College of Business and Economics
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Unlocking Synergies: Assessing Technological Collaboration and Technology Platform Sharing in Ethiopian Banks

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Addis Ababa, Ethiopia

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A Research Project submitted to Addis Ababa University College of Business and Economics in Partial Fulfillment of the Requirements for the Degree of Executive Masters of Business Administration (EMBA)

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Advisor: Mesfin Fikre (PhD)

June, 2023

Addis Ababa, Ethiopia

DECLARATION

I hereby declare that this research project is my original work and has not been submitted for examination before for the award of other degree or qualification in any other University and all sources of materials used fully acknowledged.

Declared By:

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CERTIFICATION

This is to certify that Nebiat Tekle has carried out his research work on the topic entitled "Unlocking Synergies: Assessing Technological Collaboration and Sharing Economy Dynamics in Ethiopian Banks". The study is an original work and is suitable for the submission for the reward of Executive Masters of Business Administration (EMBA) Degree.

Advisor: _____

Approval by Examining Board

Members of board of examiners approve that this examination project titled, 'Unlocking Synergies: Assessing Technological Collaboration and Technology Platform Sharing in Ethiopian Banks.' undertaken by Mr. Nebiat Tekle the necessities for the reward of the Executive Master of Business Administration (EMBA) degree in the department of management, School of Business and Economics, Addis Ababa University and is acceptable with regards to the standards and regulations of the University.

Approval: Board of Examiners

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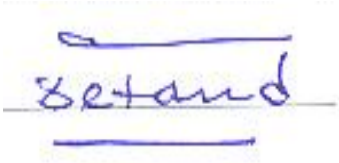
Getie Andualem (PhD)		July 13, 2023

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Acronyms and Abbreviations

ATM	Automatic Teller Machine
BaaS	Banking as a service
BIS	Bank for International Settlements
CBS	CORE Banking System
DCaaS	Data Center as a Service
DVD	Digital Versatile Disc
EFT	Electronic Funds Transfer
EthSwitch	Ethiopian National Switch
NBE	National Bank of Ethiopia
NDPS	National Digital Payment Strategy
NSI	Net Settlement Instruction
PCI-DSS	Payment Card Industry Data Security Standard
PaaS	Platform as a Service
POS	Point of Sales
PSO	Payment System Operator
PSS	Premier Switch Solutions

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Abstract

The study focused on assessing the current status of technology platform sharing among Ethiopian banks to enhance collaboration and innovation within the industry. Through qualitative data analysis the research findings highlighted the positive influence of technology platform sharing on operational capabilities, product offerings, and customer experiences in Ethiopian banks. The discussion emphasized the need for increased collaboration and resource sharing among banks, regulatory bodies, and technology providers. By actively exploring opportunities for technology platform sharing, banks can benefit from cost reduction, knowledge exchange, improved efficiency, and innovation. The study also addressed challenges and barriers associated with technology sharing, including reliable technical support, flexible governance mechanisms, dependency risks, and knowledge gaps. Based on the research findings, the conclusion was drawn that technology sharing initiatives hold great potential for the Ethiopian banking sector. However, to ensure successful implementation, a balanced approach between collaboration and competition must be maintained, allowing banks to differentiate themselves while leveraging shared platforms. The recommendations proposed a series of actions for different stakeholders. Banks were advised to embrace technology adoption, promote technology platform sharing, foster awareness and education, and find a balance between collaboration and competition. Regulators were urged to establish regulatory support and remove potential barriers to technology sharing. Technology sharing platform operators were encouraged to foster collaboration and address challenges through effective communication and trust-building measures. The Ethiopian Bankers Association was recommended to initiate a technology sharing platform, conduct comprehensive assessments, and prepare periodical insight reports.

Keywords: Technology Platform Sharing, Collaboration, Technology Adoption, Synergy, Ethiopian Banks

CHAPTER ONE

INTRODUCTION

This section aims to provide an overview of the research study on sharing economy in the Ethiopian banking sector. It outlines the research problems, research questions, objectives, and hypotheses that will be addressed in the study, as well as the significance, scope, and limitations of the research. The section concludes with an overview of the organization of the paper.

1.1. Background of the Study

The Ethiopian banking sector has experienced significant changes in recent years with the adoption of technology playing a pivotal role. Prior to the early 2000s, the Ethiopian banking sector was characterized by manual processes, limited access to technology, and a low level of automation. However, with the introduction of technology, the sector has witnessed rapid transformation in the past decade.

The Ethiopian government has been taking significant steps to modernize the financial industry and improve access to financial services for the population. One key area of focus has been the adoption of technology in the Ethiopian banking sector, which has led to the development of digital banking services. In this regard, the National Digital Payments Strategy (NDPS) for 2021–2024 is the central component of this and one of the strategic pillars of the NDPS is developing a reliable, inclusive and interoperable infrastructure through which the National Bank of Ethiopia (NBE) aimed to transform the payment ecosystem and help build a cash-lite and more financially inclusive economy (NDPS, 2019).

However, the process of technology adoption and digital banking service implementation requires a significant investment, both in terms of time and resources, including the need for significant investment in foreign currency, which can be a barrier for some financial institutions.

Despite the challenges, banks in Ethiopia have been investing in technology and developing digital banking platforms, which allow customers to access banking services from anywhere and at any time. This has improved efficiency, reduced costs, and enhanced the customer experience.

Furthermore, due to the competition among banks to be the leader in the adoption of new technologies, almost all banks are buying their own systems and building their own infrastructure,

which has proven to be expensive for the country at a macro level. In this context, the technology platform sharing presents an ideal solution for the financial sector to collaborate and share infrastructure and systems instead of compete over this. This collaboration is highly beneficial for the overall economy of the country and helps to close the financial inclusion gap.

The concept of sharing economy has gained a lot of popularity in recent years, and its influence has spread to many industries, including the banking sector. (Botsman et al., 2010) defined the sharing economy concept as "an economic model based on sharing, swapping, trading, or renting products or services, often using online platforms.". The sharing economy is a socio-economic model that involves the sharing of resources and assets among individuals and organizations, typically facilitated by digital platforms. It is an innovative approach to business that has disrupted traditional business models and transformed the way people access and use services.

Sharing economy approach has been applied to a range of industries, from transportation (e.g. ride-sharing services like Uber or Ride Ethiopia) to hospitality (e.g. home-sharing services like Airbnb). In the banking sector, sharing economy has been applied in the form of system and infrastructure sharing, where banks share their technology platforms and other resources with each other. By doing so, banks can reduce costs and improve the quality of their services, while also expanding access to financial services for underserved populations.

This research project aims to explore the extent of collaboration among banks in Ethiopia and application of the technology platform sharing in the Ethiopian banking sector, with a particular focus on system and infrastructure sharing. The study will examine the experiences of banks that have adopted this approach. In addition, the study will examine the potential benefit of system and infrastructure sharing on financial inclusion in Ethiopia, with a view to identifying strategies for further enhancing access to financial services. Overall, this study seeks to contribute to a better understanding of the potential of the technology platform sharing as a means of minimizing the cost of technology and enhancing financial inclusion in the Ethiopian banking sector.

1.2. Statement of the Problem

According to Omwansa et.al. (2014), establishing and providing financial services to the financially excluded, who are often located in remote areas, would be best achieved through collaboration of partners. It is not likely that a single provider could offer these solutions effectively, instead synergistic efforts could achieve the desired results more quickly and

efficiently. The lack of access to banking services has also impeded economic development and financial inclusion in a country, which has negatively impacted the overall growth and development of the banking sector (Omwansa & Waema, 2014).

The Ethiopian banking sector has faced challenges in adopting new technologies and infrastructure, hindering the development of efficient and effective banking services. While some financial institutions have made independent investments in new systems, there has been limited collaboration and sharing of systems and infrastructure among banks. This hesitancy to collaborate and share technology has resulted in duplicated investments, inefficient processes, higher costs, and reduced competitiveness in the banking sector. Consequently, the lack of access to banking services has impeded economic development and financial inclusion in Ethiopia, negatively impacting the overall growth and progress of the banking sector.

To address these issues, it is essential to investigate the current level of collaboration, technology adoption, and sharing economy in the Ethiopian banking sector. By understanding the reasons behind banks' hesitancy to collaborate and exploring the potential benefit of sharing economy principles, this study aims to provide insights and recommendations for promoting collaboration, improving technology adoption, and fostering sustainable growth. The focus will be on assessing the existing state of collaboration among banks, analyzing the adoption of new technologies and infrastructure, and examining how sharing economy concepts can minimize costs, enhance financial inclusion, and drive economic development in the Ethiopian banking industry.

This research aims to investigate the extent of collaboration among banks in Ethiopia, their adoption of new technologies and infrastructure, and the potential benefit of sharing economy principles. The study will explore how collaboration, technology adoption, and sharing can drive financial inclusion, minimize costs, and promote sustainable growth in the banking sector. By analyzing the current state and identifying barriers, the research will provide recommendations to enhance collaboration, innovation, and cost-effectiveness in the Ethiopian banking industry, ultimately contributing to the broader understanding of the technology platform sharing in the banking sector.

Overall, this project aims to contribute to the growing body of literature on sharing economy in the banking sector while providing insights into how sharing economy concepts can be applied in

the Ethiopian banking industry to promote collaboration, innovation, sustainable growth with minimized cost.

1.3. Research Questions

The research questions that this study seeks to answer are:

1. What are the technologies adopted in the Ethiopian banking sector, and how does it vary among different financial institutions?
2. What is the current collaboration in technology modalities among banks in Ethiopia?
3. What are the potential benefits of collaboration in technology among Ethiopian banks?
4. What are the potential challenges and barriers that hinder technology platform sharing in the Ethiopian banking sector?

1.4. Objectives of the Study

1.4.1. General Objective

The general objective of this study is to investigate the level of collaboration among banks in technology sharing within the Ethiopian banking sector and assess potential benefits, and challenges hindering technology platform sharing in the Ethiopian banking sector.

1.4.2. Specific Objectives

- To analyze the existing technology adoption practices among different financial institutions in the Ethiopian banking sector.
- To assess the current collaboration practices among banks in Ethiopia and identify ways to promote technology platform sharing in the banking sector.
- To explore the potential benefits of technology platform sharing in the Ethiopian banking sector.
- To explore the main challenges and barriers that hinder technology platform sharing in the Ethiopian banking sector?

1.5. Significance of the Study

This study has significant implications for the Ethiopian banking sector, as it provides insights into the potential of technology platform sharing as a means of enhancing financial inclusion and minimizing costs. The study findings will be useful to policymakers, practitioners, and academics in the banking sector in Ethiopia.

At the time of the study, the banking industry was investing a significant amount of foreign currency (FCY) in technological advancements to maintain its market relevance and introduce new products and services. However, product differentiation was not a major consideration for the sector, despite the increasing number of players and the absence of significant entry barriers. As a result, banks were adopting similar technologies, leading to a silo effect. Innovative institutions seeking to introduce new products faced challenges as they lacked the resources to invest in technologies used by multiple institutions. The technology platform sharing had the potential to stimulate innovation by fostering collaboration in the acquisition of specific technologies, which could then be used to develop unique products and services tailored to the diverse needs of consumers. Furthermore, the technology platform sharing could promote competition in the banking sector, resulting in improved services and products for consumers.

The adaptation of technology platform sharing concept can help to improve financial inclusion and reduce costs in the Ethiopian banking sector. By sharing systems and infrastructure, banks can save money and resources, which can be used to offer more affordable, accessible and basic banking services to people in rural areas.

Interoperability was a significant obstacle in the Ethiopian banking industry, making it challenging to access services from different banks. However, by adopting a technology platform sharing approach, banks could utilize the same technology and infrastructure to bridge this gap and provide basic financial services, particularly in rural areas. Additionally, the technology platform sharing could promote innovation and competition in the banking sector, leading to better services and products for consumers.

The study focused on the state of collaboration among banks in Ethiopia and how sharing banking systems and infrastructure could minimize costs, foster financial inclusion, and drive economic growth. Overall, the study contributed to the growing body of literature on the technology platform sharing in the banking sector, while providing insights into how technology platform sharing concepts could be applied in the Ethiopian banking industry to promote collaboration, innovation, and sustainable growth with minimized costs.

1.6. Scope of the Study

The study aims to examine the potential benefits and challenges of adopting a technology platform sharing model in the Ethiopian banking sector, with a specific focus on technology and infrastructure sharing.

This study focuses specifically on the banking sector in Ethiopia, with a particular emphasis on technology platform sharing practices and intended to cover views of current management members who are working at Information Technology and / or Digital Banking departments of the bank.

The study's primary conceptual focus was to investigate the extent of collaboration among banks in Ethiopia and to investigate the potential benefit of technology platform sharing principles in the banking sector in Ethiopia. However, it does not encompass an investigation of their effects on economic growth or job creation. Furthermore, the scope of the study is restricted to examining the regulatory and legal frameworks required to facilitate the implementation of technology platform sharing practices in the banking sector in Ethiopia, solely from the bankers' perspective.

The study utilized a qualitative research methodology, involving interviews with bankers to gather data on their perspectives on technology platform sharing practices in the banking sector in Ethiopia. The study's scope is therefore limited to the subjective experiences and opinions of the interviewees, rather than quantitative data analysis.

Overall, the aim of this study was to provide insights into the potential of a technology platform sharing model to transform the Ethiopian banking sector, enhance financial services accessibility to the unbanked population, and promote a more collaborative and sustainable economy in the sector.

1.7. Limitations of the Study

The limitations of the study include the availability and reliability of data, as well as the potential for bias in the responses of the study participants.

1.8. Organization of the Paper

The paper is organized into five sections in addition to this Introduction chapter. Chapter two will be the literature review which shows research conceptual framework, the theoretical and empirical literature review. Chapter three addresses research methodology. Data presentation and analysis

aspects of the study are discussed in Chapter four. The paper concludes in Chapter five by discussing the findings, conclusions and recommendations for further research in the area of technology platform sharing and financial inclusion in the Ethiopian banking sector.

CHAPTER TWO

LITERATURE REVIEW

This chapter provides theoretical and empirical literature review that is relevant for this study. It therefore, starts with a theoretical literature review followed by empirical one basically deals with sharing economy.

2.1. Theoretical Review

This chapter provides theoretical and empirical literature review that is relevant for this study. It therefore, starts with a theoretical literature review followed by empirical one basically deals with sharing economy.

2.1.1. Sharing Economy

Generally, sharing economy means the sharing of resources in efficient way; however, it is known by several names in the prevailing studies such as peer-to-peer economy, access-based consumption or access economy, collaborative consumption, Grassroots economy, demand economy, gig economy, platform economy and so on (Weili & Khan, 2020).

The sharing economy model is an economic system where individuals or organizations share their underutilized assets, resources, or skills with others, usually through online platforms, in exchange for a fee or other forms of compensation. The model is based on the principles of access over ownership, peer-to-peer collaboration, and sustainability (Botsman & Rogers 2010).

The sharing economy phenomenon is not only a commodities or services markets prerogative. Bitcoin can be analyzed as a sharing monetary market. The area where sharing is more consolidated is the information market, where open-source software and files sharing is still analyzed. Much attention in this field is devoted to illegal sharing, intellectual property rights and regulatory systems of piracy. Information sharing covers many separate issues, from open access resources to open data policies to open-source software creation and use. In financial markets, too, sharing is a growing opportunity with new forms of peer-to-peer lending. In what follows, the attention will be focused on the standard economic theme concerning commodities and services (Bruna, 2017).

Sharing means granting access to the use of something while not redistributing ownership of it. This form of exchange is enabled by an organization with a platform character supported by an engaged peer-to-peer community that is practicing collaborative consumption as it consumes so-called club goods. Use of the latter is non-rivalrous in a way that it does not lead to depletion of the good. Users, however, can be excluded from consumption. In contrast, classical redistribution markets fully transfer ownership of private goods where use is rivalrous and users are excludable. A key feature of sharing platforms is that they serve as a governance scheme to make accessible hitherto unexploited capacities of resources which, in principle, can be activated and marketized (Janowski et al, 2021).

Traditionally, banks operated in a vertically integrated value chain - from production to sales, distribution and servicing. Though banks had the option of outsourcing many components, but the cost structure remained mostly fixed and bloated. The threat of disintermediation has made the traditional way of banking unsustainable though highly regulated, disruptive innovation in banking ensured that they found a way to the marketplace. Banks have to reassess their vertically integrated banking models and consider platform-based business models (Dutta, 2020).

Platforms increases the reach of a market at the demand side as more diverse demand profiles can become visible. Thereby, platforms lead to generalized increasing returns, because more demand of a certain good/service offers the opportunity to produce it at larger scales where average costs are lower. Platforms in general, create positive externalities via network effects: The more supply and demand enters the platform, the greater are the exchange opportunities for all parties involved and the better are the prospects of increasing the platform reach in a second round. Sharing economies can lead to a decrease in average costs, help to fully exploit all available resources and establish market exchanges that enable general efficiency increases. The fruits of such sharing platform externalities can be referred to as economies of share. Digital platforms have high access to data which reduces information asymmetry and leads to lower customer acquisition cost and full customization. (Dutta, 2020; Janowski et al, 2021)

As we move to a less vertical banking reality, we see that some traditional financial institutions and fintechs are making use of approaches in which they offer their capacity and expertise as a service to other companies, in a flexible and on-demand basis. A model that has been explored by financial institutions is Banking as a service (BaaS), in which they enable the activity of new

market entrants through the provision of technology solutions and regulatory interface, being a great shortcut and often the most viable alternative in terms of cost-benefit for those who want to start offering financial services. On the side of those who provide the service, there are institutions that do it as a main activity or as an additional line of business, something that financial institutions and small and medium-sized banks have adopted. Banking as a Platform goes this direction and translates itself into a model in which the bank (or another financial institution) adds digital services from third parties to its portfolio, offering them on its channels. In its offerings, not only are financial products included, but other nonfinancial solutions that can make the end customer life easier (Diniz, 2021).

2.1.2. Attributes of Sharing Economy

According to Constantiou et al. (2017) & Botsman et al. (2010) the term "sharing economy" refers to the confluence of three broader socio-economic developments:

1. **Access over ownership**: Consumer attitudes and behaviors are increasingly shifting from hyper-consumerism and the primacy of buying goods toward buying access to goods and "servitized" products (e.g., streaming movies on Netflix rather than buying DVDs, relying on Uber rather than buying a car). This development is also called access-based consumption or the on-demand economy. Access over ownership refers to the idea that instead of owning a particular asset or resource, individuals or institutions can share access to it with others when they are not using it, thereby increasing its utilization rate and reducing waste.
2. **Peer-to-peer:** Internet-based networks and platforms increasingly mediate interactions and transactions among peers typically coordinated by trust relationships and personal reputation (e.g., buying second-hand goods on online marketplace). This development is also called the peer-to-peer economy. Peer-to-peer collaboration principle involves the idea that individuals can collaborate and share resources with each other, thereby creating a community-based economy. This principle emphasizes the importance of trust and social capital in enabling sharing between individuals.
3. **Allocation of idle resources and Sustainability**: More and more individuals participate casually in economic activities by resorting to privately owned resources (both assets and labor), which would otherwise remain idle. This development is sometimes called

collaborative consumption. Sustainability principle refers to the concept of using resources in a way that is environmentally friendly and socially responsible, ensuring the long-term viability of the sharing economy.

Overall, the sharing economy model promotes a more collaborative and sustainable economic system, where resources are used more efficiently, waste is reduced, and communities are empowered. The access over ownership principle, peer-to-peer collaboration, and sustainability principle can apply to a group of organizations in a given sector. These principles are often applied to foster collaboration and resource sharing between organizations, especially in sectors where resource utilization is suboptimal or there are opportunities to reduce waste and increase efficiency. (Botsman et al. 2010)

For instance, in the banking sector, access over ownership principle can be applied to reduce the need for each bank to own and operate its own IT infrastructure, instead, banks can share access to a common technology infrastructure that is managed by a third-party provider. This can reduce the overall costs of IT infrastructure and enhance efficiency.

The peer-to-peer collaboration principle can be applied to enable banks to share data and expertise on financial inclusion initiatives, risk management, and regulatory compliance. This can enhance the overall performance of the sector and promote knowledge sharing.

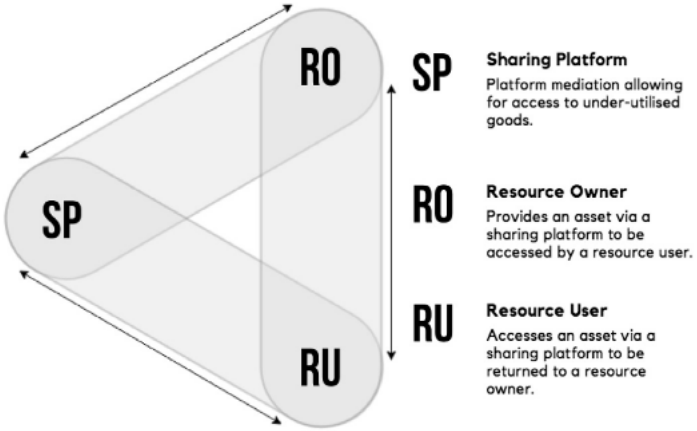
The sustainability principle can be applied to encourage banks to adopt environmentally sustainable practices, such as energy-efficient buildings, paperless banking, and responsible lending practices. Overall, the application of sharing economy principles in a group of organizations can promote collaboration, reduce costs, enhance efficiency, and promote sustainability in the sector.

2.1.3. Sharing Platform

Sharing platform refers to the entity facilitating the sharing practice. This may be any platform (e.g. a business, non-traditional organization or grassroots initiative) that operates a two-sided business model also called a triadic business model that facilitates rather than creates value, as a result of interaction between the supply- and demand-side of the platform. The key activity of a platform is mediating or matchmaking social interactions and economic transactions between two actors. Platforms do not usually own physical assets involved in the exchange, instead, they enable or facilitate access to goods and services between actors in the market. In general, platforms have

limited costs for tangible assets and relatively high investment costs in platform IT infrastructure (Curtis et al., 2020).

Platforms rely on trust between actors in the two-sided market and, therefore, often implement reputation and review systems to enhance the perception of value delivered by the platform (Andreassen et al., 2018).



Sharing platform is a phenomenon which mediates an exchange between a resource owner and a resource user to facilitate temporary access to under-utilized goods (key activity), resulting in a reduction of transaction costs associated with sharing (value proposition). While platform or triadic business models may facilitate access and transfer of ownership, it is suggested that shared platforms only facilitate access and not transfer of ownership. Shared platforms facilitate value creation by mediating an exchange between a resource owner and resource user, each of which interact with one another and carry out key activities to co-create value on the platform. The terms 'resource owner' used to the person who grants temporary access while 'resource user' is used for the person who gains temporary access to others' resources to describe the actors involved in the two-sided market facilitated by the sharing platform (Curtis et al., 2020).

2.1.4. Digital Collaboration

Digital technologies have a well-established fundamental role in banks' operations and relationships with their customers. As part of a second wave of digitization in banking, digital collaboration is not only a powerful new tool on its own, but also an enabler of other digital tools. Digital collaboration can help banks serve their customers better by improving productivity and making it easier for people to work together in a digital context. Digital collaboration can help

banks to identify business processes that can be most improved through collaboration, plot the required technology roadmap, and implement digital tools in an agile way to enable further collaboration. This can ultimately improve customer service and satisfaction.

2.1.5. Sharing Economy in the Ethiopian Financial Sector

As of 2023, the Ethiopian banking sector is made up of 30 banks, including 28 private banks, one state-owned bank, and one development bank (NBE, 2023). The largest bank in Ethiopia is the Commercial Bank of Ethiopia.

In recent years, Ethiopian banks have made efforts to adopt modern technologies to improve their service delivery and increase their reach. The adoption of technology has been slow due to a number of challenges, including a lack of infrastructure collaboration and interoperability among banks, a shortage of skilled personnel, and a lack of awareness among customers about the benefits of digital banking (World Bank, 2016).

In response to these challenges, the NBE introduced a number of initiatives in recent years to promote the adoption of technology in the banking sector. These initiatives include the establishment of a national payment switch, the development of a national digital financial strategy, and the issuance of multiple directives on payment instruments, payment operators and the use of agents improved the regulatory environment for low-cost payment models.

In terms of platform sharing, the Ethiopian banking sector is still in its early stages of development. However, there are a number of banks that are already using platform sharing to improve their operations.

Premier Switch Solutions (PSS) is a consortium owned by six private banks in Ethiopia. The company was founded in 2008 by six banks and offers a payment processing solutions, including ATM management, POS management, and e-commerce payment processing.

EthSwitch is the National Payment Switch owned by all banks (private and public) operating in Ethiopia and the National Bank of Ethiopia. EthSwitch provides channel interoperability, shared infrastructure and institute domestic card scheme. It is also the official backbone for e-payments providers and end-users in the country. EthSwitch established in 2011, however, interoperability within the digital payments' infrastructure was operationalized in 2016, five years after the establishment of EthSwitch. The objective of EthSwitch is to provide an efficient, reliable, and

safe e-payment platform infrastructure for Ethiopia. All private and public banks in Ethiopia own an equal share of the switch platform. Six banks are hosted on EthSwitch, six banks have their own switch, and six banks use the Premium Switch Services—a consortium. (NDPS, 2021)

The other aspect of infrastructure sharing banking recently looking in to at is the database infrastructure. The database infrastructure sharing practice in Ethiopia is a relatively new phenomenon, but it has the potential to revolutionize the way that data is collected, stored, and processed in the country. By sharing database infrastructure, banks can reduce costs, improve efficiency, and make data more accessible to them. Currently, there are a number of public and private Data Center as a Service (DCaaS) providers in Ethiopia. While Ethio Telecom is one of the biggest providers of this service, private companies like Raxio started providing tier-III, carrier-neutral data center service in Ethiopia. RedFox, ScutiX and Wingu are also working towards the footsteps of Raxio.

2.2. Empirical Review

The Bank for International Settlements (BIS) published a report titled "Platform-based business models and financial inclusion" that discusses the relationship between digital platforms and financial inclusion. The report stated that incumbent financial institutions are adopting platform-based business models and platforms have helped to achieve impressive gains in financial inclusion, both in emerging market and developing economies and in advanced economies. Digital platforms operate in multi-sided markets, using big data to match different parties. Three types of digital platforms are expanding in financial services: (i) fintech entrants; (ii) big tech firms; and (iii) increasingly, incumbent financial institutions with platform-based business models. These platforms can dramatically lower costs and thereby aid financial inclusion. Overall, the report highlights the potential benefits of digital platforms for financial inclusion but also raises concerns about their potential to dominate specific markets (BIS, 2022).

Schreieck et al. (2017) argue that IT platforms can enable value co-creation between companies and their customers, leading to improved customer satisfaction and loyalty. The paper provides insights from the banking sector on how established companies are leveraging IT platforms for value co-creation. The authors identify several key success factors for leveraging IT platforms in the banking sector, including a clear understanding of customer needs, effective collaboration between different stakeholders, and a willingness to experiment with new business models. The

paper concludes that IT platforms can be a powerful tool for established companies in the banking sector to create value for their customers and stay competitive in a rapidly changing market.

Charles (2013) examines the impact of the sharing economy on financial inclusion in Kenya. The study found that the sharing economy has the potential to increase financial inclusion by providing access to financial services to previously excluded individuals. The study also found that the sharing economy can help reduce poverty and increase economic growth. However, the study also identified challenges such as lack of trust, inadequate regulation, and limited access to technology that need to be addressed for the sharing economy to reach its full potential in promoting financial inclusion in Kenya.

Junaid (2019) provides empirical evidence on the necessary factors needed to create an enabling sharing economy environment in the African context. The pre-existing sharing culture in several African countries makes the concept of sharing economy gain good momentum across the continent. Sharing economy is largely driven by trust, which is an important factor in the success of these platforms. The study evaluates the possible benefits of sharing-economy companies in Nigeria and Kenya to each country's development while analyzing the important factors needed to create an environment appropriate for a sharing economy business. The study provides insights into the regulatory environment, entrepreneurial environment, social trust, and supporting private sector development needed to create an enabling sharing economy environment in the African context. The findings of this study can be used to inform policies and strategies aimed at creating an enabling environment for sharing economy platforms in the banking sector.

2.3. Conceptual Framework

Arne Floh, et al. (2019) provides insights into the key properties and dimensions of sharing platforms, their sources of competitive advantage, and the roles, challenges, and opportunities for platform providers. Sharing platforms can have competitive advantages such as network effects, data-driven insights, and challenge conventional providers, and can disrupt traditional business models. Sharing platforms can provide access to assets, resources, and services without the transfer of ownership. Perceived benefit, shared vision, knowledge sharing, exchange of technological capabilities, and optimal usage of resources are important factors in the success of sharing platforms to facilitate collaboration and better use of underutilized assets. Sharing platforms can create markets and enhance asset utilization.

The study examines several variables within the Ethiopian banking sector. The independent variables include collaboration among banks, focusing on the extent of cooperative efforts, partnerships, knowledge sharing, and joint initiatives. Another independent variable is technology sharing, encompassing the exchange of technology infrastructure, systems, and resources among banks in Ethiopia. Perceived benefit, shared vision, knowledge sharing, exchange of technological capabilities, and optimal usage of resources are also considered as independent variables, which influence the relationship between collaboration and technology sharing.

The dependent variables include the efficiency and effectiveness of banking services, measuring how collaboration, technology sharing, and sharing economy practices enhance service delivery, customer experience, and operational efficiency. The contextual factors take into account trust, competitiveness of banks and the regulatory environment and its influence on facilitating or hindering collaboration, technology sharing, and sharing economy practices within the Ethiopian banking sector.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter outlines the research methodology used to investigate the application of the technology platform sharing in the Ethiopian banking sector. It discusses the research design, data collection, and data analysis techniques employed to achieve the research objectives.

3.1. Research Design

This research employs an exploratory design to investigate the sharing technology platform landscape in the Ethiopian banking sector. The exploratory approach is chosen to gain a comprehensive understanding of the overall phenomenon, without focusing on specific platforms. It allows for a broad exploration of the benefits, barriers and challenges of sharing technology platforms in the sector.

There is a lack of previous studies or established frameworks regarding collaboration, technology sharing, and utilization of technology platform sharing concepts in the Ethiopian banking sector. This indicates a gap in the literature, making it necessary to explore the topic in-depth. In addition, collaboration, technology sharing, and technology platform sharing concepts are multifaceted and dynamic concepts. Exploratory research allows for a comprehensive exploration of these complex phenomena and provides flexibility to adapt the research design as new insights emerge during the study.

Furthermore, exploratory research used to address the knowledge gap, explore complex phenomena, gain in-depth understanding, capture diverse perspectives, and emphasize the contextual factors inherent in the Ethiopian banking sector specifically on platform technology sharing.

3.2. Target Population

The target population for this research consisted of all operational banks and payment system operators in the Ethiopian banking sector. Specifically, there were 30 banks included in the target population. These banks varied in terms of their establishment, size, and market position within the sector. Additionally, there were two payment system operators who were responsible for facilitating technology sharing among the banks. The inclusion of both banks and payment system

operators ensured a comprehensive understanding of the sharing technology platform landscape within the Ethiopian banking sector.

3.3. Sampling Design

The sampling design for this research involved selecting a total of six banks and one payment system operator (PSO) from the Ethiopian banking sector. The selection process utilized a combination of random sampling and purposeful sampling techniques.

To ensure a representative sample, two banks were randomly selected from the top tier established banks that utilize independent technology. Additionally, two banks were purposefully selected from the top tier established banks that utilize a shared technology platform. This purposeful sampling technique allowed for targeted selection, offering valuable insights into this specific subgroup of banks and their experiences with shared technology platforms.

Two banks were also purposefully selected from the recently established banks, including one new entrant. Purposeful sampling was employed to include these specific banks, providing a deeper understanding of their perspective as new players in the industry.

The payment system operator (PSO) was selected based on its relevance and significance within the Ethiopian banking sector.

By combining random sampling and purposeful sampling techniques, the research aimed to capture a diverse representation of banks in terms of their technology usage, establishment, and market position. This sampling design facilitated a comprehensive exploration of the sharing technology platform landscape within the Ethiopian banking sector.

3.4. Data Source and Collection

The researcher employed both primary and secondary data sources for the study. The primary data was collected using an open-ended semi-structured interview format with the selected participants. The interviews and focus group discussions were conducted face-to-face. Interview and focus group discussion questions were pre-distributed to the participants in advance and the interviews lasted for approximately 30-45 minutes while the focus group discussions lasted approximately 1 hour to 1 and half hour. Both the interviews and focus group discussions were audio-recorded with the participants' consent, and detailed notes were taken during the interviews and focus group discussions.

In addition to primary data, secondary data was gathered from relevant documents such as reports, policies, and regulations pertaining to the technology platform sharing in the banking sector in Ethiopia, with a specific focus on infrastructure and technology sharing. This allowed for a deeper understanding of the regulatory environment and policy framework surrounding the technology platform sharing in the banking sector.

3.5. Data Analysis

The study employed thematic analysis to analyze the data collected from the interviews. Thematic analysis is a qualitative data analysis method that involves identifying patterns, themes, and categories within the data. The audio-recordings of the interviews were transcribed in a summarized way, and the notes taken during the interviews were also analyzed.

Qualitative methods provide the flexibility to capture diverse perspectives on collaboration, allowing for a nuanced understanding of the challenges and barriers that hinder technology platform sharing in the Ethiopian banking sector. By employing qualitative data collection methods, the researcher can gain subjective insights and perspectives on how technology platform sharing can benefit the financial institutions.

Thematic analysis is chosen as the approach for this research due to its suitability in capturing and interpreting qualitative data, particularly in exploring complex phenomena and uncovering patterns, themes, and meanings within the data. Thematic analysis allows for the systematic identification, organization, and interpretation of themes or patterns that emerge from the data, enabling a comprehensive understanding of the research topic.

The steps involved in conducting thematic analysis include:

i. Familiarization with the data: The researcher became immersed in the data, reviewing and familiarizing with the content. This step included reading and re-reading the interview transcripts to gain a holistic understanding of the information.
ii. Generating initial codes: The researcher performed coding process by systematically identifying and labeling meaningful units of data, known as codes. This involved marking segments of data that are relevant to the research objectives or capture key ideas or concepts.

iii. Searching for themes: The codes were then examined and organized to identify potential themes or patterns within the data. This involved collating codes that share similar characteristics or convey similar meanings.

iv. Reviewing themes: The identified themes are reviewed to ensure they accurately represent the data and reflect the research objectives. The researcher revised and refined themes as needed to capture the most significant and meaningful aspects of the data.

v. Defining and naming themes: Each theme then further developed by providing a clear definition and assigning a descriptive label that encapsulates its essence. This step involved summarizing the key characteristics and content within each theme.

vi. Creating a thematic map: The themes and their relationships are visualized through a thematic map or diagram. This serves as an overview of the main themes, sub-themes, and their connections, providing a structural representation of the data analysis.

vii. Writing the analysis: The findings are documented in a narrative format, where the researcher presents and interprets the themes in relation to the research questions. This involves supporting the analysis with illustrative quotes or examples from the data.

The researcher identified codes and themes based on the data to gain insights and address the research questions of the study. Microsoft Word was used as a tool to manage and analyze the data manually. The research data analysis has been completed using thematic analysis, facilitating a comprehensive exploration of the findings from the interviews.

3.6. Validity and Reliability

Throughout the research process, several measures were implemented to ensure the validity and reliability of the data. Member checking was conducted, where the findings were shared with the participants to validate the accuracy and authenticity of the data. Peer debriefing was employed by sharing the findings with other researchers, seeking their feedback and insights to enhance the accuracy of the interpretations made. Triangulation was utilized, incorporating multiple data sources such as interviews, documents, and observations to corroborate the consistency and validity of the findings. These measures collectively strengthened the credibility and trustworthiness of the research outcomes.

3.7. Ethical Considerations:

The researcher obtained informed consent from all participants before conducting the interviews. All participants were given the opportunity to ask questions about the study and to withdraw from the study at any time. The researcher also ensured anonymity and confidentiality of the participants' data by assigning pseudonyms to them and the data will be used only for the academic purpose.

CHAPTER FOUR

FINDINGS AND DISCUSSION

This chapter provides a comprehensive analysis and interpretation of the collected data. It presents the key findings, examine their alignment with the research questions, and explore their implications through a systematic approach.

4.1. Research Dataset

The research dataset was derived from the sampling design implemented in this study. The dataset consisted of information collected from a total of six banks and one payment system operator (PSO) in the Ethiopian banking sector.

The sampling design employed a combination of random sampling and purposeful sampling techniques to ensure a representative and comprehensive dataset. Two banks were randomly selected namely Bank of Abyssinia and Dashen Bank from the top tier established banks that utilized independent technology. This random selection helped to mitigate bias and provide a diverse representation from this subgroup of banks.

Furthermore, two banks namely Awash Bank and Cooperative Bank of Oromia were purposefully selected from the top tier established banks that utilized a shared technology platform. This purposeful sampling technique allowed for targeted selection, focusing on gaining insights into the experiences and perspectives of banks operating within a shared technology platform environment.

In addition, two banks were purposefully selected namely Enat Bank and Tsehay Bank from the recently established banks, with one of them (Tsehay Bank) being a new entrant. Purposeful sampling was employed to include these specific banks, offering a deeper understanding of the challenges, opportunities, and unique characteristics associated with new players in the industry.

The payment system operator (PSO) included in the dataset was PSS and selected based on its relevance and significance within the Ethiopian banking sector. This ensured the inclusion of a key player involved in facilitating technology sharing among banks.

4.2. Findings & Discussion

4.2.1. Technology Adoption and Sharing Technology Platforms

4.2.1.1. Technology Adoption Practices in Ethiopian Banking Sector

The qualitative data collected from interviews and focus group discussions reveal several key points on the technology adoption practices in the Ethiopian banking sector. Participants consistently highlighted the progressive nature of technology adoption in the sector, as one interviewee stated, “The banking sector's technology adoption has experienced substantial growth over the past 10 to 20 years.” indicating that banks have increasingly embraced digital transformation as a means to modernize their services and deliver enhanced banking experiences to their customers. This includes the adoption of Centralized Online Real-time Environment (CORE) banking technology, digital channels, mobile banking applications, and internet banking platforms. Infrastructure technologies also play a crucial role in the sector, with banks utilizing data centers, network and security hardware, and software to offer their services effectively.

It is noteworthy that the adoption of CORE banking technology was enforced by the regulator, National Bank of Ethiopia (NBE), in June 2011. Since then, all banks in Ethiopia have implemented this technology, which has significantly enhanced the banking infrastructure and operational capabilities across the sector. Furthermore, the Commercial Bank of Ethiopia (CBE) can be credited as the pioneer in E-Banking technologies, as they introduced ATMs in the early 2000s, revolutionizing banking accessibility and convenience. However, it is important to highlight that while CBE initiated the ATM services, Dashen Bank is considered as the institution that fully started card banking services using Electronic Fund Transfer (EFT) Switch, further expanding the scope of electronic banking in the country.

Apart from the core technologies, banks in the Ethiopian banking sector have also made substantial investments in various other technological areas. These include Enterprise Resource Planning (ERP) systems, Customer Relationship Management (CRM) software, Data Warehousing solutions, Management Information Systems (MIS), analytics tools, access control systems, file management systems, authentication systems and many more.

The investment in these technologies highlights the sector's commitment to adopting comprehensive and robust technological solutions to meet the evolving needs of customers and stay competitive in the digital age. The introduction of CORE banking technology, the utilization

of digital channels, and the implementation of infrastructure technologies have contributed to a more efficient and customer-centric banking environment. By leveraging a wide range of technologies, Ethiopian banks are able to optimize their operations, offer innovative products and services, and deliver a seamless and secure banking experience to their customers.

4.2.1.2. Experiences in Sharing Technology Platforms

Despite the increasing adoption of technology, technology sharing was not widely practiced in the Ethiopian banking sector. Premiere Switch Solutions Share Company (PSS) considered the pioneer practitioner of sharing technologies in the banking sector. PSS was established by three private commercial banks i.e. Nib Bank, Awash Bank, and Hibret Bank in 2009 as a consortium with an objective of sharing the EFT Switch Technology and create interoperability among themselves. Subsequently, Addis International Bank, Birhan Bank, and Cooperative Bank of Oromia joined the consortium bringing the total membership to six.

In 2011, another technology sharing initiative called EthioPay, also known as Ethswitch, was launched marking another significant development in the Ethiopian banking sector. This national switch was established through collaboration among all Ethiopian commercial banks, the Ethiopian Banker's Association, and the National Bank of Ethiopia (NBE). Through EthioPay, all banks in Ethiopia became interconnected, allowing customers to access interoperable services from any bank's ATM and POS terminals, as well as facilitating person-to-person (P2P) transfers.

In line with the efforts to enhance banking services, the NBE also took the initiative to establish the Automated Clearing House, and Real Time Gross Settlement (RTGS) system to enhance efficiency in handling check transactions and to provide a mechanism for processing high value transactions between banks in real-time respectively.

More recently, a noteworthy trend in the Ethiopian banking sector is the sharing of data center services among banks. This approach allows banks to optimize their resources and infrastructure by leveraging shared data center facilities. One example of data center sharing is the utilization of Ethio Telecom's data center co-location services, which provide critical infrastructure support. Interviewees highlighted instances where banks, such as Tsedey Bank and Amhara Bank, have successfully shared Ethio Telecom's data center, effectively pooling their resources. Similarly, Enat Bank has adopted this model for its disaster recovery site, ensuring business continuity in the

event of unforeseen disruptions. Dashen Bank also opened up its newly opened Tier III ready data center for sharing with other financial firms and large public and private entities

Another notable example mentioned in the interviews is the collaboration between ZamZam Bank and CBE (Commercial Bank of Ethiopia) in sharing a data center. This strategic partnership enables ZamZam Bank to avoid additional investments in setting up separate data center facilities.

Furthermore, bundled services provided by companies like Premier Switch Solutions (PSS) and EthSwitch offer comprehensive solutions to banks in the Ethiopian banking sector. These bundled services encompass a wide range of offerings, including personalization services, ATM and POS management and international cards.

4.2.1.3. Technology diversification

According to the interviewees, despite the availability of widely used technology solutions in the Ethiopian financial sector, many banks continue to invest in and acquire the same technology independently. The interviewees claimed that this approach stems from a perceived need to maintain control over their own technology infrastructure and systems. They expressed concerns about potential limitations and dependencies associated with shared technology platforms. While this indicates a preference for independent ownership, it also results in duplicated investments, increased costs, and missed opportunities for collaboration and resource optimization.

One interviewee highlighted this perspective, stating, "We see other banks using the same technology that we have invested in, but there is a reluctance to share because we feel the need to have control over our own systems. It's a matter of trust and comfort in knowing how our technology works and we think owning and running our technology is hassle free."

The interviewees also acknowledged that the longer-established high-tier banks tend to set the technology adoption standards, influencing other banks to follow suit. However, they emphasized the potential benefits of technology sharing, such as cost reduction, knowledge exchange, and improved efficiency, if banks were to overcome their reservations and adopt a collaborative approach to platform sharing.

The researcher tried to support the technology diversification of Ethiopian banks technology use by collecting data on core banking and Switch technologies usage.

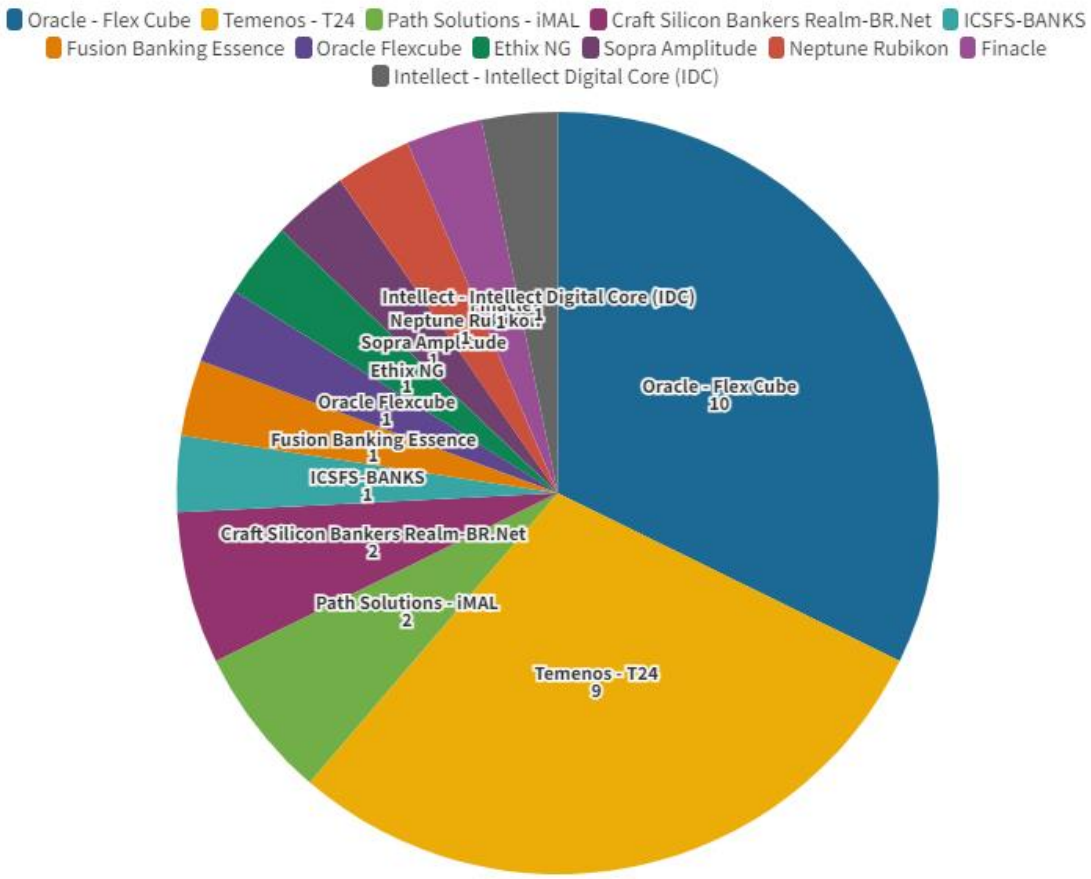


Figure 4-1 Ethiopian Banks CORE Banking Technology Vendors Diversification

As a result, majority of banks (20 out of 31) utilizing Oracle Flex Cube and Temenos T24 solutions for CBS. This widespread adoption indicates a high level of familiarity and comfort among banks in utilizing these major solutions. The choice of these well-established and widely-used solutions showcases the banks' confidence in the reliability, functionality, and operational capabilities of Oracle Flex Cube and Temenos T24. This familiarity and comfort factor creates a favorable environment for technology sharing among banks, as they are already well-versed in the operations and functionalities of these core banking systems.

When banks have a common understanding and expertise in utilizing the same CBS, it becomes easier to share resources and knowledge. The narrower the diversification of core banking systems, the smoother the process of technology sharing becomes. Banks can also leverage their collective knowledge and experiences to optimize operations, enhance interoperability, and improve overall efficiency.

The prevalence of Oracle Flex Cube and Temenos - T24 solutions in the Ethiopian banking sector provides a solid foundation for further technology sharing initiatives. Banks can build upon their existing expertise and explore opportunities to extend the benefits of shared technology to other institutions. By doing so, they can foster innovation, strengthen the banking ecosystem, and drive sustainable growth in the industry.

It is worth noting that while Oracle Flex Cube and Temenos - T24 solutions dominated the market, there are other core banking systems in use as well. As the banking landscape continues to evolve, banks may evaluate the potential for sharing technology with these alternative solutions, further expanding the scope of collaboration and knowledge sharing within the sector. The prevalence of Oracle & Temenos solutions can be attributed to their established reputation and proven track record in the industry. However, it is important to consider the potential limitations of relying solely on these major solutions, particularly in terms of cost and investment requirements.

The usage of switch solutions in the Ethiopian banking sector is primarily dominated by shared technology platform providers. Notably, Premier Switch Solutions (PSS) and EthSwitch have made significant progress in this regard. Six banks have chosen to adopt PSS's S2M solution, which offers a comprehensive range of services, while the remaining banks have opted for EthSwitch's BPC technology. This trend indicates the growing recognition among banks of the benefits and advantages of utilizing shared switch solutions provided by established platform providers. By leveraging these shared technologies, banks can streamline their operations, enhance interoperability, and improve the overall efficiency of their payment systems. The adoption of PSS and EthSwitch solutions showcases the willingness of banks to collaborate and share technology to achieve common goals and deliver enhanced services to their customers.

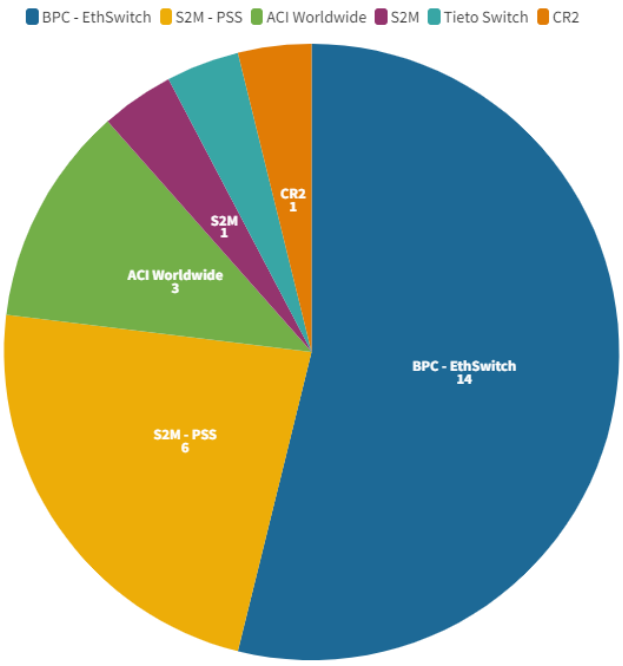


Figure 4-2 Ethiopian Banks EFT Switch Technology Vendors Diversification

Despite the domination of PSS and EthSwitch in the usage of switch solutions, there are banks in the sector that have chosen to manage their own switch technologies. Specifically, three banks, namely Commercial Bank of Ethiopia, Dashen Bank, and Bank of Abyssinia, have opted for independent implementations of ACI Worldwide as their switch solution. On the other hand, Wegagen Bank utilizes Tieto Switch, Zemen Bank relies on CR2, and Abay Bank has implemented S2M as their preferred switch solutions.

This diversification in switch technologies highlights the fact that banks have taken into account their specific needs and preferences when selecting switch functionalities and capabilities. Rather than solely relying on shared switch platforms, these banks have chosen to invest in and manage their own systems. One of the interviewees from Bank of Abyssinia expressed their perspective on the managing their own switch technologies, stating, “This decision is driven by factors such as the desire for more control over our operations, customization options, and the availability of specific features offered by our chosen switch solution. We believe that by managing our own switch technology, we can align it more closely with our strategic goals and initiative hence our unique needs and preferences, allowing us to optimize our operations and deliver tailored services to our customers effectively.”

4.2.2. Benefits of Sharing Technology Platforms

4.2.2.1. Cost Reduction

With the growing competition in the Ethiopian banking sector and the entry of new banks, the costs associated with technological investments have increased. This is a noteworthy observation, particularly considering that most, if not all, of the technologies adopted by banks are imported, resulting in substantial expenditures in foreign currency. As one interviewee from a newly established bank highlighted, "The cost of technology, both in terms of hardware and software, is very high, consuming resources that could otherwise be invested in critical business-related investments." It is important to recognize that this situation not only impacts the banking sector but also exerts pressure on the overall economy of the country, particularly during periods of foreign currency shortage.

The substantial investment in foreign currency required for importing technologies contributes to the economic strain and challenges faced by the country. It is worth mentioning that despite these investments, many interviewees expressed the belief that there are underutilized technological resources within the sector. This underutilization implies a missed opportunity to fully leverage the existing technological capabilities.

Another interviewee highlighted the potential of sharing technology to minimize costs for new entrant banks, specifically by alleviating the need for substantial initial investments in acquiring technology. According to their perspective, sharing platforms can provide an opportunity for these banks to access and utilize advanced technology without bearing the full burden of the associated costs. By participating in collaborative efforts and sharing technology resources, new entrant banks can overcome financial barriers and gain access to essential technological capabilities.

The consensus among several interviewees was that sharing technological platforms represents a viable solution for efficient utilization of the available resources. They expressed agreement that by embracing sharing platforms and fostering collaboration among banks, it becomes possible to minimize redundant investments and fully leverage the existing technology. This approach enables banks to optimize their resources effectively, ensuring that technological assets are utilized to their maximum potential.

Sharing technological platforms significantly reduces expenses for banks by adopting a shared cost model for infrastructure setup, maintenance, and upgrades. Instead of individually shouldering the

full financial burden, banks can distribute the costs among multiple participants, resulting in substantial savings. By pooling resources and sharing infrastructure, banks can optimize their IT budgets and allocate resources more efficiently. This approach allows banks to focus their financial resources on other critical areas, such as innovation, customer experience, and business expansion.

4.2.2.2. Enhanced Customer Experience

Sharing technology platforms in the banking sector has the potential to greatly enhance customer experiences and services. One of the key benefits highlighted in the study is the creation of a unified customer interface through platform sharing. By collaborating and sharing platforms, banks can provide customers with seamless access to services across multiple institutions. This means that customers can enjoy a consistent and personalized experience regardless of the specific bank they are interacting with. They can access their accounts, perform transactions, and utilize various banking services through a unified interface, eliminating the need to navigate different systems or interfaces for each bank.

During the interviews, several participants highlighted the recent government initiative to digitize fuel payments in Ethiopia. Currently, three banks have taken the lead in offering digital fuel payment services, with Commercial Bank of Ethiopia (CBE) providing two platforms. The introduction of digital fuel payment services has had a positive impact, encouraging the use of digital payments instead of cash. However, there is still confusion surrounding the full implementation and rollout of this service. One major concern is the potential confusion that may arise if all banks start participating in the digital fuel payment service. Customers and fuel station attendants may become overwhelmed and encounter difficulties as each bank assigns sales officers to train and create awareness about their respective platforms. This fragmented approach could lead to a chaotic situation where multiple platforms are being promoted simultaneously, causing confusion among users and attendants.

A unified customer interface not only simplifies the banking experience for customers but also enables banks to deliver more personalized services. With shared platforms, banks can leverage collective expertise and resources to develop innovative products and services. By pooling their knowledge and capabilities, banks can create customer-centric solutions that address the unique needs of Ethiopian banking customers. These solutions may include advanced digital banking features, tailored financial products, and improved customer support services.

The enhanced customer experience facilitated by technology platform sharing goes beyond just convenience and personalization. It also contributes to overall customer satisfaction. When customers have a seamless and consistent experience across multiple banks, they are more likely to feel valued and appreciated. The ability to access services effortlessly and receive personalized offerings can strengthen the relationship between customers and banks, fostering loyalty and trust.

4.2.2.3. Minimize Duplicated Efforts in Technology

Sharing technological platforms among banks fosters synergy and eliminates redundant efforts in developing similar systems independently. By collaborating and leveraging shared technological platforms, banks not only prevent redundant investments in, but also enjoy the indirect benefits of time and effort savings during implementation. Instead of individually acquiring and implementing identical technologies, banks can consolidate their resources and prioritize collaborative innovation. This approach empowers them to evade duplication of technology infrastructure and allocate their resources more efficiently, thereby enhancing their core competencies.

In the context of PSS, an interviewee stated, "PSS enabled six banks to use the same technology and infrastructure, thereby averting significant costs, time, and effort duplications." This demonstrates the tangible advantages of PSS, as it eliminated the need for individual banks to independently invest in and implement the same technology, resulting in substantial savings and streamlined operations.

4.2.2.4. Operational Efficiency

Operational efficiency is greatly enhanced through the sharing of technology platforms among multiple banks. This collaborative approach enables the implementation of streamlined processes and standardized operations across the participating institutions. By leveraging shared platforms, banks can eliminate the need for manual intervention and reduce redundant tasks that often arise when each bank develops and maintains its own separate systems.

By adopting common standards and best practices, banks can align their processes, data structures, and workflows, leading to improved efficiency throughout the entire banking ecosystem. This standardized approach reduces the need for repetitive tasks and manual workarounds, as processes can be automated and harmonized across the participating banks.

An interviewee from Awash Bank stated “the international bank scheme interface, certification process, and related services demand significant investment in project management, vendor payment, hardware and other indirect costs. However, by leveraging PSS, we were able to minimize and distribute these costs among us. Moreover, international schemes and payment card personalization services necessitate PCI-DSS certification, a crucial industry-standard security certification which requires periodical evaluations. Through PSS, we achieved joint certification on behalf of all member banks and these periodical checks can be managed by the PSS. ATM monitoring, clearing and settlement, and contact center operations can be processed by this shared platform. This collaborative approach not only reduced costs but also enhanced operational efficiency, enabling us to allocate funds towards other investments.”

Furthermore, shared technology platforms enable the consolidation and integration of various systems, leading to streamlined data management and improved information flow. This integration eliminates data silos and facilitates seamless communication and collaboration among the participating banks.

4.2.2.5. Improved Availability

Through shared technological platforms, banks not only enhance the availability of their services but also benefit from collaborative investment and decision-making to further improve availability. By leveraging a common infrastructure, banks can distribute their operations across multiple locations, increasing the resilience of their service delivery systems.

Additionally, collaborative decision-making among banks, facilitated by shared platforms, leads to better strategic planning and resource allocation for enhancing availability. By jointly assessing risks and identifying common vulnerabilities, banks can make informed decisions on where to invest in redundancy measures, such as backup systems, failover mechanisms, and disaster recovery solutions. This collective approach minimizes the chances of overlooking critical aspects and ensures a comprehensive availability strategy.

An interviewee from Enat Bank stated that “Through sharing technology platforms, availability can be greatly improved. By collaborating and pooling resources instead of having independent data center we can ensure that our systems are more robust and resilient. For example, if one bank faces a technical issue or downtime, the others can step in and provide uninterrupted services to

customers. In this regard, we are using Ethio Telecom's data center for our disaster recovery site and it allows us to enhance the availability of our services."

4.2.2.6. Resource Optimization

By sharing a common technology platform, banks can consolidate their IT infrastructure, eliminating the duplication of hardware and software resources. This consolidation reduces the overall number of servers, data storage systems, networking equipment, and other IT components required. As a result, banks can significantly reduce their capital expenditure on purchasing and maintaining individual IT assets.

Banks can allocate their resources more strategically by pooling their investments and collectively managing the shared infrastructure. This approach allows for better utilization of IT assets, as resources can be dynamically allocated based on demand and usage patterns. For instance, many interviewees shared the idea of data center sharing. Instead of each bank maintaining separate data centers with underutilized capacity, a shared data center enables them to optimize resource utilization and allocate resources based on the actual needs of the banks.

Furthermore, shared platforms enable banks to benefit from economies of scale. Apart from tapping unutilized resources, through consolidating their IT infrastructure and pooling their resources, banks can negotiate better pricing and licensing terms with technology vendors.

4.2.2.7. Leverage Expertise Sharing

Sharing platforms leads to the creation of a talent pool with specialized technological skills, which is a significant advantage for banks. Through collaborative technology sharing, banks have the opportunity to tap into external expertise and knowledge from various sources. By working together and sharing experiences, banks can leverage the specialized skills and insights of their industry peers, consultants, and technology vendors.

Collaborative technology sharing not only allows banks to access a broader range of expertise but also fosters a culture of continuous learning and improvement. By engaging in shared platforms, banks can draw upon the collective knowledge and experiences of multiple institutions. This collaborative effort in technology implementation and management enables banks to benefit from the diverse perspectives and innovative approaches brought by their peers.

In addition, shared platforms offer a fertile ground for knowledge exchange and skills transfer. Banks can learn from one another's best practices, successful strategies, and lessons learned from past implementations. This collective knowledge-sharing enhances the technological capabilities of each participating bank and contributes to the overall growth of the industry.

One interviewee indicates the opportunity realized by saying “I don't have to train my employees about switch technologies because it is fully managed by a shared service. Instead, I will concentrate on advancing my employees in different subjects, such as customer service, product development, and other areas that can directly contribute to enhancing our competitive advantage and customer satisfaction.”

4.2.2.8. Risk Minimization

“It is always easier and less costly to defend one site than six or ten sites from a cyber-attack.” An interviewee when stressing the advantage of sharing technological platform benefit in the context of cyber security risk.

Shared technological platforms can play a crucial role in mitigating risks, particularly in the context of increasing cybersecurity concerns. As the threat landscape evolves, protecting multiple individual sites becomes increasingly complex. However, by consolidating their technology infrastructure through sharing, banks can simplify their security measures and focus on safeguarding a single site.

This centralized approach to cybersecurity enhances the banks' ability to protect their systems, data, and customer information from malicious attacks. By pooling their resources and expertise, banks can collectively tackle emerging cybersecurity challenges, conduct comprehensive risk assessments, and establish robust risk management strategies. This collaborative effort enables them to stay one step ahead of potential threats and ensure the security and integrity of their shared technological platform.

4.2.2.9. Access Advanced Technology Solutions

Technology sharing opens doors for banks to access advanced solutions and capabilities that may have been otherwise challenging to obtain independently. By leveraging shared platforms, banks can embrace cutting-edge technologies, ensuring they stay competitive in product and service

offerings. This collaborative approach empowers banks to tap into innovative tools and solutions, driving continuous improvement and growth within the industry.

By sharing technological platforms, banks can enhance their overall technological capabilities. They can leverage shared resources, infrastructure, and expertise to drive innovation, improve system performance, and implement emerging technologies more effectively

4.2.2.10. Quick Time to Market

Technology sharing expedites the deployment of new services and products, which is especially advantageous for new entrants in the banking market. As new banks often face financial constraints and limited resources, acquiring all the latest technologies independently can be challenging. However, by leveraging shared platforms and collaborating with established industry players, new banks can overcome these hurdles. They can tap into existing infrastructure and expertise, accelerating the development and implementation of innovative solutions. This enables new banks to swiftly establish their presence, compete effectively, and meet the evolving demands of customers, despite their initial limitations in capital and technological resources.

In addition to benefiting new entrants, technology sharing also presents an opportunity for existing established banks that have already invested significant sums in acquiring various technologies. By embracing the concept of sharing, these banks can leverage their existing investments and collaborate with other institutions to maximize the value of their technology infrastructure. Instead of duplicating efforts and investments, established banks can adopt a more open and welcoming approach to sharing their technological resources. This not only promotes collaboration and efficiency within the industry but also allows banks to optimize their existing technology investments and explore new avenues of innovation together.

4.2.3. Challenges and Concerns in Sharing Technology Platforms

4.2.3.1. Technological Support

Insufficient support from technology vendors or service providers is a significant challenge that banks face when it comes to sharing technology platforms. The lack of timely assistance, issue resolution, and troubleshooting can hinder the smooth operation of the shared platform, potentially impacting the overall effectiveness of the banks' operations. This concern was echoed by multiple interviewees who are currently participating in shared services using Switch technology.

One interviewee emphasized the importance of technology or vendor openness in determining the level of support. In a shared platform, it is crucial for the platform owner to ensure that the technologies being utilized are open and accessible. However, there are indications that the level of technology support heavily relies on the vendor, while the local team contributes little to nothing in terms of technical support. This disparity in support can lead to frustrating experiences where seemingly simple technical issues remain unresolved for extended periods, causing delays and inefficiencies in the system.

4.2.3.2. Lack of Flexibility and Consensus Requirement

Achieving flexibility in sharing technology platforms is crucial for accommodating new product innovation and meeting specific requirements. However, the lack of flexibility among technology platform providers involved in the sharing process often poses challenges.

Many interviewees explained that, the current switch technology sharing models employed by both PSS and Ethswitch on new requirements or product innovations require consensus among the member banks. This approach follows a "one product suits all" strategy, which can have negative implications for new product development. Some member banks may be compelled to implement products or services that they believe are unnecessary or unsuitable for their specific market.

The common ground solutions adopted by technology providers may not align with the individual priorities and needs of each bank. This misalignment further complicates the attainment of a flexible and adaptable shared platform, hindering the introduction of new and tailored products. The consensus-based decision-making process may restrict the autonomy of individual banks, impeding their ability to innovate and meet the unique demands of their target market.

Sharing technology platforms can hinder innovation if the shared infrastructure lacks flexibility and customization options. Banks may face limitations in implementing unique features or functionalities that differentiate their services from competitors. Balancing standardization for collaboration with the need for innovation becomes crucial.

4.2.3.3. Dependency on Shared Platform Provider

Banks participating in technology platform sharing initiatives may find themselves heavily dependent on the shared platform provider. This dependency raises concerns regarding potential

vulnerabilities that could impact the overall operations and customer service. The risk of service disruptions, data security and the ability to meeting evolving technological demands all are risks which can be associated with shared services.

Technical issues or failure to deliver on the service level agreements, any downtime or interruptions in service can negatively affect the banks' ability to serve their customers and conduct business smoothly.

Furthermore, it is crucial for the shared platform provider to demonstrate its ability to adapt to the evolving technological landscape. With rapid advancements in technology, banks require assurance that the shared platform can effectively keep pace with these changes. Several interviewees shared an experience where one member of a shared technology platform user bank tried to own its own technology, and the implementation project took more than the perceived timeframe. This experience served as a lesson for the remaining member banks, highlighting the importance of relying on the shared platform and make a collaborative enhancement when needed. However, a shared platform provider must demonstrate the ability to keep up with evolving technological demands to ensure long-term viability and avoid costly disruptions caused by individual banks attempting to go their own way.

4.2.3.4. Knowledge Gap

Sharing technology platforms can present challenges related to varying levels of technological expertise and investment among participating banks. Not all banks may possess the same level of knowledge or resources to effectively navigate the evolving technology landscape or make necessary investments in upgrades and maintenance. This discrepancy can create imbalances and hinder the overall success of technology sharing initiatives.

Banks with limited knowledge or resources may struggle to keep up with the evolving technology landscape or invest adequately in necessary upgrades and maintenance. Bridging the knowledge gap and ensuring equitable technology investments among participants is crucial for the success of technology sharing initiatives.

4.2.3.5. Technology and Contextual Suitability

Banks should assess the suitability of a shared technology platform in relation to their specific operational requirements, taking into account their unique business strategies, goals, and targets.

It is imperative to recognize that banks have different ambitions and requirements, and their technology choices should align with their individual contexts and performance expectations. Simply following the established banks' technology choices may not suffice.

Given the diverse nature of banking systems and customer preferences across segments, finding a shared platform that accommodates these variations can be challenging. Therefore, banks must carefully evaluate and ensure that the shared platform they opt for aligns with their distinct needs. This necessitates a thorough assessment of the type and performance of the technology to determine its compatibility with their business strategies and operational objectives. By conducting this evaluation, banks can make informed decisions that enable them to leverage the shared technology platform effectively, supporting their unique goals and requirements.

4.2.3.6. Resistance and Lack of Success

The implementation of technology sharing initiatives often encounters resistance from individuals or departments within participating banks who perceive the change as disruptive or unnecessary. This resistance can be rooted in various factors, such as concerns about job security, loss of control, or doubts about the effectiveness of shared platforms.

One of the interviewees highlighted that internal resistance can arise when member banks fail to outsource their assigned human resources to the sharing platform owner. In some cases, member banks are actively participating in the sharing initiatives while simultaneously running departments and employing staff that engage in similar business activities managed by the shared platform owner. This situation can lead to arguments and issues between the third-party sharing platform entity and the bank staff, as there is a competition of knowledge and a desire for individual staff members to showcase their expertise, even though their services have been fully outsourced.

4.2.3.7. Sharing Modality

Determining the most suitable modality for sharing technology platforms is a multifaceted undertaking. Banks are confronted with various considerations, including the required level of integration, data sharing agreements, governance mechanisms, and decision-making processes. The choice between centralized or decentralized sharing models carries implications for system performance, data security, and overall operational efficiency. It is imperative to select the sharing modality that best aligns with the objectives and capabilities of participating banks.

In light of the current technology platform experience, several interviewees expressed limitations arising from factors such as inflexibility, inadequate support, and fierce competition within the sector. They expressed a preference for a platform-as-a-service model (PaaS), which would afford them greater flexibility in configuring new products and services, innovating new offerings, and implementing new requirements according to their preferences.

4.2.3.1. Lack of Measurements for Technology Investments

The challenge of lacking return on investment (ROI) or other measurements for technology investments in the Ethiopian banking sector is also another concern raised by interviewees. Banks tend to prefer independent technology investments, relying on familiar and established systems that have proven success in the past and avoid sharing as they don't concern the expense as such. However, this approach disregards the potential benefits of technology platform sharing and inhibits the realization of cost savings and operational efficiencies. Several key points contribute to this challenge.

Board members are primarily concerned with cost reduction and maximizing profitability. Without clear ROI measurements, assessing the impact of technology investments on the bottom line becomes challenging. The absence of tangible financial metrics makes it difficult for board members to quantify the potential return on investment in shared technology platforms, leading them to perceive investing and managing the existing technology independently is necessary or sharing platforms as risky or uncertain.

4.2.3.2. Operational complexity

Sharing technology platforms introduces operational complexities as multiple banks are involved, necessitating seamless integration and interoperability. Coordinating activities among the participating institutions, managing system upgrades, and ensuring smooth functioning across all entities can be demanding. It requires the establishment of robust governance structures and efficient coordination mechanisms to address potential challenges and ensure effective collaboration.

4.2.3.1. Conflict of interest technology platform sharing

Conflicts of interest can arise among participating banks when sharing technology platforms. Competing priorities, divergent business strategies, or concerns about data security and intellectual property can create tensions and hinder collaborative decision-making. Establishing transparent

governance frameworks, clearly defining roles and responsibilities, and addressing potential conflicts of interest are vital to foster trust and cooperation.

4.2.4. Barriers of technology platform sharing

4.2.4.1. Lack of Awareness of the technology capability

One of the barriers identified is the limited understanding of the capabilities and benefits of shared technology platforms among banks especially when it comes to CBS. While some interviewees from established banks acknowledge the feasibility of sharing CBS, citing examples such as CBE's use of the same Temenos technology for its subsidiary companies in Djibouti and South Sudan, many banks remain unaware of the potential capabilities, advantages, and opportunities that technology sharing can provide. This lack of awareness creates reluctance among banks to explore and embrace shared services.

4.2.4.2. Banks' readiness for shared services in technology platform

The readiness of banks to adopt and participate in shared services is another significant barrier. Banks differ in their preparedness and ability to integrate and collaborate with other institutions on a technology platform. Factors such as legacy systems, organizational culture, and internal processes can impact their readiness for sharing services and resources.

4.2.4.3. Initiative in creating the sharing platform

The successful establishment and implementation of a technology sharing platform in the Ethiopian banking sector require proactive initiatives from various stakeholders, including industry regulators, banking associations, and technology providers. However, the challenge of lack of initiative arises due to differing motivations among established banks and new entrants or relatively young banks.

Established banks, running smooth operations and not facing immediate cost concerns, may not find a compelling reason to initiate sharing technology. Since they already have their systems in place and may perceive sharing as unnecessary or disruptive, they may be less motivated to take the lead in creating a technology sharing platform.

On the other hand, new entrants and relatively young banks may hesitate to initiate sharing technology due to the assumption that others in the industry will prioritize their own benefit and have nothing to benefit from them. This perception can create a mindset that inhibits proactive

initiatives among these banks, as they may believe that collaboration and technology sharing may not bring immediate advantages to them.

4.2.5. Trust

Trust plays a critical role in the successful implementation of technology sharing platforms in the Ethiopian banking sector. Collaborating banks must have confidence in the platform's capability to foster innovation, protect data security, and consistently deliver high-quality services.

One aspect of trust is the platform's ability to support and encourage innovation. Banks need to trust that the shared technology platform allows for the implementation of new features, functionalities, and innovative ideas. It is important for banks to feel assured that the platform does not restrict their ability to differentiate their services and remain competitive in the market. Several interviewees suggest that the current experience of sharing model lacks this.

Data security is another significant concern in technology platform sharing. Banks must have trust in the platform's ability to adequately safeguard sensitive customer information and comply with regulatory requirements.

Furthermore, banks need assurance that the shared technology platform will consistently deliver high-quality services. Trust is built when participants have confidence in the platform's reliability, availability, and performance. Any issues such as system downtime, service disruptions, or inadequate support can erode trust and negatively impact the overall satisfaction of participating banks. In this regard, interviewees suggest the sharing platform owner to act in a high professionalism manner, enter into a service level and operation level agreements.

4.2.6. Competition

Banks that participate in technology sharing initiatives early on have the opportunity to gain a first-mover advantage. By being part of the initial group, these banks can influence the design of the shared platform, its governance structures, and decision-making processes. This advantage enables them to shape the platform to their advantage and potentially emerge as leaders in the industry.

While collaboration is the primary focus of technology sharing, it is important to recognize that participating banks still strive to maintain a competitive edge and offer innovative products and services. The shared platform creates a competitive environment where banks aim to differentiate

themselves and stay ahead in the market. Balancing collaboration and competition become crucial to ensure a healthy ecosystem that benefits all participants.

During the interviews, one participant expressed the perspective that technology is seen as a commodity that can be easily replicated and that the competitive advantage of technology is short-lived. Many other interviewees shared a similar sentiment, highlighting that the competitive advantage in technology is transient, and sharing technology does not significantly impact competitiveness. It is acknowledged that technology adoption cannot be forced solely by competition; instead, it is driven by strategic goals, product roadmaps, and initiatives. Furthermore, even if some banks have invested in a specific technology, it does not necessarily justify the investment for other banks. Technology is viewed as a derivative of strategic goals, meaning that the decision to adopt certain technologies should align with the overall strategic direction of each bank.

4.3. Discussion

4.3.1. Technology Adoption

The study reveals that Ethiopian banks have progressively embraced technology adoption over the past decade or two. This adoption has facilitated the modernization of banking services and the delivery of enhanced customer experiences. Key technologies adopted include CORE banking technology, switch technology, digital channels, mobile banking applications, and internet banking platforms. The implementation of infrastructure technologies such as data centers, network and security hardware, and software has also played a crucial role in improving operational capabilities.

The enforced adoption of CORE banking technology by the National Bank of Ethiopia (NBE) has significantly enhanced the banking infrastructure across the sector. The introduction of ATMs by the Commercial Bank of Ethiopia (CBE) revolutionized accessibility and convenience in banking. The investments made in various other technological areas, demonstrate the sector's commitment to meeting customer needs and remaining competitive in the digital age.

The significance of these adoption practices lies in the transformation of the banking environment to be more efficient and customer-centric. By leveraging a wide range of technologies, Ethiopian banks are able to optimize their operations, offer innovative products and services, and tries to deliver seamless and secure banking experiences to customers.

4.3.2. Sharing Technology Platforms

The study found that technology platform sharing among banks in Ethiopia is limited. This means that there is a lack of collaboration and sharing of technological resources and infrastructure among banks in the country. This finding emphasizes the missed opportunity for banks to leverage shared platforms and benefit from economies of scale. By sharing technology platforms, banks can reduce their individual costs of developing and maintaining IT systems, leading to improved efficiency and cost savings. Additionally, technology platform sharing can enable banks to offer innovative products and services more quickly by leveraging the expertise and capabilities of other banks.

However, there are notable instances of technology sharing initiatives that have brought benefits to the sector. For example, Premiere Switch Solutions (PSS) and EthioPay (Ethswitch) have facilitated interconnectivity and interoperability among banks, allowing customers to access services from any bank's ATM and facilitating person-to-person transfers.

Sharing data center services, such as Ethio Telecom's data center co-location, has also enabled banks to optimize their resources and infrastructure. Collaboration between banks, such as the partnership between ZamZam Bank and CBE in sharing a data center, has resulted in cost savings and operational efficiencies. Bundled services provided by companies like PSS and EthSwitch offer comprehensive solutions to banks, further supporting collaboration and resource optimization.

The significance of sharing technology platforms lies in the potential for cost reduction, knowledge exchange, and improved efficiency within the banking sector. Collaboration among banks not only fosters innovation but also strengthens the overall banking ecosystem, facilitating sustainable growth in the industry. However, the study also highlights the reluctance of some banks to share technology due to concerns related to control and familiarity with their own systems. This indicates a preference for ownership and management of technology rather than embracing the access over ownership principle, which could limit the potential benefits that sharing platforms offer. Hence it is found to be inconsistent with the access over ownership principle (Constantiou et al., 2017 & Botsman et al., 2010).

4.3.3. Technology Diversification

The findings indicate that many banks in the Ethiopian banking sector continue to invest independently in technology, even when widely-used solutions are available. This diversification

stems from a desire to maintain control over their technology infrastructure and systems. However, it results in duplicated investments, increased costs, and missed opportunities for collaboration and resource optimization.

The prevalence of Oracle Flex Cube and Temenos T24 CBS solutions in the sector indicates a high level of familiarity and comfort among banks. This familiarity creates a favorable environment for technology sharing, as banks are already well-versed in the operations and functionalities of these core banking systems. The dominance of PSS and EthSwitch in switch solutions also showcases the growing recognition among banks of the benefits of shared technology platforms.

The significance of technology diversification lies in the potential for collaboration and resource optimization. When banks have a common understanding and expertise in utilizing the same core banking systems or switch solutions, sharing resources and knowledge becomes easier. This collaboration can lead to cost reductions, improved interoperability, and enhanced efficiency. However, the study also emphasizes the importance of considering potential limitations and costs associated with relying solely on major solutions.

4.3.4. Benefits of Sharing Technology Platforms

One of the significant benefits identified in the study is cost reduction. By sharing technology platforms, banks can pool their resources and collectively invest in the development and maintenance of IT systems. This sharing of costs enables banks to achieve economies of scale, as the expenses are distributed among multiple institutions. By reducing individual expenses, banks can allocate their financial resources more efficiently and redirect them towards other strategic initiatives. This cost reduction is particularly significant for Ethiopian banks, as it can help them overcome budget constraints and invest in improving their overall technology infrastructure.

Another important benefit of technology platform sharing is increased operational efficiency. The study found that shared platforms can streamline processes, eliminate redundancies, and improve workflow across participating banks. When banks share platforms, they can leverage standardized systems and procedures, resulting in greater operational consistency. This consistency facilitates seamless integration and interoperability among banks, enhancing the overall efficiency of banking operations. In the Ethiopian banking sector, where technological advancements are still evolving, platform sharing can be instrumental in streamlining processes, reducing manual errors, and improving overall operational efficiency.

In addition, technology platform sharing enables banks to access a broader range of capabilities and expertise. The study highlighted that shared platforms can offer access to advanced technologies, innovative solutions, and specialized skills that may not be available to individual banks. By collaborating and sharing platforms, banks can tap into the collective knowledge and experience of their peers, fostering a culture of learning and innovation. In the context of the Ethiopian banking sector, where there is a need for digital transformation, technology platform sharing can bridge the technology gap and enable banks to benefit from the latest advancements in areas such as artificial intelligence, data analytics, and mobile banking.

The study also emphasized the potential for enhanced customer experiences through technology platform sharing. By sharing platforms, banks can create a unified customer interface that offers seamless access to services across multiple institutions. This integrated approach allows customers to have a consistent and personalized experience, regardless of the specific bank they are engaging with. Additionally, shared platforms can facilitate the development of innovative products and services by leveraging collective expertise and resources. This can lead to the introduction of customer-centric solutions that address the unique needs of Ethiopian banking customers and enhance their overall satisfaction.

4.3.5. Challenges of Sharing Technology Platforms

One of the significant challenges highlighted in the findings is the insufficient support from technology vendors or service providers. This finding is significant because it underscores the importance of reliable technical support in ensuring the smooth operation of shared platforms. Without timely assistance, issue resolution, and troubleshooting, the effectiveness of the shared platform and the overall operations of participating banks can be compromised. This finding emphasizes the need for banks to carefully select technology vendors that are committed to providing adequate support, ensuring that technical issues are promptly addressed and resolved. It also suggests the importance of establishing clear service level agreements with vendors to mitigate potential risks and disruptions.

The lack of flexibility and consensus requirement among technology platform providers is another noteworthy challenge identified in the findings. This finding is significant as it points to the potential limitations of a "one product suits all" approach, which can hinder new product innovation and customization. The findings suggest that the consensus-based decision-making

process may restrict individual banks' autonomy to innovate and meet the specific needs of their target market. To overcome this challenge, it is crucial for banks to establish flexible governance mechanisms and decision-making processes that allow for customization and adaptation of the shared platform. This finding highlights the need for a balance between standardization and customization, ensuring that shared platforms can accommodate diverse requirements and promote innovation.

Dependency on the shared platform provider is another concern raised in the findings. This finding is significant because it highlights the potential vulnerabilities and risks associated with relying heavily on a single shared platform provider. Banks participating in technology platform sharing initiatives may face challenges related to service disruptions, data security, and the provider's ability to keep pace with evolving technology. To mitigate these concerns, it is essential for banks to thoroughly assess the capabilities and adaptability of the shared platform provider. This includes evaluating the provider's track record, technical expertise, and ability to align with the evolving technological landscape. Additionally, establishing collaborative enhancement mechanisms can help address individual banks' specific needs while maintaining the benefits of shared platform services.

The knowledge gap among participating banks is another important challenge identified in the findings. This finding is significant because it highlights the potential imbalances that can arise when banks possess varying levels of technological expertise and investment. Banks with limited knowledge or resources may struggle to keep up with the evolving technology landscape and make necessary investments in upgrades and maintenance. Bridging this knowledge gap and ensuring equitable technology investments among participants are crucial for the success of technology sharing initiatives. It calls for the establishment of knowledge-sharing frameworks, capacity-building programs, and collaborative learning platforms to support banks in enhancing their technological capabilities.

The findings also emphasize the importance of technology and contextual suitability in the shared platform selection process. This finding is significant because it recognizes that different banks have unique business strategies, goals, and targets. Adopting a shared platform that aligns with individual banks' specific needs is crucial for successful implementation. It highlights the need for careful evaluation and assessment of the shared platform's compatibility with the banks'

operational requirements, performance expectations, and market segments. This finding underscores the importance of considering the contextual suitability and customization options when selecting a shared technology platform.

Determining the appropriate sharing modality is a complex task that requires careful evaluation of various factors, including the required level of integration, data sharing agreements, governance mechanisms, and decision-making processes. The choice between centralized or decentralized sharing models has significant implications for system performance, data security, and overall operational efficiency. Therefore, selecting the right sharing modality is crucial for ensuring that the shared technology platform aligns with the objectives and capabilities of participating banks.

The findings highlight the current limitations faced by banks in the Ethiopian banking sector regarding the sharing modality. Interviewees expressed concerns about inflexibility, inadequate support, and fierce competition within the sector. These limitations have led them to express a preference for a platform-as-a-service (PaaS) model. This preference for a PaaS model stems from the desire for greater flexibility in configuring new products and services, innovating new offerings, and implementing new requirements according to their preferences.

The significance of these findings lies in the recognition that the sharing modality has a direct impact on banks' ability to adapt and respond to market demands, differentiate their offerings, and remain competitive. By adopting a PaaS model, banks can gain the flexibility needed to customize and tailor the shared technology platform to their specific needs. This enables them to introduce new features, functionalities, and services in a timely manner, keeping up with evolving customer expectations and market trends.

Conflict of interest and resistance within participating banks are challenges identified in the findings. This finding is significant as it emphasizes the potential tensions and obstacles that can arise due to competing priorities, divergent business strategies, and concerns about data security and intellectual property. Transparent governance frameworks, clearly defined roles and responsibilities, and addressing potential conflicts of interest are essential to foster trust and cooperation among participating banks. It highlights the need for open communication channels, collaboration, and shared decision-making processes to overcome resistance and ensure successful technology platform sharing.

The challenge of lacking return on investment (ROI) or other measurements for technology investments in the Ethiopian banking sector has a direct impact on the sharing technology initiatives. Within the sector, banks tend to favor independent technology investments, relying on familiar and established systems that have proven successful in the past. This approach disregards the potential benefits that technology platform sharing can bring, hindering the realization of cost savings and operational efficiencies. Several key factors contribute to this challenge.

One significant factor is the primary concern of board members regarding cost reduction and maximizing profitability. The absence of clear ROI measurements makes it difficult for them to assess the impact of technology investments on the bottom line. Without tangible financial metrics, quantifying the potential return on investment in shared technology platforms becomes a challenge, leading to a perception of the existing silo investment on technology is a good option or overlook the impact of sharing initiatives on RoI.

Moreover, the lack of accountability and transparency within technology departments further compounds this challenge. Without clear metrics to evaluate the effectiveness of technology investments, it becomes challenging to determine the success or failure of specific initiatives. This lack of accountability fosters a conservative approach, where banks prioritize maintaining control over their technology infrastructure, even at the cost of higher expenses and missed collaboration opportunities.

Lastly, the findings highlight the operational complexity associated with sharing technology platforms. This finding is significant because it underscores the coordination and integration challenges that arise when multiple banks are involved. Establishing robust governance structures, efficient coordination mechanisms, and clear communication channels are essential to address operational complexities. It emphasizes the need for comprehensive planning, strong project management, and ongoing monitoring to ensure seamless integration, interoperability, and smooth functioning of shared platforms.

It is evident that addressing these challenges is crucial for the successful adoption and operation of shared platforms. Mitigating these concerns and implementing appropriate strategies will enable banks to harness the benefits discussed earlier, including cost reduction, improved operational efficiency, access to advanced capabilities, enhanced customer experiences, and innovation. It requires careful consideration of vendor support, flexibility, dependency management, knowledge

sharing, contextual suitability, conflict resolution, and effective governance mechanisms. By understanding these challenges and taking proactive measures, the Ethiopian banking sector can navigate the complexities of technology platform sharing and unlock its transformative potential.

4.3.6. Barriers, Trust, and Competition in sharing technology platform

The first barrier identified is the lack of awareness of the capabilities and benefits of shared technology platforms, particularly in the case of CBS. Many banks in Ethiopia remain unaware of the potential advantages and opportunities that technology sharing can provide. This lack of awareness creates reluctance among banks to explore and embrace shared services. To overcome this barrier, there is a need to increase awareness and education about the benefits and feasibility of technology sharing. By doing so, banks can better understand the potential of shared platforms and be more open to adopting them.

The readiness of banks to adopt and participate in shared services is another significant barrier. Banks differ in their preparedness and ability to integrate and collaborate with other institutions on a technology platform. Factors such as legacy systems, organizational culture, and internal processes can impact their readiness for sharing services and resources. Addressing these factors and ensuring alignment within banks is crucial to facilitate successful technology sharing initiatives. This highlights the need for banks to assess their readiness and make necessary adjustments to their systems and processes to enable effective participation in shared technology platforms.

The establishment and implementation of a technology sharing platform require proactive initiatives from various stakeholders, including industry regulators, banking associations, and technology providers. However, a lack of initiative arises due to differing motivations among established banks and new entrants or relatively young banks. Established banks, running smooth operations and not facing immediate cost concerns, may not find a compelling reason to initiate sharing technology. On the other hand, new entrants and young banks may hesitate to initiate sharing technology due to the assumption that collaboration may not bring immediate benefits. Overcoming this challenge requires fostering a collaborative mindset among all banks, regardless of their size or market position, and encouraging proactive initiatives to create a technology sharing platform that benefits the entire sector.

Trust plays a critical role in the successful implementation of technology sharing platforms. Collaborating banks must have confidence in the platform's capability to foster innovation, protect data security, and consistently deliver high-quality services. Trust is built when participants have confidence in the platform's reliability, availability, and performance. This includes the platform's ability to support and encourage innovation, allowing banks to differentiate their services and remain competitive. Data security is also a significant concern, and banks need assurance that the platform adequately safeguards sensitive customer information and complies with regulatory requirements. Ensuring trust requires the platform owner to act in a highly professional manner, entering into service level and operation level agreements that provide assurance to participating banks.

While collaboration is the primary focus of technology sharing, participating banks still strive to maintain a competitive edge and offer innovative products and services. The shared platform creates a competitive environment where banks aim to differentiate themselves and stay ahead in the market. Early adopters of technology sharing initiatives have the opportunity to gain a first-mover advantage, as they can influence the design, governance, and decision-making processes of the shared platform. However, it is important to recognize that the competitive advantage in technology is transient, and sharing technology alone does not significantly impact competitiveness. Technology adoption should align with each bank's overall strategic goals, product roadmaps, and initiatives. Technology is viewed as a derivative of strategic goals, meaning that the decision to adopt certain technologies should align with the overall strategic direction of each bank.

The findings shed light on the barriers, trust, and competition aspects of sharing technology platforms in the Ethiopian banking sector. Overcoming barriers, building trust, and balancing collaboration and competition are essential for the successful adoption and implementation of shared services. Addressing these factors will not only enhance the efficiency and effectiveness of banking operations but also foster innovation and create a healthy ecosystem that benefits all participating banks and ultimately the customers they serve.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1. Summary

The Ethiopian banking sector has made significant strides in adopting technology over the past decade. This adoption has resulted in the modernization of banking services and improved customer experiences. Key technologies embraced by Ethiopian banks include CORE banking technology, switch technology, digital channels, mobile banking applications, and internet banking platforms. Infrastructure technologies such as data centers, network and security hardware, and software have also played a vital role in enhancing operational capabilities.

The enforced adoption of CORE banking technology by the National Bank of Ethiopia (NBE) has greatly improved the banking infrastructure across the sector. The introduction of ATMs by the Commercial Bank of Ethiopia (CBE) has revolutionized accessibility and convenience. These investments demonstrate the sector's commitment to meeting customer needs and remaining competitive in the digital age.

Sharing technology platforms among banks in Ethiopia is currently limited, indicating a missed opportunity for collaboration and resource optimization. However, initiatives such as Premiere Switch Solutions (PSS) and EthioPay (Ethswitch) have facilitated interconnectivity and interoperability, allowing customers to access services from any bank's ATM and facilitating person-to-person transfers. Sharing data center services, such as Ethio Telecom's data center co-location, has also enabled banks to optimize resources and infrastructure. Collaboration between banks, such as the partnership between ZamZam Bank and CBE in sharing a data center, has resulted in cost savings and operational efficiencies.

Sharing technology platforms offers benefits such as cost reduction, increased operational efficiency, access to a broader range of capabilities and expertise, and enhanced customer experiences. However, challenges include insufficient vendor support, lack of flexibility and consensus among providers, dependency on a single provider, knowledge gaps, and resistance within banks. Overcoming these challenges requires selecting reliable vendors, establishing flexible governance mechanisms, bridging knowledge gaps, and fostering collaboration and trust among participating banks.

Technology diversification, where banks invest independently in technology despite available solutions, leads to duplicated investments, increased costs, and missed collaboration opportunities. The significance of technology diversification lies in the potential for collaboration and resource optimization when banks share a common understanding and expertise in utilizing core banking systems and switch solutions.

Barriers to sharing technology platforms include lack of awareness, readiness of banks to adopt sharing initiatives, lack of initiative from stakeholders, and the need for trust and competition within the sector. Overcoming these barriers requires increasing awareness, assessing readiness, fostering collaboration among all banks, ensuring trust through reliable platforms and data security, and balancing collaboration and competition.

Addressing these challenges and fostering collaboration will unlock the transformative potential of technology platform sharing in the Ethiopian banking sector. It will lead to cost reduction, improved operational efficiency, access to advanced capabilities, enhanced customer experiences, and innovation. Establishing reliable technical support, flexible governance mechanisms, clear communication channels, and measuring return on investment are crucial for successful technology sharing initiatives.

5.2. Conclusion

Based on the discussion presented, the research findings highlight several key points regarding the adoption and sharing of technology platforms in the Ethiopian banking sector and the findings emphasize the significant impact of technology platform sharing in the Ethiopian banking sector. The analysis reveals both the benefits and challenges associated with technology adoption, sharing, and diversification, as well as the barriers, trust, and competition that influence the implementation of shared platforms.

The study demonstrates that Ethiopian banks have progressively embraced technology adoption, leading to the modernization of banking services and improved customer experiences. Adoption of core banking technology, switch technology, digital channels, and mobile and internet banking applications has played a crucial role in optimizing operations and offering innovative products and services. The implementation of infrastructure technologies, such as data centers and security hardware, has further enhanced operational capabilities.

However, the study also reveals a limited level of technology platform sharing among banks in Ethiopia. This lack of collaboration and resource sharing hinders the realization of potential cost savings, economies of scale, and innovation. While certain initiatives, such as Premiere Switch Solutions (PSS) and EthioPay (Ethswitch), have demonstrated the benefits of sharing platforms, some banks remain reluctant due to concerns over control and familiarity with their own systems.

Furthermore, the research highlights the prevalence of technology diversification among banks, leading to duplicated investments, increased costs, and missed collaboration opportunities. Despite the dominance of widely-used solutions like Oracle Flex Cube and Temenos T24 CBS, banks continue to invest independently to maintain control over their technology infrastructure.

The benefits of sharing technology platforms are evident in the research findings. Firstly, cost reduction is achievable through shared investments in IT systems, enabling banks to allocate resources more efficiently. Secondly, operational efficiency is enhanced as shared platforms streamline processes, eliminate redundancies, and facilitate interoperability. Thirdly, shared platforms provide access to advanced capabilities, expertise, and innovation, improving the overall banking ecosystem. Finally, technology platform sharing enables the creation of seamless and personalized customer experiences, fostering customer satisfaction and loyalty.

However, the study also uncovers several challenges associated with sharing technology platforms. Insufficient support from vendors, inflexibility of shared platforms, and dependency on a single provider can compromise the effectiveness of shared platforms. The research also underscores the significance of addressing the challenge of lacking ROI or other measurement mechanisms in technology investments in the Ethiopian banking sector. Additionally, knowledge gaps among participating banks, issues related to data security, and the need for contextual suitability pose significant challenges. Overcoming these challenges requires selecting reliable vendors, establishing flexible governance mechanisms, addressing conflicts of interest, and bridging knowledge gaps among banks.

The research emphasizes the importance of trust and collaboration in successful technology platform sharing. Building awareness and education about the benefits of shared platforms is crucial to overcome the lack of awareness among banks. Ensuring readiness, alignment, and proactive initiatives from stakeholders are necessary for effective implementation. Trust is a critical factor, and banks need assurance regarding reliability, availability, performance, data

security, and compliance. Collaboration should be balanced with competition, with banks aiming to differentiate themselves while staying ahead in the market.

In general, the research findings highlight the transformative potential of technology platform sharing in the Ethiopian banking sector. The adoption of shared platforms can lead to cost reduction, improved operational efficiency, enhanced customer experiences, and innovation. However, challenges such as vendor support, flexibility, knowledge gaps, and trust must be addressed to fully unlock the benefits. Overcoming barriers, building trust, and finding the right balance between collaboration and competition are crucial for successful technology platform sharing. By doing so, Ethiopian banks can position themselves for sustainable growth and meet the evolving needs of their customers in the digital age.

5.3. Recommendation

To drive the advancement of technology platform sharing in the Ethiopian banking sector, it is crucial for banks, regulators, technology sharing platform operators, and the Ethiopian Ethiopian Bankers Association to collectively take strategic actions.

5.3.1. Banks

It is recommended to encourage technology adoption by embracing modernization efforts, thereby improving operational capabilities, offering innovative products and services, and delivering seamless and secure banking experiences to customers.

Additionally, banks should actively explore opportunities for technology platform sharing, collaborating with other banks, regulatory bodies, and technology providers to achieve cost reduction, knowledge exchange, improved efficiency, and innovation.

It is also important to foster awareness and education among banks about the benefits and feasibility of technology sharing, providing them with information and resources to understand the advantages of shared technology platforms and encouraging their active participation.

Banks should also establish a structured framework for measuring Return on Investment (ROI) on technology initiatives. This framework should include clear metrics and benchmarks to assess the financial impact of technology investments. Banks should allocate resources and personnel to analyze and track ROI, ensuring accountability and transparency. Regular reporting on ROI

performance will optimize investment allocation and foster a culture of continuous improvement in technology adoption and sharing.

Moreover, finding a balance between collaboration and competition is essential, allowing participating banks to differentiate themselves while leveraging shared platforms.

5.3.2. Regulators

Regulators play a critical role in facilitating technology platform sharing. Therefore, it is recommended that they provide support and guidance to banks in adopting shared platforms. This can be achieved by establishing clear guidelines, standards, and service level agreements that ensure data security, regulatory compliance, and reliable operation of shared platforms. Removing potential barriers to technology sharing through regulatory frameworks is also essential.

5.3.3. Technology Sharing Platform Operators

Technology sharing platform operators should foster collaboration and knowledge exchange among participating banks. By creating a platform that enables effective communication, sharing of best practices, and lessons learned, they can facilitate collaborative efforts.

Proactive measures should be taken to address challenges and barriers to technology platform sharing, such as providing reliable technical support, implementing flexible governance mechanisms, mitigating dependency risks, and bridging the knowledge gap.

Building trust among banks through appropriate measures is also crucial. Evaluating sharing modality options, such as centralized or decentralized models, based on integration requirements, data sharing agreements, governance mechanisms, and decision-making processes, will help ensure the success of shared platforms. Considering a platform-as-a-service (PaaS) model is recommended due to its flexibility and customization options.

5.3.4. Ethiopian Ethiopian Bankers Association

The Ethiopian Bankers Association should take the lead in initiating a technology sharing platform to enhance collaboration and innovation within the banking industry. This involves conducting comprehensive assessments and evaluations of technology assets and capabilities, categorizing banks into tiers, identifying potential areas of collaboration, and promoting knowledge exchange. To facilitate decision-making, the Ethiopian Bankers Association should prepare regular insight reports summarizing assessment results, tier-based rankings, potential areas of collaboration, and

cost analysis. These reports will serve as valuable resources for banks to understand their technological strengths and weaknesses, identify collaboration opportunities, and make informed technology investment decisions.

Furthermore, considering the abundance of local expertise in technology, an ambitious recommendation would be for the Ethiopian Bankers Association to explore the possibility of building the technology platform locally. While acknowledging the financial resource constraints and years of commitment required, this approach would leverage the existing expertise and empower local talents in driving technological advancements. Collaborating with government entities, investors, and international partners to secure necessary funding and support would be crucial in realizing this ambitious goal.

5.4. Future Research Direction

Future research directions in the field of technology platform sharing in the Ethiopian banking sector include evaluating shared platform performance, analyzing the return on investment (ROI) associated with technology investments by banks, exploring technological and regulatory implications, studying trust and security considerations, assessing long-term sustainability and scalability, and conducting comparative analysis with international practices. These research directions will provide insights into the benefits, challenges, and best practices of technology platform sharing, enabling policymakers, regulators, and banking institutions to make informed decisions and promote the growth of shared platforms in Ethiopia.

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Annexes

Annex I – Interview Questions

1) Technology Adoption & Sharing
    i. How would you describe the current state of technology adoption in the Ethiopian banking sector?
    ii. Have you ever used a technology platform to share with another bank?
    iii. Can you share any successful examples of technology sharing in the Ethiopian banking sector? What were the key factors that contributed to their success?
2) Collaboration Among Banks
    i. How do banks in the Ethiopian banking sector currently collaborate with each other?
    ii. How can collaboration be further enhanced to promote the technology platform sharing in banking?
3) Cost Minimization:
    i. How does collaboration among banks contribute to cost minimization within the banking sector?
    ii. What are the key factors that help reduce costs through shared infrastructure and streamlined processes?
4) Efficiency of Banking Services:
    i. How has collaboration, technology sharing, and sharing economy practices impacted the efficiency of banking services in Ethiopia?
    ii. What strategies can be employed to further optimize the efficiency of banking services?
5) Competitiveness of Banks:
    i. Does collaboration, technology sharing, and sharing economy principles influenced the competitiveness of banks in Ethiopia? How?
    ii. What challenges do banks encounter in maintaining competitiveness through collaboration and sharing economy practices?
6) Factors & Challenges
    i. How do you perceive the role of access over ownership in sharing economy models in the banking sector?
    ii. What are the experienced benefits and challenges of collaboration among banks in Ethiopia?
7) Comment or Suggestion
    i. a. Based on your expertise and experience, what recommendations would you provide to promote collaboration, technology sharing, and sharing economy in the Ethiopian banking sector?

b. Do you have any additional comments or suggestions on the topic of sharing economy models in the banking?

Annex II – Focus Group Discussion (FGD) Guideline

The focus group discussion guideline adapted and customized based on the Kruger's designing and conducting focus group interviews guideline (Krueger, 2002). The customized guidelines are the followings:

Introduction:

Welcome participants and provide a brief overview of the focus group discussion's purpose: exploring technology adoption, collaboration, technology sharing, and sharing economy practices in the Ethiopian banking sector.

Emphasize the importance of participants' perspectives and experiences in understanding the current state, benefits, challenges, and recommendations related to these practices.

Opening Questions:

How would you describe the current state of technology adoption in the Ethiopian banking sector? What are some common practices followed by banks in adopting new technologies?

Are there any specific examples or practices you can share?

Exploring Collaboration Among Banks: How do banks in the Ethiopian banking sector currently collaborate with each other? Are there any specific mechanisms or initiatives in place to promote collaboration?

Benefits: How does collaboration among banks benefits the banking sector? How do you perceive the benefits of technology platform sharing within the banking sector?

In your view, how has collaboration, technology sharing, and sharing economy principles influenced the competitiveness of banks in Ethiopia? Can you provide any examples or insights?

Factors, Challenges, and barriers: In your experience, what are the main challenges and barriers associated with collaboration among banks in Ethiopia? Are there any specific insights or lessons learned that you can share?

Recommendations and Concluding Remarks: Based on your expertise and experience, what recommendations would you provide to promote collaboration, technology sharing, and sharing economy principles in the Ethiopian banking sector?

Do you have any additional comments, suggestions, or insights on the topic of sharing economy models in the banking sector that you would like to share?

Closing:

Thank participants for their valuable contributions and insights.

Remind them that the findings from this focus group discussion will contribute to a better understanding of collaboration, technology sharing, and sharing economy practices in the Ethiopian banking sector.

Annex III – Ethiopian Banks CORE Banking & Switch Technology Providers

Bank	CORE Banking	Switch
Commercial Bank of Ethiopia	Temenos - T24	ACI Worldwide
Development Bank of Ethiopia	Temenos - T24	
Awash International Bank	Fusion Banking Essence	PSS
Dashen Bank	Oracle - Flex Cube	ACI Worldwide
Bank of Abyssinia	Temenos - T24	ACI Worldwide
Wegagen Bank	Oracle - Flex Cube	Tieto Switch
Hibret Bank	Oracle - Flex Cube	PSS
Nib International Bank	Temenos - T24	PSS
Cooperative Bank of Oromia	Temenos - T24	PSS
Lion International Bank	Sopra Amplitude	EthSwitch
Oromia Bank	ICSFS-BANKS	EthSwitch
Zemen Bank	Oracle - Flex Cube	CR2
Bunna Bank	Finacle	EthSwitch
Berhan Bank	Neptune Rubikon	PSS
Abay Bank	Oracle - Flex Cube	S2M
Addis International Bank	Oracle - Flex Cube	PSS
Debub Global Bank	Oracle - Flex Cube	EthSwitch
Enat Bank	Oracle - Flex Cube	EthSwitch
Hijra Bank	Path Solution iMal	
Zamzam Bank	Oracle - Flex Cube	
Goh Betoch Bank	Temenos - T24	
Sinqqe Bank	Oracle - Flex Cube	
Tsedey Bank	Craft Silicon Bankers Realm-BR.Net	
Shebelle Bank	Ethix NG	EthSwitch
Amhara Bank	Temenos - T24	EthSwitch
Ahadu Bank	Intellect - Intellect Digital Core (IDC)	
Tsehay Bank	Temenos - T24	EthSwitch
Sidama Bank	Craft Silicon Bankers Realm-BR.Net	
Omo Bank	Oracle Flexcube	
Gadaa Bank	Temenos - T24	
Rammis Bank	Path Solutions - iMal	