

Addis Ababa University

College of Business and Economics

School of Commerce

Department of Digital Marketing and E-commerce

THE EFFECT OF TECHNOLOGICAL, ORGANIZATIONAL, AND ENVIRONMENTAL FACTORS ON THE PERFORMANCE OF DIGITAL TRANSFORMATION IN SELECTED ETHIOPIAN BANKS

MSc. Thesis 2018/2026

This thesis is submitted to the College of Business and Economics, Department of Digital Marketing and E-commerce of Addis Ababa University School of Commerce for partial fulfillment of all requirements of MA Degree in Digital Marketing and E-commerce.

By: - Fatuma Endris Debas

ID NO: GSE/8805/15

Adviser: Andnet Werku (Ph.D)

September, 2026

Addis Ababa, Ethiopia

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DECLARATION

I, Fatuma Endris Debas, the undersigned, hereby declare that this thesis paper entitled “the effect of technological, organizational, and environmental factors on the performance of digital transformation in selected Ethiopian banks” is my original work and that it has not been submitted partially; or in full, by any other person for the award of a degree in any other university or institution and all sources used for the study have been duly acknowledged.

Declared by	Signature	Date
Fatuma Endris	_____	_____

POST GRADUATE STUDIES DEPARTMENT OF Department of Digital Marketing and E-commerce

Title: THE EFFECT OF TECHNOLOGICAL, ORGANIZATIONAL, AND ENVIRONMENTAL FACTORS ON THE PERFORMANCE OF DIGITAL TRANSFORMATION IN SELECTED ETHIOPIAN BANKS

BY: Fatuma Endris Debas

BOARD OF EXAMINERS APPROVAL

Advisor Signature

Andnet Werku (Ph.D)

Internal Examiner

Dr.Tewodros Mesfin

External examiner

Yibeltal N.(PhD)  June 10 , 2026

ACKNOWLEDGEMENT

Above all, I am deeply grateful to the Almighty Allah for granting me the patience, clarity, and perseverance to see this work through from beginning to end. None of it would have been possible without His grace. I owe a great deal to my advisor, Andinet Werku (PhD), who gave generously of his time and knowledge at every stage of this process. His sharp feedback, steady encouragement, and genuine care for the quality of this research pushed me to think more carefully and write more clearly than I otherwise would have. I also wish to thank my mother and all the participants who contributed to this study.

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Abstract

This study examines the effect of Technological, Organizational, and Environmental (TOE) factors on the performance of digital transformation in selected Ethiopian banks. Using a descriptive mixed-methods approach, data were collected from 368 bank employees via a structured Likert-scale questionnaire. Three independent variables Strategic Technological Capability (STC), Organizational and Human Capital Readiness (OHCR), and the Institutional and Market Environment (IME) were analyzed against Organizational Performance (OP) as the dependent variable. Findings indicate that all three factors are strongly and positively correlated with organizational performance. While banks demonstrate reasonable organizational readiness and digital investment, gaps in platform reliability and efficiency gains point to disconnect between strategic intent and operational delivery. The study concludes that sustainable digital transformation in Ethiopian banking requires not only internal technological and organizational investment, but complementary public-sector action in digital education and infrastructure development.

Keywords: Digital Transformation, Ethiopian Banks, TOE Framework, Organizational Performance, Mobile Banking, Fintech

CHAPTER ONE

1. INTRODUCTION

1.1. Background of The Study

The global banking environment is evolving at an unprecedented pace, thereby making digital transformation not simply a technological update, but a strategic priority to boost banking performance. Digital transformation in modern banking context has been argued to be reflected on efficiency and effectiveness of application of delivery channels in banking service delivery, in particularly mobile banking, ATM, Point of Sale terminals, Internet banking (Mller et al., 2018; Yunis et al., 2020). Technological determinants seem to be the fundamental driver of such channel's efficiency and effectiveness. For example, ICT infrastructure's efficient functioning is argued to be the main driver of operational efficiency and delivery channel service reliability (Loke et al., 2025; Digital Transformation on Banking Performance, 2026). Similarly, existence of high-speed telecommunication and secure data centers ensures reduced operating costs by reducing ATM availability while increasing ATM volume while facilitating internet banking transactions in terms of efficiency thus contributing more to non-interest revenue (Alemayehu & Alemayehu, 2024; Ndung'u, 2018; Tursunbadalov, 2022). The advanced features including the inclusion of big data and artificial intelligence within banking ICT infrastructure also aid personalization of mobile banking services directly influencing banking organizational efficiency and client retention (Sandeep Ravichandra Gourneni, 2025; Zhosan et al., 2025).

Organizational dimension stands at par with technological preparedness to define performance results of digitally led projects. The commitment from management ignites digital culture as financial and human resources are synergically directed to innovative strategies (Omar and Sultan, 2021; Verhoef et al., 2021). Prioritization of the banking leadership to lead digitally enhances the deployment of POS and mobile banking and overcomesto internally encountered barriers of change and builds a self-developing system of learning at an organization (Carcary et al., 2023; Porfrio et al., 2024). Internal capability is not only supplemented by digital workforce literacy and ability for banks to create smart fintech alliance rather it speeds up the absorption of the new monetary service (Neves et al., 2023; Kitsios et al., 2021). The extent of how institutional investment in training employees with digital intelligence can result in proper

performance of internet banking and mobile platforms toward the new paradigm consumer needs varies with the degree in Ethiopian context (Woldemariam et al., 2023; Tesfaye and Kebede, 2024). Banks with higher organizational agility show the most satisfied and profitable results (Theiri and Hadoussa, 2024; Dogan, 2024).

Lastly, external environmental factors- regulatory environment and competition- represent the context in which digital efforts take place. With clear standards in the areas of electronic payment and privacy of data, consumer confidence in ATM and POS service availability is enhanced (Appaya et al., 2024; Feyen et al., 2023). In Ethiopia, the actions taken by the National Bank towards the upgradation of the payments system has pave the path for enhanced financial inclusion and emergence of internet banking facilities (Alemayehu & Alemayehu, 2024; NBE, 2024). The threat of competition by domestic as well as international fintech can trigger Banks for further optimisation of their digital offerings in an effort to maintain their market share (Allen et al., 2022; Sorbet, 2022). Considering customer desire to use banking services around the clock and on the mobile device, the external market forces push for banks to further strengthen the scope and ease of accessibility of their digital touch points (Rahi et al., 2021; Wewege et al., 2020). Therefore, the convergence of technologically enabled conditions, organizational receptiveness and socio-cultural elements shapes the trajectory of digital transformation in the financial sector (Doran et al., 2022; Huang, 2023).

The global research has proved that there is a clear and definitive relationship between these driving forces and organizational achievement. However, the Ethiopian banking context remains to be analyzed how it behaves on driving factors with present situation. As such, the thesis aims at investigating the effect of technologically infrastructure, organizational capacity and environment condition on digital transformation performance in selected Ethiopian banks to contribute empirical insights regarding how banking institutions might effectively harness their digital channel to promote operational excellence, financial health and a growing customer based growth (Digital Transformation in Ethiopian Banks, 2024; Tesfaye & Kebede, 2024; Woldemariam et al., 2023).

1.2. Statement of the Problem

The international banking industry at present is undergoing a seismic change as digital transformation is progressing from a desirable competitive attribute, into a survival imperative that drives a shift towards AI-native, seamless omni-channel operations (Tomar, 2024; Chen et al., 2024). Within Ethiopia, under the guise of the National Bank of Ethiopia's (NBE) modernization initiative and with imminent entry of the World Bank commercial banks, the local banks had been prompted to make bold strategic changes (Policy Studies Institute, 2024; NBE, 2024). However, there is a significant gap between strategic allocation of resources and operational results for the use and level of performance in Mobile Banking, ATMs, Point of Sales terminals and Internet Banking. From a technological standpoint, the lackluster performance of the digital transformation in Ethiopia stems from the absence of comparative advantage and poor system reliability. Although banks have put in efforts to update their core banking systems, intermittent network failures and instability of power services greatly reduce ATM and POS terminal's time on line resulting in a service reliability gap (Gebre & Fekadu, 2023; Tadesse, 2021).

In addition, the difficult design of the internet banking interface and incompatibility between mobile platforms discourages user to shift from paper-based branch transaction (Molla Berhanu, 2024; Anim-Yeboah et al., 2020). However, this limitation is not only confined within system, a lack of reliable cybersecurity protocol leads the customers having higher fear about electronic fraud (Kumar & Gupta, 2022; Hassan & Karim, 2021). Another reason that dictates the failure of digitally transformed performance is the organizational internal conflict. Most Ethiopian banks, although committed to digital transformation at strategic level, lack digital leadership that has effectively cascaded this top-level strategy down to the middle managers and frontline operators, resulting to the problem where the mobile and internet banking remain confined at the IT department (Woldemariam et al., 2023; Singh & Hess, 2017). Lack of organizational readiness is also attributed to the shortage of professional digital employees and bureaucratic and traditional organizational culture which favors a traditional physical process over agile digital operations (Abebe & Lessa, 2022; Mller et al., 2019). For example, although banks were installing thousands of POS and ATM, all related process is still traditional instead of taking advantage of big data and AI to customize the experience of customers (Verhoef et al., 2021; Vial, 2019).

While policy and regulatory changes point to an increasingly cash-lite society, the reality is an environment characterized by a low level of digital penetration and a cultural reluctance to abandon cash (Fekadu, 2010; Goshu, 2019). Meanwhile, domestic banks remain primarily reactive, digitally transforming as a result of competitive pressure from the FinTech sector and the fear of foreign competitors encroaching on their territory (Gupta et al., 2021; Yunis et al., 2020). At the same time, the development of regulations covering digital contracts and consumer protection has lagged, creating trust deficit, which restricts innovation in Mobile Banking beyond simply airtime purchases (Abebe & Lessa, 2022; Hiran & Henten, 2020).

The core issue is being stuck in the low-adoption trap: Banks face considerable investments to maintain their costly physical branch network and the premium costs for their sophisticated digital platforms, but at very suboptimal scales of operation. The crucial research gap is the lack of enough empirical evidence regarding the role played by an internal interaction among TOE factors on institutional performance of the digital channels such as ATMs, POS and Internet/Mobile Banking, whereas most studies examine user-level determinants of adoption. There seems to be a lack of attention to the institutional challenge faced by banks to implement a digital mandate on a backdrop of a dynamic and challenging environment and evolving regulation of Ethiopia. This study addresses these issues by introducing a diagnostic framework enabling the integration of world class digital standards into the Ethiopian business environment (Kindie, 2016; Ononiwu et al., 2024; Shafariah et al., 2024).

1.3. Research Questions

1. To what extend does Strategic Technological Capability affects the institutional organizational performance of a selected Ethiopian banks?
2. To what extend do Organizational and Human Capital Readiness affects the institutional organizational performance of selected Ethiopian banks?
3. To what extend does the Institutional and market environment affects the institutional organizational performance of selected Ethiopian banks?

1.4. Objectives of the Study

1.4.1. General Objective

To examine the effect of Strategic Technological Capability, Organizational and Human Capital Readiness, and the Institutional and Market Environment on institutional organizational performance within selected Ethiopian banks.

1.4.2. Specific Objectives

1. To investigate the effect of Strategic Technological Capability on the organizational performance of selected Ethiopian banks.
2. To evaluate the impact of Organizational & Human capital readiness on the organizational performance of Ethiopian banks selected.
3. To inquire into the impact of institutional and market environment on selected Ethiopian Banks' Organizational performance.

1.5. Significance of the Study

For senior executives, however, this offers something tangible: a better understanding of whether investment in tech capability actually is actually delivered - or not - in terms of actual performance. In terms of the specific links between IT assets, digital channel roll out and the business outcome the study shows how best to spend money more strategically – for example spending in the area most likely to deliver actual impact, rather than simply achieving digital checklist goals. The report also highlights the people, internally generated aspect of the transformed world – no digital capability can be successful if the people managing and using it aren't properly trained, prepared or even willing. For both HR and corporate planners, the results provide a realistic lens to consider the necessary developments in human capital to facilitate the digitally transfigured bank. By carefully disentangling the regulatory and market context as separate, time-varying variables, rather than treating it as background noise, the study generates insights relevant to both the National Bank of Ethiopia and other decision-makers. Digital transformation of banking is occurring in a context with real policy implications related to investments in infrastructure, regulation of cybersecurity, creation of regulatory frameworks for new financial service providers (fintech) and fostering financial literacy among the population. Ultimately, this research advances the ongoing debate in academic literature, offering a base of

descriptive and correlational analysis which can be built upon by those seeking to conduct more sophisticated causal analyses of the banking industry in a rapidly changing environment characterized by fintech competition and ongoing regulatory reform.

1.6. Scope of the Study

This paper focuses on the uptake of digital banking in selected urban banking institutions in Ethiopia, with specific attention to Addis Ababa – home to the most mature digital offerings and the largest diversity of institutional stakeholders. In addition to the institutional context, the paper utilizes staff located at the "front" (grade one through four) branches; thus, ensuring that perspectives are captured from diverse organizational viewpoints, and that the different challenges confronted by customer service representatives and branch managers alike is addressed – understanding that the experience is very different. The research also includes customers who have, or have actively adopted digital banking products and services for a year or longer; thus, capturing the end-customer experience. Combining customer, and worker, observations allows for a fuller picture to be constructed concerning the extent that these institutions leverage digital banking and, importantly, what needs to happen next for it to fully thrive.

1.7. Definition of Concepts and Terms

Digital Transformation: - The practice of employing digital technology, solutions and innovation to profoundly change how an organization performs its activities, creates value to customers, adapts to market requirements.

E- Banking: - Banking by electronic means in carrying out transactions; this may include internet or mobile banking and automated teller machines (ATM). E- banking makes the Banking services accessible to the consumer anytime and from anywhere.

Customer Experience: - The perceptions of a customers throughout his or her dealings with a bank including electronic services, employees and branches.

Technological Infrastructure: – the computer, hardware and software which form part of an e-banking solution are not only the most expensive elements of it; they are the critical success factor of the solution.

Challenges in Digital Transformation: - Barriers to the successful adoption and execution of Digital transformation strategy; These includes technology infrastructure shortcomings, regulatory challenges, internal organizational resistance, skills constraints and a lacking culture.

Customer Perception: - Customer perceptions of quality, reliability, and usefulness of digital banking services. This has been found to impact engagement.

Change Management: - A systematic approach to moving a person or a set of people and/or the organization through a transition state from a current state to a future state or destination. **Innovation in Banking**: - The implementation of new ideas, new processes, new products or new services. It might include the deployment of newer digital technologies, or not necessarily.

Regulatory Framework: - Set of laws, rules, regulations that establish the framework within which financial institutions must operate, especially since digital innovation is becoming a concern of prudential supervisors.

Strategic Alignment: - This process ensures alignment of a firm's transformation efforts in digital with the firm's strategy, vision, and customers' needs.

1.8. Organization of the Study

The thesis has been organized into five chapters. Chapter one has the setup for the foundation of the entire thesis. It covers such topics as, the background, the problem, the research questions, and objectives, and the coverage. Chapter Two review of related literature, forms a study from which the study derives its analytical framework. Chapter Three identifies and discusses methodology to be used in the research design; where to find data and the analytical approach to them. Chapter Four discusses and analyzes data findings, while chapter five concludes the study summarizing the major findings, making conclusions, making recommendations and having suggestions for future research.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction to Digital Transformation

Digital transformation (DT) in today's business environment is the core, omnipotent and omnipresent force that has changed and remodeled global industries, especially the banking sector. Digital Transformation is not just about replacing existing technologies; it involves reshaping the entire business model the business model should adapt to digital age (Siano et al., 2020). It is the transformation of the banking industry characterized by inevitability of changing the ways that customers make payments, apply loans and manage assets with the application of digital devices and applications (Nguyen Thi Quy, 2025). It is an omnipresent challenge in the way almost any process within the banks needs to be changed (Digital Transformation in Banking: A Managerial Perspective on Barriers to Change, 2025).

2.1.2. Digital Transformation in Banking: Definitions, Drivers, and Links to Organizational Performance

Researchers have taken various perspectives toward defining digital transformation in banking, however a unifying theme links much of these definitions: transformation is a continuous journey of organizational change instigated by digital innovation, not a single tech project (Kitsios et al., 2021; Sailee Shringarpure & Ms. Sneha Hathi, 2024). Vial (2019) nicely summarizes the importance of change at the core of this discussion by conceptualizing transformation not merely as an investment in technologies, but also including changes in culture, strategy and decision making. In a more operations-oriented view, Gupta et al. (2021) defines digital transformation as the adoption of a broad range of digital technology into customer-focused areas of a company to create value and improve the performance of an organization. The pace of evolution within the digital realm poses a significant threat to traditional banks (Krasonikolakis et al., 2020). At the operational level, Warner and Warger (2019) define digital transformation as utilizing technologies including blockchain, cloud, mobile and Artificial Intelligence to realize practical improvements in business operations. With a few

simple words, Diener and paek (2021) aptly sum up the driving force behind Digital transformation.

Digital transformation begins when institutions like banks are able to begin integrating innovations such as cloud computing, AI, and blockchain to automate redundant tasks, facilitating new service delivery models (Kreger, 2025; Kitsios et al., 2021). These reports consistently align with the fact that such integration boosts capabilities in general and drives tangible organizational performance results rather than just isolated costs or efficiencies (Kitsios et al., 2021; Shanti et al., 2023).
A company's purchase of new technologies alone does not make an institution a digital enterprise. These studies regularly emphasize that unless new structures and cultures are developed within a business to align with technology, employees are adequately trained, and a foundation for change is embedded within the workforce itself, results are seldom seen (Vial, 2019; Diener & paek, 2021). The main reason that some banks succeed and continue digital transformation, while others never advance past pilot program stages, is that quality leadership involvement, adequate training measures, and structural integrity allowing for easy, flexible decision-making cannot be overlooked (Shanti et al., 2023). Since new technological integration changes how banking professionals communicate with their clients and make decisions, human capacity should be a priority in helping to bring about new service and improved results (Shanti et al., 2023).

Indeed the real effectiveness of digital transformation is also governed by factors that lie beyond the control of banks, i.e., the quality of the infrastructure, the supportiveness of the government and market, the level of competition in the industry and overall market conditions (Kitsios et al., 2021; Sailee Shringarpure & Ms. Sneha Hathi, 2024) As can be surmised under the less supportive market, DT offers potential for unique services and targeting previously unbanked or underbanked segments, but the path to it is more challenging and longer. This observation seems coherent with studies attributing limited effects of digitalization in even rapidly growing African economies to certain contextual, institutional, infrastructural and regional variations (AERC Working, Alemayehu Geda, September 2022). Although existing literature has evidenced that digitization promotes operational efficiency and enhanced service quality thereby driving up bank profitability, particularly in Ethiopian case (An Overview of digitization on Bank

Profitability, 2024); similar studies also recognize that digitization levels are apt to remain rather low relative to world average and as such DT practice can face constraints related to the lack of technology infrastructure, regulatory preparedness and market preparation (AERC Working, Alemayehu Geda, September 2022).

2.1.2. Overview of Global Trends in Digital Transformation in Banking

Given continuing innovation in technology, the banking sector is transforming digitally across the world at a quick rate. “Digital transformation (DT)” relates to how bank utilizes various sorts of social, mobile, digital technologies with an objective to re-innovate traditional ways of doings the banks activities with a new mentality and an approach towards work.DT involves the utilization of technologies like artificial intelligence (AI), mobile applications, sophisticated analytics and also the incorporation of the technologies into block-chain with all around banking services to promote production growth, customer benefit and economic capability inside the business, the DT will necessitate process and procedures change and a few remodeling of internal bank’s construction and customer interface (Kitsios et al., 2021; Sailee Shringarpure & Ms. Sneha Hathi, 2024; World Journal of Advanced Research and Reviews, 2024).

Today banks are increasingly focusing on digital service delivery platforms rather than the conventional branch-based delivery models to provide more seamless customer experience and simplify their operations (Siano et al., 2020). Banks are becoming increasingly dependent on-or rely heavily-upon AI based fraud detection, automation, big data analytics and digital service channels to promote service innovation, boost productivity and cut costs. The capabilities delivered by technology enable easier decision making, Faster service delivery which are beneficial to improve the organization performance measured by the increase in operational performance, customer satisfaction and competitive advantage (Sailee Shringarpure & Ms. Sneha Hathi, 2024; Siano et al., 2020). Furthermore, due to growing adoption of consumers digital banking across world the banks with stronger technological capabilities are expected to achieve greater market opportunities, adapt to changing customer expectations, and achieve better performance (Lalua Rahsiad, 2026).

Global research highlights, that effective DT also rely on internal preparation, despite the fact that technology adoption is frequently emphasized. According to published research, banks need

to improve their compliance skills, build supporting data infrastructure, and deal with issues related to legacy system integration. To guarantee that digital technologies are used efficiently in daily operations, organizational change management and workforce preparedness are also necessary (Elitmind, 2024; AJIS, 2025; Kitsios et al., 2021). Implementation obstacles, reluctance to change, or poor operational alignment can prevent even significant technological expenditures from improving performance in the absence of adequate preparation (AJIS, 2025; Elitmind, 2024).

2.2. Theories for Digital Transformation

A relevant conceptual framework would incorporate explanatory models for adoption of technologies, organization change and strategic fitting in the business. Some of the most commonly used models are for Technology acceptance such as Technology Acceptance Model (TAM), Task-Technology Fit (TTF) and Unified Theory of Acceptance and Use of Technology (UTAUT); that try to account for user adoption and task fit with the usage (Venkatesh et al., 2016; Davis, 1989). Furthermore, principles from complex system theory on organization symbiotic and capability remodeling can also be integrated to understand Digital Transformation. The main problem in its implementation remains legacy IT infrastructure, compliance issues, security threat, or resistance to change and adaptation at social level (Sila, 2013; Awa et al., 2017). In using TAM/ TTF/ UTAUT combination, this study also examines the technology adoption while analyzing difficulties to shape for an organization to successfully transformation and emphasize user acceptance and task fit toward value co-creation and integration at organization level (Nikhil et al., 2019).

2.2.1. Dynamic Capabilities (DC) Theory

In the context of operating in dynamic environments characterized by deep uncertainty such as the industry of transformation of classic banking services into Fintech, banks obtain a competitive advantage through a firm's ability to integrate, build, and reconfigure internal and external competences rather than on the possession of static resources (Teece et al., 1997). DC theory explained the way of how banks could use their resource bases whereas Resource Based View (RBV) explained the way how banks could leverage ownership of specific pieces of software or a strong cash position. It was later simplified to 3 types of routines: Transforming (reconfigures the old systems), Seizing (investing in digital infrastructures), Sensing (identifying

opportunities in digital space) (Teece, 2007). This means that possession of an mobile app (a resource) would be less important for banks than the capability to evolve that app with the change in the market landscape (a dynamic capability).

A DC was further amended by recent researches by clearly incorporating strategic technological capability (STC) in the framework. Warner & W (2019) posit digital transformation as simply the development of dynamic capabilities to handle digital disruption, with STC at heart taking up the advantage opportunity. In further explanation, STC makes use of the concept of the modularity of digital infrastructure (Cheng et al., 2023). The concept has been cited in how a bank moves from old technology legacy system to modern cloud based, API enabled system. A bank is able to readily integrate third-party Fintech service providers or tap to the new market segments, e.g. Buy now, pay later-BNPL. With the lack of dynamic STC in the bank, its old ways of business can stay path-dependency.

The true benefit of digital transformation is achieved at the Transforming or Reconfiguring stage. According to Marx et al. (2021), DC fosters operational agility, which connects transformation techniques to performance. This is the capacity to concurrently revamp internal back-office procedures and customer-facing services in the banking industry. Researchers like Abdurrahman et al. (2022) and He et al. (2023) show that when these skills are dynamic, it makes it possible to provide new digital goods more often and ensures that different digital tools collaborate rather than operate independently. According to Gustavo et al. (2024), DC is the major force behind resilience, enabling banks to continue operating during emergencies (such as the COVID-19 pandemic) by utilizing their digital agility to provide distant operations and virtual customer care.

According to Teece (2018), organizational inertia is a common obstacle to digital transformation in banking. COBOL based systems from the 1970s are used by many banks. Reconfiguring these poses a danger to the bank's fundamental stability in addition to being a technical issue. According to Warner and Wæ (2019), a conservative banking culture that sees emerging technology as dangers rather than possibilities frequently obstructs the Sensing phase (The identification and assessment of opportunities). The Seizing phase (The mobilization of resources to address those opportunities) of DC may be slowed considerably because banks,

unlike other ICT industries, must reorganize their capabilities inside stringent compliance frameworks (Basel III, GDPR, etc.). According to Cheng et al. (2023), banks are unable to properly mobilize their investments due to a lack of digital-native leadership, which results in digital debt technology that is purchased but never completely integrated.

2.2.2. The Resource-Based View (RBV) framework

According to the Resource-Based View (RBV), which was developed by Wernerfelt (1984) and Barney (1991), a company's competitive advantage comes from its internal resources rather than its position in the market. A resource must satisfy the VRIN requirements valuable, rare, imperfectly imitable, and non-substitutable in order to offer a sustained benefit. In light of the digital transformation of the banking sector, RBV contends that although technology is pervasive, a bank's ability to combine these tools with its organizational and human resources produces the heterogeneity needed to beat competitors.

According to modern research, off-the-shelf software is rarely a source of competitive advantage due to its ease of imitation. Digital capabilities, on the other hand, are the benefit. Wade and Hulland (2004) were among the first to classify IT resources under RBV, contending that outside-in skills like market responsiveness and inside-out capabilities like technological infrastructure are where the real value lies. Alqararah and Daud (2021) elaborated on this in the post-2010 age, pointing out that digital transformation in banks involves more than just digitizing assets it also entails building a sophisticated network of interconnected resources that rivals find difficult to imitate.Abdurrahman, Gustomo, and Prasetio (2025) contend that capability deployment acts as a mediator in the relationship between digital investment and performance. Having data alone is not enough; the bank has to have the organizational flexibility to use that data for personalized asset management or real-time credit scoring. This is consistent with Isie's (2024) assertion that the valuable aspect of VRIN (Valuable, Rare, and Inimitable, Non-substitutable) is realized only when digital resources are synchronized with the bank's strategic vision.

The idea that technology is a latent resource is a fundamental component of RBV in digital banking. Human capital unlocks its worth. Digital literacy and management skill serve as the non-substitutable elements of the VRIN architecture, as Kumar and Singh (2023) show.

Although a rival can purchase the same AI engine, it is difficult for them to imitate a bank's innovative internal culture or its employees' implicit understanding of how to apply AI to certain regulatory environments. According to Adnan et al. (2024), the main differential is organizational preparation, which encompasses leadership, structure, and culture. Because their human resources and technological resources are not in sync, banks that approach digital transformation as a technical endeavor rather than an organizational makeover frequently fail. Bharadwaj (2000) first described this synergy as IT-enabled intangibles, which continue to be the key to digital success in contemporary banking.

Larger banks frequently benefit more from digital changes, which is explained by the RBV logic of internal heterogeneity. Institutions with substantial legacy data assets possess a rare resource that fintech companies do not, according to Fung et al. (2024). These banks establish a barrier to entry when they are able to successfully envelop their enormous data stores in digital layers. However, Hess et al. (2016) warn that big banks also have to deal with resource rigidity, in which the adoption of new systems is hampered by outdated resources (legacy systems).

RBV has advantages, but there are drawbacks when it comes to digital transformation. According to Teece (2014), static resources are insufficient in quickly evolving digital contexts. As a result, Dynamic Capabilities the capacity to sense, seize, and transform resources evolved. Additionally, Mikalef and Gupta (2021) note that as cloud computing and API banking become mainstream, the rarity of technology is diminishing, compelling banks to discover new sources of uniqueness in ecosystem orchestration and customer experience.

2.2.3. Technology Organization Environment (TOE) Framework

Originally created by Tornatzky and Fleischer in 1990, the technology organization environment (TOE) framework is still essential to comprehending how banks handle digital change.According to research, the main factors influencing adoption are task-technology fit and technical readiness (Abed, 2020; Kimiagari & Baei, 2021). Additionally, a move away from physical server loads toward platforms that correspond with the worldwide spike in smartphone usage is highlighted by the movement toward mobile-first strategies and cloud-based banking (Shatalova & Huseynov, 2021; Wewege et al., 2020). In the end, digital channels must provide dependable performance and strong levels of security to win over customers, particularly in developing

nations (Rahi et al., 2021). Elements necessary for change include a decentralized structure with enabled communications, adaptable workforce able to cope with the digital age and strong senior management support (Akyuwen, 2022; Catherine & Abdurachman, 2018; Baker, 2012). In order for the change to stall the presence of obstacles such as siloed innovation – where digital projects stay within their separate departments (Panorama Consulting, 2024). External impacts include environmental issues and competitive rivalries which necessitate transformation; a government-imposed regulation structure, heightened competition from more Agile Financial Technology Firms and consumer demand for greater financial access are some examples of such drivers (Afjal et al., 2024; Allen et al., 2022; Aziz et al., 2021). A “mobile only” lifestyle is a universal global shift that dictates the necessity of digitisation for banks to survive in the modern economy (Shaikh et al., 2020).

2.2.4. Institutional Theory

Institutional theory gives an excellent base from which to understand why banks move towards digital transformation, not simply the technological aspect, but how banks need to abide by social, legal and professional guidelines within their environment. In banking, institutional isomorphism, which the process when the organization becomes increasingly like one another as a response to the environment, can often be one of the leading causes of digital transformation in this field. Coercive pressures in banking largely stem from official government requirements, regulatory agencies, where banks have to digitalise to comply with the direction set by central banks, to meet AML (anti-money laundering) and to report according to new and differing requirements. Scott (2014) defines the regulative institutional pillar as the ability of the institution to establish standards, to monitor compliance of other institutions with respect to them, and to sanction non-compliance.

According to Hinings, Gegenhuber, and Greenwood (2018) In the digital age, digital transformation is driven, to a large extent, by change-over from institutional constraints, whereby regulators set new standards for data security, and cybersecurity practices. In view of Faik, Barrett, and Oborn (2020), the compulsion to accelerate digital financial inclusion has often been a state imperative forcing incumbent institutions to reconsider IT capacity, particularly in the developing country, Moreover, Mignerat and Rivard (2012) emphasize that the causal factor for

IT initiatives in regulated industries that predominantly aim to conform is the dominant environmental forces created by institutions.

The level of technological uncertainty surrounding the transformation into the digital era leads many banks to seek guidance from leading peers or global trends within the financial technology (fintech) sector. Nambisan, Wright and Feldman (2019) claim that digital ecosystem has generated a new institutional logic to make sure businesses emulate the patterns of digital platform and ecosystem to retain its relevance. The 'FOMO (fear of missing out)' effect regarding new digital trends accelerates adaptation before the firm's internal readiness has actually been fully realized, and this act of mimicry has been theorized as a direct competitive strategy in reaction to pressure, Gong and Ribiere (2021). The pressure institutionalizes it as necessary when the criteria for success becomes digital maturity, and banks imitate leaders 'digital customer journeys' to sustain market legitimacy (Berente and Seidel, 2022).

This influence, however, is realized through the continuous mobility of IT personnel, external consultants and digital strategists among firms. These institutions have standards where correct mannerisms of digital technological adoption are dictated by industry organizations or professional networks. This has been argued by Currie (2011). There is an internalization of normative pressure that mandates digital practices due to an increasing number of banking staff adopting digital mindedness (Baptista et al., 2020). Finally, criteria of successful digital transformation has become imbedded in the organization's own beliefs, since a standard digital expertise has been established and defined among business members, directly impacting the readiness of human capital, Ciriello, Richter and Schwabe (2018).

The institutional logic of banking has shifted from an analog brick-and-mortar logic to a digital-led service logic, suggesting that the move toward digital goes beyond merely technology development. Thornton, Ocasio and Lounsbury (2012) argue that to perform well as an organization, a logic of digital should prevail, although they suggest that multiple logics are possible. Business firms have to deal with the complication of various conflicting logics to successfully pursue performance objectives, as mentioned by Greenwood et al. (2011). According to Vial (2019), when institutional conditions enable digital transformation in banks, adoption barriers are reduced and business operations become more efficient. Baiyere et al.

(2020) further argue that as consumers and investors are more supportive of organizations that appear as modern and technologically adept and are more likely to patronize these organizations, institutional legitimacy through a digital transformation are indispensable for business viability.

2.2.5. Synthesis

Most modern literature acknowledge that banks do not exist in the society like any isolated beings; there is already institutional, normative and regulative embedding for banks' digital strategies. Digitalization according to Hinings et al. (2018) is an institution that it brings about transformation in fundamental practices, norms, and rules in an institution or industry (digitality). This implication is that, for banking industry, digital beingness is necessary to legitimation instead of optional feature for itself any more. As reinforced in Scott's (2014) three pillars of institution isomorphism (normative, cultural-cognitive and regulative), banks have been adoptingdigital technologiesas their methods to conform to the taken-for-granted expectations about being a bank at the contemporary period. The drivers of coercive isomorphism that lead banks adopt digitalization are the resource dependence and regulatory agencies. Al-Ajlouni and Al-Hakim (2019) point out that government policies and central bank mandates, including cybersecurity procedures or open banking legislation, frequently require the financial industry to use digital technology.In a similar vein, Bitar and Tarazi (2019) talk about how post-2008 regulatory reforms compelled banks to adopt standardized digital reporting and risk management systems. According to Sia, Soh, and Weill (2016), the difficulty here is that banks have to change quickly in order to comply with these regulatory obligations, which frequently causes internal conflict between new compliance technology and old systems.

There is a lot of technical uncertainty in the banking sector (e.g., AI, Blockchain, FinTech entrance). According to Kitsios, Giatsidis, and Kamariotou (2021), banks mimic the digital tactics of recognized market leaders in order to reduce perceived risk when faced with such uncertainty. Wewege provides more evidence for this herd behavior.According to Lee and Shah (2020), mid-tier banks frequently implement mobile banking features because market leaders have established a benchmark that they believe they must achieve in order to stay competitive, rather than because of a particular internal need. Masoud and Basahel (2023), however, caution

that this mindless copying may result in a problem: a lack of strategic difference, when many banks provide the same digital services.

The professionalization of the labor creates normative demands. According to Yoo, Boland, Lyytinen, and Majchrzak (2012), the transfer of IT executives and consultants across companies disseminates particular "digital logics" throughout the industry. Parviainen, Tihinen, Kääriäinen, and Teppola (2017) contend that industry conferences and professional networks standardize common professional norms in the banking sector, such as cloud-first initiatives or Agile project management. According to Nassehi (2021), this leads to a common cognitive map among bankers, where being digital becomes a prerequisite for professional identity, independent of short-term profitability.

Decouplin, in which a bank adopts the look of digital transformation without altering its basic activities, is a major difficulty noted in recent research. According to Pal and Ojha (2017), banks may adopt digital interfaces (the "ceremon) while continuing to use manual, conventional back-office procedures (the practice"). This causes what Mergel, Edelmann, and Haug (2019) refer to as a "transformation gap," where the company finds it difficult to balance its creative reputation with its inflexible institutional past. Additionally, Suddaby (2015) emphasizes that deep-rooted organizational issues arise throughout the transition process due to the contradiction between old banking logics (stability and tradition) and "new" digital logics (agility and speed).

2.3. Drivers of Digital Transformation in Banking

A combination of internal and external factors is the main drivers of the banking sector's digital transformation. Understanding these dynamics provides insight into how banks are adapting to rapidly changing environments.

Changing Consumer Expectations

Almost, 77% of consumers now say that they switch banks to be provided customized banking solutions because we value more convenient, effective, personalized, and transparent banking process (Accenture, 2021). Customers are accustomed to experiencing digital technology in highly personal yet extremely convenience-centered industries like retail and hospitality which influences their expectations toward the banking sector. The establishment and popularity of financial Technology(fintech) companies with customer-centric innovation also heightened this

expectation and pushed conventional banks to improve their digital services (Lee and Shin. 2020; Liu and Kim. 2022). As access to the Internet and Mobile technologies increases, customers' increased need to have a convenient banking service with paperless process forced banks to change and transition towards digital process and services (Chen. 2021). The arrival of the Financial Technology (Fintech) companies into Financial sector also poses a substantial threat to traditional banks. Fintech firms have particular offerings that directly solve problems of consumers such as cumbersome lending process and slow transaction speed (Lee and Shin, 2020). Such emergence had led incumbent banks to revise their business strategies and to heavily invest in the digital infrastructure in order to meet customers' expectations, which in turn, foster the collaboration and competition between traditional and fintech firms and generate the opportunities of efficient cost reduction in the banking industry (Sharma, 2022; Zhao, et al., 2021).

Competitive Dynamics

The development of the fintech companies has dramatically changed the competitive landscape in the banking sector, creating major threats to traditional banking models. Research shows that the fintech companies have exploited the state-of-the-art techniques such asblockchain technology and artificially intelligence to leverage them in addressing the customer dissatisfaction on issues such as transaction speeds and heavy loans applications through customizable financial solutions (Gomberet al., 2018). According to Mc Kinsey & Co (2020), traditional Banks risk losing as much as 40 percent of their revenues to the leaner competitors as this disruptive technology reorients traditional banks strategy framework.

Meanwhile incumbent financial institutions, keen to hold onto their market share, have been spending on digital transformation initiatives (Berger et al. 2020). These dynamics are creating an ecosystem in which rivalry and cooperation co-exist, as established banks also begin to explore the mutual benefits of partnering with fintechs to drive innovation and operational improvements (Weber et al. 2019). Studies suggest that such partnerships can be mutually beneficial, allowingbanks to leverage fintech innovation while retaining their position in the market (Raimo et al. 2020). Ultimately, the interaction between innovation and competition in this industry can be seen as emblematic of the wider trend ofdigitization in financial services,

with both strategic acumen and flexibility essential in navgating these new relationships (Puschmann, 2017)

Technological Improvements

The basis for changes in the banking sector is a reliable and developing core digital technology (Jia, 2024; Li, 2023; Shanti, 2023). These technologies include cloud computing, artificial intelligence, the Internet of Things and data analysis based on big data. Together, they form the basis of the SMACIT abbreviation (Li et al., 2017; Sebastian et al., 2017; Dai, 2024), as well as Blockchain technology, which, owing to smart contracts, is increasingly recognized as the basis of secure, automated financial relations (Udeh et al., 2024b; Ko et al., 2018; Dai, 2024; Salzler et al., 2016). As AI and machine learning analyse data about users to offer personalized advice and advice (Nimmagadda, 2021; Kanaparthi, 2024), the use of these technologies provides personalized access to the banking experience (Nimmagadda, 2021; Kanaparthi, 2024).

Innovations in artificial intelligence (AI), big data analytics, and cloud computing provide banks with capabilities to improve operational efficiency, risk management, and client engagement, which is a major driving force behind this transition (Jia, 2024; Li, 2023; Shanti, 2023; Dai, 2024). According to research, banks may improve service models and drastically save costs by using AI (Deloitte, 2022). By automating repetitive operations, this technology not only helps banks better understand consumer habits through data analysis, but it also increases operational efficiencies (Jia, 2024; Li, 2023; Shanti, 2023). In addition to these fundamental technologies, Automated Teller Machines (ATMs), online banking, and mobile banking apps are examples of how digital banking has evolved and moved customer interaction away from physical branches (Al-Busaidi & Al-Muharrami, 2019; Rogers, 2016; Dai, 2024; Ma, 2025). Due to their accessibility, time-saving features, and ease of use, mobile and online banking in particular are recognized as the most valuable digital products (IEEE Xplore, 2024). Regulations requiring banks to work with third-party providers have prompted innovations like open banking, which have increased competition and innovation in the industry (Martin, 2021). Digital transformation and bank performance are positively correlated, according to empirical research; nevertheless, this effect can differ depending on institutional scale, for example (Wilson et al., 2020). In the

end, developing a more responsive and inclusive financial environment requires the convergence of innovation and technology.

Regulatory Pressures

Banks' digital transformation strategies are greatly influenced by regulatory restrictions, which also have a direct impact on the banking industry's service innovation and technology adoption. For example, the General Data Protection Regulation (GDPR) and other data protection laws have forced financial institutions, including banks in developing nations like Ethiopia, to create sophisticated digital infrastructures that guarantee compliance and promote customer trust (Smith, 2021; Abebe, 2020). Strong data governance frameworks must be established in order to comply with GDPR and comparable local laws. These frameworks are necessary for the safe and open handling of consumer data (Jones, 2022).

In addition, key policy developments in other parts of the world, such as the EU's Payments Directive 2 (PSD2) has caused notable developments on legal and policy environment for sharing data in Banking industry. Though PSD2 is for the most part applied in Europe the policy idea has applicability in Ethiopia, where the legal/regulation frameworks are undergoing a transformation to spur competition and innovation in the financial service sectors (Johnson, 2020; Tadesse, 2021). The regulations foster collaboration, and fuel the development of innovative products and services, through open-banking mandate where consent from customer allowing a third-party access the data (Odhiambo, 2021).

Moreover, the involvement of third-party providers in the financial application market ensures better client services and the customized solutions to meet various client requirements (Martin, 2021). In terms of Ethiopian banking sector, a digital banking is more relevant to extending accessibility and availability of financial service (Kebede, 2021). At the same time, this move toward digitization in banking sector also aligns with the wider economic objectives, such as expanding financial inclusion. The adoption of mobile and digital wallets within the banking sector has increased access to banking facilities for poor communities and facilitated their access to otherwise out of reach formal finance sector (Choudhury, 2020; Tesfaye, 2022). These technologies also help individuals minimize the entry barriers to financial sector thereby contributing to local economic development across regions.

Hence, social context and regulations provide the incentive to banks to take on more innovate and inclusive digital practices. This provides opportunities for financial institutions to view regulatory compliance challenges as chances to innovate technology and create better client's interaction. Such approach helps achieve the broader agenda of developing a more inclusive banking sector with regard to both regulation compliance and meeting regulatory requirements, particularly with regard to a developing economy such as Ethiopia (Kebede, 2021).

2.4. Empirical Review

In the study of Otieno, Karimi and Nyataya used a Descriptive research approach and involved Kenyan commercial banks (39 in number). The method included collection of data from a Sample using; Questionnaires and Interview guides out of 235 questionnaires that were distributed, only 209 questionnaires had been adequately completed and used in data Analysis(70%response). The analysis was carried using SPSS version 24 under the guidlines of guiding theories such as the Innovation Diffusion theory, Technology Acceptance Model to establish the positively correlation between customer satisfaction with the adoption of digital with at the same time testing the implementation aspects (Otieno et al., 2025)

In their 2022 study, Dehnert, M., & Schumann, J. used a discrete choice experiment (DCE) to examine German consumers' preferences for checking account services, with a particular emphasis on the effects of digitization. Three main steps comprised the research design: creating a survey with demographic questions and DCE sections; collecting data from a sample of 1,197 respondents using an online panel and additional recruitment through a financial magazine; and analyzing the data using partial least squares structural equation modeling (PLS-SEM) and finite mixture modeling. Analyses showed multiple diverse customer groupings based on varying choices driven by societal norms and personal traits. The primary factors assessed were provider type, service scope, customer service experience, digital innovation, and professional knowledge (Dehnert & Schumann, 2022)

In their study, Jeyaraj, S. S., Paramasivan, C., Sumathi, M., & Silpa, S. (2024) use a descriptive research technique to examine the opportunities and problems that cloud computing presents in the digital transformation of the banking industry. The authors summarize current research on cloud computing adoption, its models, obstacles, and best practices in banking using secondary

data from a variety of trustworthy sources, such as industry papers, academic journals, and organizational publications. To get an understanding of how cloud computing improves operational efficiency, security, and customer satisfaction while resolving regulatory issues, the research methodology makes use of qualitative analytical approaches, particularly thematic analysis. Since the study focuses on synthesizing current literature, it does not define a specific sample size; nonetheless, it makes use of a wide range of prior research and datasets to offer a thorough understanding of the topic (Jeyaraj et al., 2024)

The research approach used in the study by Do, T. D., Pham, H. A. T., Thalassinos, E. I., & Le, H. A. (2022) is quantitative. Using a balanced panel dataset of 13 joint-stock commercial banks from 2011 to 2019, the authors analyze the data using the Generalized Method of Moments (GMM) system (SGMM). This sample size, which accounts for roughly 61% of the total assets held by Vietnamese commercial banks, was carefully selected based on the data that was available. In order to determine the direct effects of digital transformation (as shown by the variable CDS) and how it interacts with bank size (QM) on performance (TE), as determined by Data Envelopment Analysis (DEA), two models must be estimated. A Markov Chain Monte Carlo (MCMC) approach with a sizable sample size is also used for Bayesian analysis to confirm the robustness of the GMM findings, offering a thorough understanding of how well digital transformation affects banking performance across various bank scales (Do et al., 2022).

This paper (Verhoef et al. 2021) applies a scoping review approach to review the conceptualization of the transformation of the digital context across multiple disciplines such as information systems, marketing, innovation, and strategic management. Extensive literature search from 2000-2018 was carried out but only 84 robust works are kept and evaluated with strict relevance and theory driven selection criteria, resulting in identifying the three phases of digital transformation- digitalization, digital transformation and digitization, as well as their related strategic actions. The multidisciplinary insights into the impacts of the digital transformation on organizational structure, resources and metrics that a multidisciplinary perspective offers can guide the objectives for future research directions in this vital research field.

Digital transformation's impact on operation effectiveness, competitive edge, and customer experience, performance organizational and risk management Jordanian Islamic Banks was

assessed through the use of the descriptive-analytic method by Shehadeh et al. (2024). Original data were gathered using questionnaires designed for one hundred and twenty employees of four Islamic banks. There were sixty-eight useful answers as, after the calculations, they represented approximately 56.66% response rate SPSS was used in processing data and the examination the stated hypotheses utilizing both of correlation and linear regression test. The items were skillfully analyzed by the test of an array of specialists to assure the appropriateness of the tools used, This, approach enabled the research to provide valuable findings in view of significance and the role of digital transformation in the area of Jordanian Islamic banking (Shehadeh et al., 2024).

Alqararah Shehadeh Yaseen, (2025) explore relationship between the digital transformation capabilities and banking performance of Jordanian commercial banks, used quantitative design methodology, data were collected via a survey on-line to investigate effect of the research construct on perceived Jordanian commercial banks performance through accessing 129 bank managers of from sixteen selected banks, used convenience sample, and questionnaire were designed which contained 29 Likert -Scale 5-items relating to technology adapt-ions, com-petitive positioning, and strat-egic positioning and perceived perform-ance, and data analysis uses multiple linear regres-sion, results showed that relationship be-tween in -dependent vari-able and pre-ceive per-for-m-a-n-ce was positive andsig-ni-fic-a-nt. Multiple linear regression explained 68% of the variance in performance out comes.

Despite sample size constraints from practical banking limitations, a post hoc power analysis confirmed adequate statistical power for the regression analysis, offering insights into digital transformation dynamics in Jordan's banking sector (Alqararah et al., 2025). Through a thorough examination of the literature, Thiago Felipe, Rui Torres de Oliveira, Agnes Tóth-Peter, Shane Mathews, and Uwe Dulleck investigate how commercial banks are incorporating Industry 4.0 technologies. Micro, meso, and macro strategies were identified by a qualitative systematic analysis of 287 peer-reviewed publications that were synthesized using thematic coding. Customer experience, data security, and digital accessibility are the focus of micro-level initiatives that prioritize co-creation, security, and inclusivity. Agile organizational structures, automation, and enlarged digital platforms are examples of meso-level initiatives that facilitate collaborations and expedite procedures. Developing totally digital banks, integrating digital

elements into conventional operations, or working with stakeholders to develop novel business models are examples of macro-level strategies. A conceptual framework illustrates cross-level interactions, links them to theories of dynamic capacities and general-purpose technology, and draws attention to issues like internal opposition, legacy systems, and regulations (Felipe et al., 2025)

Munachi Ijeoma Ononiwu, Obianuju Clement Onwuzulike, Kazeem Shitu, and the researcher Olaoluawa Ojo use a mixed-methods study design to investigate the digital transformation of banking in emerging economies. This includes document analysis, qualitative interviews, and a survey 312. The report evaluates how blockchain, artificial intelligence, and mobile platforms increase operational effectiveness and broaden financial inclusion while pointing out obstacles such regulatory obstacles, inadequate infrastructure, and gaps in digital literacy. In response, banks use fintech collaborations, organizational reorganizations, and technological investments to save expenses, improve consumer engagement, and streamline operations. The results emphasize the value of creative business models and strategic relationships, but they also raise concerns about cybersecurity and regulatory issues. The authors conclude that in order to achieve inclusive, resilient growth, governments, banks, and IT companies must coordinate their efforts, maintain regulatory backing, invest in infrastructure continuously, and align strategically (Ononiwu et al., 2024)

The impact of digital technology on banking is examined bibliometrically by B. Lavanya and A. Dunstan Rajkumar. An analysis of 328 papers from Web of Science and Scopus published between 2009 and 2023 using R and VOS viewer is a quantitative bibliometric study. In order to discover paradigm shifts toward FinTech, innovation, digital transformation, acceptance of digital banking, the digital economy, e-commerce, and digitization, the study maps publishing trends, co-authorship, and keyword networks. Results reveal a significant spike in research effort from 2017 to 2023 and an 18.29% annual rise in article creation. Network study emphasizes the 2017–2023 timeframe as crucial for the subject, highlighting changing research clusters and increasing scholarly focus to technology-driven innovation in banking (B. Lavanya & A. Dunstan Rajkumar, 2024)

The COVID-19 pandemic hastened banks' digital transition, combining digital channels with human contact in multichannel initiatives, according to this study by R. Baskerville, F. Capriglione, and N. Casalino. A qualitative case study evaluation of 24 banks that evaluated process redesign, innovation pathways, and organizational transformation through executive interviews, document analysis, and customer service logs. 2020 is a watershed year, according to the findings, as digital adoption is accelerated by remote work regulations and growing public confidence in AI, machine learning, big data, blockchain, and digital currency. Banks are using structured innovation management, centralizing some controls while decentralizing operational choices, and flattening and simplifying structures. According to the study, 2021 is be a critical year for the integration of digital technologies, necessitating knowledge management, ongoing learning, and regulatory-sensitive governance to increase productivity, resilience, and competitiveness in a financial environment that is changing quickly (Baskerville et al., 2020).

The article explores the broad socio-economic implications of technological innovation and their effects on the transformation of the banking sector, with comparative policy analysis, thematic synthesis, a qualitative systematic review of 142 existing studies. In addition to outlining the legal, social, and technical dimensions of digitalization of financial intermediaries, research reveals that technological innovation can lead to more substantial financial impacts, such as increased efficiency gains, risk transmission, and financial inclusiveness. These changes not only affect the banking activities but also social behavior, legal regulations and macro-economic mechanisms through interaction among their various drivers, such as the modification of banks and their strategies, as well as the adaptations of public policies to innovation. It presents an integral approach that outlines the links between innovation activities and economic effects, as well as proposed the integration of institutional measures and public policy reforms (Grozea & Troanc, 2023).

2.5. Conceptual Framework

According to Imenda (2014) and Grant & Osanloo (2014), a conceptual framework involves the compilation of existing literature and empirical findings about what the variables are and how they are assumed to relate. It leads data collection procedures and provides an framework for analysis of the results,serving as a "road map" of the entire project (Ravitch & Riggan, 2016;

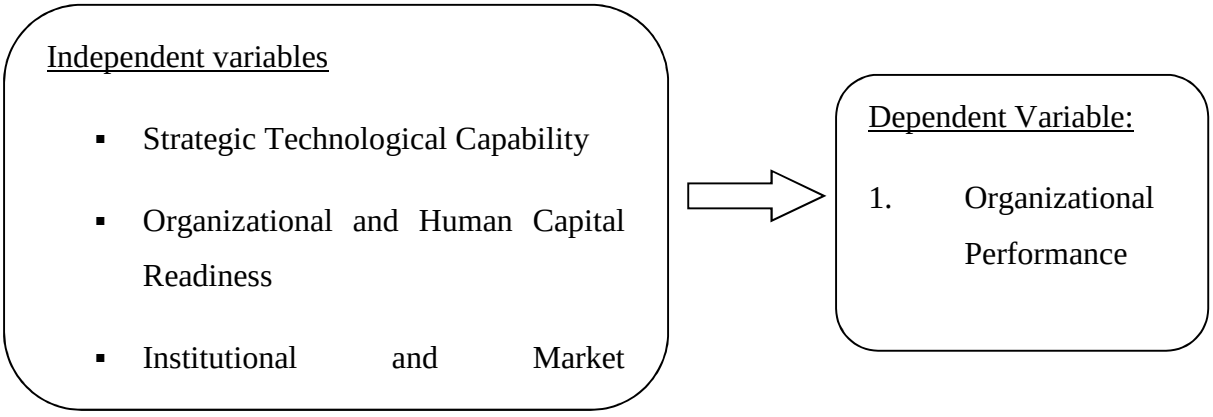
Scribbr, 2022).

To make it totally consistent with the study's research questions, the conceptual framework clearly defines each operational element relative to the central independent and dependent variables. The study's independent variables also embrace a holistic and multi-dimensional view of the digital transformation by encompassing technology strategic, human and environmental dimensions (Warner & Warger, 2019).

The bank's investment and preparedness in both core and emerging technologies are captured by the first independent variable, Strategic Technological Capability (Shanti et al., 2023; Martin, 2021). Both the technology drivers and conventional ICT infrastructure are immediately addressed by this variable. Additionally, it uses ecosystem-oriented strategies including open banking and partnerships with FinTech firms (Dai, 2024). The second independent variable is Organizational and Human Capital Readiness, which emphasizes how people's and organizational systems' preparedness affects how effective technology is in the end (Moghavvemi et al., 2020). Internal "soft" drivers of transformation are addressed (Scholkmann, 2021; Gupta & Satyanarayana, 2019).

According to the et al. (2025), banks must connect their digital strategy with the surrounding institutional environment. The second independent variable is the Institutional and Market Environment, which illustrates the external variables that drive and influence digital transformation. The National Bank of Ethiopia's (NBE) regulatory reforms and mandates, external network dependability problems, and more general market-level competitive forces are all closely correlated with this characteristic.

Organizational performance, the study's main dependent variable, is assessed as a multidimensional construct using four complementary indicators: financial performance, operational performance (efficiency), customer experience, and competitive advantage (Nguyen-Thi-Huong et al., 2023; Do et al., 2022).



CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methods and procedures the researcher employed to conduct the study, including the sampling strategies and data collection procedures. The tools and procedures for processing data are also covered in this chapter. These include the research design, which provides an explanation and justification for the design choice; data collection; data analysis; reliability and validity; and establishment of credibility to describe the steps taken to enhance the quality of the data and the knowledge claim derived from the data; Additionally, methodological assumptions, ethical considerations; and summary.

3.2. Research Approach

This study uses a mixed-methods approach comprising quantitative and qualitative data. The rationale is uncomplicated - quantitative data on its own do not suffice for adequately understanding complex and contexts-dependent phenomenon such as the digital transformation of Ethiopian banks. On one hand, quantities data demonstrate associations and general patterns across large groups of people and organizations, whereas, on the other, qualities data explain rationale, rationale and local contexts underpinning such general patterns. Integration between qualitative and qualitative approach allows triangulations that is: the process of using a multitude of sources and strategies in order to verify one's findings and ensure the credibility of the study, as is demonstrated by Shaanika (2022). Quantitative methodology is largely shaped by survey techniques that collect data in order to show meaningful trends and correlations between measures-mostly regarding new technology use and ecosystem readiness (Khanboubi and Boulmakoul, 2019, Vial, 2019). In conjunction, semi –structured interviews and case studies address the qualities aspects of the issue: the analysis enables to assess strategic conflicts and human/social/cultural related processes (Verhoef et al., 2021) which cannot simply appear into statistic figures. These elements collectively portray more comprehensively how Ethiopian banks move from existing infrastructure to digital operational procedures

3.3. Research Design

A clear research design acts as the roadmap for an inquiry, guiding the formulation of research questions, selection of methods, and gathering and analyzing of data. By incorporating crucial components like problem identification and ethical considerations, it guarantees that study objectives are successfully met (Simpson, 2015; Busetto et al., 2020). A study design encourages applicable and cost-effective approaches by outlining the precise procedures for collecting and analyzing relevant data. Since descriptive research seeks to accurately depict the features of a specific situation or phenomenon, it is a suitable design for examining how digital transformation affects banks' operations. It focuses on comprehending the fundamental difficulties of a phenomenon (Munira, 2025).

As suggested by studies that have used descriptive statistics to analyze trends in digital banking (Xuan et al., 2025; Murashiki, 2025); and research by Manish Kumar Soni and Prof. (Dr.) Aslam Sayeed (2025), which specifically used a descriptive and comparative design to examine the impact of digital banking transformation on selected banks, the descriptive research design is

appropriate for elucidating connections between variables like digital transformation and bank practices because it seeks to describe the current state and relationships. Descriptive analysis is used to assess how digital transformation projects affect bank performance, according to the International Journal for Research Trends and Innovation. This is consistent with the objective of understanding fundamental mechanisms through description.

3.4. Source and Types of Data

The study is incorporate data from both primary and secondary sources. The primary sources are be chosen Addis Ababa banks. Examples of secondary data sources include websites, NBE guidelines, and published publications. To bolster the study's conclusions, the researcher looked at relevant research findings and conclusions. This provided conclusions and recommendations as well as insights into different perspectives on the matter. The study mostly used primary data gathered through questionnaires to accomplish its objectives.

3.5. Population and Samples

3.5.1. Population

The study's target demographic may include individual customers, corporate customers, and potential customers settled in Addis Ababa, Ethiopia's banking sector (financial institution). This may also include a range of regulatory and infrastructure readiness, data protection and open-banking regulations, explicit fintech rules, and the technological infrastructure of demographic groups, such as age, gender, educational attainment, and socioeconomic status, in order to understand how these elements, affect digital transformation and digital banking practices.

3.5.2. Sampling Technique

A systematic method for selecting a sample from a given population is called a sampling technique. The actual process used to choose each sample member to reflect the population is known as the sampling procedure. A straightforward random selection procedure was used to choose a representative sample from the total population. random sampling is justified because it works effectively in situations when the population is heterogeneous (Oso and Onen, 2009).

This relates to the method or process the researcher are employ in order to choose the items for the sample.

In sample surveys, random sampling is a probability sampling technique. Participants in the target population are separated into discrete groups, or strata, and members of each stratum have specific traits in common that are significant to the survey. In terms of survey expenses and estimate accuracy, random sampling is also utilized to improve sample design efficiency (Singh, Ajay S. and Masuku, Micah B., 2014). For this study, the researcher employed stratified sampling. By figuring out the percentage of employees in each industry compared to the overall population, the sample size for each industry was established.

3.5.3. Sample Size

The target sample for the study is selected using a straightforward random sampling technique. Banking Customers were surveyed to identify the target sample, and a sample size that are be practical for gathering the study's data was selected. According to Noor et al. (2022), random sampling is suitable since it guarantees that each respondent has an equal chance of being selected for the study, removing bias and making it easier to generalize the findings.

A research sample is crucial to guaranteeing the caliber of the investigation. (Hair et al., 2021) Ajay and Micah define sampling as the practice of selecting a subset of a community's members in order to mimic the characteristics of the full population. There are three parts. The objectives of the study, the size of the population, the degree of variability in the qualities being assessed, the accuracy level (also known as sampling error), the level of confidence or error risk, and the degree of variability should all be described (Miaoulis and Michener, 1976).

Choosing the appropriate sample size to examine banking customer’s involvement in the in Ethiopian digital banking transformation and their level of digital banking practice indicate who the intended audience is. Identify current and potential customers, including individual, retail, and institutional banking customers. Evaluate the degree of confidence and the margin of error: Usually, the confidence level is set at 95% and the margin of error at 5%. Calculate the Population Proportion: The data that is currently available can be used to determine the proportion of persons who are financially literate (p). A cautious estimate of p = 0.5 should be applied in the absence of data.

$$Z^2 (P (1-p)/e^2 = n$$

In which n is the sample size?

Z is the chosen degree of confidence's standard error (for 95% confidence = 1.96).

(0.05) is the tolerable sample error (e).

p = success probability (let's say its 0.5).

Z^2 (P (1-p)/e^2 = n

(1.92) n One-half (0.5(1-0.5)) ÷ (0.05) n=384

Thus, 384 is the ultimate sample size for this investigation but if more respondent is it is open.

For example, this results in a sample size of approximately 384 respondents. Adjust for Finite Population, If the target population is small, apply a finite population correction factor. Consider practical constraints; factor in time, budget, and accessibility when finalizing the sample size.

3.6. Methods of Data Collection

The required information was gathered from primary and secondary sources. Create an organized survey to evaluate prospective digital transformation challenges and practices in the Ethiopian banking industry. The target respondents are Ethiopian financial professionals and prospective bankers and banked customers. The data for this quantitative investigation were gathered using standard both open and closed-ended questionnaire. The questionnaire's organizational structure, which includes sections on regulatory and infrastructure readiness (including data protection, open banking, fintech regulations, and technological infrastructure), digital transformation practices (including technology adoption, organizational practices, and ecosystem practices), and banking performance (separated into operational efficiency, cost reduction, customer experience & inclusion, and financial metrics), reflects a thorough approach to evaluating digital transformation that is frequently used in academic research on the banking industry. As demonstrated by Babiker, A. E., & Elfaki, A. O. (2023) in their framework for assessing readiness, studies evaluating the readiness for digital transformation frequently include domains related to legislation and regulation in addition to data infrastructure readiness.

In contrast, alternative studies analyzing the implications of digital transformation do directly measure such outcomes (e.g., operational performance, customer experience) as dependent variables and measure them-e.g., as the case in Rashmi K R & Arun Raj K (2024), on analyses of effects on digital banking by Khanboubi, F & Boulmakoul, A (with focus in banking process and digital risk). This explicit separation offers the advantage of distinguishing influences of internal operations processes from regulations on measurable performance consequences. This design satisfies the condition of analyzing leading and lagging aspects. In the current investigation, the questionnaire was adopted by utilizing validated measurement scales from previous studies that examined constructs in the area of study.

3.7. Validity and Reliability

The appropriateness of the study's instrument has been checked out. In order to ensure topic validity and that the final products are in line with the research goals, the questionnaires were developed directly from the analysis of pertinent literature. By incorporating components from the current measuring device that have been proven to be valid and reliable in previous research projects, the validity and reliability of the measurement tool were guaranteed.

Hair Jr (2021) to assess validity, the response can be grouped according to measurement-relevant types; this established hierarchy separates validity into three primary categories: (1) construct validity, (2) criterion-related validity, and (3) content validity. Convergent validity is be determined by calculating the average variance extracted (AVE) value of the construct. This is expected to be greater than 0.50, which indicates that the construct of the indicators accounts for more than half of the variability in the indicators.

3.8. The Analyzing Method Used in The Study

The same established guidelines is be followed in the collection, updating, coding, and categorization of the necessary data. Analytical techniques is be employed to analyze numerical data. For data collection and analysis, both open-ended and closed-ended questions as well as qualitative and quantitative methods analysis is be employed

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4. 1. Introduction

This chapter presents the findings of the study on the effect of Technological, Organizational, and Environmental (TOE) factors on the performance of digital transformation in selected Ethiopian banks. Data were collected through a structured Likert-scale questionnaire administered to 368 bank employees across a range of positions and institutions in the Ethiopian banking sector. The framework for analysis is composed of three exogenous variables Strategic Technological Capability (STC), Organizational and Human Capital Readiness (OHCR) and Institutional and Market Environment (IME) and one endogenous variable Organizational Performance (OP). The following is describing demographic character of respondent, descriptive statistics for each of constructs, measuring of reliability and the assessment of correlation of individual construct prior to the interpretation of result.

4. 2. Demographic Profile of Respondents

A total of 368 completed questionnaires were collected from bank employees working across a variety of roles in the Ethiopian banking sector. The tables below break down the sample by gender, age, work experience, and related characteristics.

4.2.1 Distribution by Gender

Table 4. 1: Demographics of Respondents by Gender

Gender	Frequency	Percentage
Male	132	63.0%
Female	136	37.0%
Total	368	100.0%

Source: survey of 2026

Male respondents made up 63.0% of the sample (n=232), with female respondents accounting for the remaining 37.0% (n=136). This breakdown broadly reflects the existing gender composition of the Ethiopian banking workforce, though the proportion of women represented in the sample is meaningful and contributes to the diversity of perspectives captured in the study.

4.2.2 Distribution by Age Group

Table 4.2: Demographics of Respondents' Age Group

Age group	Frequency	Percentage
18-25	46	12.5%
26-35	241	65.5%
36-45	54	14.7%
Above 45	27	7.3%
Total	368	100%

Source: survey of 2026

The sample is clearly a young one. Nearly two-thirds of respondents (65.5%, n=241) fall in the 26–35 age bracket, with the 36–45 group contributing a further 14.7% (n=54). This is significant for a study on digital transformation: younger professionals have grown up with digital tools and

tend to engage with new technologies more readily, which is likely to be reflected in how they perceive and experience their banks' digital initiatives.

4.2.3 Distribution by Work Experience

Table 4.3: Demographics of Respondents Work Experience

Years of experience	Frequency	Percentage (%)
Less than 1 years	40	10.9%
1-5 years	201	54.6%
6-10 years	74	20.1%
Above 10 years	53	13.95%
Total	268	100.0%

Source: survey of 2026

The biggest cohort of respondents, at 54.6% (n=201), has only been in the banking industry from one to five years, with 20.1% from six to ten years, and 13.9% more than 10. The relative youth of the majority in the industry is important to bear in mind when reading these results. Those who recently entered will probably be thinking about banking as it is now – likely with digital systems already implemented and well-ensconced – with a different perspective from someone who was working in banking before then.

4.3. Reliability Analysis

Table 4.4: Reliability Analysis

Construct	No of items	Cronbach's alpha	Interpretation
Strategic Technological Capability (STC)	6	.833	Good
Organizational & Human Capital Readiness (OHCR)	6	.900	excellent
Institutional & Market Environment (IME)	5	.822	good
Organizational performance	4	.868	Good

Source: our survey of 2026

Cronbach's alpha was determined for each construct in order to ascertain the internal consistency or degree to which items measuring the same scale represent the same basic concept. Values of above 0.70 are taken to be acceptable and above 0.80 acceptable. All four of our constructs exceed the generally accepted thresholds, with the alpha range being from 0.833 (Strategic Technological Capability) to 0.900 (Organizational and Human Capital Readiness). The highest value of Cronbach's alpha was for the OHCR scale suggesting that all six items do indeed measure very similarly and providing confidence in the validity of the scales.

4.4. Descriptive Statistics of Study Variables

Responses were measured on a 5-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. The following section presents the mean scores and standard deviations for each construct and their individual items. A mean score above 3.50 is generally interpreted as reflecting agreement, while scores between 2.50 and 3.49 indicate a neutral position, and scores below 2.50 indicate disagreement.

4.4.1. Strategic Technological Capability (STC)

Strategic Technological Capability refers to the bank's ability to deploy and integrate digital infrastructure, platforms, and systems in support of its digital transformation agenda.

Table 4.5: Descriptive Statistics of Strategic Technological Capability

Item	Mean	Std.dev	Interpretation
Financial & human resource allocation for digital innovation.	4.31	0.91	Strongly Agree
Clear digital vision and roadmap communicated across all levels	4.00	0.87	Agree
Legacy ICT infrastructure flexible enough to integrate modern platforms	4.10	0.98	Agree
Digital platforms (Mobile/Internet Banking) consistently available	3.54	1.07	Agree
Digital transformation improves speed and efficiency of banking operations	3.39	1.24	Neutral/Agree

Internal systems compatible with external payment gateways/fintechs	3.94	0.86	Agree
OVERALL MEAN	**3.88**	**0.86**	**Agree**

Source: our survey of 2026

Overall mean of strategic technological capability was 3.88 (SD = 0.79), implying that a somewhat reserved optimism surrounds the state of technology, or technological foundations of banks, in the minds of employees. Fortunately, the top scorer was indeed Resource allocation for digital innovation (M = 4.31), implying some faith among employees that banks are willing to spend 'serious money' on digital aspirations. In contrast, the hoped-for gains in terms of efficiency and speed achieved through digitalization received much lower ratings (M = 3.39), implying a disconnect between expectations of what digitalization should bring to the table and employees' lived reality. Platform reliability received roughly similar scores (M = 3.54), with over a quarter of respondents either disagreeing or, at least partially, being undecided about the quality of their respective bank platforms.

4.4.2. Organizational and Human Capital Readiness (OHCR)

This construct measures the bank's internal readiness in terms of leadership commitment, organizational culture, staff training, decision-making agility, and employee incentivization for digital innovation.

Table 4.6: Descriptive Statistics of Organizational and Human Capital Readiness

Item	Mean	Std.dev	Interpretation
Since implementing digital transformation, we have observed a significant increase in customer satisfaction and retention	4.32	0.85	Strongly Agree
Senior leadership demonstrates strong commitment to digital strategy	3.99	0.91	Agree
Organizational culture encourages embrace of new digital tools	4.07	0.90	Agree
Regular and effective training provided to enhance digital competencies	3.99	0.89	Agree

Decision-making processes are agile enough to support digital changes	4.23	0.82	Neutral/Agree
Employees incentivized/rewarded for digital service improvements	4.17	0.87	Agree
OVERALL MEAN	**4.13**	**0.75**	**Agree**

Source: our survey of 2026

Organizational and Human Capital Readiness Our first independent variable proved to be the most robust. On average across all 8 OHCR items, there was a mean score of 4.13 (SD = 0.75). This indicates that at least from the internal viewpoint of employees, internal organization and people are better prepared for the digital future than technology in the banks; two items, analytics driven customer focus (M = 4.32) and dynamic organizational processes (M = 4.23), performed particularly well. We recorded identical average scores for training and top management dedication (M = 3.99). This is still very positive, but a definite jump below the other items. It implies that training is an area to focus on ongoingly, not periodically. A high proportion of our respondents, 88.5% average responses, supported OHCR items – at minimum agrees. However, this is still based on a self-evaluation by employees.

4.4.3. Institutional and Market Environment (IME)

The IME construct captures the role of external environmental factors including regulatory frameworks, infrastructure, digital literacy levels, and competitive dynamics on digital transformation outcomes.

Table 4.7: Descriptive Statistics of Institutional and Market Environment

Item	Mean	Std.dev	Interpretation
Compliance with NBE's cybersecurity and data privacy mandates is a key driver of our digital security investments	4.13	.84	Agree
NBE regulatory reforms are supportive of digital banking expansion	4.19	.88	Agree
National telecom & electricity infrastructure	4.92	.88	Agree

provides reliable foundation			
Low digital literacy is a major barrier to adoption of digital products	4.27	.85	Agree
Competitive pressure from banks & fintech's (Tele birr/M-Pesa) accelerates DT	4.00	.94	Strongly agree
OVERALL MEAN	**4.11**	**.72**	**Agree**

Source: our survey of 2026

The Institutional and Market Environment construct resulted in an overall average of 4.11 (SD = 0.72). The biggest takeaway from this construct is almost unanimity regarding the concern for public digital literacy: 88.1% of individuals perceive that poor literacy level heavily hinders the widespread adoption of digitally-delivered banking product(s) (M = 4.27). This is a very sobering revelation. No matter how well-appointed the technology or the staff, unless customers can access it and use it without fear of personal inadequacy – be it their inability to use a mobile application or their intimidation by an online banking website – the whole initiative stalls just before hitting the end user. Fortunately, NBE regulatory policy reforms are found to be enabling (M = 4.19), signalling true belief in the policy thrust and a vote of confidence. Infrastructure reliability comes at the bottom of the list (M = 3.92) – a perennial issue whose significance is amplified outside the major urban centers.

4.4.4. Organizational Performance (OP)

Organizational Performance in this study captures the extent to which digital transformation has translated into measurable improvements in operational efficiency, cost reduction, workload relief, and product launch agility.

Table 4.8: Descriptive Statistics of Organizational Performance

Variable item	Mean	Std.dev	Interpretation
Digital transformation improves speed and efficiency of banking operations	4.06	0.96	Agree
Digital transformation significantly reduced cost of processing transactions	4.09	0.90	Agree

Digitalization reduced physical workload and overcrowding at branches	4.04	0.93	Agree
Bank is more capable of launching new products faster than before	4.05	0.92	Agree
OVERALL MEAN	**4.06**	**0.81**	**Agree**

Source: our survey of 2026

On average, respondents showed themselves to be extremely positive about digital transformation outcomes across all four dimensions. For one thing, there is a tight concentration of item scores around the mean of 4.06 (SD = 0.81). And that tight grouping, itself, shows - it indicates that whatever the fruits of transformation are, they're dispersed rather than concentrated in one quadrant. More than four out of five of those that participated in our survey saw transaction costs fall; more than 80% saw product launches speed up (see box), and over a third claimed their branches were less crowded (M=4.04).

4.4.5. Correlation Analysis

To assess the nature and strength of relationships between the independent variables (STC, OHCR, IME) and the dependent variable (Organizational Performance), Pearson correlation coefficients were computed. The results are presented below.

Table 4.9: Descriptive Statistics of Correlation Analysis

Variable	STC	OHCR	IME	OP
Strategic Technological Capability (STC	1.000	0.800**	0.758**	0.765**
Org. & Human Capital Readiness (OHCR)	0.800**	1.000	0.847**	0.799**
Institutional & Market Environment (IME)	0.758**	0.847**	1.000	0.849**
Organizational Performance (OP)	0.765**	0.799**	0.849**	1.000

** Correlation is significant at the 0.01 level (2-tailed)

The Correlation matrix supports the findings of the descriptive stats-that all three independent constructs share a high, positive relationship with Organizational Performance: Strategic Technological Capability (r = 0.765)-This is a very robust value, demonstrating the baseline importance that technology investment & infrastructure play in performance results. Organizational and Human Capital Readiness (r = 0.799)-A very high value reflecting the fundamental role that people (training, leadership, and change readiness) play in successful digital transformation efforts. The Institutional and Market Environment (r = 0.849) -This sounds a little weird initially but if we look deeper, it's hard for a bank to control government regulation, the availability of infrastructure, or the general level of digital maturity amongst its consumers-and it turns out that this seems to be the largest variable to overcome/leverage when trying to turn investment into improved performance outcomes. Looking across the inter-construct correlations, they all look very high (between 0.758–0.847). This reflects the TOE framework-technology, organizational readiness and the external environment all influence each other and not simply the outcome of the transformation.

4.5. Discussion of Major Findings

4.5.1. Strategic Technological Capability and Organizational Performance

There is a strong positive relation between STC and OD. Performance (r = 0.765) and also quite strong overall mean for OD of 3.88 which clearly identifies technology capability is an ingredient in achieving success in digital transformation implementation. It seems Ethiopian bank have emphasized the digital transformation innovation area; all banks are keenly aware to allocate resources; in support of this argument is the good score allocated on resource allocation (M=4.31). It appears it is perceived within the institutional knowledge how important the financial commitment the digital technology requires. Not so certain is how many banks are utilizing the capital on hand appropriately; it also appears through mean score in platform availability (M=3.54) and perceived benefits from digital transformation technology, in form of gaining productivity and efficiency (M=3.39), that something about these funds, which the bank is investing is missed somewhere; either it does not provide the intended function for those, which are external the banks but connected externally like Telebirr, M-pesa and others has very

positive mean value of 3.94 so it is evident it has been successfully implementation area although due to constant development in the fintech space, there isn't scope for self-complacency. It seems to be the same well-documented gap between strategic focus to operational reality ofdigital banking implementation in sub-Sahara Africa, infrastructure and legacy systems still hold hostage even well-capitalized projects at sub-Saharan Africa. Ensuring technology works as its intended use would be another most highlighted area to prioritize this study points out to.

4.5.2. Organizational and Human Capital Readiness and Performance

Organizational and Human Capital Readiness (alpha = 0.900, r with OP = 0.799) as the highest reliability scores among all the constructs, and showed as a major predictor of the digital transformation performance. Special good scores observed at usage of data analytics (M=4.32) and ability to react quickly on decisions (M=4.23) reflects a creation of real capabilities in internal capacity-banks are in action on insights provided by digital systems and the operating environment structure supports decision making. Training and Leadership commitment in the other hand were recorded relatively lower mean scores (3.99 each), this implies real risk. Leadership support and systematic training are generally key enablers for transformation durability over the bumpy journey against resisting and overcoming various hurdles of change. A decline in any of these two leads to the erosion of all building blocks. Employee incentives received relatively higher score (4.17) as a good sign of internally embedded motivation. The striking point from this section is wide gap between mean scores of Organizational Readiness (4.13) and Technological Readiness (3.88) at the sampled Ethiopian banks. In simpler terms, bank’s workforce seems better ready for digitization challenges and benefits than the tools and technology. This might result in work pressure on staff due to tools limitations and may lead to disappointment; and thus, a clear task to bring technological readiness at par with the workforce's organizational readiness.

4.5.3 Institutional and Market Environment and Performance

The result that the Institutional and Market Environment, has the highest correlation to Organizational Performance (r=0.849) is not something to gloss over. It means that whatever a bank does internally is, in the end, less of a determinant of the success of its digital transformation than the environment in which it operates-the regulatory space, the underlying

national infrastructure, citizen digital literacy, the pressure of competition from fintech. 'There seems to be almost universal agreement among bank respondents that low levels of citizen digital literacy pose a major challenge to digital transformation (M=4.27, 88.1% agreement)' – this finding has major policy implications. There is a limit to how far banks can solve the problem of digitally disenfranchised citizenry individually; if a substantial part of its customer base is not comfortable operating a mobile app, there is a ceiling to the returns on technology investment or the training provided to staff.

This is a demand-side problem requiring supply-side (government/public sector) intervention. 'The Banks perceive the National Bank of Egypt's reforms positively (M=4.19) which is in itself very positive – it is good that Banks see the regulatory environment as facilitating digital transformation which is crucial in guiding long term investment decisions'. The competitive threat from fintech's like Tele birr is obviously being experienced (M=4.00), driving action but 'the perceived lack of reliability with Telecommunications and Electricity services will continue to pose an infrastructure constraint to digital transformation especially in peri-urban and rural areas of the country where the need for financial inclusion services is greatest (M=3.92)'.

4.5.4. Overall Organizational Performance Perceptions

The organizational performance data is unequivocally good, with the overall mean across all items of 4.06 falling into a tight range from 4.04-4.09. And notice that's from one item to the next – the impact of digital on the employee workforce is clearly and evenly applied across efficiency, cost cutting, workload relief, and product agility - rather than being narrowly applied. The most interesting metric for bank leadership making a business case for ongoing digital transformation is the cost-reduction finding: 86.4% of all employees are of the view that digital transformation has "reduced transaction-processing costs by at least half." And the data that speaks volumes to competitive success for banks in a market increasingly defined by tech-savvy millennials and Gen Y; 80.5% of all employees agree that "digital transformation has helped [their institution] introduce new products much faster." Lastly, while you may not be surprised by M=4.04 on branch workload relief, consider what that implies beyond mere efficiency – reduced pressures for in-branch staff often translate into better customer experience for those who still opt for face-to-face services.

CHAPTER FIVE

5. SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary of Major Findings

The present study has utilized 368 appropriate questionnaires received from the banks employees of Ethiopian banking industry. Main conclusion of the study may be described as:

- 368 bank employees, the majority of whom were male (63%), in the ages 26-35 (65.5%), a bachelor's degree holders (62.8%) and a majority (54.6%) had 1-5 years of banking experience thereby describing the younger and educated banking workforce within the Ethiopian banking sector.
- Internal reliability of all the measurement instruments were satisfactory to excellent (Cronbach's alpha: 0.833-0.900) ensuring for valid data analysis; Strategic Technological Capability (STC) obtained a relatively moderate to strong mean score (3.88), where the majority respondents have viewed the resource deployment favorably, whereas the platform Reliability and productivity gains need much attention; Organizational and Human Capital Readiness (OHCR), was assessed the strongest of the four independent variable measures with a mean score of 4.13.
- Strengths include utilization of the big data analytics and rapid decision-making, whereas training and management commitment is something to continuously be taken care of; Institutional and Market Environment (IME) reported a overall mean score of 4.11.
- It suggests Digital illiteracy identified as the key barriers external to organization (M = 4.27), with NBE providing crucial support (M = 4.19). Organizational Performance (OP) obtained consistent mean score of 4.06 in all the dimensions thus overall high organizational performance outcome linked to digital transformation. Institutional and Market Environment (IME) has been strongly correlated with organizational performance (OP) with coefficient (r=0.849) it is more followed by Organizational and Human Capital Readiness (OHCR) and Strategic Technological Capability (STC), therefore environment factors are positively correlated and stronger for a performance metric toward digital transformation and independent variables are highly intercorrelated (r =0.758-0.847)

5.2. Conclusions

The purpose of this study was to determine how technology, organization, and environment factors influence digital transformation performance for selected Ethiopian Banks. From the analysis the study concludes the following: (1) the process of digital transformation is largely viewed within Ethiopian Banks as performance-enhancing, contributing positively to efficiency, cost reduction, reduced branch traffic, and faster new product cycles; overall performance is viewed positively by 4 out of the 5 metrics measured (mean = 4.06). (2) technology is the biggest hurdle. Strategic Technological Capability ranked lower of the three independent variables (mean = 3.88) and, as we saw, we found the expected mismatch between amount spent on digital technology and the technology experience of customers and bank staff – the returns are hindered by our platform infrastructure and integration capability gaps. (3) organization readiness is relatively high on average for the Banks (mean= 4.13), with specific strength in data analytics used in decision making processes. As we mentioned in our prior work on digital organization this finding hides some obvious weaknesses: digital readiness must be managed on an on-going basis for leaderships and team skills to increase, to stay relevant and to avoid decay over time. Our analysis showed relatively low digital leadership and digital training within the banks. (4) The environment plays a bigger role in enabling/disabling digital transformation than either of our internal factors. The high correlation (0.849) between our environmental variables and Bank performance is arguably the study's highest impact conclusion and speaks directly to the need for policy makers and a wide range of stakeholders to participate in enabling digital transformation. This is particularly clear given that low consumer digital literacy was singled out as the most significant barrier to digital transformation in Ethiopia. The technology organization environment – TOE frame appears to be robust and useful for understanding the dynamics of digital transformation performance within the Ethiopian banks. Intercorrelations of the three main constructs confirm hypothesis of the TOE model which supports the argument that not one element alone contributes to digital transformation process rather than the 3 elements together determines the performance of digital transformation in Ethiopian Banks.

5.3. Recommendations

- Banks need to be incentivized to invest seriously in reliable and interoperable digital channels – no amount of investment in modern (on paper) systems will achieve desired

outcomes if their ATMs are frequently down or if their banking apps cannot hook up with third-party payments systems (like Telebirr, M-Pesa). Closing that disconnect needs targeted, consistent, and continuous investment, not a once off "update".

- Incentive frameworks around innovation must be clearly defined and clearly linked to concrete, measurable outcomes so that personnel feel truly empowered to champion change. Most critically, in the absence of an enabling demand environment, serious investment is needed on the part of the National Bank of Ethiopia and the government to provide incentives for public digital literacy, in order to promote wider digital skills adoption in rural and underbanked populations where, by virtue of its vast reach alone, intervention here will make more inroads than current bank-level investments possibly can.
- Telephone and power infrastructure must be built in peri-urban and rural areas so that whatever is invested in on the banking side can effectively translate into real life outcomes in areas where lights can and do constantly go out. Regulation will continue to need to facilitate the space needed to innovate in this rapid sector while also keeping pace with developments to protect consumers.

5.4 For Future Research

- The present research is descriptive and correlational. Causal inferential analyses should be conducted in subsequent studies using alternative analyses such as Multiple Regression, SEM or PLS and estimate the individual and simultaneous impact of STC, OHCR and IME on organizational performance.
- It could be important to examine sector specific moderating variables such as bank size, private versus state ownership, and urban versus rural branching to determine if the found relations apply to various types of banks operating in Ethiopia.
- Customer focused researches to examine the supply-side or employees' perceived experiences and supply side or clients' experience on adopting digital banking should be conducted to understand comprehensive consequences of digital transformation in Ethiopia.

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QUESTIONNAIRE



SCHOOL OF COMMERCE

DEPARTMENT OF DIGITAL MARKETING AND E-COMMERCE

PRACTICE AND CHALLENGES OF DIGITAL TRANSFORMATION IN SOME SELECTED ETHIOPIAN BANKS

Dear Sir/ Madam,

This questionnaire is designed to collect the necessary information for the research title practice and challenges of digital transformation in selected Ethiopian banks. Thesis submitted in fulfilments of the requirements for the degree of masters of science in **Digital Marketing and E-Commerce program**. Your participation is very important for the success of the study. The information you provide will be used only for academic purpose and will be kept strictly confidential. The following questions have no right or wrong answers. Please don't hesitate to provide important information to the best of your knowledge. You are not required to write your name. Completing this questionnaire will take you few minutes. Please indicate the degree to which you agree. After you read each statement put a tick mark ( ) under the choices below. Research title. Thank you in advance for spending your precious time to answer the questions and please do not hesitate to contact the undersigned with any questions.

General Instructions:

For your free and genuine responses, please tick by putting ( ) in front of each alternative and encircle your appropriate answer.

Part I General Information of the Respondent

1. **Gender** 1. Male 2. Female
2. **Age** **1.** 18-25 **2.** 26-35

3. **Years of Work Experience**

1.Less than 1 year **2**.1-5 years **3**.6-10 years 4**.** Above 10 years

4. **Educational Qualification**

1.Diploma **2.** Bachelor degree **3**. Master's degree **4.** PhD 5**.** Other

5. **Current Position**

1.Officer**2.**Customer Service**3.**Supervisor**4.**Manager**5.**IT Specialist**6.**Other

Part II.

Below is a set of over 20 questions organized by your variables. This uses a 5-point scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

Section 1: Strategic technological capability		**1**	**2**	**3**	**4**	**5**
1	Our bank allocates sufficient financial and human resources specifically for digital innovation projects.					
2	There is a clear digital vision and roadmap communicated effectively across all levels of the organization					
3	Our existing legacy ICT infrastructure is flexible enough to integrate with modern digital banking platforms.					
4	The bank's digital platforms (Mobile/Internet Banking) are consistently available and reliable for customers.					
5	We believe that digital transformation significantly improves the speed and efficiency of our banking operations					
6	Our internal systems are highly compatible with external payment gateways and third-party fintech services.					

Section 2: Organizational and Human Capital Readiness		1	2	3	4	5
1	Our bank's senior leadership demonstrates a strong, visible commitment to the digital transformation strategy.					
2	The current organizational culture encourages employees to embrace new digital tools rather than resisting them.					
3	Our bank provides regular and effective training to staff to enhance their digital competencies.					
4	Internal decision-making processes are agile enough to support rapid digital changes.					
5	Employees are incentivized or rewarded for suggesting and implementing digital service improvements.					
6	Digital initiatives have improved our ability to reach unbanked populations in remote areas.					
7	Since implementing digital transformation, we have observed a significant increase in customer satisfaction and retention					

Section 3: Institutional and Market Environment		1	2	3	4	5
1	The National Bank of Ethiopia's (NBE) regulatory reforms are supportive of digital banking expansion.					
2	National telecommunications and electricity infrastructure provide a reliable foundation for our digital services.					
3	The low level of digital literacy among the general public is a major barrier to the adoption of our digital products.					
4	Competitive pressure from other banks and fintechs (like Telebirr/M-Pesa) accelerates our digital transformation.					
5	Compliance with NBE's cybersecurity and data privacy mandates is a key driver of our digital security					

	investments.					

Section 4: Organizational Performance		**1**	**2**	**3**	**4**	**5**
1	Digital transformation significantly improves the speed and efficiency of our banking operations.					
2	Digital transformation has significantly reduced the cost of processing individual customer transactions.					
3	Digitalization has reduced the physical workload and overcrowding at our brick-and-mortar branches.					
4	Our bank is now more capable of launching new products faster than it was before the digital shift.					