnson & Onwuegbuzie, 2004; Halaweh, 2012). The integration combines the Grounded theory procedures into the use of an interpretive Case study strategy (Fidler, Halaweh, & McRobb, 2008). It applies the Grounded theory data analysis procedures against qualitative secondary datasets which have been collected via the use of Case study requirements (Halaweh, 2012; Adwan, 2017).

3.2   SIMILAR STUDY REVIEW

The Case study research method is adopted in the IS research field (O'Connor, 2012), and Grounded theory is also becoming popular in the IS field (Fidler, Halaweh, & McRobb, 2008). The Grounded theory examines new phenomena within organisational contexts (Goulielmos, 2004), and investigates social aspects within technology (Martin, 2009; Hoda, Noble, & Marshall, 2011). However, there is the argument that Grounded theory lacks maturity and brings errors into the IS field (Birks, Fernandez, Levina, & Nasirin, 2013). Adwan (2017) disagrees and reports that the issues are linked to the user's inability or lack of experience to fully adhere to the Grounded theory procedures while claiming the effective use of it. Another reason for the misuse is the lack of understanding of its application as a methodology, or as a method (Glaser & Strauss, 1967; Strauss & Corbin, 1990; Strauss & Corbin, 1994).

The Grounded theory is implemented as a method when it offers predefined "*procedure or technique used to collect and/or analyze data*"; and it is implemented as a methodology when it offers a complete end-to-end theory generation framework

(Lazenbatt & Elliott, 2005; Fidler, Halaweh, & McRobb, 2008; O'Connor, 2012, p.23). When it is defined as a methodology, then:

"methodology is the entire research process from the identification of one or more research questions and the selection of a research strategy, through to the formulation of the findings and results, in which the entire process is based on philosophical assumptions (ontology and epistemology). (Fidler, Halaweh, & McRobb, 2008, p. 2)

Multiple IS studies have deployed Grounded theory as a complete stand-alone methodology in examining the social aspects of technology (Coleman & O'Connor, 2007; Crabtree, Seaman, & Norcio, 2009; Adolph, Hall, & Kruchten, 2011). Nonetheless, it is rationally reasonable to integrate the Grounded theory as a method with other research methods to construct a complete research methodology (Laws & McLeod, 2004; Fernández, 2004; Jacelon & O'Dell, 2005; Fidler, Halaweh, & McRobb, 2008; Fernandez & Lehmann, 2011; Adwan, 2017). The integrative use of Case study strategy and Grounded theory procedures driven by interpretive assumptions is deemed a compatible and complete methodology (Fidler, Halaweh, & McRobb, 2008; Adwan, 2017).

The combined methodology of Case study and Grounded theory is adopted in multiple research studies within the IS field and across different industries. For example, in technology (Halaweh, 2012; Nielsen, 2014), in education (Taber, 2000), and in health (Adwan, 2017).

3.3 THEORETICAL FRAMEWORK

Research paradigms are grouped into three categories based on the philosophical reasoning of ontology and epistemology, and with further resolution into positivist, critical, and interpretive groups (Chua, 1986; Myers, 1997; Myers & Avison, 2002; Halaweh, 2012). A Positivist paradigm demands the segregation and independence between the knowledge and human-conduct. Thus, the researcher is only driven by

scientific evidence based on quantitative methods; this approach is used for testing and verifying existing theories via the use of procedures such as surveys (Orlikowski & Baroudi, 1991; Hoda, 2011). An Interpretive paradigm advocates that the knowledge is woven in with humans. It considers the human-conduct, reactions of humans, and the meaning behind such reactions, necessary to extract the ultimate knowledge of the studied phenomena (Myers & Avison, Hoda, 2011; 2002; Kara, 2018; Kara, 2018). A Critical paradigm is also called the "*transformative paradigm*", as it seeks a change and reform while advocating for realism; and this is mostly used in action studies (Kivunja & Kuyini, 2017; Mertens, 2007). For this research the Case study and Grounded theory methods are in alignment in terms of objectives and nature, and interpretive assumptions.

Research methods are also categorised into qualitative and quantitative (Jick, 1979). The quantitative method is reliant on numerical data and generates results in the form of figures and statistical outcomes. The qualitative method considers human-conduct, social and behavioural cues to fully understand "*the experience, thoughts, and opinions*"; it generates theoretical textual-data (non-numerical) outcomes (Jick, 1979; Bernard, 2017; Farnsworth, 2019). Case studies are referenced as quantitative or qualitative depending on the type of research and the nature of collected data whether numerical or categorical (Yin, 1984; Stake, 1995; Zainal, 2007). The Grounded theory uses its procedures to inductively generate theory because it is a "*qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon*" (Strauss & Corbin, 1990, p. 42; Halaweh, 2012). For this research the Case study and Grounded theory are qualitative research methods (Strauss & Corbin, 1990; Yin, 1994).

3.4 CASE STUDY METHOD

In the technology and IS research fields, Case studies are considered "*preferred search strategy to answer* the *'How?' and 'why?'*" questions (Walsham, 1995, p. 74). Yin (1994) defines the Case study method as follows:

"an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident." (Yin, 1994, p. 13)

The Case study verifies existing or generates new theory propositions with interpretive or positivist paradigms (Yin, 1994; Fidler, Halaweh, & McRobb, 2008). The Case study is positivist when it is applied repetitively to test and verify theories in pre-contextualised hypotheses with the ability to generalise to broader theory. In this context the researcher "*remains detached, neutral and objective*" to avoid influencing research outcomes (Darke, Shanks, & Broadbent, 1988, p. 276; Myers & Avison, 2002). The Case study is interpretive when it utilises the acquired tacit and explicit knowledge from participants to generate a theoretical framework. The theorising step requires a full understanding of the examined phenomenon including its surrounding factors and interlinked social cues and human interactions (Darke, Shanks, & Broadbent, 1988; Walsham, 1995). In this context, the researcher is viewed as a participant of the study and is actively involved in rationalising participant contributions (Walsham, 1995; Halaweh, 2012).

The Case study is with deductive or inductive principles (Yin, 1994; Saunders, Lewis, & Thornhill, 2009). It is deductive when the theory is established, hypothesis is articulated, or the objective of the research is to verify existing knowledge. It is inductive when the researcher is at liberty to interpret data and construct conclusions to generate theory (Yin, 1994; Saunders, Lewis, & Thornhill, 2009).

The identification of Case study objectives, propositions, and protocol offers guidance and an execution roadmap to researchers (Yin, 2011; Yin, 1994). The propositions are developed from reviewing existing literature and theoretical concepts in relation to the studied unit (Darke, Shanks, & Broadbent, 1988; Yin, 1994). The objectives are derived from determining the outcome of a study, and whether it is a theory validation or generation (Eisenhardt, 1989; Zainal, 2007). The protocol outlines the key features of the Case study (Yin, 1994). It manifests in a form of a document that serves as a "*mental framework*" for researchers which allows them to clearly state the objectives,

procedures, issues, and investigated questions in relation to the Case study unit (Yin, 1994; Yin, 2011, p. 14).

The Case study specifications of "*Boundary*", "*Scope*" and "*Unit of Analysis*" are identified prior to the commencement of the research actions (Yin, 1994). According to Yin (2003) Case studies are either "*single case study, holistic case study, or multiple case studies*". The single Case study uses a single unit, and it limits the representation to a single voice and a single perspective. Multi-case study offers multiple voices and various perspectives, it allows the emergence of a wider prospective (Feagin, Orum, & Sjoberg, 1991).

The Case study method is subject to criticism for the following disadvantages. First, it offers an analysis of large volumes of qualitative data without having a robust technical mechanism in place (Darke, Shanks, & Broadbent, 1988; Halaweh, 2012). This is remedied by combining Case study with another research method which has rigorous and effective qualitative data analysis techniques and procedures such as Grounded theory (Zainal, 2007, Adwan, 2017). Second, a criticism that it lacks the ability to generalise from a single case study (Shaw & Holland, 2014). Yin (1994) acknowledges the challenge of generalising from single case studies "*How can you generalise from a single case?*" (Yin, 1984, p. 21; Zainal, 2007). Yet, Yin (2009) assures the validity of the generalisation of theory propositions from a single Case study; however, it is an "*Analytical generalisation*" not "*Statistical generalisation*" (Yin, 2009, pp. 38-39; Yin, 2011). Also, Adwan (2017) clarifies that "*single case studies are theoretically but not statistically generable*" (2017, p. 299). Third, it requires documentation and artefacts to conduct research via the use of Case study (Yin, 1984; Zainal, 2007). Finally, Halaweh (2012) refers to the lack the enthusiasm from participants to engage in Case study research. That is because the participation requires time, effort, a level of trust associated with privacy concerns (Halaweh, 2012).

3.5   GROUNDED THEORY

The Grounded theory is developed by Barney Glaser and Anselm Strauss in 1967 while they were cooperatively researching patients in the health sector. They have published their book "*The Discovery of Grounded Theory*" which tends to set the foundation for all future Grounded theory related literature (Glaser & Strauss, 1967; Hoda, 2011).

The main purpose of Grounded theory is "*the discovery of theory from data systematically obtained and analysed in social research*" (Glaser & Strauss, 1967, p. 2). This is done by analysing collected data to discover social and behavioural patterns in relation to examined issues "*to generate a theory that accounts for a pattern of behaviour which is relevant and problematic for those involved*" (Glaser, 1978, p. 93). Grounded theory facilitates the emergence of theory, and it allows researchers to inductively generate new theory using extracted knowledge which is grounded in the data (Glaser, 1978; Glaser, 1992). Glaser (1992) defines the Grounded theory as a complete methodology as follows:

> "*a general methodology of analysis linked with data collection that uses a systematically applied set of methods to generate an inductive theory about a substantive area*" (Glaser, 1992, p. 16)

3.5.1   GLASERIAN AND STRAUSSIAN APPROACH

Further to their joint work in bringing the Grounded theory together, the founders Glaser and Strauss have taken different stands in viewing the best mechanism of implementing Grounded theory into fields of study. This variance in views has resulted in the emergence of a "*Glaserian Approach*" and "*Straussian Approach*" (Glaser, 2002; Glaser & Holton, 2004; Charmaz, 2006; Hekkala, 2007; Strauss & Corbin, 2008; Halaweh, 2012). Cooney (2010) suggests that it is Strauss' understating of Grounded theory that has changed and arguably evolved; while Glaser has stayed aligned to the original 1967 design of Grounded theory in terms of its essence and procedures (Cooney, 2010).

The core difference between the two approaches revolves around two arguments. The first argument is whether it is valid for researchers to review and site existing literature before commencing the research work; or if they must start from a completely clean state of no pre-assumptions, no research questions, and no pre-determined paradigms (Glaser, 1992; Stern, 1994; Suddaby, 2006; Hoda, Noble, & Marshall, 2011). The second argument is whether the Grounded theory can be utilised as a confirmation method, and hence the generated theory is used in the verification of existing literature (Cooney, 2010).

The "*Glaserian Approach*" believes in the "*true reality*" (Glaser, 2002) which means that reality is out there and collecting exact data enables the reality to reveal itself irrespective of the relevance to the subjectivity of surroundings in terms of people, place, time, and interactions (Glaser, 2002; Devadas, Silong, & Ismail, 2011).

According to Glaser (1978), the objective of Grounded theory is to "*discover what is going on, rather than assuming what should go on*" (Glaser, 1978, p. 2). Glaser (1992) asserts that the researcher should not review or leverage any exiting literature in relation to the study; that is to avoid having pre-assumptions which might contaminate the neutral nature of true reality (Glaser, 1978). Glaser (2002) and Hekkala (2007) argue that having pre-assumptions in researcher's mind distorts the study and jeopardizes the theory generation process. In the classic Grounded theory "*Glaserian Approach*" there is no pre-defined problems or research questions before conducting the research. The questions only emerge during the study (Glaser, 1992; Glaser & Holton, 2004; Hekkala, 2007; Halaweh, 2012). Also, Glaser (1992) adamantly insists that Grounded theory strictly adheres to inductive principles in theory generation and should not be used for theory verification (Glaser, 1992; Cooney, 2010).

The "*Straussian Approach*" believes in the "*constructive reality*" (Strauss & Corbin, 2008) which means that the researcher constructs reality with participants by accepting assumptions (Devadas, Silong, & Ismail, 2011). Additionally, Strauss and Corbin (1990) support some degree of literature review prior to the commencement of fieldwork. They advocate that the literature review helps in focusing the research on areas

of interest, identifying research questions, and guiding the process of theoretical sampling, (Strauss & Corbin, 1990; Hoda, Noble, & Marshall, 2011; Adwan, 2017).

Strauss (1987) allows for the use of Grounded theory in theory deduction and verification and says it is "*absolutely essential*" (Strauss, 1987, p. 13; Cooney, 2010). According to Hekkala (2007) the "*Straussian approach*" is an inductive-deductive principle. Deductive when it is applied to verify existing knowledge using pre-determined concepts and paradigms; and inductive when it facilitates the emerging of new concepts and theory (Strauss & Corbin, 1998; Hekkala, 2007; Halaweh, 2012).

3.5.2 GROUNDED THEORY PROCEDURES

The Grounded theory serves as a methodology or as a method (Glaser, 1992; Strauss & Corbin, 1998). It serves as a *methodology* when the "*Glaserian Approach*" is adopted (Glaser & Strauss, 1967; Glaser, 1992). It serves as a *method* when the "*Straussian Approach*" is adopted (Strauss & Corbin, 1990). This research adopts the use of the "*Straussian Approach*" as a method. Thus, this section focuses the "*Straussian Approach*" procedures and techniques.

The "*Straussian Approach*" has systematic procedures and techniques for rigorous qualitative data analysis (Strauss & Corbin, 1990; Hekkala, 2007; Halaweh, 2012). Figure 3.2 shows the steps and procedures of Grounded theory "*Straussian Approach*".

Literature Review ➔ Theoretical Sampling ➔ Data Collection ➔ Data Analysis (Coding, constant comparison analysis, categorising) ➔ Theory Generation.

Figure 3.2 Straussian Approach Procedures (Strauss & Corbin, 1990)

A constant iterative interplay cycle of data collection and analysis is applied to achieve a higher degree of data abstraction. The cycle keeps in action until the collected data shows repetitiveness and stops revealing new information. At that point the process is at the "*Theoretical Saturation*" stage which stipulates the end of the data collection phase

(Glaser & Strauss, 1967; Strauss & Corbin, 2008; Hoda & Noble, 2017). Table 3.1 shows and describes in detail the main procedures for Grounded theory (*Straussian approach*).

Table 3.1 Major Procedures of Grounded theory

Procedure	Detail
Sampling	Sampling is driven by the Grounded theory "*Theoretical Sampling*" concept (Glaser & Strauss, 1967). It guides the sampling of new data using already emerged concepts -from the data collected and analysed in previous rounds- which have theoretical significance (Strauss & Corbin, 1990; Glaser, 1978). The first round of data sampling uses the derivative concepts from the literature review which have significance to the research questions, otherwise "*the researcher might be tempted to collect everything*" (Adwan, 2017, p. 298). Upon the completion of the first round of data analysis, the newly emerged concepts are become the basis of the second round of sampling and so on. The exact same process keeps repeating until the completion of data collection (Halaweh, 2012).
Data Collection	Data collection uses an interview mechanism to record the "*actions, interaction, reactions, and relationships*" between participants and the examined topic (Strauss & Corbin, 1990). The interview is conducted in a semi-structured environment and uses open ending questions which allows participants to elaborate on their social and behavioural views (Hoda, Noble, & Marshall, 2011; Adwan, 2017). Data collection stays in action until reaching the point of "*theoretical saturation*" (Hoda & Noble, 2017).
Coding	Coding is the key procedure of the data analysis process. It commences straight after the first round of data collection and continues with an iterative and retrospective effect (Strauss & Corbin, 1990). The coding procedures are not rigid but rather flexible and acknowledge the different nature of each research context: "*we do not at all wish to imply rigid*

adherence to them" (Strauss & Corbin, 1990, p. 59). The coding types are substantive which includes open and selective, and with theoretical codes (Glaser, 2005). A study which adopts the "*Straussian approach*" is guided by the "*Open, Axial and Selective*" codes which are applied in parallel with the constant comparison analysis procedure (O'Connor, 2012; Shiau & George, 2014; Halaweh, 2012; Adwan, 2017; Shiau & George, 2014).

Open Coding: is the process of "*breaking down, examining, comparing, conceptualizing and categorizing data*" (Strauss & Corbin, 1990, p. 61). It highlights "*key Points*", collates and groups similar key points, then assigns them to a unique code. A code: is a *"sentence that summarises the key points in two or three words maximum"* (Strauss & Corbin, 1990; Hoda, Noble, & Marshal, 2012, p. 619; Georgieva & Allan, 2008). The coding answers the two "*What*" questions in the form of (W*hat does that mean*?) and (*What does that represent?)* (Halaweh, 2012).

Constant Comparison Analysis (CCA): According to Glaser and Strauss (1967) "*CCA is an iterative process of reducing data through constant recoding*" (Adwan, 2017, p. 306). The process constantly compares emerging codes against new and existing ones. It groups emerging codes and generates a higher level for data abstractions called "*Concepts*" (Glaser & Strauss, 1967).

Axial Coding: is the process of applying CCA on emerged concepts to generate a higher level of data abstraction called "*Categories*" (Hoda, Noble, & Marshal, 2012; Adwan, 2017). The process assembles and establishes links between concepts to create a broader theme (category). Then it identifies the reoccurring, steady, major, and minor categories (Strauss & Corbin, 1990; Halaweh, 2012; Adwan, 2017).

	Selective Coding: is the process which is applied against the emerging themes and categories to "*integrate and refine theory*" (Lawrence & Tar, 2013, p. 33). However, this is only done after identifying the "*Core Category*" which represents the main theme, concern, or problem of the study. According to Glaser (1978) the core category reveals itself when it "*accounts for a large portion of the variation in a pattern of behaviour*"; and according to Hoda (2011) it is "*central, reoccurs frequently, is related to the other main categories, and accounts for most variations in data*" (Hoda, 2011, p. 52). Upon the discovery of the core category the process ceases open coding, and limits the selective coding and CCA to only categories and concepts which are with relationships to the core category (Glaser & Holton, 2004; Strauss & Corbin, 1990).

The process of generating theory applies coding and constant comparison analysis procedures against collected data. It employs them repetitively to achieve a higher level of data abstraction as follows (*Row Data* ➔ *Key point* ➔ *Code* ➔ *Concept* ➔ *Category* ➔ *Theory*) (Hoda, 2011, p. 51). For example, this scenario applies the Grounded theory procedures against a fictious sample of data. The participant is a bank manager who is giving their views on the method of communication with customers under Open banking. Table 3.2 shows the application of Grounded theory procedures and data abstraction process for this example.

Table 3.2 Example of coding procedure in Grounded theory

Collected Data	Key points	Code	Concept	Category
Participant Role: Banking manager	Open banking enables direct comm channels	Approach customer directly	Open comms	Communication
Participant quote: "*Open banking allows*	Open banking enables secure messaging	Exchange data safely	Safe comms	

		Customers understand more	Clear comms	
banks to securely reach customers faster which helps customers to understand the benefits of new products and services".	Open banking delivers understating to customer			
	Open banking delivers benefits to customers	Brings benefits to customers	Beneficial comms	

3.6 COMBINED METHDOLOGY

The combined methodology of this research integrates the Case study and Grounded theory "*Straussian Approach"* research methods. Most of Grounded theory studies in the IS field leverage the "*Straussian approach"* method (Hekkala, 2007). The combined methodology of Case study method and Grounded theory "*Straussian Approach*" is adopted in multiple IS studies including (O'Connor, 2012; Shiau & George, 2014; Halaweh, 2012; Adwan, 2017; Nielsen, 2014; Fernández, Lehmann, & Underwood, 2002; Taber, 2000; Fidler, Halaweh, & McRobb, 2008).

3.6.1 CASE STUDY: GROUNDED THEORY COMBABILITY

The Case study and Grounded theory methods are aligned and compatible (Fernandez, Lehman, & Underwood, 2002). The theory generation mechanism of Grounded theory is in alignment with Case study research of an interpretive nature, particularly when it is applied in the context of organisational and behavioural research (Hughes & Jones, 2003).

Fidler, Halaweh, and McRobb (2008) assure the compatibility and conformity between and the Case study and the Straussian approach. The compatibility and cohesion between the two integrated methods manifests in multiple aspects. First, the two methods seek a literature review before the commencement of research, and the Case study leverages the acquired knowledge in developing targeted questions to participants. Grounded theory uses the knowledge gained to direct the theoretical sampling which focuses and narrows the scope of data collection to be aligned with the scope and

questions for the research (Strauss & Corbin, 1990; Yin, 1994; Fidler, Halaweh, & McRobb, 2008).

Second, the two methods consider the interview technique with participants as the core source of capturing data (Yin, 1994; Strauss & Corbin, 1990; Allan, 2003; Fidler, Halaweh, & McRobb, 2008).

Third, the two methods share the objective of generalisation of findings. This is to accept that the originated results are applicable to other different situations which have comparable conditions and features (Fidler, Halaweh, & McRobb, 2008). Strauss and Corbin (1990) explain that data abstraction drives the generalisation; and there is a robust relationship between the degree of abstraction and generated theory in terms of "*the more abstract the concepts, the more theory applicability*" (Fidler, Halaweh, & McRobb, 2008, p. 7). Yin (1994) confirms the Case study ability of generalisation via the use of single Case study findings; however, it is an "*Analytical generalisation*" not "*Statistical generalisation*" (Yin, 1994).

The integration of these two methods produces "*novel theories*" and these "*theories are likely to be testable*" and the "*emergent theories are empirically valid*" (Eisenhardt, 1989, p. 532; Adwan, 2017, p. 299).

The approach of combined methodology addresses criticism linked to the use of Case study method alone. A Case study is limited by its inability to process colossal volumes of qualitative data without using a formal analytical approach (Darke, Shanks, & Broadbent, 1988). Therefore, the integration with Grounded theory procedures overcomes this disadvantage by applying the data analysis procedures and techniques of Grounded theory against the qualitative data collected via Case study (O'Connor, 2012; Fidler, Halaweh, & McRobb, 2008).

Another criticism is the limitation of Case study to within its boundaries. However, the use of theoretical sampling of Grounded theory allows researchers to cross and expand these boundaries for identification of emerging concepts (Halaweh, 2012).

3.6.2 CASE STUDY: GROUNDED THEORY METHODOLOGY

The integration between Case study and Grounded theory involves all the phases which include design, data collection, data analysis, findings, and theorising. The assumed model of the combined methodology for this research is adopted from previous studies Pandit (1996, p. 8-10), Rowlands (2005, p. 88), Fidler, Halaweh, & McRobb (2008, p. 10) Halaweh (2012, p. 40), Adwan (2017, p. 300) and Rowlands (2005, p. 58).

Table 3.3 explains the phases and steps of the combined methodology of Case study and Grounded theory as adopted from Adwan (2017) and Fidler, Halaweh, & McRobb (2008).

Table 3.3 Phases and steps of Case Study: Grounded Theory methodology

Phase	Steps	Actions
Define and Design	1: Exploring Research area	▪ Identify general research area
	2: Literature Review	▪ Identify gaps ▪ Discover new areas of research ▪ Extend existing body of knowledge
	3: Select Study Topic	▪ Select research topic ▪ Identify research questions ▪ Identify research problems ▪ Propose initial conceptual model
	4: Use Case Study Strategy	▪ Develop Case study protocol ▪ Identify Case study unit of analysis
	5: Pre-Data Collection	▪ Apply for ethics approval (_not required for this research_) ▪ Identify participants ▪ Design data collection protocol (method, location, artefacts) ▪ Design data collection tools (recorder, transcribing tool)
Data Collection	6: Enter Study Field	▪ Collect data (Primary ➔interviews), OR (Secondary ➔ previous studies, journals, reports, and available artefacts) **_Note_**: (Secondary data is the choice of this research)

		▪ Transcribe cases
Data Analysis	7: Data Coding	▪ Open coding ▪ Axial coding ▪ Core category ▪ Selective coding
Interplay loop (between data collection and data analysis)		▪ Theoretical sampling ▪ Constant comparison analysis (CCA) ▪ Theoretical saturation
Findings	8: Research Model	▪ Findings (Codes, Concepts, Categories) ▪ Core category ▪ Relationships between categories
Conclusion	9: Theory Generation	▪ Showing contribution to literature ▪ Comparing against existing literature

Figure 3.3 shows the framework of the combined methodology of Case study and Grounded theory for this research as adopted from Adwan (2017) and Fidler, Halaweh, & McRobb (2008).

Phase I: Define and Design

Step 1: General Research area
- Identify general research area

Step 2: Literature Review
- Identify gaps
- Discover new areas of research
- Extend existing body of knowledge

Step 3: Select Study Topic
- Select research topic
- Identify research questions
- Propose initial conceptual model

Step 4: Use Case Study Strategy
- Develop case study protocol
- Identify case study unit of analysis

Step 5: Pre Data Collection
- Apply for ethics approval
- Identify target participants
- Design data collection protocol (method, location, artefacts ..etc)
- Design data collection tools (recorder, transcribing tool ..etc)

- Theoretical sampling
- Constant comparison analysis (**CCA**)
- Identify case study unit of analysis

NO

Interplay loop

Theoretical Saturation?

YES

Phase II: Data Collection

Step 6: Enter Study Field
- Collect data (*Primary ->* interviews), **OR** (*Secondary ->* documents, journal, and available artifacts..etc)
- Transcribe cases

Phase III: Data Analysis

Step 7: Data Coding
- Open coding
- Axial coding
- Core category
- Selective coding

Step 8: Research Model
- Findings (Codes, Concepts, Categories)
- Core category
- Relationship between them

Step 9: Theory Generation
- Showing contribution to literature
- Comparing against existing literature

Figure 3.3 Case study: Grounded theory combined methodology, adapted from (Adwan, 2017, p. 300; Halaweh, 2012, p. 40)

3.7 APPLICATION OF THE METHDOLOGY

This section describes the practical deployment of the combined methodology of Case study and Grounded theory. It applies successive phases and sequential steps which are listed in Table 3.3 and displayed in Figure 3.3. It proposes that this research is a theoretical study based on qualitative methods and uses secondary datasets.

3.7.1 GENERAL RESEARCH AREA

The research discovers the impact of introducing a change catalyst within a specific study field (Lunenburg, 2010). The general research area for this study is "The impact of Open banking on the banking industry". The study environment is the banking industry, the change catalyst is Open banking, and the research examines the impact of Open banking on the social construction of the banking industry.

3.7.2 LITERATURE REVIEW

Chapter two reviews the existing literature in relation to the researched topic which is Open banking and research questions in section 1.3. It discovers issues, problems, and gaps within the existing body of knowledge. The research details their discovery in sections 2.5, 2.5.1, 2.5.2, 2.5.3, 2.5.4, and 2.5.5 then summarises them in Table 2.3 of section 2.6.

In summary, the banking industry faces a fundamental change which is the introduction of the Open banking environment. Open banking disrupts the current traditional banking industry. It entices competition, seeds innovation, provides customers with control, and offers a wide variety of innovative products and services (Das, 2019; Gozman, Hedman, & Olsen, 2018; OBIE, 2018; Brkić, Sala, Guaus, & Rodriguez, 2018).

Open banking uses a technical layer of new services which are secure and digitally connected via the use of standardised open Application Programming Interfaces (APIs). The regulator mandates that APIs exchange customer financial data between different parties within the Open banking environment (CMA, 2017; CMA, 2016; Fingleton, 2019; Zachariadis & Ozcan, 2017; Gozman, Hedman, & Olsen, 2018). Open banking allows

new challengers to enter the banking industry market (Frame, Wall, & White, 2018; Omarini, 2018; Dermine, 2019). The approach of Open banking adoption varies between banks, and the adopted strategy defines a bank's role and position within the Open banking market (Premchand & Choudhry, 2018; Gozman, Hedman, & Olsen, 2018; Guibaud, 2016; Fiordelisi, Soana, & Schwizer, 2013).

Open banking adoption introduces changes to the social construction of customer relationships. The aim is to capture and sustain the customer's interest in acquiring Open banking products and services (Dunphy & Herbig, 1995; Yousafzai, Foxall, & Pallister, 2010; Yaghoubi & bahmani, 2010). The customer's attitude drives the acceptation behaviour for the business experience. The customer's acceptance decision is multi-layered, and it comprises of the acceptance of products and services, applications, service providers, and the overall Open banking environment (Davis, Bagozzi, & Warshaw, 1989; Ginnis, Stamper, Byrne, Garrett, & Strong, 2018; Pousttchi & Schurig, 2004). The Open banking environment gives customers the full ownership and control of their financial data, and hence changes the construction of the traditional relationship between customers and banks (Das, 2019; Gozman, Hedman, & Olsen, 2018; OBIE, 2018; Brkić, Sala, Guaus, & Rodriguez, 2018).

In qualitative studies, research questions are constructed with coherence and clarity because "*poorly conceived or constructed questions will likely create problems that affect all subsequent stages of a study*" (Agee, 2009, p. 431). Therefore, upon the completion of literature review and the discovery of issues and problems in chapter two, this section summarises and lists guidelines for study (Barbour, 2013; Clark & Badiee, 2010). Table 3.4 lists the main guidelines for the research after completing the literature review process.

Table 3.4 Main Study Guidelines

Item	Details
Research area	Open banking environment in the banking industry

General research question	What is the impact of Open banking adoption on the banking industry?
Main research question	What is the impact of Open banking on the social construction of the banking industry?
Sub research questions (detailed)	- What is/are the impact of Open banking on the structure of the banking industry? - What is/are the impact of Open banking on the adaptation behaviour of customers? What is/are the impact of Open banking on the relationship between customers and banks?
Literature Review Outcome	- There is an opportunity to extend the body of knowledge of existing literature in relation to examining Open banking implications. - There is an opportunity to contribute theory to the literature which addresses the change in the social construction. - There is an opportunity to contribute theory to the literature which addresses the customer's responsive attitude and subsequent adaptation behaviour towards Open banking. - There is an opportunity to contribute theory to the literature which addresses the change to the relationship between customers and banks.

3.7.3 CASE STUDY AND UNIT OF ANALYSIS

The research implements the use of a single Case study approach (Yin, 2003). The participants of this Case study are extracted from the selected secondary datasets from eligible previous studies, publications, electronic sources, and industry reports (Hox &

Boeije, 2005). The unit of analysis for this research is the individual *participant's opinion* in the form of interview snippets. That is the participant's opinion of Open banking in general, the impact of Open banking adoption, and changes within the traditional banking industry from social, behavioural, and functional points of views.

The selection of participants guides the development of the data analysis (Glaser & Strauss, 1967; Yin, 2003). The selection of the first round of initial participants is selected by the concept of "*purposive sampling*" which chooses participants based on their relevance to the examined topic of Open banking (Patton, 1990; Tongco, 2007). The relevance is established by a literature review, industry knowledge, and understanding the segments of participants which are directly linked to the examined topic (Patton, 1990; Halaweh, 2012).

The selection of participants for the next rounds is guided by the "*theoretical sampling*" procedure of the Grounded theory (Glaser & Strauss, 1967). The characteristics of the participants pool are not fixed but rather dynamic and guided by theoretical sampling (Glaser & Strauss, 1967; Strauss & Corbin, 1998). The direction of the data collection process follows the emerging concepts, categories, concerns, and relationships. Therefore, the nature of the targeted participants is constantly reviewed after each round of data collection and accordingly gets updated for subsequent rounds which ensures the alignment with emerging concepts (Strauss & Corbin, 1990).

3.7.4   CASE STUDY PROTOCOL

The research produces a Case study protocol ahead of the commencement of the data collection phase, that is in the form of a document which outlines the key features of the Case study (Yin, 1994). The protocol serves as a "*mental framework*" for the researcher, and it articulates and lists the objectives, procedures, and investigated questions in relation to the Case study (Yin, 2011, p. 14). The research stipulates the Case study questions to be "*explorative, relevant and appropriate for the objectives of this study*" (Ajzen, 2002; Holden, 2010; Adwan, 2017, p. 304).

The Case study protocol for this research is adopted from Adwan (2017), Halaweh (2012), and Yin (2003). Table 3.5 shows the design of Case study protocol for the research.

Table 3.5 Design of Case Study protocol

Case Study protocol – Open banking Ecosystem Within Banking Industry
Objective: This research investigates the impact of Open Banking adoption on the social construction of the banking industry.
Key issues: - What is/are the impact of Open banking on the structure of banking industry? - What is/are the impact of Open banking on the adaptation behaviour of customers? What is/are the impact of Open banking on the relationship between customers and banks?
Participants' Questions: *This research uses secondary datasets; hence the researcher seeks and extracts relevant secondary datasets from eligible materials which answers the below hypothetical questions*: - In the material, what is the general opinion about the adoption of Open banking environment in the banking industry (advantages/advantages)? - How does the material describe the change in the banking industry structure because of Open banking adoption? - How does the material describe the change in the customer's social and behavioural cues because of Open banking adoption? - How does the material describe the change in the relationship between customers and banks because of Open banking adoption?

3.7.5 DATA COLLECTION

The use of digitised services allows a swift and efficient access to existing data sources in databases and libraries. It has electronic mechanisms with capabilities to store, sort,

sequence, and archive large amounts of historical and current data in a digital format (Boslaugh, 2007; Trzesniewski, Donnellan, & Lucas, 2011; Johnston, 2014). The expediency in data accessibility allows researchers to reutilise existing data as secondary data sources in successive quantitative or qualitative studies (Hox & Boeije., 2005; Boslaugh, 2007; Vartanian, 2011; Johnston, 2014).

The use of secondary datasets provides flexibility, efficiency, and cost reduction. It saves time and cost associated with primary data collection (Castle, 2003; Johnston, 2014; Windle, 2010). The relevancy and authenticity of secondary datasets are essential to the success of the research (Houston, 2004; Hox & Boeije., 2005; Johnston, 2014). The lack of relevancy leads to "*absence of specificity*" which derails the development of the research (Cowton, 1998; Nicoll & Beyea, 1999). Authentic datasets are acquired physically or electronically from reliable sources including eligible previous studies, academic publications, government records, and organisations official reports (Hox & Boeije., 2005; Vartanian, 2011).

The evaluation process of secondary datasets requires a rigor to ensure data accuracy and to maintain the integrity of the findings (Cowton, 1998; Castle, 2003; Hox & Boeije., 2005). The process assesses the original primary datasets, it examines the techniques used in the primary data collection, limitations, and quality controls (Houston, 2004; Hox & Boeije., 2005; Vartanian, 2011). The quality of secondary data entails the verification of the history and background of the original primary data. It applies the *six-W* questions which are the *Who, When, Where, How, What, Whether* (Tashakkori & Teddlie, 2003; Hox & Boeije., 2005). For example: *Who* collected the primary data? *When* was the primary data collected? *Where* was the primary data collected? *What* type of data is collected? *Whether* data is consistent? (Hox & Boeije., 2005).

This research is a theoretical study which uses the type of secondary data because New Zealand has no empirical primary data. The text of the secondary data is in the form of interviews with participants. The data collection of these textual interviews is guided by the Case study research questions.

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The secondary data is the result of the Fifth round of the Delphi literature selection method as explained in section 2.0.1. The research uses two phases to store and manage collected data. It is all saved on a secured hard-drive and protected with a password.

This research is a theoretical study which uses approved secondary datasets. The secondary datasets are verified against the criteria of authenticity, reliability, and relevance to the examined topic of Open banking. The secondary datasets are acquired from public databases of industry and research reports. The relevancy and accuracy of the secondary data is assessed by applying the six-W questions against the collected secondary data in relation to the examined topic of Open banking.

3.7.6   DATA ANALYSIS FRAMEWORK

The combined methodology analyses the approved secondary datasets via the use of Grounded theory procedures of the *Straussian approach* (Strauss & Corbin, 1990; Strauss & Corbin, 2008). It applies a continuous process of data collection and analysis which keeps playing in a cyclic loop until it reaches a theoretical saturation point. At that point the data collection process ceases and data analysis continues (Strauss & Corbin, 1998; Hoda, Noble, & Marshall, 2011).

The research makes use of Computer Assisted Qualitative Data Analysis Software (CAQDAS). It uses the NVIVO software application (Bergin, 2011; Bazeley & Jackson, 2013). The use of CAQDAS software does not replace the role of the researcher in data analysis because the software is "*not to analyse data but rather to aid the analysis process, which the researcher must always remain in control*" (Zamawe, 2015, p. 15).

The use of the NVIVO application is practical in qualitative research due to the volume of data and tool capability for text-based analysis (Bergin, 2011). It assists in systemising the process of analysing text-based qualitative data, and for grouping emerging patterns and linking relationships between categories (Bergin, 2011; Hilal & Alabri, 2013).

Consistency with applying steps and procedures throughout data analysis ensures uniformity across the key areas in the research (Bergin, 2011; Tie Chun, Birks, & Francis, 2019). Thus, the researcher designs a systematic framework in which predefined sequential steps are coherently listed and described (Bergin, 2011; Tie Chun, Birks, & Francis, 2019). This framework is applied against the collected secondary datasets across all the key areas. The data analysis process applies sequentially steps (S01➔S09) of Table 3.6 against each key area. The steps (S01➔S08) are applied in a strict sequential order, then step (S09) is conducted successively to interpret the analysed data. Table 3.6 shows the data analysis's systematic framework for the current research.

Table 3.6 Data analysis systematic framework

ID	Step	Summary
S01	Reading interviews	The step scans through the mapped data which allows the mind to be part of the collected interviews. It is important to make sense of the data before commencing the coding process (Creswell & Poth, 2018) . Further, Agar (1980) urges researchers to "*read the transcripts in their entirety several times*" to "*Immerse yourself in the details, trying to get a sense of the interview before breaking it into parts*" (Agar, 1980 in Creswell & Poth, 2018, p.103). The reading of interviews is as "*initial foray as into new data*" (Bazeley, 2013, p. 101).
S02	Loading data into NVIVO	The step uploads each mapped sub-datasheet into the NVIVO software.
S03	Open coding	The step involves "*breaking down, examining, comparing, conceptualizing and categorizing data*" (Strauss & Corbin, 1990, p. 61). A detailed account of how to conduct open coding is explained in Table 3.1.

S04	Constant Comparison Analysis (CCA)	The step compares the emerged codes against new and existing ones found in the same or other participant data. The objective is data reduction and achieving higher data abstraction. A detailed account of how to conduct CCA is explained in Table 3.1.
S05	Axial coding	The step assembles and establishes links between concepts to create a broader theme (higher abstraction: category). It also identifies reoccurring, steady, major, and minor themes/categories (Strauss & Corbin, 1990; Halaweh, 2012; Adwan, 2017). A detailed account of how to conduct axial coding is explained in Table 3.1.
S06	Selective coding + core category	The step is to "*integrate and refine theory*" out of emerging themes and categories (Lawrence & Tar, 2013). This is only done after identifying the "*Core Category*" which represents the main theme, concern, or problem of the study. According to Glaser (1978) the core category reveals itself when it "*accounts for a large portion of the variation in a pattern of behaviour*"; and according to Hoda (2011) it is "*central, reoccurs frequently, is related to the other main categories, and accounts for most variations in data*" (Hoda, 2011, p. 52).
S07	Refining	After the discovery of the core category (categories) the researcher stops open coding and delimits coding and CCA to only categories and concepts which are related to the core category (Glaser & Holton, 2004). This process carries on until it reaches the theoretical saturation point.
S08	Theoretical Saturation	At this point the interplay of data collection and data analysis ceases. It manifests when emerging finding are

		being "*repetitive and no new insights gained*" (Halaweh, 2012, p. 45).
S09	Hypothesising	The step interprets the analysed data and concludes findings (Strauss & Corbin, 1990; Strauss & Corbin, 2008; Adwan, 2017; Halaweh, 2012).

3.7.7 FINDINGS AND REPORTING

The research reports and represents the findings by assuming the conventional voice of a "*logician or debater*" (Polkinghorne, 1997, p. 3). It presents the final reporting to relevant audience and stakeholders which allows the "*community of scholars to judge the validity of the knowledge claim*" (Polkinghorne, 1997, p. 4; Zohrabi, 2013).

The research findings are documented in accordance with the AUT university format and standards for a thesis. Also, it adheres to the recommended guidelines for qualitative studies reporting (Polkinghorne, 1997; O'Brien, Harris, Beckman, Reed, & Cook, 2014). The research reporting highlights limitations, strengths, boundaries, weaknesses, and prospective areas for future research to expand the body of knowledge (O'Brien, Harris, Beckman, Reed, & Cook, 2014).

The research explains findings, answers research questions and links them back to the existing body of knowledge; and at the same time "*preserves the connection between knowledge and the zest of life*" (Whitehead, 1929; Penfield, Baker, Scoble, & Wykes, 2014, p. 22). In qualitative studies, the credibility of findings is subject to the evaluation criteria of conformity and compatibility to the existing literature and professional sources (Halaweh, 2012). Also, Cutcliffe & McKenna (1999) urge that findings to be validated by industry professionals "*researchers are encouraged to return to the participants and attempt to gain verification*" (Cutcliffe & McKenna, 1999, p. 379). Invalid outcomes are rejected by conformance requirements and only "*an account is valid when represents accurately those features of the phenomena*" (Hammersley, 1992, p. 69; Cutcliffe & McKenna, 1999, p. 376).

3.7.8 SUGGESTED SOLUTIONS

The research finds solutions to the identified issues and problems. The use of Grounded theory facilitates theorising and "*identifying solutions to pragmatic problems*" (Modell, Humphrey, Elharidy, Nicholson, & Scapens, 2008, p. 141).

Therefore, after discussing the findings and the validation of these findings, the research is equipped with adequate evidence to answer the research questions. It can then draw up a set of suggestions and practical recommendations to the academic and professional communities concerned. This set of suggestions addresses the identified issues and problems in section 2.5 and summarised in Table 2.3 in relation to the researched topic of Open banking.

3.8 LIMITATIONS

The research describes obstacles and limitations that "*influence the trustworthiness of the project*" (Poggenpoel & Myburgh, 2005). Academic research is subject to verification audit for the validity of the evidence, reliability of the method, and generalisation to other contexts (Shipman, 2004). Hence the need to declare the "*characteristics of design or methodology that impacted or influenced the interpretation of the findings*" (Price & Murnan, 2004; USC, 2019).

The declaration of limitations sets expectations for the transfer of knowledge (Ioannidis, 2007). It allows reviewers to examine the appropriacy of the evidence in relation to the declared limitations (Shipman, 2004). It enhances credibility by acknowledging the research scope and serves as a "*procedure for establishing the credibility of research*" (Ioannidis, 2007; Shipman, 2004). It also enables future research opportunities (Price & Murnan, 2004). However, to serve its purpose the declaration must be "*realistic and adequately self-critical delineation of limitations and weaknesses*" (Campion, 1993, p. 717; Aguinis & Edwards, 2014, p. 165).

However, the lack of declaring limitations exposes the study to criticism and further questions its credibility. Also, it exposes future research to a potential risk of failure or suffering negative consequences when there is an attempt to repeat the study

with different settings (Price & Murnan, 2004; Ioannidis, 2007; Brutus, Aguinis, & Wassmer, 2013;).

This is qualitative research which employs the use of combined methodology of Case study and Grounded theory. Thus, the generalisation of the findings of this research are open to criticism. It is based on concepts and theories coming from qualitative data with significant interpretative aspects (Walsham, 1995).

Killbourn (2006) argues that "*qualitative inquiries normally take pains to make clear that they are not generalizable*" (Kilbourn, 2006, p. 534). Scheurich (1997) claims that the generalisation in qualitative research only "*represent the mindset of the researcher*" (Scheurich, 1997). Also, Wolcott (2009) shares the same point of view "*how do you generalise from a qualitative study? ... you don't, that is a safe and accurate answer*" (Wolcott, The Art of Fieldwork, 2005, p. 163).

Polit & Beck (2010, p.1452) state that the generalisation of qualitative studies is possible, however, it is "*more complicated, and more controversial*", and accordingly suggests that for qualitative studies it is an analytical but not statistical generalisation. According to Payne & Williams (2005, p.256), qualitative studies are subject to generalisation "*within a context of supporting evidence*". Similarly, Eisenhart (2009, p.52) argues that "*generalizations from qualitative research are both possible and important*". Also, Ercikan & Roth (2006, p.22) support the generalisation for non-quantitative studies as "*generalization is not a feature of mathematization but a descriptor for the tendency of interferences to go beyond the context and participants*".

The Case study is limited by its inability to process large volumes of qualitative data without using a formal analytical approach (Darke, Shanks, & Broadbent, 1988). However, the integration with Grounded theory procedures overcomes this disadvantage (Fidler, Halaweh, & McRobb, 2008; O'Connor, 2012). Also, the qualitative Case study method is often subject to criticism with the inability to generalisation (Gomm, Hammersley, & Foster, 2000; Yin, 2013). However, Yin (2003) explains that "*case studies are generalisable to theoretical propositions and not to populations or universes*" (Yin, 2003, p. 10). He further elaborates that the generalisation is actually "*Analytical*

Generalisation" not "*Statistical Generalisation*" (Yin, 1994). Moreover, Strauss and Corbin (1990) explain that the generalisation in Grounded theory is driven by data abstraction "*the more abstract the concepts, the more theory applicability*" (Strauss & Corbin, 1990; Fidler, Halaweh, & McRobb, 2008, p. 7). Moreover, Halaweh (2012) asserts that, "*Interpretive case studies and grounded theory research are similar in terms of the generalisability of the results*" (Halaweh, 2012, p. 37). Therefore, for this research the findings are only analytically and not statistically generalised to other situations which share comparable context and conditions to the current research.

3.9   CONCLUSION

This research adopts the combined research methodology of the Case study and Grounded theory. The methodology framework integrates the Case study method and Grounded theory method (*Straussian Approach*). The integration strengthens the research methodology with adequacy, robustness, and coherence. It uses a systematic approach of applying successive phases and sequential steps which are guided by the procedures of the two research methods.

Chapter three identifies the key characteristics of the adopted research methodology. Section 3.2 locates the research as a socio-technical study within the banking industry under the overarching umbrella of the IS field. It applies qualitative research methods and interpretive actions against the eligible secondary datasets. It examines and inductively theorises the impact of Open banking on the social construction of the banking industry. Section 3.3 reviews existing comparable studies which offers a starting point, identifies sources, and shows a practical application of the adopted combined methodology. Section 3.5 describes the Case study method, and it also communicates its strengths, limitations, and applicability to this research. Section 3.6 discusses Grounded theory and explains the two approaches of the *Glaserian approach* as a methodology*,* and the *Straussian approach* as a method. Section 3.6.1 compares the two Grounded theory approaches and gives the reasoning for the selection of the *Starussian approach* as the method for this research.

Section 3.7.1 justifies the rational of integrating the Case study with the "*Straussian Approach*" of Grounded theory, and it explains their compatibility in functioning together as a complete research methodology. Section 3.7.2 constructs the research methodology framework, and it is summarised in Table 3.3 and in Figure 3.3. Section 3.8 explains the mechanism of applying this framework to the study field of the banking industry. It lists the flow of its successive phase and sequential steps. Section 3.8.4 designs the protocol of the Case study and identifies its objective, unit of analysis and questions. Section 3.8.5 explains the method of data collection via the use of Case study. Section 3.8.6 discusses the data analysis process which is guided by the Grounded theory techniques and procedures. Table 3.6 lists the data analysis steps (S01 ➔ S09) which are applied in strict sequence against the collected data from across the research key areas. Section 3.8.7 and 3.8.8 explain the reporting guidelines and standards to which the research adheres. Also, the chapter declares limitations and possible ways to generalise knowledge from a qualitative study.

Chapter 3 builds the foundation for chapter four activities. Chapter four describes the findings of the data collection phase. It explains the criteria and mechanism for capturing specific qualitative secondary datasets. It summarises the nature and type of selected secondary datasets. It verifies, maps, groups, then links approved secondary datasets back to the research key areas and research questions in readiness for the next data analysis phase.

Chapter 4: Research Findings

4.0   INTRODUCTION

This research employs the use of eligible secondary datasets "*which were originally collected for other purposes*" (Glaser, 1963, p. 11; Boslaugh, 2007; Vartanian, 2011; Johnston, 2014). The analysis of secondary data investigates "*new questions verifying previous studies*" and generates new theory (Heaton, 2004, p. 16; Fielding, 2004). It explores new perspectives from the "*raw materials of recent or earlier research to gain both methodological and substantive insights*" (Fielding, 2004; Corti & Bishop, 2005, p. 6). Also, it applies a different research methodology because often the "*re-analysis of primary data using a different methodology would yield a different outcome*" (Andrews, Higgins, Andrews, & Lalor, 2012, p. 12).

The secondary data analysis enriches the research with flexibility, efficiency, and effectiveness (Johnston, 2014; Johnston, 2014). It offers flexibility because it reduces the limitation of crossing boundaries between multiple segments of participants. It offers efficiency because it provides the ability to narrow down and to zone into multiple lines of inquiries (Johnston, 2014; Windle, 2010). It offers effectivenss because it utlises resources again to reduce the consumed time and cost in data collection (Johnston, 2014; Heaton, 2004; Andrews, Higgins, Andrews, & Lalor, 2012).

Chapter 4 describes the findings of the data collection processes for Case study method. It defines and applies the mechanism of secondary data selection and collection. It explains the search strategy which is driven by the criteria of data eligibility and outlines the resulting datasets. Also, it applies the inclusion/exclusion criteria against collected datasets which determines the eligibility of datasets.

As a result, a total of 301 entries (interviews snippets extracted from secondary datasets) are selected from different verified and reliable sources which includes exiting studies, publications, reports, and the banking industry formal journals. Then, the methodology applies a data mapping process which is guided by the research key areas

and questions. It uses key identifiers to categorise and classify approved secondary datasets. It then presents multiple views of the mapped data to confirm the sufficiency and adequacy for covering the aspects and questions of the research.

The chapter lists excerpts of the collected interviews which demonstrates the credibility and conformity of the selected secondary data to the examined topic of Open banking. Finally, the methodology categorises and groups the eligible secondary data into data sub-sheets. That is in preparation for chapter five which applies the Grounded theory data analysis process against the approved secondary datasets as explained in chapter 3.

4.1 DATA ELIGIBILITY

Qualitative research applies different methods in data collection which depends on the form of target data whether text, audio, or video (Guest, Namey, & Mitchell, 2013). According to Mack et al. (2005) the process of qualitative data collection uses three main methods. First, the researcher immerses themselves in the routine of the targeted participants; that is to observe closely and experience first-hand their actions and reactions. Second, the researcher deals with a subset focus group which represents a wider group of participants and reflects their insights, norms, and dynamics. Third, the researcher conducts in-depth interviews with targeted participants to capture their perspectives (Mack, Woodsong, Macqueen, Guest, & Namey, 2005).

The in-depth interview is conducted in a semi-structured setup and offers open ending questions which allows participants to express themselves freely with unrestrictive boundaries (Smith, 1995; Schmidt, 2004; Guest, Namey, & Mitchell, 2013).

The research selects interview data from the secondary data bases via the use of Case study method. The search strategy scans and extracts interviews from eligible sources which have already published in relation to the examined topic of Open Banking, and the study's questions and goals (Houston, 2004; Hox & Boeije., 2005; Johnston, 2014). The secondary data sources are:

- Existing studies and publications stored in digital banking and IS Databases (IMF eLibrary Data, EMED Emerging Asia, NZ Times Series, IGI Global Database, AIS eLibrary, ACM Digital Library, EBSCO).

- Publications and directives by government regulators (Reserve Banks, and Financial Market Authorities)

- Published practitioners' interviews on industry media portals such as (ANZ Media Centre, Media Centre – ASB bank, FinTech)

- Industry publications

4.1.1 CRITERIA FOR INCLUDING OR EXCLUDING STUDIES

The secondary data search strategy is systematic, unbiased, and accepts only completed studies (Grady, Cummings, & Hulley, 2013; Guest, Namey, & Mitchell, 2013). A theoretical review prior to commencing the data search assisted in focusing efforts and locating relevant data (Doolan, Winters, & Nouredini, 2017).

The eligibility of existing studies is determined by the data inclusion or exclusion criteria which is constructed from the six-W key validation questions (Q1➔Q6) (Hox & Boeije., 2005). The research applies four more *what* questions (Q7➔Q10) to achieve greater resolution of the data elements. Table 4.1 shows the ten questions (Q1➔Q10) of applied inclusion or exclusion criteria which determines the eligibility of existing data sources as a suitable source of secondary data.

Table 4.1 Secondary data inclusion/exclusion criteria

Category	Question	Objective	Inclusion/Exclusion
Who (Q1)	Who is the author?	To validate the credibility and reliability of existing data	The research accepts only reputable authors.
Who (Q2)	Who is the interviewee?	To validate the relevancy of	The research only considers interviewees

		participants to the research questions.	from the following targeted groups (customers, managers, executives, FinTech practitioners).
When (Q3)	When was the study conducted?	To validate whether the study is outdated or still valid as a source.	The search accepts studies from 2015 onwards.
Where (Q4)	Where was the data collected from "geographically"?	To check if there is any geographical restriction to data.	No geographical restriction or boundaries on data collection for this research.
How (Q5)	How primary data was collected?	To check the comparability of environment, conditions, and methods of primary data collection.	The research considers personal interviews, questions, and official reports.
What (Q6)	What kind of research (qualitative or quantitative)?	To check the suitability of the primary data to this study.	The research accepts existing studies with qualitative data.
What (Q7)	What research method is used in the study?	To check whether the Case study or Grounded theory is used in the data analysis.	The research accepts existing studies with Case study and/or Grounded theory method.

What (Q8)	Does the existing study (partially/fully) address the Open banking environment, structure, or competition?	To check the relevancy to this study's first research question.	The research accepts the studies with relevance to research question ONE.
What (Q9)	Does the existing study (partially/fully) address the change in the customer's behaviour and social construction?	To check the relevancy to this study's second research questions.	The research accepts the studies with relevance to research question TWO.
What (Q10)	Does the existing study (partially/fully) address the change in the relationship between customers and banks?	To check the relevancy to this study's second research questions.	The research accepts the studies with relevance to research question THREE.

4.1.2 SUMMARY OF SELECTED SOURCES

The research applies the sequential questions (Q1➔Q7) of Table 4.1 to determine the eligible data sources. As a result, the following sixteen data sources are deemed relevant and approved for this research. Table 4.2 shows the eligible sources of secondary datasets for this study.

Table 4.2 Sources of approved secondary data

Type	Source
Previous Study	(Nyström, 2020; Omarini, 2018; Zetsche, Buckley, Arner, & Barberis, 2017; Ginnis, Stamper, Byrne, Garrett, & Strong, 2018; Läckberg & Larsson, 2020)
Reports	(EY-Seren, 2018; Wiebusch, 2019; Colleran & Hawkins, 2019) (Johnson & Kazarian, 2019; O'Keefe, Dodd, Fowles, Simester, & Lucraft, 2019; Turner, 2018; Stamper, 2018; Bud, 2020; Soliman, 2021; Coeckelbergs, 2019; Mual, 2017)

These data sources are the result of round 5 Delphi data selection and represent the results of applying the criteria in Table 4.1. Further, Table 4.3 shows an approximate balance of source types and Table 4.4 the representation of roles within the sources. The imbalance reflects the weighting of role numbers in an organisation. For example, there are fewer managers than users. Also, the databases tended to have banking information rather than FinTech information, therefore the FinTechs are fewer in number. Overall, this is a workable and suitable representation of the topic for research.

4.1.3   SUMMARY OF SOURCES VS. PARTICIPANTS

The research further applies questions (Q8➜Q10) of Table 4.1 to achieve a higher level of abstraction. This step locates and extracts qualified qualitative secondary data in the form of interviews from within the identified eligible sources of Table 4.2.

As a result, from the sixteen eligible sources, a total of 301 entries of interviews with participants from across the different professional groups are collected and deemed applicable. The research ensures that there is a balanced data distribution and representation across the eligible data sources which avoids potential skewing of findings.

The research ensures that the 301 interview entries are not derived from a single source type. Table 4.3 shows the breakdown of interview entries against the type of sources.

Table 4.3 Sources vs. participants entries

Type	Source	Entries
Previous Study	(Nyström, 2020; Omarini, 2018; Zetsche, Buckley, Arner, & Barberis, 2017; Ginnis, Stamper, Byrne, Garrett, & Strong, 2018; Läckberg & Larsson, 2020)	154
Reports	(EY-Seren, 2018; Wiebusch, 2019; Colleran & Hawkins, 2019) (Johnson & Kazarian, 2019; O'Keefe, Dodd, Fowles, Simester, & Lucraft, 2019; Turner, 2018; Stamper, 2018; Bud, 2020; Soliman, 2021; Coeckelbergs, 2019; Mual, 2017)	147

Figure 4.1 shows a pie chart of the percentage distribution of data (sources vs. participants). This figure shows that 49% of the entries of the participants are derived from existing studies, while 51% are derived from other publications including industry interviews and reports.
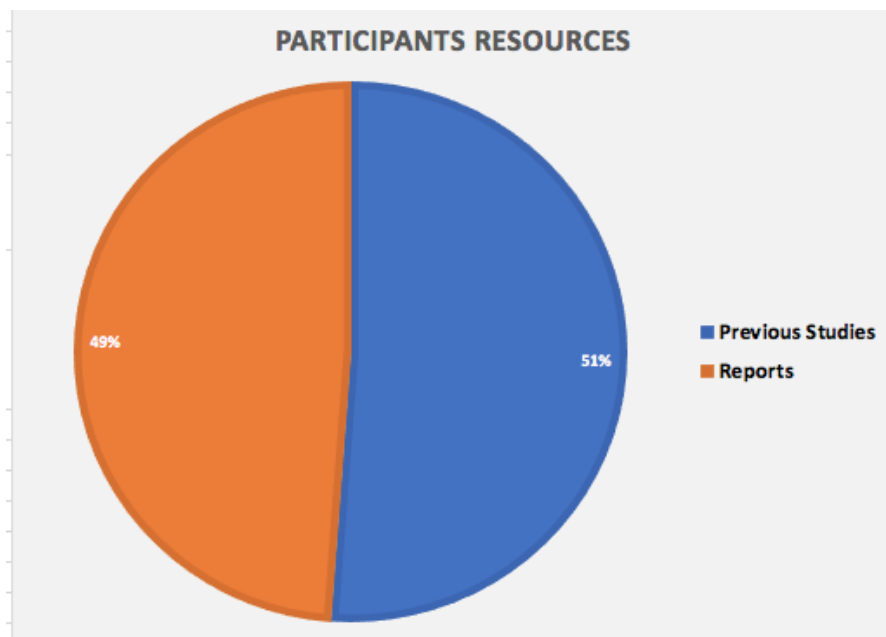
Figure 4.1 Participants source

4.1.4   SUMMARY OF PARTICIPANTS VS. ROLES

The key groups of participants are Customer, Bank management, Bank executive, and FinTech practitioner. The research ensures that selected secondary data represents the key groups and associated roles across the Open banking environment. Table 4.4 displays the breakdown of groups and roles vs. interview entries.

Table 4.4 Role vs. participants entries

Group	Job Title	Entries
Customer	Customer - Open banking users.	138
Bank, Management	Branch manager, Product owner, Product Manager, Open banking manager, Consultancy, Country manager, Manager, Head of products.	87
Bank, Executive	CCO, CIO, CEO, Co-Founder, CPO, CTO, Director, Executive director, Head of Digital, Head of commercial, Head of policy, Head of product, Head of risk solutions, Managing director	72
FinTech	Founder, Product owner, Technology Manager	4

Figure 4.2 shows a pie chart of the percentage distribution of data (roles vs. participants). It shows that 46% of the entries of the participants are derived from customer interactions, while 29%, 24%, and 1% are derived from bank management, bank executive, and FinTech practitioner roles respectively.
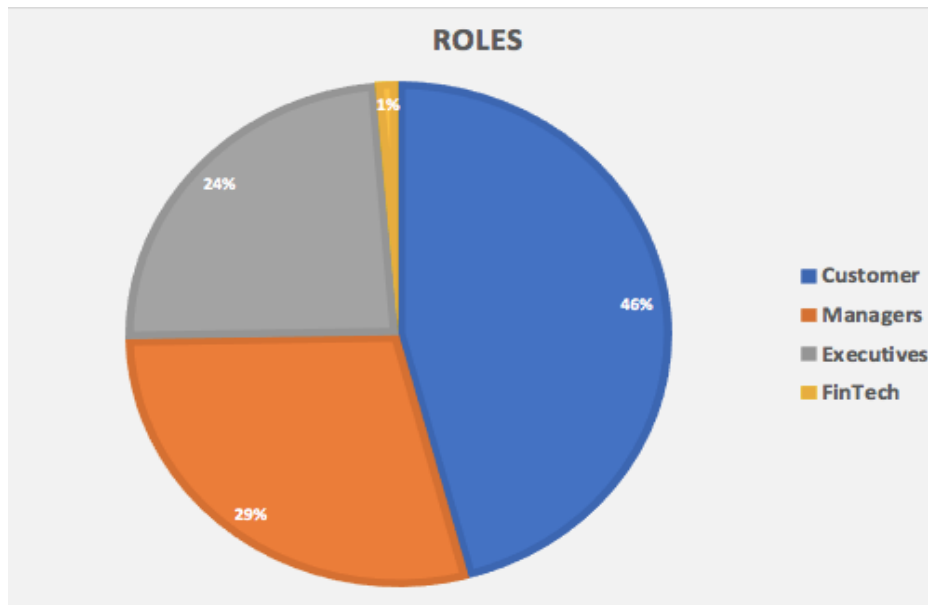
Figure 4.2 Participants Roles

4.1.5   SUMMARY OF PARTICIPANTS VS. RESEARCH QUESTION

The research identifies three key research areas. The first key area which links to the first research question is *Open banking* context. It examines the changes in the structure and competition within the banking industry. The second key area which links to the second research question is *Customer behaviour*. It examines the changes in the customer's behaviour and associated social norms. The third key area which links to the third research question is *Relationships.* It examines the change in the newly emerging relationship between customers and banks.

The research ensures an adequate representation of the key areas and associated research questions within the collected secondary data. Table 4.5 displays the breakdown of interview entries against research questions and key areas.

Table 4.5 Research questions vs. participants entries

Research question	Key Area	Entries
Q1 - Question one	Open banking context	88
Q2 - Question two	Customer behaviour	131

| Q2 – Question three | Relationships | 82 |

Figure 4.3 displays the pie chart of percentage distribution of data for interview entries against research questions and key areas. It shows that 29% of interview entries covers the Open banking context area and question one, 44% covers the customer behaviour area and question two, and 27% addresses the customer relationship and question three.

Figure 4.3 Questions and key areas distribution

4.2 SUMMARY OF DATA PRESENTATION

The data mapping process categorises and organises the selected interviews in preparation for the following phase of data analysis. The research uses Excel for the data mapping process, it scans through each of the selected interviews and accordingly tags them with key-identifiers for further classification. These key identifiers are constructed from the combined criteria of key areas and the research questions.

Then, it concatenates the selected data in a central data excel sheet and labels it as "*Raw data sheet*". The sheet has three high-level headers (domains) which includes *Source details*, *Interview details*, and *Data mapping* where each domain has its own key

identifiers. Table 4.6 shows the domains and key identifiers used in the data mapping process.

Table 4.6 Key identifiers of data mapping

Domain	Key Identifiers
Source Details	Reference: APA referencing and page Author: Author of the source Date: Year of published material Source Type: Existing study, reports, formal interviews Source Name: The title of publication Link: Link to the saved source
Interview details	Bank/TPPs: Name of the organisation (if disclosed) Region: Location of the bank Country: Country of the bank Interviewee: Name of the participant (if disclosed) Role: Title of the participant (job description and responsibilities if applicable)
Data mapping	Research question: Research Question Q1, Q2, or Q3 Category: Customer, Management, executive, Fintech Key word: The main theme of the interview Interview quote: copy of interview snippet extracted from the approved materials

Figure 4.4 shows screenshots of an example of the data mapping process for an interview with an Open banking manager.

Figure 4.4 Example of data mapping process

The research applies a higher level of classification which divides the *raw data sheet* into sub-sheets. The first three sub-sheets are derived from the mapping which uses the key participant groups (Customer, Management, Executive, FinTech) as identifiers.

Then, the research applies further mapping which uses the research questions and key areas as identifiers. The naming convention is derived from combining these two key identifiers (*Research Question + Key Area*). This results in adding three sub sheets (Q1- Context, Q2- Customer behaviour, Q3- Relationships). Figure 4.5 shows the labels of key areas and associated mapped sub-datasheets.

Figure 4.5 Mapped sub-datasheets

4.2.1 OPEN BANKING CONTEXT - DATA

The outcome of the data mapping process concerns the key area of *Open banking Context* (for the first research question) results in 88 interview entries as highlighted in Table 4.5. Further, Table 4.7 shows excerpts of the mapped secondary data for this key area. This

gives relevancy for the selected secondary data and shows consistency in process execution.

Table 4.7 Excerpts of data on Open banking context impact

Source	Participant	Quote
(Johnson & Kazarian, 2019)	[Interview, bank, CEO, North America, Canada, undisclosed].	*"if we can figure out how to solve for security, transparency and control, we can have an open banking system in this country that could work very well, in my view. For the banks, the idea of sharing data may be uncomfortable, but it's important to remember that open banking offers them many opportunities and benefits. Besides tapping into new innovations, the efficiencies created by open banking can help the banks reduce costs. Open banking also has the potential to reduce other risks faced by big banks, such as fraud and money laundering, as the increased access to and sharing of data among institutions will make it easier to spot anomalies"*
(Mual, 2017)	[Interview, bank, Director, Europe, Netherland, undisclosed].	*"We foster innovation by connecting and integrating applications. The open banking APIs will help streamline financial administrative processes by taking out unnecessary steps in connecting applications and boosting the take-up of added-value*

		financial services. Innovative applications can, for example, help merchants with budgeting, invoicing, accounting, which, of course, is not core banking ... thus, by freeing up time for end customers, it gives them more and real-time control over their finances""
(Läckberg & Larsson, 2020)	[Interview, undisclosed, Open banking manager, Europe, Sweden].	*" The platform business mode is based on the assumption that you have quite large volumes, while the niched approach focuses on selling less volume with good margins. Therefore, I can't really understand the purpose of why we would willingly decide to become a niched actor. Yet, I do understand that PSD2 and open banking will lead to more niched actors, because all banks will not afford to continue being universal banks, whereas the established banks which will become niched actors will do so because they are forced to"*
(Turner, 2018)	[Interview, undisclosed, Head of digital, Europe, UK].	*"Open banking is overrated right now, but underrated in the long term – there is no pressing urgency to do anything right now, the market posture is to wait and see"*

4.2.2   CUSTOMER BEHAVIOUR - DATA

The outcome of the data mapping process concerns the key area of *Customer behaviour* (for the second research question). It results in 131 interview snippets as shown in Table 4.5. Table 4.8 shows excerpts of the mapped secondary data for this key area.

Table 4.8 Excerpts of data on customer behaviour impact

Source	Participant	Quote
(Nyström, 2020)	[Interview, undisclosed, Customer, Europe, Finland].	*"Yes, younger people especially, because they are so in touch with everything! No but, they are more in touch with technology and changes. I think that young adults are the first group to take these types of services into use. They are using banking services, and they are usually the first adopters when it comes to technological services"*
(Stamper, 2018)	[Interview, undisclosed, Customer, Female aged 26-45, Europe]	*"I would feel nervous. I find it sometimes when I go online, I get pop-ups about things that they shouldn't know that I have an interest in, shoes and holidays. They get my information from something I've filled out. I haven't directly given them that information"*
(Ginnis, Stamper, Byrne, Garrett, & Strong, 2018)	[Interview, undisclosed, Customer, Female aged 26-45, Europe]	*""Almost all people agree that you feel like an open book. Sometimes I feel that too much is out there of myself. I question why do these people they want your information? I grew up where we didn't have internet, and now these companies they know so much about people.*
(Nyström, 2020)	[Interview, undisclosed, Customer, Europe, Finland].	*"I think that it's just about the gut feeling that consumers might have. Can I trust something that I have never heard of and that hasn't been established hundred years ago""*

4.2.3 RELATIONSHIPS - DATA

The data mapping process concerns the key area *Relationships* (for the third research question). It results in 82 interview snippets as shown in Table 4.5. Table 4.9 shows excerpts of the mapped secondary data for this key area.

Table 4.9 Excerpts of data on communication behaviour impact

Source	Participant	Quote
(Läckberg & Larsson, 2020)	[Interview, Branch manager undisclosed, Europe, Sweden].	*"Customer loyalty has decreased somewhat the last couple of years, but the big difference is the ease by which a customer can switch banks today .... No one can constrain customers to be loyal, banks probably have to accept that nowadays customers are comparing alternatives and the bank needs to fight to do as good as they can to maintain and recover what is lost to other actors"*
(Bud, 2020)	[Interview, bank, Managing Director, undisclosed, Europe, UK].	"*A satisfied customer is not as loyal today as they were 10-15 years go. A loyal customer 10 years ago was a full-range customer. Today, a loyal customer is one who has most of their financial business within the bank but likewise chooses to utilize alternative actors*"
(Nyström, 2020)	[Interview, Customer undisclosed, Europe, Finland].	*"If they are provided a well enough service, then they don't really have a reason to switch banks. So as long as the bank is providing an adequate service, it doesn't have to be brilliant or amazing, it just needs to work in order for people to stick with it"*

(Läckberg & Larsson, 2020)	[Interview, bank, Open banking manager, undisclosed, Europe, Sweden].	*"I often used the argument that if the customers did all of their banking with us, they'd be able to get better and more relevant advice, since we'd get a better overview of their situation. And in comes open banking, and now you can use digital tools to access the same overview. With that, the argument for collecting all of one's banking falls apart"*

4.3   SUMMARY

Chapter 4 presents the methods for data collection and selection based on the guidelines for Case study research. The adopted data collection process ensures the uniformity and conformity of secondary datasets to serve the objectives of the research. The chapter defines and applies the inclusion and exclusion criteria for the selection strategy which ensures the credibility and authenticity of the selected secondary data. The eligible selected data is in the form of interviews.

The chapter presents multiple views of the selected secondary data for disclosure, confidence in the quality of the work, and relevancy of the data. It ensures an adequate level of representation to sources, participants, groups, roles, research questions, and the key areas of this research. It displays a view of selected data in relation to the eligible sources which ensures a balanced data representation and distribution as explained in Table 4.3 and Figure 4.1. This displays a view of the selected data in relation to the participant groups and roles. It ensures adequate representation of key groups and associated roles within the Open banking environment as explained in Table 4.4 and Figure 4.2. Also, it displays a view of the selected data in relation to the identified key areas for research and questions. It ensures the applicability and ability of the selected secondary data to fulfil the objectives of the research and simultaneously have evidence to answer the questions, as explained in Table 4.5 and Figure 4.3.

The chapter explains the data mapping process which develops a central raw secondary data sheet. It applies sorting and classification process against the central sheet via the use of key identifiers which results in sub-datasheets as displayed in Table 4.6 and illustrated by an example in Figure 4.4. It lists excerpts of mapped interview entries in relation to the research key areas which ensures transparency and applicability of the selected data to achieve the objectives and goals of this research as displayed in Tables 4.7, Table 4.8, and Table 4.9.

After completing the organisation and mapping of the qualitative secondary data based on the Case study guidelines, it now conforms to specific eligibility criteria and ensures adequate representation. The researcher is now confident that the data is organised with an adequate state of readiness to proceed to the next step of analysis. The following chapter five gives analysis of the mapped qualitative secondary data via the use of systematic data analysis techniques. The researcher applies sequential steps with strict ordering which are guided by the techniques and procedures of the Grounded theory as explained Table 3.3 and illustrated in Figure 3.3.

Chapter 5: Analysis

5.0   INTRODUCTION

The qualitative data analysis generates many propositions. These deliverables rely on the degree of consistency and uniformity when applying the methodical data analysis requirements. Analysis transforms a mass of data into meaningful findings (Miles & Huberman, 1994; Patton, 2002; Denzin & Lincoln, 2008; De Vos, Strydom, Delport, & Fouché, 2005; John, 2012; Glesne, 2016). Consistency ensures conformity, prevents deficiencies, and guides the emerging findings (Thomas, 2003; Zhang & Wildemuth, 2009; Bergin, 2011).

Chapter five presents the data analysis process and generates theory propositions. The data analysis process is driven by the procedures of the Grounded theory as explained in chapter three. The research applies the data analysis process consistently against the mapped data of each of the key identified research areas which have been collected via the use of Case study method. It implements the sequential steps (S01 ➜ S09) of Table 5.1 in strict order. It presents the outcome of Grounded theory procedures of open coding, axial coding, constant comparison analysis, and selective coding. It discovers the core category (categories) and analyses the emerging findings for associated patterns, paradigms, and relationships to generate hypotheses theory.

The chapter compiles the hypotheses and verifies them against the research evaluation criteria which ensures the integrity, credibility, and conformity of the research findings. The outcome serves as the core material for the following chapter six which discusses the verified hypotheses, addresses the identified issues and problems, links them to existing literature and industry practice, and answers the research questions.

5.1   DATA ANALYSIS FRAMEWORK

The research adopts a systematic framework with pre-defined steps as explained in section 3.7.6. It utilises NVIVO software version 12 for the main data store for analysed data, for pre-coding and post-coding datasets, and it assists in the development of visual

representation of code distributions and relationships (Welsh, 2002; Bergin, 2011; Bazeley, 2013). The framework applies the sequential steps (S01➔S09) of Table 5.1 in strict order against each of the key identified research areas (*Context, Customer behaviour, Relationships*). The steps (S01➔S08) are applied first then followed by step (S09) which gives interpretation for the analysed data. Table 5.1 shows the adopted framework for data analysis with its pre-defined steps.

Table 5.1 Data analysis framework

ID	Step
S01	Reading interviews
S02	Loading data into NVIVO
S03	Open coding
S04	Constant Comparison Analysis (CCA)
S05	Axial coding
S06	Selective coding + core category
S07	Refining – Higher data abstraction
S08	Theoretical Saturation
S09	Hypothesising

5.1.1 KEY AREA – OPEN BANKING CONTEXT

This section applies the data analysis steps against the mapped data of the sub-datasheet *Q1-Context* which concerns the key area *Open banking Context* and research question *One* as explained in Figure 4.5.

5.1.1.1 DATA ANALYSIS

The research applies the following pre-defined sequential steps for the data analysis. First, it applies step (S01) of Table 5.1. As a result, this builds a connection and establishes a level of awareness of the data before starting the coding process (Creswell & Poth, 2018).

Second, it applies steps (S02 ➔ S03) of Table 5.1 which involve starting the manual open coding process which produces associated codes and concepts of *Q1-*

Context. As a result, it generates twenty-seven codes with different reoccurrence frequency (see Appendix A for full emerged codes list). For example, the "*Innovation enablement*" code appears 14 times, the "*Accountability*" code appears 7 times, while the "*Seamless integration*" code appears 20 times.

Third, the research applies steps (S04 ➔ S05) of Table 5.1 which concern the axial coding and CCA processes. As a result, the process applies a higher level of data abstraction which generates twenty-one themes/categories with different aggregated frequency.

The research applies an ascending sorting process against the emerging categories for the categories with a higher impact on the *Q1-Context* key area. Figure 5.1 shows the chart for ascending sorted emerging categories for the *Q1-Context* key area.
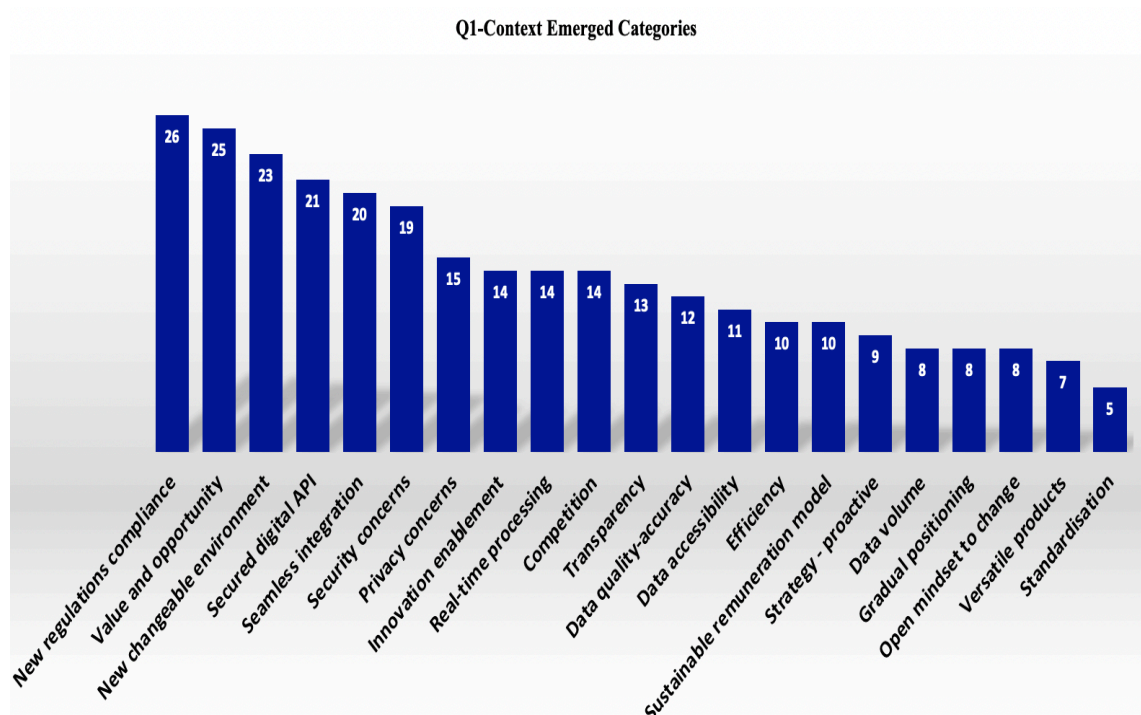
Figure 5.1 Chart of emerged categories of Q1-Context

Figure 5.1 shows and identifies the key categories with higher impact for *Q1-Context*. These identified key categories (potential core categories) are Regulations compliance,

Change in environment, Value and opportunity, Competition, Seamless integration via APIs, Innovation enablement, and Real-time processing.

Fourth, the research applies step (S06) of Table 5.1 which identifies the core category (categories) and applies further selective coding. The research uses a matrix table for the relationship analysis between emerging categories. The emerging categories are represented vertically while potential key core categories are represented horizontally. Table 5.2 displays the relationships analysis between categories for *Q1-Context* key areas.

Table 5.2 Relationships between categories for Q1-Context

Relationships	Regulations compliance	Value and opportunity	Change in environment	Seamless integration via APIs	Innovation enablement	Real-time processing
New regulations compliance	X	X	X		X	X
Value and opportunity		X		X	X	X
New changeable environment					X	
Secured digital API	X			X	X	X
Seamless integration		X		X	X	X
Security concerns	X		X		X	X
Privacy concerns	X		X		X	X
Innovation enablement	X	X	X	X	X	X
Real-time processing	X	X	X	X	X	X
Competition	X	X	X	X	X	X
Transparency	X	X			X	
Data quality-accuracy	X	X	X	X	X	X
Data accessibility	X		X	X	X	X
Efficiency		X			X	X

Sustainable remuneration model		X			X	
Strategy - proactive			X		X	
Data volume	X	X	X	X	X	X
Gradual positioning					X	
Open mindset to change		X	X		X	
Versatile products		X	X		X	X
Standardisation	X		X	X	X	

Table 5.2 shows and discovers that the category "*Innovation Enablement*" is the core category for the *Q1-Context*. The innovation emblement core category fulfils the criteria of key category because it has links to other categories, is frequently mentioned by participants, and it represents a main area for the first research question (Adwan, 2012). Other categories "Real-time processing" and "Change in environment" are key items in terms of relationships to other categories as well, hence they are closely considered in the subsequent analysis stages.

Fifth, the research applies step (S07) of Table 5.1 which achieves a higher degree of abstraction. It restricts the coding and CCA to the categories and concepts which are linked to the core category.

Finally, the research applies the step (S08) of Table 5.1 which finds the theoretical saturation point.

5.1.1.2 OBSERVATION AND HYPOTHESIS

The research applies step (S09) of Table 5.1 which collates and examines the findings of data analysis in section 5.1.1.1. Then, it constructs an illustrative summary of the emerging hypotheses which are guided by the identified core category "*Innovation Enablement*" to address the impact of Open banking adoption on the structure of the banking industry. Figure 5.2 displays the emerging hypotheses for research question one.
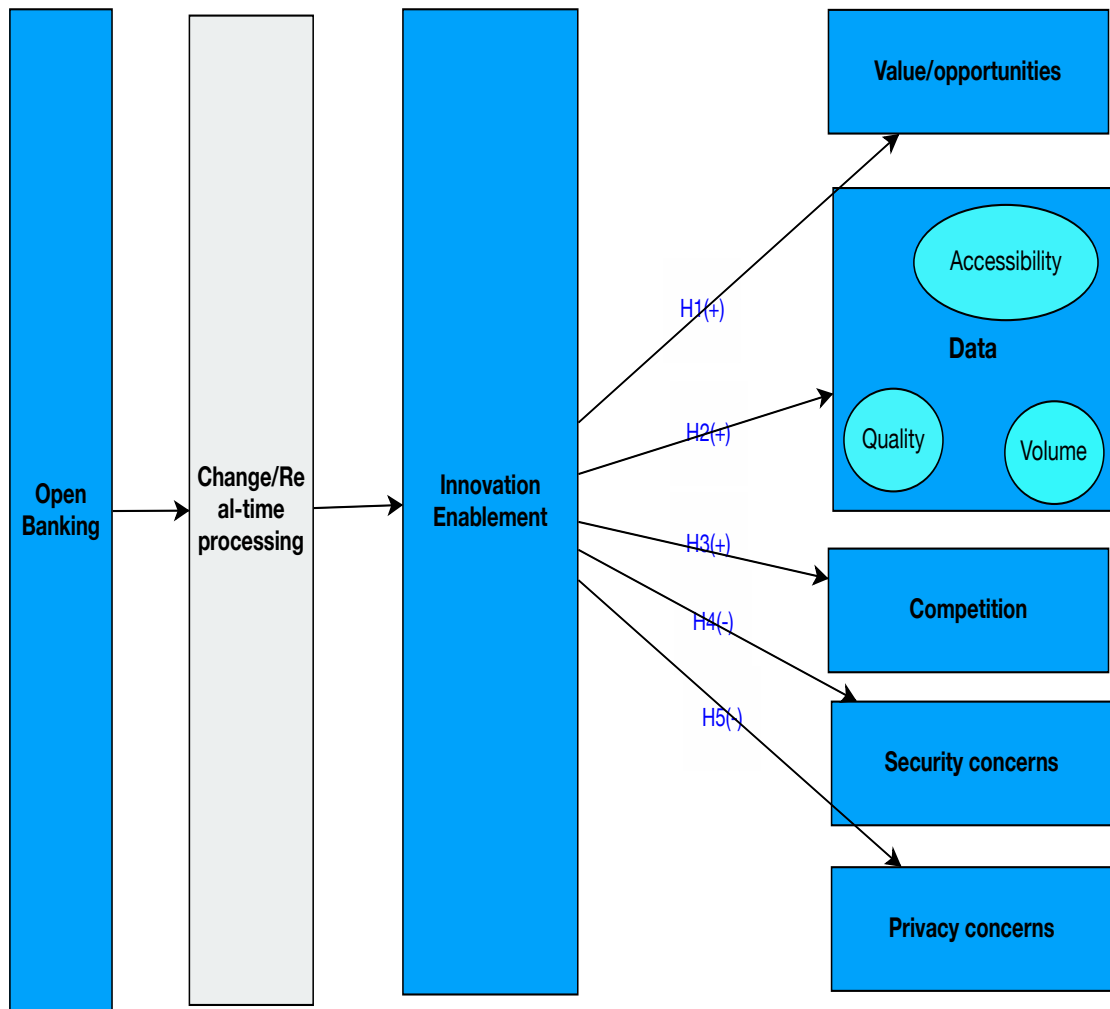
Figure 5.2 Emerging hypotheses of research question one

In reflection on the illustrative summary of Figure 5.2, the research proposes five hypotheses with positive and negative nature to address the impact of Open banking adoption on the structure of the banking industry.

Hypothesis 1: H1(+): The change introduced via Open banking including real-time processing enables innovation which adds value and positively influences opportunity creation to incumbents within the banking industry.

Hypothesis 2: H2(+): The change introduced via Open banking including real-time processing enables innovation which positively influences the data sharing and processing within the banking industry in terms of accessibility, quality, and volume.

Hypothesis 3: H3(+): The change introduced via Open banking including real-time processing enables innovation which increases competition within the banking industry.

Hypothesis 4: H4(-): The change introduced via Open banking and enablement of innovation triggers security concerns.

Hypothesis 5: H5(-): The change introduced via Open banking and enablement of innovation triggers privacy concerns.

5.1.2 KEY AREA – CUSTOMER BEHAVIOUR

This section applies the data analysis steps against the mapped data of the sub-datasheet *Q2-Customer Behaviour* which concerns the key area *Customer Behaviour* and research question *Two* as shown in Figure 4.5.

5.1.2.1 DATA ANALYSIS

The research follows the exact sequential steps shown in Table 5.1 against the data analysis of the key area *Q2-Customer Behaviour*.

The research applies the steps (S01➔S03). As a result, it generates twenty-eight codes with different reoccurrence frequency (see Appendix B for full emerged codes list). For example, the "*Financial management*" code appears 26 times, the "*Lack of confidence*" code appears 27 times, while the "*Customer added benefits*" code appears 13 times.

The research then applies steps (S04➔S05). As a result, it generates twenty themes/categories with different aggregated reoccurrence frequency.

The research applies an ascending sorting process against the emerging categories. Figure 5.3 shows the chart for ascending and sorted emerging categories for the *Q2-Customer Behaviour* key area.

Figure 5.3 Chart of emerging categories of Q2-Customer Behaviour

Figure 5.3 identifies the key categories with higher impact on the area of Q2-Customer Behaviour. These categories are Personalised customer experience, Customer lack of awareness and confidence, Customer financial management, and Customer convenience/satisfaction.

The research applies step (S06) to analyse the relationships between the emerging categories. Table 5.3 displays the relationships analysis of the *Q2-Cusomer Behaviour* key area.

Table 5.3 Relationships between categories for Q2-Customer Behaviour

Relationships	Personalised and real-time customer journey	Customer lack of (awareness/understanding)	Customer financial management	Customer convenience/satisfaction
Personalised customer experience	X		X	X
Lack of confidence		X		
Customer financial management	X		X	X
Customer convenience/satisfaction	X		X	X
Streamlined customer journey	X		X	X
Spontaneous transactions	X			
Attractive to young segments	X	X	X	X
Lack of understanding		X	X	X
Lack of trust		X		
Lack of awareness		X		
Customer averse behaviour		X	X	X
Customer multiple aggregated views	X		X	X
Customer added benefits	X		X	X
Attractive to Travellers segment	X		X	X
Attractive to Tech-savvy segment	X		X	X
Customer high expectations	X			
Data loss concerns		X		
Customer open mindset		X		

Customer confusion		X		
Customer friendly services	X		X	X

The research discovers the core categories of Q2-Customer Behaviour which are "Personalised real-time customer journey" and "Lack of both understanding and awareness".

5.1.2.2 OBSERVATION AND HYPOTHESIS

The research applies step (S09) of Table 5.1 which collates and examines the findings of the data analysis in section 5.1.2.1. Then, it constructs an illustrative summary of the emerging hypotheses which are guided by the identified core categories "*Personalised real-time customer journey*" and "*Lack of both understanding and awareness*". This addresses the impact of Open banking adoption on the adaptation behaviour of a customer. Figure 5.4 displays the emerging hypothesis for research question two on customer behaviour.
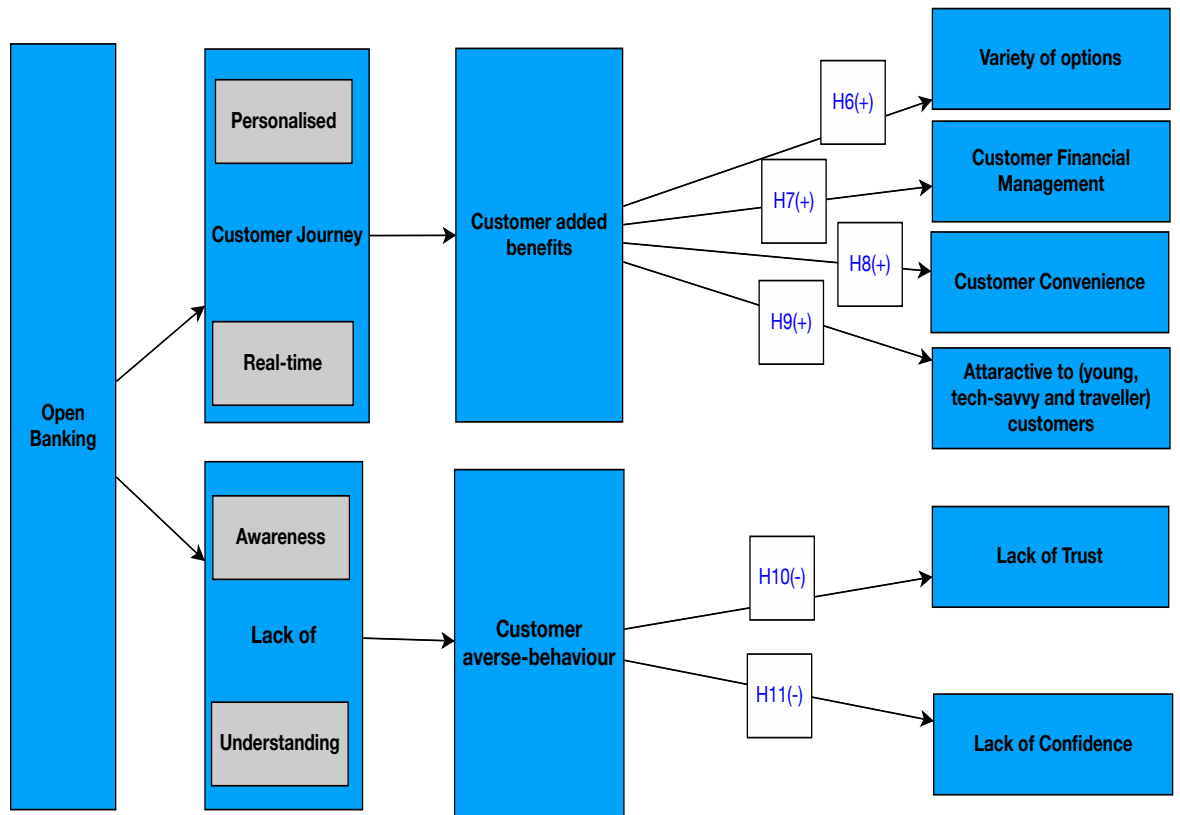
Figure 5.4 Emerging hypothesis of research question two

In reflection on Figure 5.4 the researcher proposes five hypotheses as follows:

Hypothesis 6: H6(+): Open banking enhances the personalised and real-time customer journey which facilities added benefits in terms of increasing the variety and spectrum of products and services available to customers.

Hypothesis 7: H7(+): Open banking enhances the personalised and real-time customer journey which improves the ability of customers to manage their financials using innovative customised digital products and service.

Hypothesis 8: H8(+): Open banking enhances the personalised and real-time customer journey which positively influences the degree of convivence of the customer's overall banking experience.

Hypothesis 9: H9(+): Open banking enhances the personalised and real-time customer journey which attracts specific demographic segments including the young, tech-savvy, and travellers.

Hypothesis 10: H10(-): The lack of awareness about Open banking triggers aversion attitude which negatively influences customer's behaviour in reducing the level of trust in adopting the new technology.

Hypothesis 11: H11(-): The lack of understanding of Open banking triggers an aversion attitude which negatively influences a customer's behaviour in reducing the level of confidence to use the new products and services.

5.1.3   KEY AREA - RELATIONSHIPS

This section applies the data analysis steps against the mapped data of the sub-datasheet *Q3-Relationships* which concerns the key area *Relationship,* and the research question *Three,* as shown in Figure 4.5.

5.1.3.1 DATA ANALYSIS

The research follows the exact sequential steps highlighted in Table 5.1 against the data analysis of key area *Q3-Relationships.*

The research applies the data analysis steps (S01➔S03). As a result, it generates twenty-seven codes with different reoccurrence frequencies (see Appendix C for the full emerging codes list).

The research then applies steps (S04➔S05). As a result, it generates twenty themes/categories with different aggregated frequencies for the *Q3-Relationships* key area. It applies an ascending sorting process against the emerging categories. Figure 5.5 shows the chart for ascending sorted emerging categories for the *Q3-Relationships* key area.
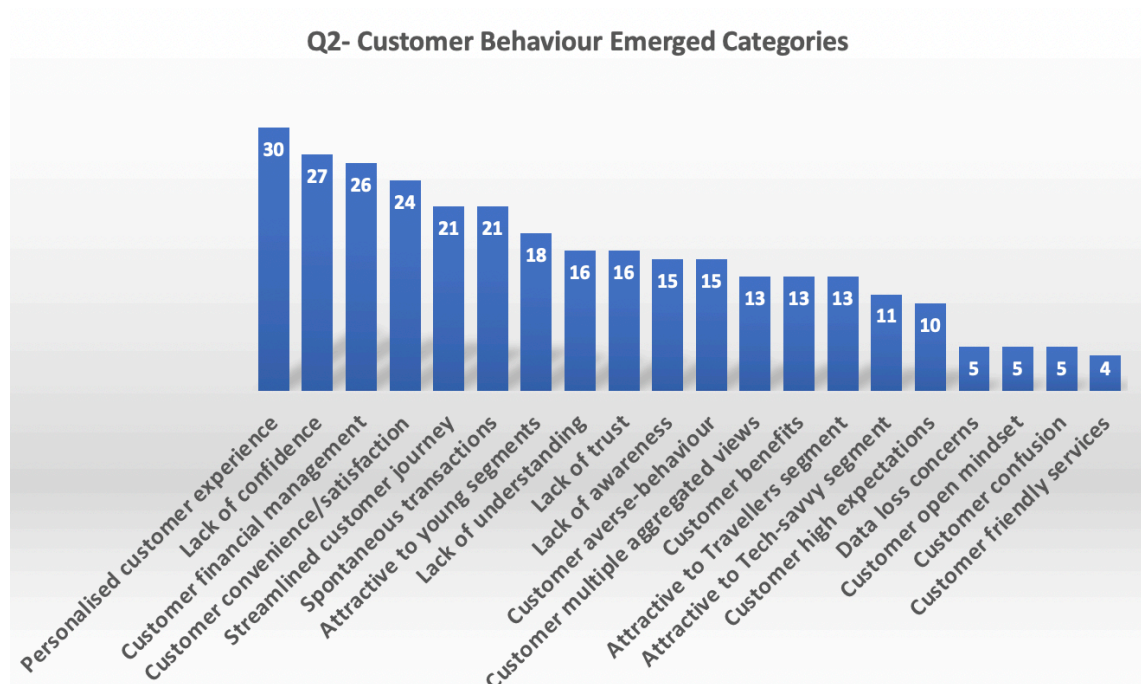

Figure 5.5 Chart of emerged categories of Q3-Relationships

The researcher examines Figure 5.5 and identifies the key categories with higher impact on this area of *Relationship behaviour*. These categories are Customer attrition, Customer control of data, Ability to revoke access, Data ownership, Social banking, and Trust in banks.

The researcher applies step (S06) which analyses the relationships between the emerging categories. Table 5.4 displays the analysis for the *Q3-Relationship behaviour* key area.

Table 5.4 Relationships between categories for Q3-Relationships

Relationships	Customer attrition	Customer control of data	Ability to revoke access	Data ownership	Social banking	Reliance-trust on banks
Lack of customer loyalty	X	X		X		
Reliance-trust on banks					X	X
Customer attrition	X	X	X	X	X	
Data quality-accuracy					X	
Customer control of data	X	X	X	X	X	
Social banking		X	X	X	X	X
Ability revoke access instantly		X	X	X		
TPPs Skepticism	X					X
Data ownership	X	X	X	X	X	
Customer negative experience	X				X	
Easier banks switching	X	X	X	X		
Customer confidence		X	X	X	X	X
Legal dispute risk	X			X		X
Digital identity					X	
Enhanced customer engagement		X		X	X	
Lack of human touch	X					
Customer retention					X	X
Reputational risk	X					
Trusting Influencers		X	X	X	X	

The researcher discovers that the core categories for the key area of *Q3-Relationships behaviour* are "*Data ownership and control*" and "*Social banking*".

5.1.3.2 OBSERVATION AND HYPOTHESIS

The researcher applies step (S09) of Table 5.1 which collates and examines the findings of the data analysis in section 5.1.3.1. Then, it constructs an illustrative summary of the emerging hypotheses which are guided by the identified core categories "*Data ownership and control*" and "*Social banking*". This addresses the impact of Open banking adoption on the relationship between customers and banks. Figure 5.6 shows the emerging hypotheses for research question three of the relationship between customers and banks.
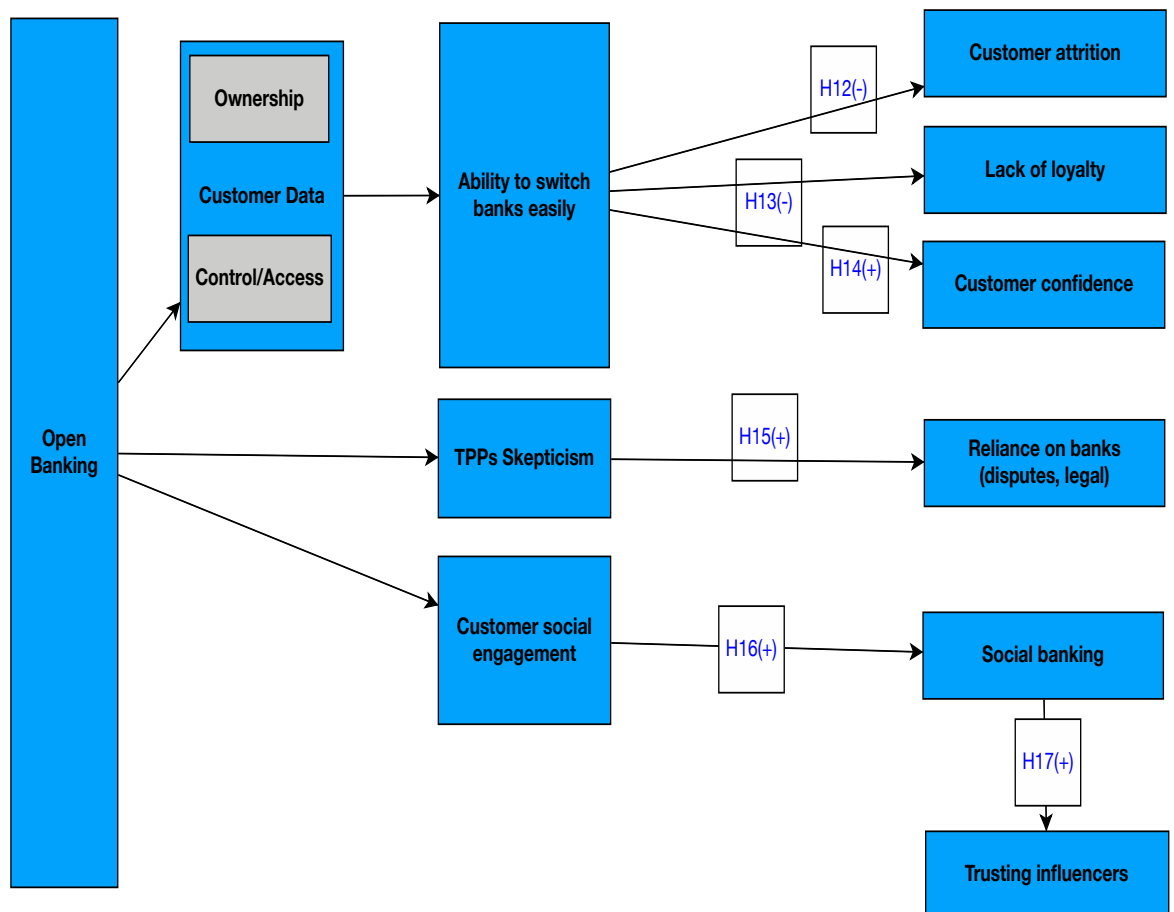
Figure 5.6 Emerging hypothesis of research question three (Relationships)

In reflection on Figure 5.9 the researcher proposes six different hypotheses as follows:

Hypothesis 12: H12(-): Open banking enables customers to have full ownership and control over their financial data which shifts the power in the relationship with banks towards customers resulting in making it easier for a customer to switch banks and accordingly increases the risk of customer attrition for banks.

Hypothesis 13: H13(-): Open banking enables customers to have full ownership and control over their financial data which shifts the power in the relationship with banks towards customers resulting in making it easier for a customer to switch banks and accordingly this decreases the loyalty to banks.

Hypothesis 14: H14(+): Open banking enables customers to have full ownership and control over their financial data and accordingly increases the conviction of customer confidence in trying new products and services.

Hypothesis 15: H15(+): Within Open banking, customers develop scepticism towards Third Party Providers (TPPs) which positively influences the reliance and relationship with traditional banks to govern the engagement with TPPs especially in possible future disputes or legal proceedings.

Hypothesis 16: H16(+): Open banking allows for ongoing customer social experience which enables a transition from a transactional banking industry environment into a social banking experience.

Hypothesis 17: H17(+): Open banking enables social banking experience which increases the effect of social influencers on a customer's

acceptance and adoption decisions while engaging with new products and services.

5.1.4 KEY AREA - EMERGING

The researcher recognises the emergence of new categories with low recurrence frequency. These identified categories are not directly linked to the research questions or identified key areas (*Context, Behaviour, Relationships*). Nevertheless, these categories are significant to the overall Open banking environment which justifies the necessity to analyse them within the context of this research.

The research adds a new key area under the name "*Emerging*" in reference to the emerging concepts under Open banking. Section 5.1.4 explains the data analysis steps of these emergent categories in relation to the new key area "*Emerging*".

5.1.4.1 DATA ANALYSIS

The researcher follows the exact sequential steps listed in Table 5.1 against the data of the area *Emerging*.

The research applies steps (S01➔S03). As a result, it generates twenty-three codes with different reoccurrence frequency (see Appendix D for full emerged codes list).

The research applies steps (S04➔S05) and takes the categories which appear with aggregated references more than seven times. As a result, it generates thirteen themes/categories with different aggregated frequencies for the *Emerging* key areas.

The research applies an ascending sorting process against the emerging categories. Figure 5.7 shows the chart for ascending sorted emerging categories for the *Emerging* key area.
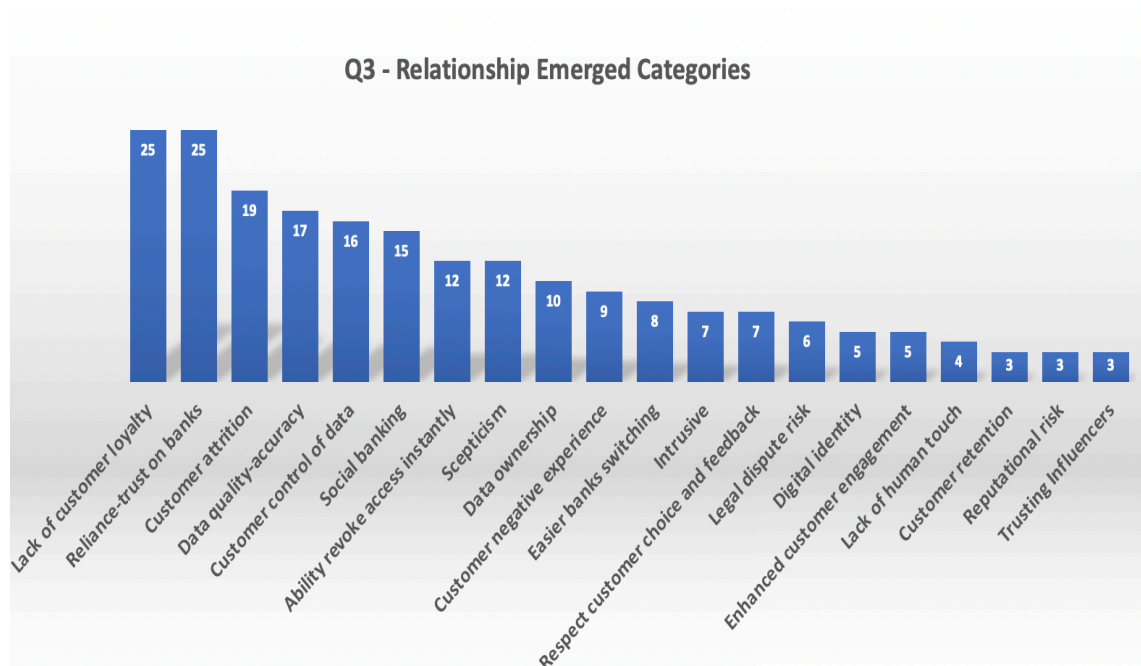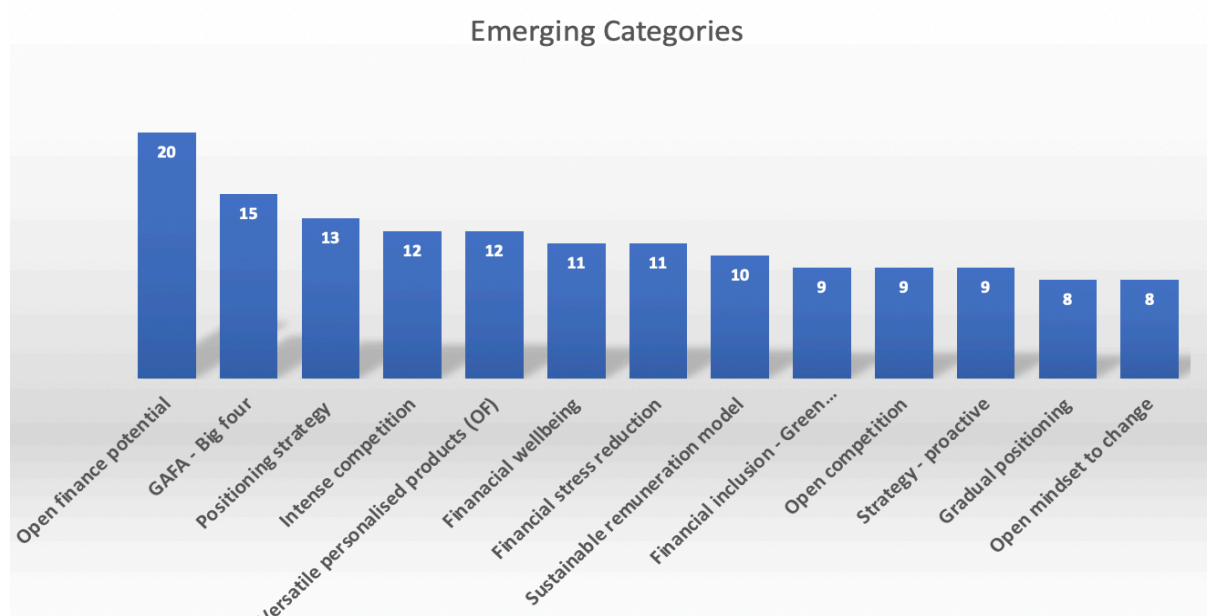
Figure 5.7 Chart of emerging categories of Emerging

The researcher examines Figure 5.7 and identifies the key categories with the higher impacts. These categories are Open finance, GAFA – Big four, Positioning strategy, and Financial wellbeing.

The research applies step (S06) which analyses the relationships between emerging categories. Table 5.5 displays the relationships analysis of the *Emerging* key area.

Table 5.5 Relationships between categories for Emerging

Relationship	Open Finance	GAFA - Big four	Positioning strategy	Financial wellbeing
Open finance potential	X	X	X	
GAFA - Big four	X	X		
Positioning strategy			X	

Intense competition	X	X		
Versatile personalised products (Open Finance)				
Financial wellbeing	X			X
Financial stress reduction	X			X
Sustainable remuneration model	X		X	
Financial inclusion - Green environmental impact	X			X
Open competition		X		
Strategy - proactive			X	
Gradual positioning			X	
Open mindset to change			X	
Changeable environment		X	X	X
Data accessibility (Open Finance)	X	X		X
Data visibility (Open Finance)	X	X		
Premature landscape			X	
Data quality (Open Finance)	X	X		X
Complex competition		X		
Disruptive competition		X		
Financial product comparison		X		
Strategy - Wait and see			X	

The research discovers that the core categories for Emerging area are "Open finance", "GAFA – Big four (Google, Amazon, Facebook, Apple)" and "Positioning strategy".

5.1.4.2 OBSERVATION AND HYPOTHESIS

The researcher applies step (S09) of Table 5.1, then collates and examines the findings of the data analysis in section 5.2.4.1. Then, an illustrative summary of emerging hypotheses is constructed as guided by the identified core categories "*Open finance*", "*GAFA – Big four*" and "*Positioning strategy*". Figure 5.12 shows the emerging hypothesis for the category *Emerging* key area.
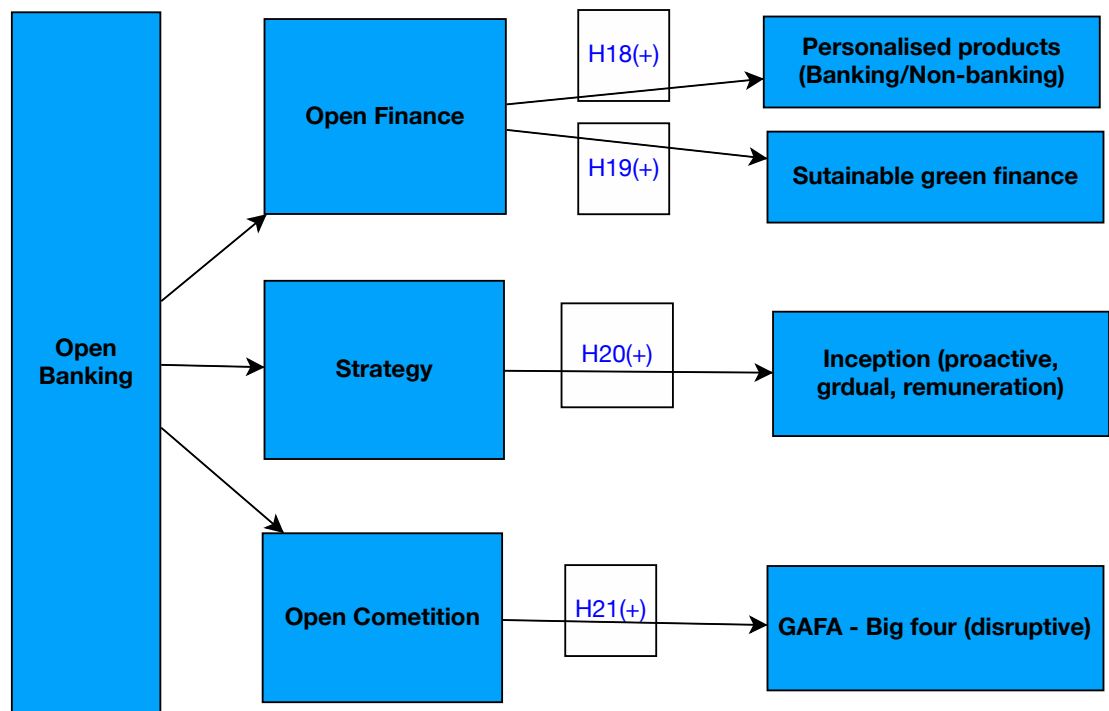
Figure 5.8 Emerging hypothesis for Emerging

Reflection on Figure 5.12 the researcher proposes four hypotheses as follows:

> *Hypothesis 18: H18(+): Open banking allows for the inclusion and integration with non-banking financial entities resulting in the enablement of open finance which increases the availability of banking and non-banking financial personalised products.*

> *Hypothesis 19: H19(+): Open banking enables open finance which accelerates the growth of green finance segment by facilitating a customer's accessibility to a wide range of sustainable green financial products.*

Hypothesis 20: H20(+): Within the Open banking changeable environment, banks to adopt an inception strategy that is proactive with gradual positioning while ensuring a sustainable remuneration model.

Hypothesis 21: H21(+): Open banking enables open competition allowing for the entrance of the big four tech (Google, Amazon, Facebook, Apple) which results in a disruptive and intense competition within the banking industry and accordingly presents a risk to traditional banks.

5.2 RESEARCH EVALUATION

The evaluation processes for qualitative findings ensures the robustness and quality of the research outcomes (Horsburgh, 2003; Stige, Malterud, & Midtgarden, 2009). The evaluation criteria for interpretive qualitative studies include the verification of credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985).

Fidler, Halaweh, & McRobb (2008) recommend the use of the same criteria for research which adopts the use of combined research methodologies with Case study. Table 5.6 shows the application of the evaluation criteria for this research as adopted from Lincoln & Guba (1985) and Fidler, Halaweh, & McRobb (2008).

Table 5.6 Research evaluation

ID	Criteria	Evaluation
E01	Credibility	Which is the "*confidence in the truth of the findings*" (Lincoln & Guba, 1985). This research proactively displays an adequate level of transparency throughout its development including limitations. It defines and presents the design of the selected research methodology including Case study protocol, steps, mechanism, and Grounded theory procedures prior to the commencement of data collection and analysis. It identifies participants, subject of study, and the unit of analysis to ensure transparency of Case study conduct. It selects eligible sources

		of qualitative secondary data carefully against rigid inclusion or exclusion criteria. The researcher adheres to the AUT supervision protocol and presents the supervisors with the study progress reports and research construction step by step, that is in seeking feedback, guidance, and corrections along the research journey.
E02	Transferability	Which is the ability to "*generalise the findings to other situations*" (Fidler, Halaweh, & McRobb, 2008). The generalisation of this qualitative finding is "*Analytical*" not "*statistical generalisation*" (Halaweh, 2012, p. 45). The nature of generalisation highlights the validity of application to produce the same outcomes when it is applied within different but comparable situations which share same properties (Fidler, Halaweh, & McRobb, 2008). The research explains the methodology framework and associated steps, procedures, and techniques which are used in conducting this study. It describes the framework and predefined steps of the data collection and analysis. This gives the confidence that if other researchers undertake the same research, then they can methodically and systematically follow these steps and subsequently acquire the same findings.
E03	Dependability	Which is ensuring that the "*research process is systematic and well documented and can be traced*" (Fidler, Halaweh, & McRobb, 2008, p. 8). The research adequality identifies the aims and objectives for the research. It documents thoroughly the progress and development of its construction including the steps and actions and declares the limitations.

E04	Conformability	Which is to ensure and "*assess whether the findings emerge from the data collected from cases and not from preconceptions*" (Fidler, Halaweh, & McRobb, 2008, p. 8). The research exhibits transparency in presenting excerpts of the collected secondary data in chapter four which are collected from participant statements in relation to the examined topic of Open banking. This demonstrates the relevancy and conformity of analysed data to the researched topic Open banking.

In applying the evaluation criteria against this study, the researcher is satisfied that it fulfils, conforms, and adheres to the criteria of Table 5.6.

5.3 CONLUSION

Chapter five presents the data analysis process and generates theory propositions. It explains the mechanism of the data analysis processes against the approved secondary datasets which are collected in the previous chapter four. It states the nine data analysis steps (S01➜S09) as listed in Table 5.1 which are applied in strict order against the selected secondary data. The chapter reports the framework's techniques in applying these steps against each of the key areas *Context, Behaviour, and Relationship* in addition to the newly identified key area *Emerging*.

The analysis applies the coding and CCA processes jointly and repetitively to achieve a higher degree of data abstraction which results in the emergence of categories for each of the key areas. It examines the relationships between emerged categories and discovers the core category (categories) which facilitates the generation of theory propositions. The chapter proposes seventeen hypotheses in answering this research's three questions as identified in section 1.3. Also, it proposes a further five hypotheses in relation to the emerging concepts that have significance to the Open banking environment. Table 5.7 lists the twenty-one proposed emerging hypotheses.

Table 5.7 Research hypotheses

Research question	Key Area	ID	Hypothesis
One	Context	Hypothesis 1	H1(+): The change introduced via Open banking including real-time processing enables innovation which adds value and positively influences opportunity creation to incumbents within the banking industry.
One	Context	Hypothesis 2	H2(+): The change introduced via Open banking including real-time processing enables innovation which positively influences the data sharing and processing within the banking industry in terms of accessibility, quality, and volume.
One	Context	Hypothesis 3	Hypothesis 3: H3(+): The change introduced via Open banking, including real-time processing, enables innovation which increases competition within the banking industry.
One	Context	Hypothesis 4	H4(-): The change introduced via Open banking and the enablement of innovation triggers a security concerns.
One	Context	Hypothesis 5	H5(-): The change introduced via Open banking and the enablement of innovation triggers a privacy concerns.
Two	Customer Behaviour	Hypothesis 6	H6(+): Open banking enhances the personalised and real-time customer

			journey which facilities added benefits in terms of increasing the variety of digital products and services available to customers.
Two	Customer Behaviour	Hypothesis 7	H7(+): Open banking enhances the personalised and real-time customer journey which improves the ability of customers to manage their financial data using innovative customised digital products and services.
Two	Customer Behaviour	Hypothesis 8	H8(+): Open banking enhances the personalised and real-time customer journey which positively influences the degree of convivence of the customer's banking experience.
Two	Customer Behaviour	Hypothesis 9	H9(+): Open banking enhances the personalised and real-time customer journey which attracts specific demographic segments including the young, tech-savvy, and travellers.
Two	Customer Behaviour	Hypothesis 10	H10(-): The lack of awareness about open banking triggers an aversion attitude which negatively influences the customer's behaviour in reducing the level of trust in adopting the new technology.
Two	Customer Behaviour	Hypothesis 11	H11(-): The lack of understanding of open banking triggers an aversion attitude which negatively influences a customer's

			behaviour into reducing the level of confidence in using the new products and services.
Three	Relationship	Hypothesis 12	H12(-): Open banking enables customers to have full ownership and control over their financial data which shifts the power in the relationship with banks resulting in making it easier for a customer to switch banks and accordingly increases the risk of customer attrition for banks.
Three	Relationship	Hypothesis 13	H13(-): Open banking enables customers to have full ownership and control over their financial data which shifts the power in the relationship with banks resulting in making it easier for customer to switch banks and accordingly decreases the level of loyalty to banks.
Three	Relationship	Hypothesis 14	H14(+): Open banking enables customers to have full ownership and control over their financial data and accordingly increases the customer's confidence in trying new products and services.
Three	Relationship	Hypothesis 15	H15(+): Within Open banking, customers develop scepticism towards TPPs which positively influences the reliance and relationship with traditional banks to govern the engagement with TPPs especially in future disputes or legal proceedings.

Three	Relationship	Hypothesis 16	H16(+): Open banking allows for ongoing customer social experience which enables an overall transition from the current transactional banking industry environment into a social banking one.
Three	Relationship	Hypothesis 17	H17(+): Open banking enables a social banking environment which increases the effect of social influencers on a customer's adoption and acceptance decision while engaging with new products and services.
-	Emerging	Hypothesis 18	H18(+): Open banking allows for the inclusion and integration with non-banking financial entities resulting in the enablement of open finance which increases the availability of banking and non-banking financial personalised products to customers.
-	Emerging	Hypothesis 19	H19(+): Open banking enables open finance which accelerates the growth of a green finance segment by facilitating a customer's accessibility to a wide range of sustainable green financial products.
-	Emerging	Hypothesis 20	H20(+): Within the Open banking changeable environment, banks must adopt an inception strategy that is proactive with gradual positioning while ensuring a sustainable remuneration model.

-	Emerging	Hypothesis 21	H21(+): Open banking enables open competition which allows for the entrance of the four big tech (Google, Amazon, Facebook, Apple) which results in a disruptive and intense competition within the banking industry leading to a risk to traditional banks.

The research now continues to chapter six which discusses the hypotheses that are listed in Table 5.7. It interprets the findings and answers the research's three questions. It proposes solutions to the identified issues and problems of the research topic. Then, it links the findings to existing literature and professional banking industry practice for assurance of conformity and the validity of the findings.

Chapter 6: Discussion

6.0   INTRODUCTION

Chapter six discusses and interprets the research findings which are summarised in Table 5.7. The objective is to answer the research questions and give solutions to the identified issues and problems which are summarised in Table 2.3. It explains the relevance of the findings to the topic of Open banking and verifies the applicability to existing literature and for banking industry practice.

The chapter develops an Open banking adoption model for managers that is constructed from the key findings and serves as a high-level planning and guidance tool to banks and industry practitioners for Open banking adoption plans. The adoption model proposes a phased approach and systemises the adoption process from early inception to completion. It has clearly defined steps, expected outcomes, and illustrative mechanisms to show adoption progress.

6.1   FINDINGS DISCUSSION

The research examines the impact of Open banking on the banking industry structure, the customer's adaptation behaviour, and the relationship between customers and banks. It answers the research three questions as declared in section 1.3.

The data analysis in chapter five has generated a total of twenty-one hypotheses as listed in Table 5.7. This section discusses each of the research questions and the related hypotheses.

6.1.1   RESEARCH QUESTION ONE

To answer the first research question; *What is/are the impact of Open banking on the structure of the banking industry?* the research proposes seven hypotheses in Table 5.7 with positive and negative influences as follows *H1(+), H2(+), H3(+), H4(-), H5(-), H20(+), and H21(+)*.

6.1.1.1 DISCUSSION

Open banking uses the standardised APIs as the connectivity mechanism which enables real-time transaction processing and digital data sharing between service providers across the banking industry. The real-time transaction processing increases the velocity of money across the financial system. The real-time digital data sharing maintains a unified, timely and accurate view of the customer's financial data across the banking industry. The real-time transaction processing and data sharing act as drivers for innovation as discussed in section 5.1.1.2.

H1(+) and H2(+) hypotheses of Table 5.7 indicate that the innovation enabled by Open banking has a direct positive impact on opportunity creation and growth expansion for the banking industry. That is because the real-time processing and data sharing expedites data movement which allows for a wide-scaled development of innovative and data driven products and services that are not restricted to the boundary of one bank. The expansion of the bank's portfolios of products and services strengthens its competitive position within the Open banking market as shown in Figure 5.2.

H3(+), H21(+) hypotheses of Table 5.7 indicate that Open banking has a positive impact on the structure and competition within the banking industry. It changes the structure of the banking industry from being almost monopolistic and enclosed with high entry barriers, to become open with lower entry barriers which facilitates the entrance of new challengers including the four big companies (GAFA). The increase in competitors results in the availability and accessibility of a wide range of competitive products and services. This changes the nature of the competition from being levelled and weak to becoming strong and disruptive.

H4(-) and H5(-) of Table 5.7 hypotheses indicate that Open banking has a negative impact. That is because it introduces security and privacy concerns within the banking industry. This is linked to the discrepancy in practice between banks and TPPs which results in a gap that exposes vulnerabilities in operations and integration arrangements.

H20(+) hypothesis of Table 5.7 indicates that the inception environment of Open banking is changeable, and with variables including regulations, the nature of competition, and market players. Proactive adoption strategies to manage and respond to the change imposed by these variables is required.

6.1.1.2 RELATIONSHIPS

The research recognises the key contribution of innovation. The real-time processing and data sharing of Open banking actively participates in facilitating innovation. The innovation opportunity and changes in the banking industry entry barriers influence a change in competition as indicated by H3 and H21. Thus, based on Table 5.2, Table 5.5, Figure 5.2, Figure 5.8, and the discussion of section 6.1.1.1 the research concludes the following relationships.

There is a positive relationship between the degree of innovation and the bank's ability to withstand the competition within the Open banking environment. In this direct relationship, from the bank's perspective, having a higher amount of innovation strengthens the bank's ability to withstand and lead the competition; and having a lower degree of innovation weakens the bank's ability to withstand the competition.

From the banking industry perspective, the research concludes a positive correlated relationship where having a higher overall degree of innovation increases the level of competition across the banking industry; and having a lower overall degree of innovation weakens the level of competition across the banking industry.

The research concludes a negative correlated relationship between the banking industry entry barriers and the level of competition within the Open banking market. In this inverse relationship, having lower entry barriers strengthens competition, and having higher entry barriers weakens competition.

The research concludes a negative correlated relationship between the banking industry entry barriers and emerging privacy and security risks. In this inverse relationship, having lower entry barriers increases privacy and security risks, and having higher entry barriers decreases privacy and security risks.

6.1.1.3 LITERATURE COMPATIBILITY

The research examines the compatibility of these findings to the literature reviewed. The emerging hypotheses are in alignment with the existing literature and serve common purposes.

The concept of innovation as a change catalyst in Open banking and its influence is examined in multiple studies including Brodsky & Oakes (2017); Farrell (2019); Gozman, Hedman, & Olsen (2018); Cortet, Rijks, & Nijland (2016); Sieber (2020); Premchand & Choudhry (2018); and Hoshi & Patrick (2000). The significance of innovation as a major disruptive factor associated with Open banking is analysed in studies including Tapiero (2013); Chiu (2016); and Omarini (2018). The link between the innovation enablement and the underlying technology of standardised APIs is addressed in studies including Marous (2017); Soulé (2017); Stoychev (2019); Greatorex & Mitchell (1994); and Littler & Melanthiou (2006). The importance of innovation in positioning strategies as a strengthening factor is highlighted in multiple studies including Standaert, Muylle, & Cumps (2020); Mintzberg (2000); Realini (2015); Fingleton (2019); and Flejterski & Labun (2016). The disruptive change of the competition within the Open banking environment is analysed in studies including Farrell (2019); Premchand & Choudhry (2018); Moysan & Rudnicki (2019); Gozman, Hedman, & Olsen (2018); Guibaud (2016); and Lewan (2018). The linkage between innovation and competition within Open banking is noted in multiple studies including Cornaggia, Mao, Tian, & Wolfe (2015); Premchand & Choudhry (2018); Húsek, Brich, & Procházka (2016); Sieber (2020); and Standaert, Muylle, & Cumps (2020). The effect of APIs on innovation and the competition level is addressed in studies including Guibaud (2016); Ho & Mallick (2010); and Farrell (2019). The ease of entry to the Open banking market by new entrants is noted in studies including Tyler (2019); and Khanboubi & Boulmakoul (2019). The risk of technology platforms entering the Open banking market is addressed in studies including Podszun (2019); Omarini (2018); Yunis, Koong, Liu, Kwan, & Tsang (2012);

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Tyler (2019); Canzer (2019); Gera, Secchi, Scaccheri, Sadowski, & Trott (2016); Valentine (2012); Moysan & Rudnicki (2019); Wack (2018); and Dove (2020).

6.1.1.4 OUTCOME

The research shows that the analysed hypotheses H1(+), H2(+), H3(+), H4(-), H5(-), H20(+), and H21(+) of research question one is firstly, relevant to the examined topic of Open banking. Secondly, the hypotheses are compatible with the existing literature and body of knowledge. Thirdly, they answer the first research question which explains the impact of Open banking on the structure of the banking industry. Therefore, these hypotheses are valid outcomes and answers for the research question.

The Open banking changes to the structure of the banking industry. The change manifests in three main dimensions. It enables innovation which expands growth and opportunity creation which increases the size of the banking industry. Second, it changes the nature of competition from being monopolistic and closed to become competitive and open. Third, it changes the characteristics of competition from being weak and limited to become intense and widely distributed. Fourth, it changes the banking industry barriers from being high entry barriers to become low entry barriers which results in the entry of new challengers. Table 6.1 summarises the impact of the Open banking on the structure of the banking industry.

Table 6.1 The Impact of Open banking on the structure of banking industry

Dimension	Impact
Innovation	o The impact enables innovation
	o The impact expands opportunity creation
	o The impact entices the growth of the banking industry
	o The impact increases the size of the banking industry
Competition	o The impact changes the competition from being Monopolistic and closed, to Competitive and open

	o The impact changes the competition characteristics from Weak and limited, to Intense and widely distributed
Industry barriers	o The impact changes the banking industry barriers from High entry barriers to Low entry barriers
	o The impact leads to a surge in FinTech TPPs challengers
	o The impact leads to the entry of super platforms GAFA
	o The impact increases privacy and security concerns

6.1.2 RESEARCH QUESTION TWO

To answer the second research question; *What is/are the impact of Open banking on the adaptation behaviour of customers?* the research proposes six hypotheses H6➔H11 in Table 5.7 that have positive and negative influences on the customer adaptation behaviour towards Open banking as follows: *H6(+), H7(+), H8(+), H9(+), H10(-), and H11(-)*.

6.1.2.1 DISCUSSION

Open banking allows the data sharing of a customer's data which enables product personalisation. This enhances the banks' capabilities in developing innovative and personalised digital products and services to the wants and needs of customers.

H6(+) and H7(+) hypotheses of Table 5.7 indicate that the Open banking has a positive impact on the customer's financial wellbeing. The availability of a wide array of personalised products and services improves the customer's state of financial welfare. That is because it equips the customer with capabilities and skills to personally control and manage their financials which results in positive tangible and intangible outcomes. This manifests in an improvement in the customer's sense of financial security and reduction in the sense of financial anxiety which fosters a positive customer attitude towards Open banking and develops a positive adaptation behaviour.

H8(+) hypothesis of Table 5.7 indicates that Open banking has a positive impact on the level of customer convenience. The banking experience is in their personal control. It equips the customer with capabilities to do their banking tasks remotely and digitally which reduces the customer's unaccounted depletion of personal resources, such as time. The enhanced level of convenience fosters a positive customer attitude towards Open banking and a positive adaptation behaviour.

H9(+) of Table 5.7 indicates that Open banking has a positive impact on specific customer demographic segments. It attracts the young, tech-savvy, and traveller demographic segments. Each segment is receptive to Open banking due to the defining characteristics. The young segment has curiosity and urge to engage with new digital products and services. Particularly when these products are encapsulated in social themes and ingrained in the daily tasks of life. The youth does not have a long relationship with their original banks which decreases their attachment and diligence of loyalty. The tech-savvy segment is driven with capabilities and technical skills to maximise the benefits of the Open banking new digital products and services. The traveller segment is driven by the need for remote and real-time accessibility to banking services irrespective of the restrictions of geographical location.

H10(-) and H11(-) hypotheses of Table 5.7 indicate that the Open banking produces a negative impact when there is a lack of awareness of its nature and understanding of its products and services. The abrupt introduction of Open banking develops a sense of uncertainty which creates aversity towards the use of its products and services. This delivers an aversive customer attitude and develops a negative adaptation behaviour.

6.1.2.2 RELATIONSHIPS

The research recognises that the customer's adaptation behaviour does not develop itself in isolation. Behaviour is constructed from the customer's perception and attitude towards the experience of interacting with the Open banking products and services. The personalisation, demographic characteristics, and awareness influence the customer's

attitude and adaptation behaviour. Thus, based on Table 5.3, Figure 5.4, and the discussion of section 6.1.2.1 the research concludes the following relationships.

There is a positive relationship between product personalisation and the customer's adaptation behaviour towards Open banking. In this direct relationship, having a higher degree of personalisation in products and services development, strengthens the adaptation behaviour of customers. Having a lower degree of personalisation weakens the adaptation behaviour of customers.

There is a negative relationship between the customer's age segment and the adaptation behaviour. In this inverse relationship, having a lower age segment (youth) strengthens the adaptation behaviour of customers, and having a higher age segment weakens the adaptation behaviour of customers.

There is a positive relationship between the customer's technological literacy and the adaptation behaviour. In this direct relationship, having a higher degree of technological literacy strengthens the adaptation behaviour of customers, and having a lower degree of technological literacy weakens the adaptation behaviour of customers.

There is a negative relationship between the customer's state of residence and the adaptation behaviour. In this inverse relationship, having a customer in a travelling state strengthens the adaptation behaviour, and having a customer in permanent residence state weakens the adaptation behaviour.

The researcher concludes a positive relationship between the customer's degree of awareness of Open banking and understating of its products and services, to the adaptation behaviour. In this direct relationship, having a higher degree of awareness and understanding strengthens the adaptation behaviour of customers, and having a lower degree of awareness and understanding weakens the adaptation behaviour of customers.

6.1.2.3 LITERATURE COMPATIBILITY

The research examines the compatibility of these findings to the literature reviewed. The findings are in alignment with the existing literature and support common conclusions.

The enablement of personalised products and services is a point of difference for Open banking which is leveraged in competition as examined in multiple studies including Menat (2016); Fenu & Pau (2015); Sampaio, Ladeira, & Santini (2017); Gomber, Kauffman, Parker, & Weber (2018); Crosby & Johnson (2001); Treuhaft (2006); Vives (2017); and Nicoletti (2017). The product personalisaiton fosters personalised relationships between incumbents and customers which enables a positive customer experience as discussed in Dahlberg, Mallat, Ondrus, & Zmijewska (2008); Lu, Lee, & Tseng (2011); Pousttchi & Schurig (2004); Kapoor & Vij (2020); and Liu, et al. (2015).

The impact of demographic variables on the customer's behaviour is in alignment with existing literature. The analysis of demographic characteristics and its effect on the customer's behaviour is examined in Lazer (1994). The links between demographic variables and the customer's expectations are examined in Webster (1989). The influence of age segment is used for market segmentations to assess the customer's receptivity to new products and services (Belch & Belch, 1993). Also, in another study the age segment is directly linked to the outcome of consumer behaviour (Thompson & Kaminski, 1993). In the banking industry demographic variables enable a degree of assurance in the customer's behaviour and the outcome varies amongst demographic segments that is examined in studies including Jain (2013); Webster (1989); Belch & Belch (1993); Thompson & Kaminski (1993); Lazer (1994); and Jain (2013). The importance of awareness and customer education in influencing outcomes is in alignment with existing literature as examined in studies including Vasiljeva & Lukanova (2016); Dunphy & Herbig (1995); Koh & Owen (2000); Jick (1979); Bernard (2017); and Farnsworth (2019).

6.1.2.4 OUTCOME

The research shows that the analysed hypotheses *H6(+), H7(+), H8(+), H9(+), H10(-), and H11(-)* of research question two are firstly, relevant the examined topic of Open banking. Secondly, they are compatible with the existing literature and body of knowledge. Thirdly, they answer the second research question which explains the impact

of Open banking on the adaptation behaviour of customers. Therefore, the research accepts these hypotheses as valid outcomes and answers to the research question.

The change in customer adaptation behaviour is influenced by the applied personalisation in products and services development for the customer's age, state of residence, technological literacy, and level of awareness and understanding. Table 6.2 summarises the change in the customer adaptation behaviour.

Table 6.2 The Impact of Open banking on the customer behaviour

Dimension	Impact
Personalisation	The Personalisation of products and services influences the adaptation behaviour: ▪ Adequate personalisation influences a positive adaptation ▪ Lack of personalisation influences a negative adaptation (rejection)
Age segment	The customer's age influences adaptation behaviour: ▪ Youth influences a positive adaptation ▪ Old influences a negative adaptation (rejection)
Technological literacy	The customer's technological literacy influences adaptation behaviour: ▪ Technological literacy influences a positive adaptation ▪ Technological illiteracy influences a negative adaptation (rejection)
Sate of residence	The customer's sate of residence influences adaptation behaviour: ▪ Travellers influences a positive adaptation ▪ Residency influences adaptation variously
Awareness & Understanding	The customer's level of awareness/understanding influences adaptation behaviour ▪ Adequate awareness/understating influences a positive adaptation

	▪ Lack of awareness/understating influences a negative adaptation (rejection)

6.1.3 RESEARCH QUESTION THREE

To answer the third research question; *What is/are the impact of Open banking on the relationship between customers and banks?* the research proposes six hypotheses H12➔H17 in Table 5.7 with positive and negative influences on the relationship between customers and banks as follows: *H12(-), H13(-), H14(+), H15(+), H16(+), and H17(+).*

6.1.3.1 DISCUSSION

Open banking changes the ownership of customer financial data. This grants customers the flexibility and freedom to switch service providers and bargain-hunt for competitive products and services across the banking industry. This is an act of liberation for customers and redefines the boundaries of the traditional relationship between customers and banks.

H12(-), H13(-) hypotheses of Table 5.7 indicate that Open banking from the bank's perspective, has a negative impact on the traditional relationship between customers and banks. That is because the customer enjoys flexibility and freedom of selecting products and services from different service providers. This changes the boundary of the traditional *one-one* relationship between customer and banks and constructs a new *one-many* relationship for multiple parties. As a result, it decreases the sense of a customer's loyalty and allegiance towards their original banks.

H14(+) and H5(+) hypotheses of Table 5.7, indicate that Open banking has a positive impact on the relationship with banks. That is because the freedom in selection without a long commitment increases the customer's confidence in trialling new products and services with banks. In addition, driven by the scepticism towards TPPs, the customer develops a degree of reliance on their bank to govern the engagement with TPPs, and act as a mediator and safety-net in potential future conflicts, disputes, or legal proceedings.

H16(+) and H17(+) hypothesis indicate that the Open banking has a positive impact on the relationship between banks and customers. Open banking enables social interactions between customers and the socially themed products and services. This transforms the traditional relationship from being only transactional to become a social engagement for a social banking experience. This facilitates the transformation of banks into financial and social platforms. The social banking experience increases the impact of social influencers on the outcome of a customer's adaptation behaviour.

6.1.3.2 RELATIONSHIPS

The research finds that the customer's freedom and social banking experience influences a change in the relationship between customers and banks. Thus, based on Table 5.4, Figure 5.6, and the discussion of section 6.1.3.1 the research concludes the following relationships.

There is a negative relationship between a customer's freedom of selection, loyalty towards original banks, and customer attrition. In this inverse relationship, having a higher degree of customer freedom weakens the loyalty towards original banks. As a result, it increases the risk of customer attrition. Second, having a lower degree of customer freedom strengthens the loyalty towards original banks. As a result, it decreases the risk of customer attrition.

There is a positive relationship between the social dimension enabled by Open banking, the emergence of social banking experience, and customer retention. In this direct relationship, having a higher degree of social interaction between customers and banks strengthens the emergence of a social banking experience. As a result, it increases customer retention. Second, having a lower degree of social interaction between customers and banks weakens the emergence of social banking experience which decreases customer retention.

There is a positive relationship between the customer's scepticism towards TPPs and the degree of reliance on traditional banks. In this direct relationship, having a higher

degree of scepticism towards TPPs strengthens the reliance on original banks, and having a lower degree of scepticism towards TPPs weakens the reliance on original banks.

6.1.3.3 LITERATURE COMPATIBILITY

The research examines the compatibility of these findings to the literature reviewed. The findings are in alignment with the existing literature and support common conclusions directly and indirectly.

The customer's freedom under Open banking has not been examined on its own, however, it is discussed as an outcome of fair competition, which is covered in multiple studies including Farrell (2019); Premchand & Choudhry (2018); Moysan & Rudnicki (2019); Gozman, Hedman, & Olsen (2018); Guibaud (2016); and Lewan (2018). The improvement in the customer's convience is a direct outcome of open competition, as has been discussed in studies including Tyler (2019); and Khanboubi & Boulmakoul (2019). The enablement of social banking experience via Open banking is examined in relation to the theme of social innovation which acts as a change agent in the emergence of new banking experiences (Moore, Westley, & Nicholls, 2012). These experiences ultimately lead to "*the generation of positive social externalities*" (Nicholls, Paton, & Emerson, 2015, p. 3). Banks, hence, develop higher customer interaction rates to attain social relationships (Joshi & Josi, 2006). Further, the social dimension contributes to the longevity of relationships between customers and banks (Weber, 2010).

6.1.3.4 OUTCOME

The research shows that the analysed hypotheses *H12(-), H13(-), H14(+), H15(+), H16(+),* and *H17(+)* of research question three, are relevant to the examined topic of Open banking. Secondly, they are compatible with the existing literature and body of knowledge. Thirdly, they answer the third research question which explains the impact of Open banking on the relationship between customers and banks. Therefore, the researcher accepts these hypotheses as valid outcomes and answers to the research question.

Open banking changes the traditional relationship between customers and banks. It changes its dimension from one-to-one to become one-to-many. It changes its nature from transactional to become socially interactive. It decreases the customer's loyalty towards their original bank. It contributes to transforming banks into becoming social and financial platforms to offer social banking experiences. Table 6.3 summarises the change to the new relationship between customers and banks.

Table 6.3 The Impact of Open banking on the relationship between customers and banks

Dimension	Relationship Impact
Data ownership	The data ownership changes from banks to customers
Relationship dimension	The relationship dimension changes from one-one ➔ one-many
Control	The control of the relationship shifts to the customer
Freedom	The customer enjoys a higher degree of freedom in roaming and bargain-hunting freely across the banking industry
Loyalty	The customer exhibits less loyalty towards original banks
Social interaction	It contributes to transforming banks to social and financial platforms and the relationship changes from being transactional into becoming social banking experience.
Reliance	The customer exhibits more reliance on original banks in governing the engagements with TPPs.

6.1.4 SUMMARY OF RELATIONSHIPS

The summary of relationships contributes to the development of the solutions for the issues and problems in this study. The research summarises the concluded relationships which are developed in sections 6.2.1, 6.2.2, 6.2.3. Table 6.4 gives a summary of the research relationships.

Table 6.4 Summary of emerging relationships

Relationship	Dimension	Nature
RE-01	The degree of applied innovation verses the bank's ability in competition	Direct
RE-02	The degree of applied innovation verses the competition level	Direct
RE-03	The banking industry entry barriers verses the competition level	Inverse
RE-04	The banking industry entry barriers verses emerging privacy and security concerns	Inverse
RE-05	Product personalisation verses the customer's adaptation behaviour	Direct
RE-06	The customer's age verses the customer's adaptation behaviour	Inverse
RE-07	The customer's technological literacy verses the customer's adaptation behaviour	Direct
RE-08	The customer's state of residence verses the customer's adaptation behaviour	Inverse
RE-09	The customer's awareness/understanding verses the customer's adaptation behaviour	Direct
RE-10	The customer's freedom of selection verses the customer's loyalty verses customer attrition	Inverse
RE-11	Social interaction verses social banking experience verses customer retention	Direct
RE-12	The customer's scepticism towards TPPs verses the customer's reliance on original banks	Direct

6.2 SOLUTIONS

This section gives solutions to the identified issues and problems of the research which are summarised in Table 2.3. The solutions are derived from the emerging hypotheses and discovered relationships. The research presents the solutions to industry practitioners as future research for consideration and feedback on the validity, practicality in implementation, and alignment with the banking industry practices.

A mapping process links the identified issues and problems to the three research questions, the hypotheses of Table 5.7, and the relationships of Table 6.4. The process ensures reference to the research findings and justification of the suggested solutions. Table 6.5 displays the mapping between issues, research questions, hypotheses, and relationships.

Table 6.5 Mapping the issues to research questions, hypotheses, and relationships

Issue/Problem	Research question	Hypothesis	Relationship
Pace of adoption and competition	One	H1, H2, H3, H21, H20	RE-01, RE02, RE-03
Security and privacy concerns	One	H4, H5	RE-04
The Adaptation/rejection behaviour	Two	H6, H7, H8, H9, H10, H11	RE-05, RE-06, RE-07, RE-08, RE-09
Relationship	Three	H13, H14, H15, H16, H17	RE-10, RE-11, RE12

6.2.1 PACE OF ADOPTION AND COMPETITION

The research finds solution to the issue of IP5 in Table 2.3 which concerns the pace of Open banking adoption. It links to H1, and H20. Thus, the leadership of the banking industry must adopt proactive Open banking inception strategies ahead of the enforcement by the regulator. The early adoption mitigates risks and increases the bank's

capability to respond to the changeable variables within the inception environment. Further, it recommends that the positioning strategies are gradual and follow risk-based approaches towards the targeted position within the Open banking market. The suggested positioning strategy requires specific actions and includes roadmaps, investment slates, systematic phases, and checkpoints, to ensure adequacy in the state of readiness.

In addition, to manage capital exposure the researcher recommends developing a commercial model which is feasible in context, sustainable, and suits the characteristics and profitability targets of each of the gradual positioning phases including producer, distributor, integrator, and platform. Each position varies commercially and offers different opportunities. The inability to develop remuneration models disrupts the Open banking inception process.

The research finds solution to the issue IP1 of Table 2.3 which concerns the competition within the Open banking environment. The solution links to H2, H3, H21 and RE-01, RE-02, RE-03, RE-11. Thus, the research, driven by RE-01 and RE-02, recommends that banks adopt and invest in innovation to increase their capabilities and resilience by developing competitive products and services. This enhances the bank's products and services which improves the ability to withstand and lead the competition.

In addition, RE-03 and RE-11, recommend that banks adopt personalisation and social interaction themes in products and services development which contributes to the transformation of banks into becoming social and financial platforms. This allows the bank to gain the competitive advantage of offering the social banking experience with innovative and personalised products and services for customer retention.

6.2.2 SECURITY AND PRIVACY CONCERNS

The research finds solution to the issues IP2 and IP3 of Table 2.3 in relations to security and privacy concerns. The study links to H4, H5 and RE-04. Thus, the researcher recommends banks to refrain from customised integration solutions between the bank and TPPs and focus instead on the use of standardised APIs. The integration touchpoints increase the risk of exposure in terms of exploitation and vulnerability.

The research recommends banks to mandate the compliance of TPPs, hence banks must develop a rigorous and comprehensive security and privacy standard for partnership agreements with TPPs. The agreement ensures a unanimous adoption to expected security and privacy standards within the banking industry, it also dictates consequences for non-compliant actions.

The researcher recommends that the ownership of liability is to be treated as variable and not stationary. Thus, it follows the journey of exchanging data between service providers is dynamic. For example, in the case of data exploitation which involves multiple service providers, the liability lies with the service provider which owns the vulnerability where the actual exposure occurred. The lack of detail to liability ownership exposes all parties including customers, banks, and TPPs, to disputes, damages, and legal proceedings.

6.2.3 ADAPTATION AND REJECTION BEHAVIOUR

The research finds solution to the issue IP4 of Table 2.3 in relation to the customer's adaptation behaviour. The study links to H6, H7, H8, H9, H10, H11 and RE-06, RE-07, RE08, RE-09.

The researcher, driven by RE-06, recommends that banks develop strategies and marketing campaigns to attract a young demographic segment who tends to exhibit less risk averseness attitude and more positive adaptation behaviour.

RE-07 recommends that banks develop strategies and educational programs around technological literacy to target technologically illiterate demographic groups. This minimises the barriers of technology to influence positive attitude and adaptation behaviour.

RE-08 recommends banks to develop strategies and adequate marketing campaigns to attract the traveller segment which tends to appreciate and seek instant remote accessibility and expediency in doing their banking. This leads to a positive attitude and adaptation behaviour.

RE-09 recommends a collaboration between banks, TPPs, policy makers, and government agencies to develop national strategies and actionable plans to educate customers about Open banking, ahead of its inception. These actions improve a customer's awareness about Open banking and their understanding of its products and services. This influences positive attitudes and adaptation behaviour.

6.2.4 RELATIONSHIP

The research finds solutions to the issue IP6 of Table 2.3 which concerns the change in relationship between customers and banks. The research links to H13, H14, H15, H16, H17 and RE-10, RE-12.

The researcher, driven by RE-10, recommends that banks adopt pre-emptive strategies to mitigate the risk of decreasing the customer's loyalty and customer attrition. The authentic sense of loyalty in the traditional relationship only remains when it is mutual and rewarding to both sides. Thus, the researcher further recommends banks to actively develop a genuine and balanced relationship with customers prior to the inception of Open banking.

RE-12 recommends that banks adopt pre-emptive strategies prior to incepting Open banking to build a level of customer trust in the original bank. The established trust increases the customer's reliance on their original banks to use their products and services, and to govern the relationship with TPPs.

6.2.5 MODELLING THE ADOPTION SOLUTIONS FOR MANAGERS

The adoption of Open banking imposes radical change to the structures and processes of banking organisations. This is a management challenge and the data from this research can be constructed into a reference model and solution for practitioners seeking guidance. The adoption is not a one-off task of a single phase of implementation but has a lifecycle of phases and entails multiple steps in implementation and frequent readiness checkpoints. The research develops a reference Open banking adoption model for

managers, that is constructed from the key findings and suggested solutions presented in sub-sections 6.2.1, 6.2.2, 6.2.3, and 6.2.4 of this research.

A model is a representation of reality and in this case the representation is of the Open banking phenomenon from a banking manager perspective. The construction uses illustration from the information gathered in the data analysis to explain and to communicate the purpose, phases, and steps of the model (Havenga, Poggenpoel, & Myburgh, 2014). The process of model construction entails two major steps. The first step is the "*construction of conceptual meaning*" which identifies and selects key concepts and dimensions of the research outcomes (Havenga, Poggenpoel, & Myburgh, 2014, p. 150). The selected key dimensions are in alignment with the study conclusions, research design, and derived from the findings (Chinn & Kramer, 2011; Meleis, 2012). The second step is "*structuring and contextualising the model*" which defines the purpose of the model, describes its key components, and illustrates its relationships (Chinn & Kramer, 2011; Meleis, 2012; Havenga, Poggenpoel, & Myburgh, 2014, p. 153).

The modelling singles out from the defined solutions for managers the following key dimensions for Open banking adoption which are *Inception, Investment, Innovation, and Socialising*. The inception refers to the initial stage of Open banking activation which is driven by regulation. The investment refers to enhancements in the bank's capabilities which allows it to assume the targeted position within the Open banking market. The innovation dimension is shown in H1, H2, RE-01, and RE-01. The socialising dimension is shown H16 and RE11.

Second, the research identifies the purpose of this adoption model, which is to serve as a reference planning and guiding tool for managers to simplify and systematises the adoption of Open banking from the early inception stage and to the positioning phases within the banking industry. It has a clear set of defined steps, expected outcomes, and illustrative communication mechanisms.

Third, the research describes the structure of this model. It has a sequential nature in implementation and has ongoing feedback relationship loops between its dimensions.

Table 6.6 shows the adoption model for managers and explains the entry and exit criteria of each of its phases and expected outcomes and pre-requisites.

Table 6.6 The open banking adoption model for managers

Phase	Outcome	Pre-requisites
Inception	• Regulations compliance • Developing standardised APIs • Developing Minimal Viable Product (MVP) • Developing internal business processes • Developing remuneration modules • Developing positioning strategies • Developing privacy and security agreements with TPPs • Developing a culture of openness and Agile mentality	• The bank establishes sustainable relationships with customers • The bank activates awareness and understanding campaigns • The bank conducts market research
Investment	• Investing in infrastructure and cut-edge technology (ML, AI, bot ...etc.) • Investing in developing new lines of personalised product and service • Investing in the social engineering of product development • Investing in human capital and skills • Investing in external partnerships	• The bank communicates via standardised APIs across the banking industry • The bank seeks external partnerships

Innovation	• Offering socially interactive and personalised products and services • Offering standardised APIs to other industries • Pivoting into platform positioning • Utilising cutting-edge technology (ML, AI, bot ...etc.)	• Active personalised products •Active external partnerships
Socialising	• Transforming into a financial and social platform • Offering non-financial products	•Active socially interactive and personalised products •Active APIs across other industries (i.e., utilities)
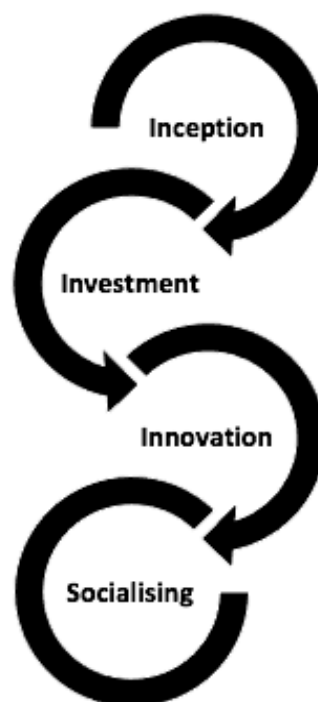
Figure 6.1 Open banking adoption reference model for managers

Figure 6.1 has visual communication for the adoption model of Open banking for managers and the relationship loops between its dimensions. Managers may use this tool for ready reference and checkpoint navigation.

The researcher promotes the use of a radar chart to work jointly with the model for guiding manager tactic knowledge. The chart acts as an illustrative and indicative tool for positioning performance and progress checkpoints for banks in their Open banking adoption. Each of the defined outcomes is measured and scored separately. Then the outcomes are collectively scored with indicative averaged values (Boehm & Turner, 2003; Hoda & Noble, 2017). Table 6.7 displays the mapping between the suggested score values and the positioning on the radar chart which uses basic scoring keys of Low, Medium, High. To achieve more accurate and granulated representation, the model uses a (1-10) scaling system corresponding to L, M, H values as displayed Table 6.7.

Table 6.7 Radar chart mapping values

Value	Definition	Position
L (0-3)	Low performance in achieving outcome	Innermost on the radar chart
M (4-7)	Medium performance in achieving outcome	Central on the radar chart
H (8-10)	High performance in achieving outcome	Outermost on the radar chart

To demonstrate the use of the radar chart (Figure 6.2) and the adoption reference model (Figure 6.1), case examples are taken from the research database and computed here. An example of two cases is extracted from the collected secondary data of bank (A) and bank (B) which are adopting Open banking within the same environment (country is the UK). This means that they do face and share the same expectations in terms of regulations and surrounding challenges. Data analyse of the cases proceeds by stripping the adoption plans and related materials and computing an estimated score for each bank against the criteria of the adoption model for managers, as follows in Table 6.8.

The researcher -guided by the collected data of bank (A) and (B) scores each of the outcomes of the Open banking reference model dimensions as displayed in Table 6.8. The scoring is verified by two independent practitioners within the banking industry. The objective of the validation process is to ensure neutrality and objectivity in scoring each bank's outcomes.

Table 6.8 Example of Open banking adoption model for managers

Dimension	Outcome	(A)	(B)
Inception	Regulations compliance	8	6
	Developing standardised APIs	7	5
	Developing Minimal Viable Product (MVP)	9	3
	Developing internal business processes	6	2
	Developing remuneration modules	7	5
	Developing positioning strategies	6	4
	Developing privacy and security agreements with TPPs	6	3
	Developing a culture of openness and Agile mentality	4	1
		6.625	**3.625**
Investment	Investing in infrastructure and cut-edge technology (ML, AI, etc.)	8	8
	Investing in developing new lines of personalised product and service	7	5
	Investing in the social engineering of product development	7	3
	Investing in human capital and skills	6	2
	Investing in external partnerships	5	6
		6.6	**4.8**
Innovation	Offering socially interactive and personalised products and services	5	4
	Offering standardised APIs across industries	7	3
	Utilising cut-edge technology (ML, AI, bot ...etc.)	3	0
	Pivoting into platform positioning	2	0
		4.4	**2.4**
Socialising	Transforming into financial and social platform	5	0
	Offering non-financial products	1	0
		3	**0**

Figure 6.2 displays the data of Table 6.8 on a generated radar chart to show each bank's performance and position in relation to the suggested Open banking adoption model for managers. The radar chart illustrates a quick comparison and shows that bank (A) is almost positioned centrally and leans towards the outermost. The graph of bank (B) leans towards the innermost. This indicates that the bank (A) is ahead of bank (B) in their Open banking adoption.
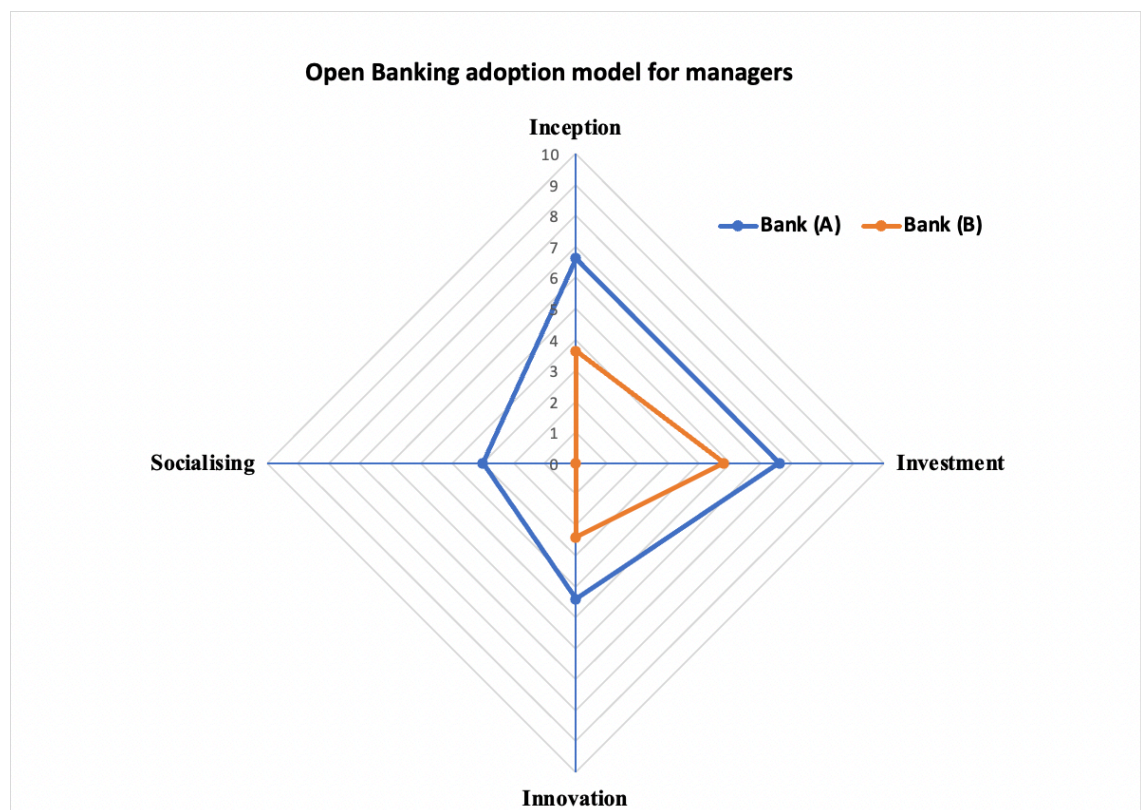
Figure 6.2 Radar chart for the Open banking adoption for managers

Further, the bank (A) displays a consistent investment case in technology and innovation which allows it to offer socially interactive and personalised products ahead of bank (B) which is still lagging in the inception phase while trying to meet the regulatory requirements. The chart indicates that the bank (A) is actively working towards transforming itself into a financial and social platform which offers social banking experience rather than being only a transactional traditional bank.

The example illustrates the comparison of banking readiness and stage attainment between banks, but it can also be used between bank branches or within a single branch. In this way the adoption reference model is an applicable ready reckoner for managers to plot and to plan strategy and resource allocations. It can be used to target resources and to motivate staff to achieve the required organisational outcomes. The reference model and the tool make a valuable contribution to managers guiding their organisation and staff through the radical changes brought by the Open banking movement.

6.3   LIMITATIONS OF THE STUDY

The researcher declares the following limitations to exbibit trust and reliability in findings. First, the generalisation of the research findings is based on concepts and theories coming from qualitative data only which opens it for criticism as explained in section 3.9 (Walsham, 1995). Nonetheless, Eisenhart (2009, p. 52) confirms that the "*generalizations from qualitative research are both possible and important*" and Polit & Beck (2010, p. 1452) assert that "*it is analytic not statistical generalisation*". Additionally, Yin (2003, p.10) explains that "*case studies are generalisable to theoretical propositions and not to populations or universes*", and the generalisation is actually "*Analytical Generalisation*" not "*Statistical Generalisation*" (Yin, 1994). Further, Strauss and Corbin (1990) explain that the generalisation in Grounded theory is driven by data abstraction, and there is a relationship between the level of data abstraction and generated theory (Strauss & Corbin, 1990) in terms of "*the more abstract the concepts, the more theory applicability*" (Fidler, Halaweh, & McRobb, 2008, p. 7). Halaweh (2012, p.27) asserts that "*Interpretive case studies and grounded theory research are similar in terms of the generalisability of the results*". Therefore, the findings of the research are only analytically and not statistically generalised to other situations which are comparable in the context and conditions to the current research.

Second, with COVID-19 travel restrictions there was the limitation of acquiring a fresh set of primary data from overseas participants where Open banking is implemented; that is in places such as United Kingdom or the Scandinavian countries. However, the

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research acknowledges that the use of secondary data is sufficient for the objective of this study. Yet, there are other lines of inquiry that the researcher would have preferred to have access to the original participants of secondary data to follow up on specific questions. For example, the customer's evolving behaviour towards the experience of using GAFA financial products.

Third, Open banking is an emerging topic and there is a constant change in its vision and implementation by the practitioners of the global banking industry. The researcher has continuously updated this research with the emerging materials and concepts in relation to the evolution of the Open banking topic, until today.

6.4   DISCUSSION SUMMARY

Chapter six discusses the finding and hypotheses of chapter five which are summarised in Table 5.7. It discusses each hypothesis separately then aggregates them to answer each of the research questions.

In answering question one, the discussion discovers four relationships RE-01, RE02, RE03, RE-04. These relationships describe the impact of Open banking on the structure of the banking industry. They also explain the change in competition because of lowering the entry barriers to the banking industry which facilitates the entry of new challengers including TPPs and GAFA. This changes the nature and intensity of competition as described in Table 6.5. The discussion explains the linkage between the competition and innovation which is a key driver to intensify the competition, and results in an expanding opportunity for creativity and the size in the banking industry. The discussion covers the emerging customer's privacy and security concerns and explains the linkages to the degree of openness in competition, and industry entry barriers. These changes are summarised in Table 6.1.

In answering question two, the discussion discovers four relationships RE-05, RE-06, RE07, RE09. These relationships explain the factors which influence the customer's adaptation behaviour. Personalisation is a key factor in influencing the customer's behaviour, and to build a positive attitude towards the adoption of new products and

services. The discussion reveals direct and inverse relationships between the adaptation behaviour and specific demographic segments. The youth and traveller demographic segments are motivated and receptive to positive adaptation behaviour in comparison to other demographic segments including old and non-travellers. Technological literacy directly influences the customer's adaptation behaviour to adopt the use of innovative products and services. The discussion explains the relationship between the customer's privacy and security concerns and rejection behaviour. It further iterates the importance of building pre-emptive strategies to instigate a foundational awareness of the Open banking opportunity and understanding of its products and services. These adaptation behavioural changes are summarised in Table 6.2.

In answering question three, the discussion discovers three relationships RE-10, RE-11, RE12. These relationships explain the changes to the traditional relationship between customers and banks. Open banking changes the ownership of the customer's financial data, from banks to customers. This shifts the power and control in the relationship towards the customer. As a result, the customer enjoys a transpired sense of freedom of choice and selection. This manifests in breaking the traditional sense of loyalty to original banks, and instead the customer roams freely and seamlessly bargain-hunting across the banking industry. The discussion explains the significance of embedding social engineering into to the process of product development to add interactive social themes. The transformation to a social and financial platform allows banks to offer a social banking experience and to improve customer retention. The discussion shows that the customer exhibits further reliance on the relationship with original banks in managing the risk and concerns related to TPPs and potential disputes. These changes in the relationship between customers and banks are summarised in Table 6.3.

This chapter gives solutions to the identified issues and problems in section 2.6.1, 2.6.2, 2.6.3, and 2.6.4. The solutions are driven by the emerging findings and the developing relationships RE01➜RE-12 which are summarised in Table 6.4.

The chapter develops an Open banking adoption model for managers which serves as a high-level planning and guidance tool to banks and industry practitioners in their Open banking adoption. The dimensions of this model are derived from the four significant emerged findings of Inception, Investment, Innovation and Socialising.

Chapter seven now offers a comprehensive conclusion to the research. Thus, it offers a set of recommendations to the banking industry practitioner to assist banks in their Open banking adoption. Further, it recommends to academic and professional communities prospect areas for future research in relation to the examined topic of Open banking.

Chapter 7: Conclusion

7.0   INTRODUCTION

The conclusion presents the key conclusions, objectives and arguments which allow readers to leave the details and view the holistic picture of the research (Bunton, 2005). Chapter seven summarises the actions and findings of the research. It recaps the main goals and outcomes for each of the sequential chapters to report the fulfilment of their goals and objectives. It revisits the emerged hypotheses, relationships, and the answers to the research questions, before drawing final conclusions.

The chapter presents recommendations to the banking industry which ensures the linkage between the research outcome and its practical implementation within the banking industry. The set of recommendations cover the solutions to the identified issues and problems, inception strategy, and the Open banking adoption model for managers which measures and tracks the adoption progress. Also, the researcher puts forward to the academic and professional communities a list of emerging research areas for future investigation.

7.1   SUMMARY OF THE STUDY

The research is a socio-technical theoretical study within the banking industry under the overarching umbrella of the Information System field. It applies qualitative research methods against selected qualitative secondary data sets. The research uses a combined research methodology which integrates the Case study and Grounded theory methods in one framework. The research examines the impact of the Open banking environment on the social construction of the banking industry. It inductively theorises its impact on the banking industry structure, adaptation behaviour of customers, and the new relationship between customers and banks.

This research contributes to professional and academic communities. First, it provides future researchers with a combined research methodology construction and systematic steps in studying emerging socio-technical phenomena. Second, it develops

an Open banking adoption model for managers which serves as a high-level planning, guidance, and reference tool for industry practitioners in banks during and before Open banking adoption. Third, it puts forward a list of practical suggestions and mechanisms in managing the Open banking adoption. Fourth, it contributes to the body of knowledge by joining the continuing discussions on demystifying the multifaceted impacts of Open banking adoption. Specifically, it contributes to the body of Information Systems (IS) knowledge by constructing and validating twenty-one generated hypotheses (H1➔H21) and discovering twelve direct and inverse relationships (RE01➔RE12) which facilitates theory generation to remedy detected gaps and identified issues and problems in the reviewed literature.

Chapter two reviews the existing literature in relation to the researched topic which is Open banking. The research adopts the systematic Delphi framework for literature selection as described in detail in section 2.1.1 for the adequacy, consistency, and efficiency in potential outcomes. Upon the completion of the literature review, the researcher detects gaps in the existing body of knowledge and identifies issues and problems related to Open banking as discussed in section 2.5 and summarised in Table 2.3.

Chapter three explains the adopted combined research methodology. The methodology framework integrates the Case study method and Grounded theory method (*Straussian Approach*). The objective of integrating two research methods into one methodology is to utilise the strengths of each of the methods to overcome the gaps and shortcomings of the other. Case study serves as a mechanism for data collection, and the Grounded theory is applied for data analysis and theory generation via the use of its procedures of coding and abstraction. The chapter illustrates the design and structure of this combined methodology framework in Figure 3.3 and explains its sequential phases and steps in Table 3.6.

Chapter four describes the findings of the Case data collection process. It defines the mechanism of secondary data selection and collection. It explains the search strategy which is driven by the criteria of data eligibility and outlines the potential datasets. It

applies the inclusion/exclusion criteria against the datasets which determines eligibility as described in Table 4.1. As a result, a total of 301 entries (snippets of interviewee interviews) are collected from different verified and reliable sources. The process uses key identifiers to categorise and classify approved secondary datasets. It then presents multiple views of the mapped data which confirms its sufficiency and adequacy in covering the aspects and questions of the research. The chapter four gives lists of excerpts from the collected interviews to demonstrate the credibility and conformity the selected secondary data to the examined topic of Open banking.

Chapter five presents the data analysis process and generates theory propositions. The data analysis process is driven by the procedures of the Grounded theory as explained in chapter three. The research applies the data analysis process consistently against the mapped data of each of the key identified research areas. It implements the sequential steps (S01➔ S09) of Table 5.1 in strict order. It presents the outcome of Grounded theory procedures of open coding, axial coding, constant comparison analysis, and selective coding. It discovers the core category (categories) and analyses the emerging findings for associated patterns, paradigms, and relationships to generate hypotheses theory. The chapter compiles the hypotheses and verifies them against the research evaluation criteria which ensures the integrity, credibility, and conformity of research findings. In total, the research proposes twenty-one hypotheses (H01➔H21) as listed in Table 5.7.

Chapter six discusses and interprets the findings of Table 5.7. It explains the context of findings, examines the findings compatibility to the topic of Open banking, links them to the research questions, and verifies their applicability to existing literature and the banking industry practice. The chapter six answers the research questions, finds solutions to the identified issues and problems in section 2.5. The solutions are driven by the findings of the research.

The chapter six answers question one and discovers four relationships RE-01, RE02, RE03, RE-04. It confirms that Open banking changes the structure and competition intensity in the banking industry. First, Open banking changes the size of banking industry by opening new opportunities for business relationships. Innovation expands opportunity

creation and directly contributes to the growth of the banking industry. Second, it changes the nature of competition from being monopolistic, closed, weak, and limited, to become competitive, open, intense, and wide. Third, it lowers the banking industry barriers to entry, which allows the entry of new challengers including TPPs and GAFA. It discovers a relationship between the degree of adopted innovation and its direct influence on holding off the competition. Also, it finds relationships between the customer's emerging privacy and security concerns and the degree of openness, competition, and entry barriers in the banking industry. These changes are summarised in Table 6.1.

Chapter six answers question two and discovers four relationships RE-05, RE-06, RE07, RE09. It confirms that Open banking changes the customer's attitude and their subsequent adaptation behaviour. It confirms that personalisation is a key factor in influencing the customer's behaviour because it develops a positive experience and attitude towards the Open banking products and services. It finds that the youth segment is motivated with a receptive attitude and positive adaptation behaviour in comparison to other demographic age segments. It finds that the segment of travellers is enthused and highly receptive to Open banking products and services. Also, it discovers that technological literacy plays a direct role in influencing a positive customer's adaptation behaviour. It also explains the relationship between the customer's privacy and security concerns and rejection behaviour. It iterates the importance of building pre-emptive strategies to instigate a foundational awareness of the Open banking movement and understanding its products and services to influence a positive adaptation behaviour. These behavioural changes are summarised in Table 6.2.

The chapter six answers question three and discovers three relationship RE-10, RE-11, RE12. It confirms that Open banking changes the traditional relationship between customers and banks. Open banking changes the ownership of the customer's financial data which shifts the power and control towards customers. It changes the dimensions and boundaries of the traditional relationship from (One ➜ One) to become (One ➜ Many). This liberates the customer and rewards them with a transpired sense of freedom of choice and selection. As a result, the customer becomes less loyal to original banks,

and instead the customer roams freely and seamlessly bargain-hunting across the banking industry.

Chapter six also explains the significance of embedding social engineering into the process of product development to add interactive social themes. It changes the nature of the traditional relationship from transactional to become a social banking experience which enables the transformation of banks into financial and social platforms. Also, it discovers that the customer exhibits further reliance on the relationship with original banks in managing the risk and concerns related to TPPs and potential disputes. These relationship changes are summarised in Table 6.3.

Chapter six develops an Open banking adoption model for managers which serves as a high-level planning, guidance, and reference tool to banks and industry practitioners in their Open banking adoption. The dimensions of this model are derived from the four significant research phase classification findings of Inception, Investment, Innovation and Socialising.

7.2   RECOMMENDATIONS TO THE BANKING INDUSTRY

The researcher puts forward a set of recommendations for the banking industry leadership, strategists, and practitioners. This can assist banks with the adoption of Open banking, and to exploit opportunity, provide mechanisms to withstand the new competition, and mitigate and manage emerging risks within the banking industry.

These recommendations are derived from the findings of this research including emerging hypotheses, relationships, and solutions to the identified issues and problems. The list of recommendations is as follows:

Table 7.1 List of recommendations

Number	Area	Recommendation
R01	Perception	The research recommends banks to alter their perception of viewing Open banking as a threat. It encourages them to expand their views and perceive it as an opportunity

		with risk advantages. The opportunity comes with ample benefits to all participants including customers, banks, competitors, and to the overall banking industry. However, the risk needs to me managed closely to avoid wasting resources, unexpected outcomes, and undesirable consequences.
R02	Risk Management	The research recommends banks to adopt proactive strategies to cultivate and construct a suitable inception environment ahead of the Open banking enforcement by the regulator. This equips banks with an advantage to manage challenges and risks within the inception environment, ahead of competitors
R04	Managing pace of adoption	To achieve an optimum pace of adoption this research recommends a bank to: o Adopt proactive inception strategies with change management and adequately calculated risk. This mitigates risks and increases the bank's readiness to respond to changing variables within the inception environment. o Implement a commercial model which is feasible in context, sustainable, and suits the characteristics and profitability targets of each of the gradual positioning phases including producer, distributor, integrator, and platform. Each position varies commercially and offers different opportunities.
R05	Managing Competition	To adequately manage and withstand the new nature of competition this research recommends a bank to:

		o Invest in innovation to increase the banks' capabilities and resilience in developing competitive products and services to the wants and needs of customers. o Invest in personalisation which facilitates socially themed products and services. This allows banks to gain a competitive advantage of enabling a "*social banking experience*".
R06	Managing Privacy and security	To manage the customer's security and privacy concerns this research recommends a bank to: o Avoid customised integration and intermediary staging touchpoints between the bank with different TPPs and focus instead on the use of standardised APIs. o Develop and mandate the compliance of TPPs, hence banks must develop a rigorous and comprehensive security and privacy standard for partnership agreements with TPPs. The agreement ensures a unanimous adoption to expected security and privacy standards within the banking industry, it also dictates consequences for non-compliant actions. o The ownership of liability is to be treated as variable and not stationary. Thus, it follows the journey of exchanging data between service providers is dynamic. The lack of detail to liability ownership exposes all parties including

		customers, banks, and TPPs, to disputes, damages, and legal proceedings.

R07	Managing the adaptation behaviour.	To manage the customer's adaptation behaviour this research recommends to banks to:
		
		   o Invest in developing innovative and personalised products and services as core competencies in influencing a positive attitude and adaptation behaviour.
		
		   o Develop adequate strategies and marketing campaigns to target specific receptive demographic segments including youth and travellers.
		
		   o Develop strategies and educational programs around technological literacy to lower the barrier for specific demographic segments.
		
		   o Collaborate between banks, TPPs, policy makers, and government agencies to develop national strategies and actionable plans to create awareness about Open banking ahead of its inception.

R08	Managing the new relationship	To manage the new relationship this research suggests banks to: o Adopt pre-emptive strategies to mitigate the risk of customer attrition because of the emerging customer's lack of loyalty to an original bank. That is because an authentic sense of loyalty only persists if it is mutual and rewarding to both sides. The research advises banks to set goals in

		constructing and developing genuine loyal and balanced relationships with their customers ahead of the inception phase of Open banking. o Invest in the transformation to social and financial platforms driven by personalisation, innovation, and social behavioural engineering. This transforms the traditional transactional relationship between customer and banks to become a social banking experience. o Adopt pre-emptive strategies prior to incepting Open banking and to build a level of customer trust in the original banks. The established trust increases the customer's reliance on their original bank, the use of their products and services, and to govern the relationship with TPPs.
R09	Adoption model	The research recommends banks to adopt the use of the Open banking adoption model for managers which serves as a high-level planning, guiding, and reference tool for banks and industry practitioners in their Open banking adoption.

7.3 FUTURE RESEARCH

Open banking is an emerging topic which offers an attractive environment for further research as it continues to evolve and mature. Throughout the development of this study, the researcher has noted down key future research areas which fall beyond the scope and boundaries of this research.

Therefore, driven by this research's findings, limitations, and these documented notes, the researcher proposes to academic and professional communities the following recommendations for future research in relation to the topic of Open banking:

- o Each of the emerging hypotheses of this research summarised in Table 5.7 is an area of interest for future focused studies. The proposed research is to analyse the impact and relationship for Open banking from each emerging hypothesis as an asserted hypothesis.

- o Upon the legislation and implementation of Open banking in New Zealand, the researcher proposes conducting/repeating the same research with the use of primary data within the geographical boundaries of New Zealand. The collected primary data will be collected from participants from within New Zealand and its banking industry.

- o As Open banking evolves and expands its reach to a wider range of service providers within the financial industry then a broader concept for Open Finance required investigation. Thus, the integration of standardised APIs reaches further to involve other financial institutions including insurance, superannuation, pension, and investment providers. Therefore, the researcher proposes research which examines the impact of Open Finance on the long-term financial and social wellbeing of customers.

- o Open banking introduces security concerns as confirmed in this research. The underlying mechanism uses secured digital APIs; therefore, the researcher proposes research which examines the impact of Open banking on the degree of fraud detection and identity theft within the banking industry.

- o Open banking within its wider context could be integrated with government agencies such as the Work and Income office of the Ministry of Social Development (MSD) in New Zealand. This allows government officers to have full and accurate views of each of the applicant's financial position on a real-time basis, instead of relying on time dated paperwork. This will allow them to make informed and accurate decisions to beneficiaries. The researcher proposes

research which examines the impact of Open banking in detecting social welfare fraud within the Work and Income department.

o Open banking facilities the entry of GAFA super platforms into the banking industry as confirmed in this research, therefore the researcher proposes two more research projects. First, research which examines the impact of the emergence of GAFA on the innovation and productivity levels within the Open banking environment. Second, research which examines the degree of a customer's satisfaction in using GAFA products and services within the Open banking environment.

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APPENDIX A. EMERGING CODES FROM THE Q1-CONTEXT

Folder	Name	References
Nodes\\Q1 - Structure-Context	Accountability	7
Nodes\\Q1 - Structure-Context	Adoption value	8
Nodes\\Q1 - Structure-Context	API connectivity	17
Nodes\\Q1 - Structure-Context	Catalyst actuator	4
Nodes\\Q1 - Structure-Context	Changeable environment	7
Nodes\\Q1 - Structure-Context	Complex competition	5
Nodes\\Q1 - Structure-Context	Data accessibility	11
Nodes\\Q1 - Structure-Context	Data quality-accuracy	12
Nodes\\Q1 - Structure-Context	Data volume	8
Nodes\\Q1 - Structure-Context	Digital secure channels	4
Nodes\\Q1 - Structure-Context	Efficiency	10
Nodes\\Q1 - Structure-Context	Endless opportunities	7
Nodes\\Q1 - Structure-Context	Gradual positioning	8
Nodes\\Q1 - Structure-Context	Innovation enablement	14
Nodes\\Q1 - Structure-Context	Intense competition	12
Nodes\\Q1 - Structure-Context	New regulations compliance	26
Nodes\\Q1 - Structure-Context	Open competition	9
Nodes\\Q1 - Structure-Context	Open mindset to change	8
Nodes\\Q1 - Structure-Context	Privacy concerns	15
Nodes\\Q1 - Structure-Context	Real-time connection	14
Nodes\\Q1 - Structure-Context	Seamless integration	20
Nodes\\Q1 - Structure-Context	Security concerns	19
Nodes\\Q1 - Structure-Context	Standardisation	5
Nodes\\Q1 - Structure-Context	Strategy - proactive	9
Nodes\\Q1 - Structure-Context	Sustainable remuneration model	10
Nodes\\Q1 - Structure-Context	Transparency	6
Nodes\\Q1 - Structure-Context	Versatile products	7

APPENDIX B. EMERGING CODES FROM Q2-CUSTOMER BEHAVIOUR

Folder	Name	References
Nodes\\Q2 - Customer Behaviour	Attractive to Tech-savvy segment	11
Nodes\\Q2 - Customer Behaviour	Attractive to Travellers segment	13
Nodes\\Q2 - Customer Behaviour	Attractive to young segments	18
Nodes\\Q2 - Customer Behaviour	Customer aggregated view	3
Nodes\\Q2 - Customer Behaviour	Customer averse behaviour	10
Nodes\\Q2 - Customer Behaviour	Customer added benefits	13
Nodes\\Q2 - Customer Behaviour	Customer confusion	5
Nodes\\Q2 - Customer Behaviour	Customer control of data	15
Nodes\\Q2 - Customer Behaviour	Customer convenience	24
Nodes\\Q2 - Customer Behaviour	Customer fear of change	5
Nodes\\Q2 - Customer Behaviour	Customer financial management	26
Nodes\\Q2 - Customer Behaviour	Customer friendly services	4
Nodes\\Q2 - Customer Behaviour	Customer high expectations	10
Nodes\\Q2 - Customer Behaviour	Customer lower cost	2
Nodes\\Q2 - Customer Behaviour	Customer multiple views	10
Nodes\\Q2 - Customer Behaviour	Customer open mindset	5
Nodes\\Q2 - Customer Behaviour	Customer personalisation	13
Nodes\\Q2 - Customer Behaviour	Customer satisfaction	5
Nodes\\Q2 - Customer Behaviour	Customised customer experience	17
Nodes\\Q2 - Customer Behaviour	Data loss concerns	5
Nodes\\Q2 - Customer Behaviour	Lack of awareness	15
Nodes\\Q2 - Customer Behaviour	Lack of confidence	27
Nodes\\Q2 - Customer Behaviour	Lack of trust	16
Nodes\\Q2 - Customer Behaviour	Lack of understanding	16
Nodes\\Q2 - Customer Behaviour	Less fees	3
Nodes\\Q2 - Customer Behaviour	Less rigid	3
Nodes\\Q2 - Customer Behaviour	Spontaneous transactions	21
Nodes\\Q2 - Customer Behaviour	Streamlined customer journey	20

APPENDIX C. EMERGING CODES FROM Q3-RELATIONSHIPS

Folder	Name	References
Nodes\\Q3 - Relationship	Ability revoke access instantly	10
Nodes\\Q3 - Relationship	Customer attrition	16
Nodes\\Q3 - Relationship	Customer control of data	16
Nodes\\Q3 - Relationship	Customer loyalty programs	9
Nodes\\Q3 - Relationship	Customer negative experience	7
Nodes\\Q3 - Relationship	Customer retention	3
Nodes\\Q3 - Relationship	Data ownership	5
Nodes\\Q3 - Relationship	Data ownership concerns	5
Nodes\\Q3 - Relationship	Data quality-accuracy	12
Nodes\\Q3 - Relationship	Data visibility	5
Nodes\\Q3 - Relationship	Digital identity	5
Nodes\\Q3 - Relationship	Easier banks switching	8
Nodes\\Q3 - Relationship	Enhanced customer engagement	5
Nodes\\Q3 - Relationship	Feedback enablement	3
Nodes\\Q3 - Relationship	Intrusive	7
Nodes\\Q3 - Relationship	Lack of customer loyalty	16
Nodes\\Q3 - Relationship	Lack of human touch	4
Nodes\\Q3 - Relationship	Legal dispute risk	6
Nodes\\Q3 - Relationship	Negative experience	3
Nodes\\Q3 - Relationship	Real-time revoke data access	2
Nodes\\Q3 - Relationship	Reliance-trust on banks	25
Nodes\\Q3 - Relationship	Reputational risk	3
Nodes\\Q3 - Relationship	Respect customer choice	4
Nodes\\Q3 - Relationship	Skepticism	12
Nodes\\Q3 - Relationship	Social banking	10
Nodes\\Q3 - Relationship	Social personalised services	5
Nodes\\Q3 - Relationship	Trusting Influencers	3

APPENDIX D. EMERGING CODES FROM THE EMERGING CATEGORY

Folder	Name	References
Nodes\\Q4 - Emerging	Changeable environment	7
Nodes\\Q4 - Emerging	Complex competition	5
Nodes\\Q4 - Emerging	Data accessibility (Open Finance)	7
Nodes\\Q4 - Emerging	Data quality (Open Finance)	6
Nodes\\Q4 - Emerging	Data visibility (Open Finance)	7
Nodes\\Q4 - Emerging	Disruptive competition	4
Nodes\\Q4 - Emerging	Financial product comparison	3
Nodes\\Q4 - Emerging	Financial wellbeing	11
Nodes\\Q4 - Emerging	Financial inclusion - Green environmental impact	6
Nodes\\Q4 - Emerging	Financial stress reduction	11
Nodes\\Q4 - Emerging	GAFA - Big four	15
Nodes\\Q4 - Emerging	Gradual positioning	8
Nodes\\Q4 - Emerging	Intense competition	12
Nodes\\Q4 - Emerging	Open competition	9
Nodes\\Q4 - Emerging	Open finance potential	20
Nodes\\Q4 - Emerging	Open mindset to change	8
Nodes\\Q4 - Emerging	Premature landscape	7
Nodes\\Q4 - Emerging	Positioning strategy	13
Nodes\\Q4 - Emerging	Social personalised services	5
Nodes\\Q4 - Emerging	Strategy - proactive	9
Nodes\\Q4 - Emerging	Strategy - Wait and see	3
Nodes\\Q4 - Emerging	Sustainable remuneration model	10
Nodes\\Q4 - Emerging	Versatile personalised products (Open Finance)	7