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# Impact of Digitalization

## A Qualitative Study on the Impact of Digitalization within Organizations in Ethiopia

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# Kurzfassung

Der Begriff „digitale Transformation“ bezieht sich auf verschiedene Veränderungen und Innovationen, die durch fortschrittliche Technologien ausgelöst und verwurzelt werden [1]. Er geht über vorübergehende Trends hinaus und weist auf eine kontinuierliche Entwicklung hin, die seit den Anfängen des Internets an Popularität gewonnen hat. Sowohl Organisationen als auch Einzelpersonen arbeiten intensiv daran, die Digitalisierung in ihre täglichen Aktivitäten einzubinden, was zu einer erheblichen Veränderung der modernen Arbeitsweise geführt hat.

Dennoch hat sich der globale Wandel der Digitalisierung nicht gleichmäßig vollzogen. Entwicklungsländer wie Äthiopien stehen vor der Herausforderung, sich an den aktuellen technologischen Paradigmenwechsel anzupassen. Bei den vorgeschlagenen Veränderungen in diesen Ländern handelt es sich nicht um schrittweise, sondern vielmehr um drastische Veränderungen, die tief verwurzelte gesellschaftliche Normen und bestehende Infrastrukturen in Frage stellen. Wie viele andere Entwicklungsländer hat auch Äthiopien mit infrastrukturellen Zwängen und kulturellen Konventionen zu kämpfen, die sich direkt auf die Arbeitsweise von Unternehmen und die Beziehungen untereinander auswirken. Der Widerstand gegen diese bedeutenden Veränderungen ist groß und tief in der historischen Struktur der äthiopischen Gesellschaft verankert.

Ziel dieser Arbeit ist es, einige Herausforderungen, Beschränkungen und Strategien zu beleuchten, die äthiopische Organisationen wie das Welternährungsprogramm, die Awash Bank, die Addis Abeba City Administration Civil Registration and Residency Service Agency und Ahun auf ihrem Weg zur digitalen Transformation durch ausführliche Interviews mit Hilfe der Qualitative Research Methodology anwenden. Die Ergebnisse dieser Untersuchung betonen eingesetzte Strategien zur Mitigation negativer Auswirkungen der Digitalisierung. Darüber hinaus kann diese Arbeit als Grundlage für künftige Bemühungen dienen, die nationale Entwicklung durch digitale Transformation zu beschleunigen und Äthiopien für den Erfolg in einer zunehmend digitalen Umfelt zu positionieren.

# Abstract

The term "digital transformation" refers to various changes and innovations instigated and rooted in advanced technologies [1]. It transcends transient trends, indicating a continual evolution that has gained popularity since the Internet began. Both organizations and individuals have been working extensively to incorporate digitization into their daily activities, leading to a significant shift in the modern mode of operation.

Nevertheless, the global digitization transformation has not occurred uniformly. Developing countries like Ethiopia have faced challenges adjusting to the current technological paradigm shift. The proposed changes in these countries are not incremental but rather drastic alterations that challenge deeply rooted societal norms and existing infrastructures. Like many other developing countries, Ethiopia faces infrastructure constraints and cultural conventions that directly impact how businesses operate and relationships with one another. The resistance to these significant changes is substantial and is deeply anchored in Ethiopian society's historical fabric.

This thesis aims to shed light on some challenges, limitations faced, and strategies used by Ethiopian organizations in the case of the World Food Programme, Awash Bank, Addis Ababa City Administration Civil Registration and Residency Service Agency and Ahun; in their digital transformation journey through rigorous, in-depth interviews by employing Qualitative Research Methodology.

The findings from this research highlight various strategies implemented to mitigate the negative impacts of digitalization. Additionally, this thesis can serve as a foundation for future efforts to accelerate national development through digital transformation, positioning Ethiopia for success in an increasingly digital landscape.

# Contents

CHAPTER 1

# Introduction

The year 2020 presented both opportunities and challenges worldwide. It significantly accelerated digital transformation efforts in developed countries, creating obstacles for developing countries like Ethiopia. While developed countries already had established digital practices, Ethiopia needed help in swiftly adapting to the new changes brought on by the COVID-19 pandemic. The Ethiopian government's recent efforts to digitize various sectors indicate a significant shift towards embracing digital solutions in the forthcoming years, as demonstrated by initiatives such as the "National Digital Payments Strategy: 2021–2024" by the National Bank of Ethiopia [2].

However, implementing these transformative digital strategies is met with significant resistance. The existing infrastructure shapes business operations and societal interactions, leading to strong opposition to proposed radical changes. Overcoming this resistance and gaining stakeholder support requires a subtle approach that acknowledges and addresses concerns within the interconnected social structures overall in Ethiopian organizations. This group mentality often leads to negative perceptions of digitalization, complicating efforts to align organizational goals with workforce sentiments and external factors.

Organizations in Ethiopia are thus faced with the challenge of advancing business objectives through strategic digital implementation while maintaining positive relationships with their workforce amidst general resistance.

To understand the challenges encountered by organizations in Ethiopia, the research aims to pinpoint the root issues stemming from resistance to change and uncover various strategies organizations employ as they transition to digitalization. To probe this complexity, the research is guided by the following comprehensive set of research questions:

1. How are the organizations managing their digitalization journey in Ethiopia?
    - Internal factors: How are organizations embracing and implementing change alongside the existing business and organizational structure?

- External factors: How are the changes in the government policy, industry standards, and competitors affecting the organization's journey towards digitalization?

2. What are the effects on employees and management?

   - Micro level: How are the employees adapting and working with the current ongoing organizational changes? How does the senior management manage their staff?

   - Meso level: What are the positive and negative impacts of such adaptations on the employees' social life?

## 1.1 Background

The Federal Democratic Republic of Ethiopia, located in the Horn of Africa, is the region's largest and most populous nation [3]. Its economic backbone primarily relies on agriculture, constituting almost half of the country's overall GDP and dominating its export sector [4].

Ethiopia has experienced fast economic growth since 2005, with GDP increasing at an annual rate of 10.5% in 2004–05 and 2012–13, according to the Ministry of Finance and Economic Development (MoFED), in 2013. The first Growth and Transformation Plan (GTP) was implemented in 2015; it was the country's comprehensive 5-year development plan with targets related to achieving middle-income status by the mid-2020s and significant growth prospects and constraints. According to available evidence, Ethiopia's economic growth has indicated a structural shift away from traditional and primary industries and toward secondary and tertiary sectors [5].

According to the data published in the Data Reportal, internet users in Ethiopia increased significantly, reaching 23.96 million in January 2021. As a result, there were 2.8 million more users, representing a 13% growth rate between 2020 and 2021 [6]. These numbers show the growing level of digital literacy among Ethiopians throughout the given period.

The recently approved digital strategy "Digital Ethiopia 2025, A Digital Strategy for Ethiopia's Inclusive Prosperity" [7] aims to simplify digital service supply for Ethiopia's major economic sectors, such as agriculture, manufacturing, and tourism, by embracing Ethiopia's global economic advantages, such as lower labor costs. The strategy also emphasizes the need for "optimal use of new and emerging technologies to modernize the agriculture sector". Building a national digital agriculture platform and assisting agricultural technology entrepreneurs are identified as funding priorities, emphasizing precision agriculture and vertical farming.

## 1.2 Purpose

Over the past two decades, Ethiopia has seen exceptional economic progress in Africa. Before COVID-19 in 2020, the government predicted a 9% economic growth in 2019/20, while official statistics from the National Bank of Ethiopia in 2020 indicate 6% [8]. Ethiopia's economy has grown significantly in the previous fifteen years, but persistent difficulties such as poverty and unemployment remain. This persistence is due to a lack of structural improvements and a failure to generate adequate opportunities. As a result, policymakers face the critical responsibility of addressing these issues, based on research in cooperation with the Economic Research Forum (ERF). Rapid, transformative growth is needed, and digitization stands out as a critical driver. Digitalization appears as an essential means for combating these significant economic difficulties in Ethiopia by generating necessary structural transformations within the economy, increasing global competitiveness, and enabling technology improvements across industries [8] [9].

Ethiopia is chosen as the focus point for this thesis to investigate the influence of digitalization on organizations, a decision rooted in a profound connection with the country as an Ethiopian. Ethiopia's recent economic growth and persisting challenges such as poverty and unemployment sparked interest in investigating how digital technology can help the country undergo significant transformation. This personal acquaintance comes from being a native Ethiopian with a unique awareness of the country's cultural, economic, and social landscape. It provides a great insider perspective on Ethiopian organizations' challenges and opportunities in the digital era. Through diligent research, the thesis seeks to improve the scholarly conversation surrounding the impact of digitalization. Simultaneously, it will leverage insights to inform practical digital solution implementations in Ethiopia, ultimately generating positive change within the country's organizational structure.

CHAPTER 2

# Theoretical Background

Before discussing digital transformation, it's crucial to clearly understand what "digital" refers to in this context. The term "digital" can be interpreted in various ways. McKinsey's definition of digital is not limited to a single process but rather incorporates the broader operational methods of companies. This definition mainly focuses on three significant areas:

1. Creating value at the new frontiers of the business world: This involves exploring and leveraging new opportunities and innovations that arise within the business landscape.
2. Optimizing processes that directly affect the customer experience: This includes enhancing and streamlining operations that directly impact customer interactions and experiences.
3. Building foundational capabilities that support the entire business initiative: This refers to establishing core competencies and capabilities that underpin and facilitate the overall functioning and objectives of the business [10].

"Digitization" and "Digitalization" are terms often used interchangeably across numerous literatures, yet they are closely linked concepts. Brennen, J. S., and Kreiss, D. argue that there is significant analytical benefit in clearly differentiating between these two ideas [11]. The earliest instances of the terms 'digitization' and 'digitalization' being used in relation to computer technology date back to the mid-1950s, as stated by the Oxford English Dictionary (OED). The OED defines digitalization as "the action or process of digitizing; the conversion of analogue data (esp. in later use images, video, and text) into digital form". Conversely, digitalization is characterized as "the adoption or increase in use of digital or computer technology by an organization, industry, country, etc" [11] [12].

## 2.1 Digitization

The term "digitization" has different meanings depending on the context, but one of the most prominent meanings is converting from analog to digital. Researchers from various domains commonly define digitization as the process of converting an analog into a digital form; for instance, the process of converting a photograph to a digital image [10]. Scholars from diverse fields also describe digitalization as technical process of converting analog information streams into digital bits represented by discrete and discontinuous 1s and 0s. According to communication scholar Tony Feldman, digital information differs from analog data because it is based on only two distinct states rather than constantly changing values [13]. Looking at the definition of digitalization, the first can be viewed as more transformational, while the subsequent definition is process-oriented.

Companies should avoid simply digitizing analog things to conform to current trends; Brennan and Kreiss argue that any material with two separate states can store and transmit digitized signals. Digitization includes both symbolic and material aspects. Symbolically, it converts analog signals into binary code, which is represented by 1s and 0s. As a result, digitization generates information that can be expressed in various formats, materials, and systems. In theory, any material with two easily identifiable states, like silicon transistors, punch cards, and even atoms, can be used to store and transfer digitized signals. Because of this theoretical flexibility, many researchers have emphasized the "immaterial" aspect of information generated by digitalization while disregarding the significance of the material systems that house this information.

The finding has prompted many scholars to emphasize the "immaterial" aspect of information from digitalization while downplaying the importance of the material systems containing this information, such as transistors. This definition of digitization emphasizes an original mediating process between the material (sensors) and the immaterial (business processes) [10] [13].

Furthermore, several industry professionals have offered additional definitions of digitization. Cisco, for instance, defines digitization as "the connection of people, processes, data, and things to provide intelligence and actionable insights enabling business outcomes" [10].

Schallmo and Williams's (2018), research emphasizes the need for a definition of Digital Transformation in relation to transforming business models despite extensive discussions over the years. In their book, they thoroughly examines the history of digital transformation and offers a comprehensive overview of the revolutionary changes that digital technology has brought about in business models and operations. There is a need for a defined methodology that includes distinct stages, tools, and practical examples to guide the digital transformation of business models.

Although Digital Transformation has been a recurring topic of discussion, the understanding of concepts like products, services, and platforms was already well-established in the 1990s and early 2000s, and the period between 2000 and 2015 witnessed changes

driven by the adoption of smart devices and the rise of social media platforms. This shift brought about changes in customer communication patterns, expectations for responses, and increased demand for channels of availability. Businesses recognized this as an opportunity to engage with their customers on a level, in time, through digital channels.

The increasing accessibility of digital payment options, for instance platforms such as PayPal, has led to the rise of online commerce and the introduction of web-based purchase points. Mobile devices play an increasingly significant part in acquiring personalized customer data and providing value to consumers. This customized data enables businesses to fine-tune their products, communications, and interactions to satisfy their consumers' individual needs [10].

## 2.2 Digitalization

The term "digitalization" was first employed in a 1971 essay by Robert Machal published in the North American Review. Wachal delves into the social implications of the "digitalization of society" within the framework of examining objections to and potentials for computer-assisted humanities research [13].

I-SCOOP, a digital business consultancy, provides a succinct definition of digitalization as I-SCOOP (2016) offers a concise definition; "Digitalization means the use of digital technologies and of data (digitized and natively digital) in order to create revenue, improve business, replace/transform business processes (not simply digitizing them) and create an environment for digital business, whereby digital information is at the core"[14].

Daniel R. A. Schallmo and Christopher A. Williams define digitalization as restructuring business processes and models informed by insights gained from value-driven digitization initiatives [10].

## 2.3 Digital Transformation

There are various definitions of digital transformation. Below we can see some definitions outlined by different authors:

BMWi strongly focuses on digitalization, although it does not explicitly define digital transformation; "Digitization stands for the complete networking of all sectors of the economy and society, as well as the ability to collect relevant information, and to analyze and translate this information into actions. The changes bring advantages and opportunities, but they create completely new challenges"[15].

According to Bowersox et al. (2005), Digital Business Transformation is a "process of reinventing a business to digitize operations and formulate extended supply chain relationships". They perceive the managerial challenge as driving organizations to harness the full potential of information technology across the entire value chain [16].

Westerman et al. (2011) assert that technology plays a crucial role in digital transformation by improving performance and expanding the reach of companies. Adopting emerging technologies is directed toward optimizing operational processes, enhancing customer experiences, and innovating business models. "Digital Transformation —the use of technology to radically improve the performance or reach of enterprises—is becoming a hot topic for companies across the globe. Executives in all industries are using digital advances such as analytics, mobility, social media, and smart embedded devices—and improving their use of traditional technologies such as Enterprise Resource Planning (ERP)—to change customer relationships, internal processes, and value propositions" [17].

Mazzone defines digital transformation as, "the deliberate and ongoing digital evolution of a company, business model, idea process, or methodology, both strategically and tactically". This definition illustrates that digital transformation can relate to various dimensions as well [18].

PricewaterhouseCoopers International Limited (PwC) defines digital transformation as "the fundamental transformation of the entire business world through the establishment of new technologies based on the internet with a fundamental impact on society as a whole." It is evident that utilizing emerging technologies takes precedence within this definition [19].

Boue´e and Schaible understand digital transformation as "consistent networking of all sectors of the economy and adjustment of the players to the new realities of the digital economy. Decisions in networked systems include data exchange and analysis, calculation and evaluation of options, as well as initiation of actions and introduction of consequences" [20].

Digital advancements have brought about a transformation in both the economy and society, much like the changes that occurred during the Industrial Revolution in the 19th century. The introduction of early computers in the 1960s led to numerous initiatives aimed at enhancing efficiency across various industries. With the emergence of the internet, specifically the World Wide Web (www), in the 1990s, the momentum for digital transformation gained unprecedented levels. Digital transformation has been an ongoing journey since the 1960s, closely linked to the continuous evolution of technological innovations [21].

Don Tapscott has been a leading voice in analyzing the impact of technological advancements on culture and the economy since 1981. In his seminal work "The Digital Economy," the author predicted that computers would have a complex and nuanced impact - a consistently emerging theme throughout his analysis. He examines how organizations have evolved over time and how they are now under tremendous pressure to transform, as evidenced by initiatives like the total quality movement of the 1980s and the business process reengineering trend of the 1990s. He notes that resistance to change is a common roadblock to transformation, often leading to failed attempts. He cautions against simplistic solutions like workforce reduction and process streamlining,

noting that true transformation must address critical aspects such as customer service, responsiveness, and innovation.

According to Tapscott's (1995), the majority of new job opportunities are emerging within information-intensive sectors of the economy, with around 60% of the American workforce categorized as knowledge workers. He emphasizes, "Innovation, rather than access to resources, plant, and capital, is what counts most" (p. 19)[22].

To thrive in this emerging economy, he asserts that organizations must adapt to an entirely new playing field where the rules are in constant change rather than simply improving their existing strategies. He describes 12 interrelated themes characterizing this new economy, encompassing concepts such as digitization, disintermediation, and discordance, all revolving around the importance of knowledge.

He envisions a future where success is predicated on intellectual prowess rather than physical assets, with organizations harnessing the collective intelligence of their digitally connected employees. He predicts that email represents only the initial phase of human collaboration in the information age and that virtual work arrangements will become increasingly prevalent, enabling organizations to recruit talent globally and consumers to access goods and services through virtual platforms, given the global nature of knowledge exchange and networking.

Tapscott has identified seven technological shifts driving the new economy forward, seven themes that outline the interconnectivity of governance in this digital era, and six educational principles that shape learning dynamics within the digital landscape. He highlights the convergence between work and learning, shifting educational focus away from traditional academic institutions and towards private sector initiatives.

According to the author, employee education is growing faster than academia, 100 times more or 10,000% faster. He emphasizes the increasing intertwining of learning and work and warns that organizations that fail to adapt to this changing landscape risk becoming obsolete. This echoes the concept of the "learning organization" introduced by Peter Senge.

In this evolving paradigm, Tapscott emphasizes the expanding role of the private sector in facilitating lifelong learning, which has become a necessity in an economy where knowledge becomes rapidly outdated. Workers in the new economy must constantly update their skills to remain relevant, as knowledge doubles every 18 months. Traditional career planning is becoming obsolete in this context.

In the new economy, an organization's ability to outpace its competitors depends on its ability to adapt quickly. Overcoming "learning disabilities" necessitates creating a culture that seamlessly integrates individual and team learning into the organizational consciousness, encompassing the entire firm. While leadership in the old economy relied on hierarchical command and control systems, the present economy necessitates a collective, virtual force-driven leadership propelled by a jointly developed and shared vision.

In the past, cultural leaders emphasized personal charisma to spread individual views. However, leadership in the current economy is based on empowered teams with the capability to direct the learning experience. More than simply presenting a top-down vision is required. Success now depends on developing a shared vision.

Despite his general optimism, he recognizes the enormous challenges that lie ahead as industries undergo significant transformation, affecting almost every job role. Many of today's companies need more management and leadership, hindering the development and dissemination of knowledge required for economic survival. The exponential growth of technology highlights the importance of knowledge acquisition and adaptation. Those needing more knowledge and technological proficiency face marginalization, but there is now a scarcity of leadership capable of societal transformation.

Tapscott's original book, "The Digital Economy," explores the daunting challenge of leadership, arguing that every organization needs to develop innovative leaders from within to navigate the transition to a new era successfully. The book received financial support from many CEOs and government officials who endorsed this idea.

However, he observed that many of these CEOs needed help implementing change within their organizations. It is striking and somewhat alarming to see how many early book supporters had their organizations drastically transformed or obliterated by the relentless wave of change.

Even after two decades, the leadership challenge remains as urgent as ever. With the pace of change accelerating, we find ourselves in a period of great uncertainty, confusion, and upheaval, with the digital revolution frequently outpacing our collective ability to comprehend its implications. Like any paradigm shift, leaders accustomed to the old ways have the most difficulty embracing the new.

Consider the rise of well-known names that were unknown decades ago, such as Facebook, Twitter, Uber, and Airbnb. Industries have seen significant shifts in leadership, from the downfall of Wall Street giants to the disruption of the automotive sector by innovators like Tesla and Google.

In response to these upheavals, several sectors are rethinking their entire foundation. For example, the pharmaceutical industry is grappling with the patent cliff. It is beginning to embrace data sharing for clinical trials, a significant shift that can change the competitive landscape. Similarly, the healthcare sector is on the verge of a massive shift, driven not by traditional providers but by industrial giants such as Amazon, Apple, and Google.

As stated in his Anniversary Edition, he remains convinced that we are standing on a burning platform for change. This fitting analogy emphasizes the increasingly unsustainable nature of continuing the status quo. The consequences of the 2008 financial crisis continue to reverberate throughout the global business world, fueling a need for transparency, ethics, and sustainable corporate practices. However, entrenched interests from Wall Street to Washington, D.C., continue to resist change, creating a significant barrier to progress [22] [23].

The economy of networked intelligence shares many traits with the digital economy. In the past, physical means like cash, checks, and in-person meetings were used to exchange information. Analog communication methods such as phone calls and radio broadcasts were standard, with documents such as reports, maps, and musical scores being passed around.

Nowadays, every type of information is digitized and stored as bits in computers that can be transmitted at lightning speed across networks. This shift to digital format has dramatically changed how we communicate and interact with information, turning them into binary code made up of ones and zeros. This transformation has led to a world of possibilities as revolutionary as the advent of language, replacing the previous paradigm of physical interactions [23].

Nicholas Negroponte's book "Being Digital" paints a picture of a future where everyday objects like cufflinks and earrings can communicate with each other through low-orbiting satellites and have processing abilities that outperform current PCs. Phones would no longer ring randomly; instead, they would intelligently manage incoming calls like a well-trained English butler. Schools would be transformed into a combination of museums and playgrounds where children can interact with peers from all over the globe. Negroponte's vision is of a digital world where technology is as small as a pinhead yet pervasive in all aspects of life [24].

The COVID-19 pandemic has significantly influenced digital transformation, accelerating its adoption across various sectors and highlighting its importance for resilience and adaptability. The crisis exposed vulnerabilities in traditional economic and political systems, compelling businesses and governments to rapidly adapt to a new reality shaped by lockdowns, travel restrictions, and social distancing measures.

Nosova and colleagues characterize the pandemic as the "greatest catastrophe of the XXI century" (2021)(p. 658). They underline its role in triggering a global economic crisis and amplifying pre-existing issues, including social stratification, environmental disasters, and cyber threats.

In the face of these challenges, digital technologies have emerged as essential tools for ensuring business continuity. They enable remote work, facilitate online commerce, and support communication and collaboration. The pandemic has acted as a catalyst for digital transformation, prompting organizations to adopt digital technologies and succeed in a rapidly changing environment.

Nosova and colleagues further emphasize the transformative potential of artificial intelligence (AI) in digital transformation. AI has risen as a critical driver during the pandemic, offering powerful tools to accelerate and enhance digital initiatives. The urgency for resilience created by the pandemic aligns with AI's capabilities, making it a pivotal technology in shaping the future.

Despite this progress, they highlight that digital transformation has yet to reach the majority of the global population. AI presents a promising solution to accelerate this

process and bridge the digital divide. Additionally, the authors stress the importance of adopting a "digital style" in economic policy, which likely includes leveraging AI for data analysis, process optimization, and developing innovative products and services.

The pandemic's impact on digital transformation emphasizes the need for strategic investments in digital infrastructure, a skilled workforce, and a supportive business environment. These measures are essential to navigate the challenges and seize the opportunities of a post-pandemic world [25].

## 2.4 Digital Transformation in Organizations

Society today has an unprecedented platform for using the collective talents, skills, and knowledge required to fuel growth, promote social progress, and build a just and sustainable society. The internet has significantly decreased collaboration costs and transformed how we organize society's ability for innovation, production, and wealth creation.

A significant shift occurs as numerous businesses and governments encounter difficulties and crises. The media industry faces challenges, while the financial services sector exhibits more extraordinary recklessness. Immediate measures are necessary to rejuvenate our energy grid and transportation systems, yet international organizations designed for collaboration and problem-solving must still expand.

Partnerships between companies and the public are emerging and reshaping collaborative dynamics by addressing common concerns and difficulties uniquely. Globally, there is an increase in collaborative initiatives in various fields, including education, science, civic engagement, and democracy. These initiatives represent a new paradigm for the twenty-first century, emphasizing values like collaboration, openness, sharing, interdependence, and integrity [22].

"The Digital Economy" is a valuable contribution to the existing literature. Although, like other predictive works, it may have its limitations in accurately forecasting the future, Tapscott's work provides a solid foundation for his insights, conclusions, and forecasts. Despite occasional repetition in certain sections, the book is a compelling read and easily understandable. It is an essential resource for anyone aiming to maintain their employment in the developing knowledge-based economy.

His work offers a comprehensive analysis of the digital economy. The book's insights and forecasts are grounded on a solid foundation, making it a valuable contribution to the literature. However, as with all predictive works, it may have some limitations in accurately predicting the future. Despite this, the book remains a compelling read and is easily understandable. It is highly recommended for anyone looking to maintain their employment in the developing knowledge-based economy [23].

The emergence of new media is causing a significant shift in how we work, conduct business, create wealth, and even the very nature of commerce itself. We are seeing a move away

from traditional institutions towards a network-driven economy. In addition, the COVID-19 pandemic has become one of the most pressing issues of the 21st century, highlighting the urgent need for research. A study by Nosova and colleagues (2021), aimed to explore the growth of the digital economy as a new paradigm in modern economic policy [25]. The prolonged global economic crisis, coupled with the pandemic, has intensified several global challenges, including international terrorism, social inequality, environmental degradation, and increasing cyber threats. These challenges are rapidly propelling humanity towards significant upheavals in the global economic system, particularly given the unpredictable aftermath of the pandemic.

The digital age has ushered in new opportunities for economic growth and entrepreneurship, but it has also brought intense competition and restructuring that can affect governance. Digital startups are now recognized as critical economic development drivers, impacting production and management structures. This can present challenges for established organizations as they strive to attract resources and maintain a competitive edge while also adapting to institutional structures that may need to be modified to align with entrepreneurial objectives [25].

The economy's digital transformation is being fueled by the integration of digital technologies into business processes. This necessitates the creation of digital products that are attuned to consumers' explicit and implicit needs, as well as their behavioral patterns. The impact of digital transformation is being felt across various industries, including media, retail, banking, telecommunications, and manufacturing. Industry 4.0, with its focus on smart and digital factories, and the requisite production and management technologies, enables the mass production of personalized items. However, these items must be thoughtfully designed and integrated into a comprehensive system that encompasses services, sales, and support. In this process, design thinking methods are indispensable. The emergence of digital technologies calls for manufacturers to establish robust digital divisions. This involves formulating a vision and content for digital transformation and ensuring that digital technologies are applied consistently and cohesively as part of a single strategy. To quote Rogers, D.'s (2017) practical guide, " the main aspect of the digital revolution is not the new technologies themselves, but changes in the way of thinking and business strategies"(p. 344)[25] [26].

The impact of digital transformation on society and the economy is far-reaching. It fosters collaboration and data exchange among stakeholders, giving rise to novel processes. The digitization of business models heavily relies on technological capabilities. Modern products seamlessly integrate mechanical and electrical components, creating complex systems that incorporate hardware, software, and data storage, resulting in more intelligent products. New business models digitize products, services, processes, and value chains.

Capgemini defined digital transformation as "the use of technology to radically improve the performance or reach of enterprises" in 2011. This definition underscores the extensive nature of digital transformation and emphasizes that technology implementation alone is

insufficient. Successful digital transformation requires technology to provide added value for customers, the business, and other essential stakeholders.

Leading companies that aim to succeed in digital transformation focus on t complementary activities: redefining customer value propositions and leveraging digital technologies to transform their operations, thereby increasing customer interaction and collaboration [13].

Forbes magazine notes that digital transformation is not just a one-time project or program, but rather a new way of life. As a result, it will become a part of the growth processes of businesses, regions, cities, and other entities. It is clear that implementing such changes will not be uniform, complete, or immediate, and digital transformation will look different in each situation. The "Digital Transformation Maturity Matrix" as seen in Figure 2.1 below is a useful tool for conducting comparative analyses of digital transformation progress in different scenarios. This matrix evaluates the pace of the digital transformation roadmap and assigns higher scores to faster development [25].

| |
|---|
| **1 Entry level** |
| Organization of work<br>• Disparate initiatives from different departments<br>Content of works<br>• Translation of various aspects of information processing (classification, storage, enrichment, use for decision-making, etc.) into digital representation |
| **2 Projectlevel** |
| Organization of work<br>• Creating a CDTO position (Chief Digital Transformation Office) as the head of the central project office (Project Management Office - PMO) for the execution of projects Digital Transformation<br>• Chaotic definition of MDG projects Workcontent<br>• Piecemeal automation of aspects of information processing (classification, storage, enrichment, use for decision-making, etc.) in digital representation<br>Sometimes this level is called "Digitalization". |
| **3 Architecturallevel** |
| Organization of work<br>• Introduction of a central architectural control to launch and control digital transformation projects<br>Content of works<br>• Initiatives on aspects of the overall architecture (e.g. infrastructure, data, information, documents, content, or solution)<br>• Internal standardization of formats and functions |
| **4 Coordinationlevel** |
| Organization of work<br>• Fully functional central architecture group<br>• Execution of purchases in accordance with architectural solutions<br>• All bodies and procedures for the goal management of digital transformation are defined and functioning<br>Content of works<br>• The digital representation of the system elements and the relationships between them becomes the basis of the system<br>• External (in the ecosystem) standardization of formats and functions |
| **5 Internalization level** |
| Organization of work<br>• Most central coordination functions are decentralized across departments or groups of related departments<br>Content of works<br>• The digital representation of the system elements and the relationships between them becomes the basis of the system |

Figure 2.1: Digital Transformation Maturity Matrix

*(Source: Nosova, S., Norkina, A., Makar, S., & Fadeicheva, G. (2021). Digital transformation as a new paradigm of economic policy)*

A framework for digital transformation guides organizations in managing significant changes that arise from evolving business trends. It is a comprehensive tool that supports management at all levels of an organization. In today's digital age, industries digitize core functions within their vertical operations while extending digitalization to their horizontal partners along the value chain. This combination of digital transformation and business model innovation has significantly impacted customer behaviors and expectations, putting established organizations under pressure and disrupting various industries. To effectively manage digital transformation, businesses must adopt comprehensive strategies that include digital strategy, capabilities, IT development, collaboration, transparency, and agility. According to Verhoef, three significant drivers are fueling the demand for digital transformation: the increasing usage of the internet, the growing popularity of related technologies such as cloud computing, cryptocurrency, speech recognition, and digital

payment methods, and the dominance of large global businesses like Apple, Amazon, Facebook, and Alibaba across various industries. Additionally, customer behavior has shifted in response to the digital revolution, with a noticeable preference for online purchases [27] [28].

Having a maturity model in place is crucial for understanding its purpose and implementation. Many studies have explored this topic, particularly emphasizing the digital aspects of IT management, project coordination, supply chain sustainability, and business operations. Indeed, many of these models aim to measure the progress of digital transformation or Industry 4.0 initiatives. In the upcoming sections, we will focus on the digital maturity processes of three large international consulting firms to assess their level of digital transformation.

1. **PricewaterhouseCoopers International Limited (PwC)**

   PwC has identified four archetypes for companies undergoing digital transformation: Digital Novice, Vertical Integrator, Horizontal Collaborator, and Digital Champion. By assessing firms PwC has created a framework for measuring digital maturity.

   - **Digital Novices**: Are companies in the early stages of their digital journey, relying mainly on traditional methods with a clear distinction between online and offline channels. They need more integration with external partners, and their analytical capabilities are constrained, with manual data extraction and fragmented IT infrastructure. The company's functional focus tends to be siloed within organizational departments.

   - **Vertical Integrator**: At this level, companies have progressed beyond experimentation and are actively leveraging digital technologies. Their service offerings include digital products and a range of software, data, and machine-to-machine (M2M) networks. These enterprises have embraced data analytics supported by business intelligence (BI) technologies and possess a cohesive, in-house IT infrastructure that facilitates cross-departmental teamwork. However, their primary obstacle remains effectively coordinating digital initiatives and ensuring sustained success.

   - **Horizontal Collaborator**: The concept of horizontal integration involves reaching out to customers and external stakeholders while seamlessly incorporating comprehensive data integration across the network. Leading businesses have recognized the value of implementing business intelligence (BI) systems, which bring together all relevant information sources (both internal and external), decision support systems, predictive analytics, and event management systems, all backed by high-performance computing and advanced IT architecture.

- **Digital Champions**: Means leading companies striving to enhance customer experience through digital marketing, data analytics, and various sales channels. By calling capabilities of Customer Relationship Management (CRM) systems, these firms have established robust databases and sophisticated machine learning algorithms to generate predictive analytics for automated event handling and real-time monitoring. Consequently, they are equipped to offer valuable decision support to their customers.

2. **Capegemini**

   Capgemini Consulting developed a comprehensive framework for evaluating an organization's level of digital maturity in collaboration with the MIT Centre for Digital Business. This model comprises two dimensions: "Digital Intensity" encompasses strategic assets, investments, digital capabilities, and elements. The second dimension, "Transformation Management Intensity," primarily comprises managerial traits such as governance, engagement, and digital vision.

   - **Beginners**: Are companies that often need help to develop their digital intensity and transformation management intensity. As they embark on their digital transformation journey, they tend to rely on outdated digital methods, like enterprise resource planning tools, and miss out on the vast opportunities presented by modern technology. This could be attributed to their limited exposure to emerging disruptive technologies or a need to understand how to leverage them effectively.

   - **Fashionista**: These companies have progressed beyond experimentation and embraced various disruptive technologies. However, they may need more managerial expertise to create a successful digital transformation roadmap. Although Fashionistas may appear impressive from the outside, they often lack consistency and substance. The main challenge for these companies is synchronizing their digital practices to deliver tangible company-wide benefits effectively.

   - **Conservative**: Are companies that recognize the significance of cutting-edge, technology-driven services and possess the capability to implement them effectively and efficiently. They may be digital experts in the company's digital transformation and deeply understand digital expertise. Despite this, such organizations proceed with caution regarding emerging technologies.

   - **Digiratis**: Are the most advanced digital firms that have embraced the most recent disruptive technologies and operate with a vision and digital mindset, leading to a rise in productivity. Consequently, these companies enjoy a competitive edge over their peers.

3. **Deloitte**

   The digital maturity model, created by Deloitte and the TM Forum, is a valuable tool for evaluating an enterprise's digital maturity about industry standards. The model's key components include customer, technology, strategy, operations, and organization and culture, enabling communication service providers to be assessed along two dimensions: digital service enablement and service provisioning.

   - **Initiating**: Companies are just beginning to incorporate business processes into their operations.
   - **Emerging**: Companies are expanding and starting to incorporate business processes into all daily operations at this level.
   - **Performing**: At this stage, companies have set clear goals and objectives, created plans, and implemented adaptability across all departments.
   - **Advancing**: At this level, companies are expected to expand their goals and objectives to implement new creative ideas and strategies to enhance their industry expertise.
   - **Leading**: At this juncture, companies are acknowledged as pioneers in their field, establishing the industry norm [29].

Digital transformation requires substantial changes across multiple aspects of an organization. These changes may include:

- **Business processes**: Automation, integration, and optimization of existing processes.
- **Resources**: Adopting and integrating new technologies like cloud computing, AI, and big data analytics.
- **Operational methods**: Transitioning to agile methodologies and adopting data-driven decision-making practices.
- **Culture**: Cultivating a digital-first mindset that promotes collaboration, transparency, and continuous employee skill development

Effective change management is essential for successfully navigating the challenges associated with digital transformation. Several key challenges that necessitate robust change management strategies include:

- **Lack of internal skills**: Organizations often face a shortage of employees who are not equipped with the necessary digital skills. This requires investments in training and development programs to upskill existing employees and attract new talent.

- **Integrating new technologies**: Seamlessly incorporating new technologies into existing systems and workflows can be complex and require careful planning and execution.
- **Strategic challenges**: Developing a clear digital vision and strategy that aligns with overall business objectives is essential. This involves identifying and prioritizing digital initiatives, securing necessary resources, and effectively communicating the vision throughout the organization.
- **Short-term view challenge**: Digital transformation is a long-term commitment that demands sustained investment and dedication. Organizations must avoid short-sightedness and ensure their planning extends beyond the initial phases.

In addition, building a digital culture is fundamental to achieving successful digital transformation. Organizations must promote an environment that encourages experimentation, collaboration, and continuous learning. This involves:

- **Empowering employees**: Equipping employees with the necessary tools, training, and autonomy to effectively utilize digital technologies.
- **Encouraging cross-functional collaboration**: Removing barriers and promoting communication and cooperation between different departments.
- **Developing a customer-centric mindset**: Prioritizing the understanding and fulfilling customer needs through digital channels.

Moreover, leadership is essential in steering digital transformation initiatives. Effective leaders must define a clear digital vision and strategy, gain approval and support from all stakeholders, advocate for the adoption of new technologies and innovative work practices and cultivate a culture that prioritizes innovation and agility. Organizations can develop customized strategies and roadmaps for their digital transformation journey by understanding an organization's digital maturity level [27].

The COVID-19 pandemic has had a significant impact on the African economy. Experts predict that Africa's real GDP will rise 3.4% in 2021, following a 2.1% decrease in 2020 due to the pandemic. Unfortunately, working hours across the continent fell by 7.7% in 2020, potentially leading to a loss of 29 million jobs, as reported by the World Bank. Certain sectors of the global economy were hit harder than others, including the informal sector, labor-intensive manufacturing, and micro, small, and medium-sized businesses. On the other hand, COVID-19 has increased demand for Information and Communication Technology (ICT) and ICT-enabled services, with global ICT service exports expected to reach USD 676 billion in 2020.

To mitigate the economic impact of COVID-19 in Africa, many experts view digital transformation and digital trade as critical avenues. Digitization is expected to boost

growth by roughly 2% points and decrease poverty by one percentage point each year in Sub-Saharan Africa (SSA). These positive effects could be doubled with additional investments in human capital [30] [31] [32].

Throughout history, agriculture has significantly generated export earnings and employment opportunities across various African countries. For instance, it accounts for 65% and 84% of these aspects in Kenya and Ethiopia, respectively. Despite this, the agricultural sector has experienced a decline in employment by nearly 18% over the past two decades despite still employing over 50% of the sub-Saharan African workforce. The COVID-19 pandemic has presented various challenges to the agricultural sector in African countries, including:

- Reduced access to markets due to movement restrictions, market closures, and significant declines in household incomes.
- Limited access to labor during lockdowns.
- Loss of farming land due to the inability to afford rent.
- Difficulties in topping up mobile phones with credit because of travel restrictions have contributed to supply-side shock.

However, since the agricultural sector in Africa has traditionally focused on serving the domestic market rather than depending heavily on exports, it has been relatively less impacted by adverse demand shocks caused by the pandemic [33].

Africa experienced significant economic growth in the 2000s, surpassing the rate of the 1990s by double. However, most African countries have failed to succeed in their attempts to industrialize, and they continue relying on primary commodities with limited value addition. According to Rodrik, while Africa remains a minor player in manufacturing trade, concerns are growing about "jobless growth" and premature de-industrialization [34]. Industry's percentage of African GDP fell from 29.9% to 26.8% between 1990 and 2019, while service activities driven by mobile telephony, lower ICT costs, and financial services have contributed to an increase in Africa's GDP. However, recent research has renewed the focus on industrial development and growth led by manufacturing, as evidenced by the rise in manufacturing workers from 7.2% to 8.4% in Sub-Saharan Africa (SSA) between 2010 and 2018. This growth in industrialization in SSA is driven by informal small enterprises that manufacture low-quality commodities for domestic markets [35].

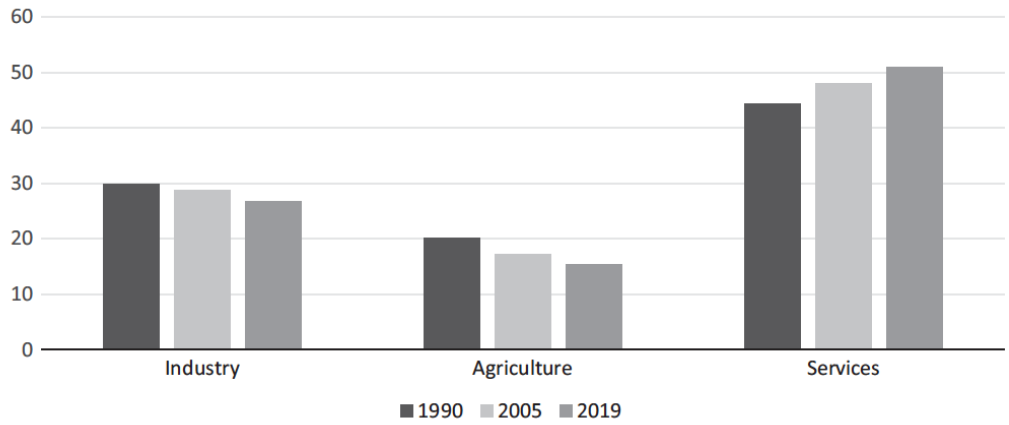


Figure 2.2: Sectoral Share of Africa's GDP (%)

*(Source: Banga, K. (2022). Digitalisation, Globalisation, and COVID-19: Unpacking the Opportunities for African Labour Markets. In Africa–Europe Cooperation and Digital Transformation. Routledge: World Development Indicators database)*

The rapid digitalization of manufacturing supply chains due to COVID-19 and the possibility of bringing manufacturing jobs back to local shores has sparked concerns about the potential for manufacturing-led growth to generate employment in Africa. Consequently, African nations are increasingly shifting their focus towards a services-led transition. As shown in Figure 2.2, services now make up approximately 51% of Africa's GDP and are becoming increasingly significant in the total exports of several African countries. Between 2014 and 2018, services accounted for over 40% of the average exports of Ethiopia, Mauritius, Kenya, Morocco, and Uganda. Digital technologies are creating new opportunities for value addition in the services sector, particularly in Information Technology (IT) or IT-enabled services such as business and finance. However, these services may not be labor-intensive as they often require skilled workers. The pandemic significantly impacted international service trade, with a notable decrease in the World Trade Organization's (WTO) global services trade barometer in 2020, followed by a significant recovery in 2021. However, a wave in global demand for ICT and ICT-enabled services has led to more companies, including those in traditional industries like cloth manufacturing, to transition online with employees working remotely. This shift has opened up new economic opportunities, including increased digital services like cloud computing and online-deliverable services like legal services, e-commerce, and remote work. Digitalization has also led to a higher demand for workers in service industries such as maintenance, repair, delivery, and postal services while also changing the nature of work through digital platforms and the growing number of online job opportunities [35].

The United Nations Conference on Trade and Development reports that while non-digital services continue to dominate the trade in Africa, Digitally Deliverable Services (DDS), including ICT, insurance, financial services, and others, are expected to be more resilient to the effects of the pandemic. Despite this resilience, DDS make up less than 30% of overall services trade in African countries and are heavily concentrated in a few countries, with Ghana, Morocco, South Africa, Algeria, Kenya, and Nigeria driving most of the trade. Nonetheless, the trade value of digitally deliverable services in Africa is substantial, amounting to USD 24.3 billion. Some countries, such as Tanzania, Ethiopia, Mozambique, the Gambia, and Namibia, account for less than 10% of this trade [35] [36].

While developing countries have shown faster growth in the digital economy compared to developed countries, a global digital divide remains between developed and less-developed countries and between developing and least-developed countries. SSA countries, in particular, face significant challenges in internet access, with Internet Penetration Rate (IPR) trailing 10% behind South Asia in 2016. Additionally, SSA countries are behind in adopting digital technologies such as cloud computing, e-commerce, and smart computing. Shockingly, Africa's share of robot sales in 2015 was only 0.2% of global sales, despite its GDP accounting for approximately 3% of the global total.

The potential benefits for African countries that embrace digitalization are numerous, including increased output and exports, job creation, reduced production costs that enable small and medium-sized businesses to enter the market, and lower trade costs that facilitate participation in Global Value Chains (GVCs). However, if digital inequality persists despite the growth of the global digital economy, African nations will face significant challenges. As capital costs decrease in developed countries and become more affordable than labor in outsourced locations, it may become more economically advantageous for developed economies to bring industrial activities back home. This could have a substantial negative impact on employment in outsourced destinations. Recent United States (US) data from 2010 to 2016 indicates that for every company that restores manufacturing to the US, 126 jobs in Africa are lost.

Digitalization brings forth additional consequences for African nations, including being left out of GVCs, the abundance of digitally sophisticated products in developed countries, and the need for Africa to lower wages to remain competitive. These effects are detailed in Table 2.1, which highlights the opportunities and challenges at the national level that impact African countries, and in Table 2.2, which presents the challenges at the international level that impact African nations.

| **National-level impacts on African countries** | **Pathways of impact** | **Likely labour market impact** |
|---|---|---|
| **Opportunities** | Increase in productivity | Increase in jobs |
| | Increase in demand for new and existing products | Increase in jobs |
| | Reduction in costs of production enabling new entrants and Small and mid-size enterprises (SME) to enter the export market | Creation of new jobs |
| | Reduction in cost of trading leading to strengthening of GVC participation | Increase in jobs |
| **Challenges** | Substitution of labour with automation | Decrease in jobs, unskilled workers are likely to be more affected |
| | Cognitive robots can be used to replace skilled labour | Decrease in skilled jobs; skilled labour moves to less-skilled jobs; increasing skill mismatching |
| | Increase in precarious work on digital labour platforms | Reduction in "good" jobs |

Table 2.1: National-level Impacts on African Countries

*(Source: Banga, K., & te Velde, D. W. (2018). Digitalisation and the Future of Manufacturing in Africa. London: OD)*

| **International-level impacts on African countries** | **Pathways of impact** | **Likely labour market impact** |
|---|---|---|
| **Challenges** | Re-shoring of manufacturing | Reduction in jobs |
| | Automation can have a backstopping effect; robot deployment in developed countries can pressure developing countries to become more competitive | Fall in wages for labour |
| | Exclusion from GVCs and concentration of future production of digitally-advanced goods in developed economies | Loss of potential jobs |

Table 2.2: International-level Impacts on African Countries

*(Source: Banga, K., & te Velde, D. W. (2018). Digitalisation and the Future of Manufacturing in Africa. London: OD)*

In recent years, there has been a significant increase in the number of robots in developed countries and a shift towards reshoring production from developing regions. Unfortunately, this has resulted in a slowdown in global commerce, which has left fewer opportunities for emerging countries to catch up. While new econometric evidence suggests that industrial labor productivity is converging across 155 countries, this convergence has slowed between 2002 and 2013 compared to 1991-2002. For instance, the convergence rate in Sub-Saharan Africa has declined during this time. As digitization has decreased convergence, developing countries have fewer chances to catch up. Empirical results confirm this, with a doubling of internet penetration increasing labor productivity by an average of 10%, but with an impact of 8% lower for low-income countries at 3.3% compared to lower- and upper-middle-income countries at 11.3% as shown in the Figure 2.3 below. This trend also applies to SSA countries when compared to others. As the economy becomes digitalized, the impact of technological advancement on productivity grows, but this effect is minor in lower for low-income countries and SSAs.

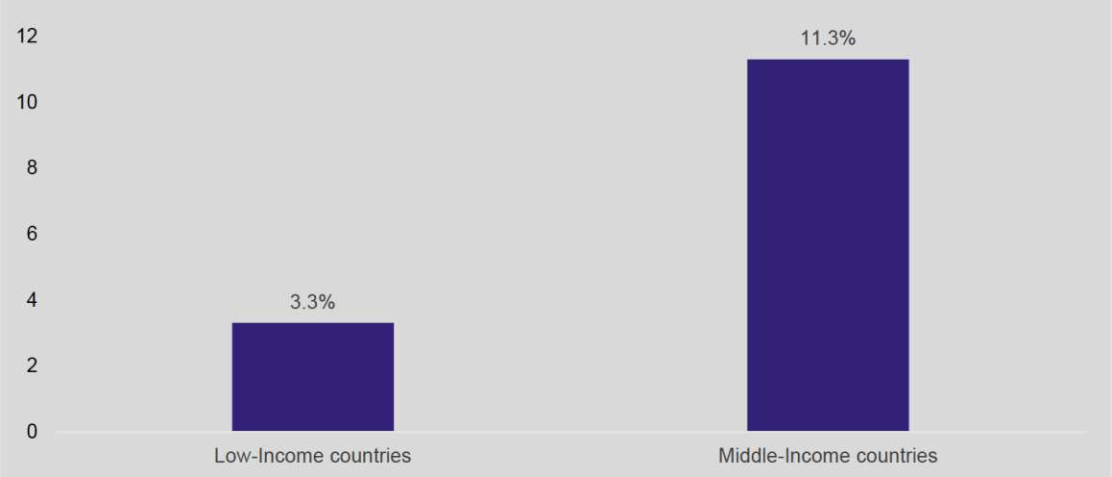


Figure 2.3: Average impact of doubling internet penetration on manufacturing labour productivity (%)

*(Source: Banga, K., & te Velde, D. W. (2018). Digitalisation and the Future of Manufacturing in Africa. London: OD)*

The Figure 2.3 above indicates that the process of digitalization could restrict the achievement of convergence, as developing countries face challenges in adopting cutting-edge technologies due to the complex nature of digital systems and the need for implicit knowledge. To fully capitalize on the advantages of digitalization, it is essential to invest in skill enhancement. A proficient workforce can significantly enhance the influence of internet accessibility and technological advancements on manufacturing efficiency [37].

## 2.5 Digitalization in Ethiopia

The Digital Ethiopia 2023 report indicated that Ethiopia had 20.86 million internet users, correlating to a 16.7% internet penetration rate. Additionally, the country had 6.40 million social media users in January 2023, accounting for 5.1% of the total population. Ethiopia also had 66.80 million active cellular mobile connections, representing 53.5% of the population. While these statistics offer valuable insights into Ethiopia's digital landscape, further data analysis is necessary to gain a more comprehensive understanding of digital trends in the country. According to Kepios data (see Figure 2.4), there was a 2.6% increase in internet users in Ethiopia between 2022 and 2023, totaling 520 thousand new users. This means that as of January 2023, 83.3% of the population, or 104.1 million people, still had no internet access. Due to the complexity of gathering and analyzing internet user data, there may be a lag in research publishing, potentially leading to an underestimation of actual internet adoption and growth [38] [39].

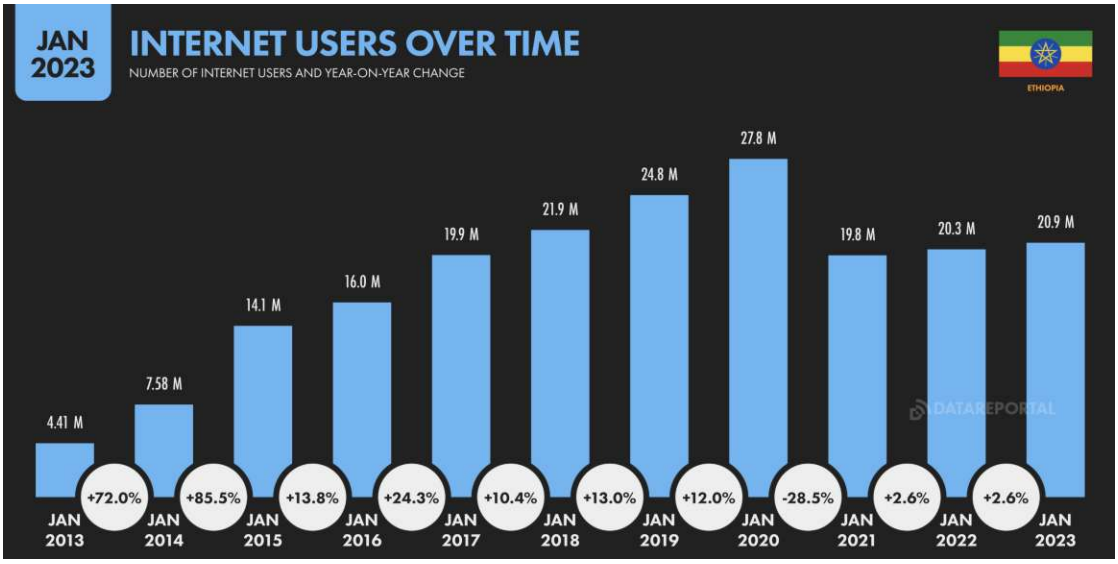


Figure 2.4: Internet Users Over Time

*(Source: Kepios Analysis)*

Additionally, according to Ookla's data, Ethiopian customers experienced an average mobile internet connection speed of 19.10 Mbps across cellular networks and an average fixed internet connection speed of 5.19 Mbps as of the beginning of 2023. Ookla also reported a significant 38.0% increase in the average mobile internet connection speed in Ethiopia, with a 5.26 Mbps rise over the 12 months leading up to the start of 2023. Furthermore, the research showed a 56.8% increase in fixed internet connection speeds in Ethiopia, with a 1.88 Mbps increase over the same period [38] [40].

## 2.6 Governmental Organization, Intergovernmental Organization, Financial Institute and Startup in Ethiopia

Ethiopia is home to various organizations across various sectors, encompassing governmental, intergovernmental, and financial entities essential to its economic landscape. Governmental organizations such as Ethio-Telecom and the Ethiopian Airlines Group are vital to overseeing critical services and key industries under state jurisdiction. Meanwhile, Intergovernmental organizations actively address societal, economic, and environmental challenges, regulated by entities like the Federal Democratic Republic of Ethiopia (FDRE) Authority for Civil Society Organizations [41] [42].

The country's financial sector is robust and supported by major institutions, including the National Bank of Ethiopia and the Commercial Bank of Ethiopia. These institutions not only facilitate economic growth but also ensure financial stability [43]. In parallel,

Ethiopia's startup ecosystem is flourishing, driven by initiatives led by the Ministry of Innovation and Technology and supported by innovation hubs like Iceaddis. These hubs act as catalysts for entrepreneurial endeavors, providing essential resources and nurturing networks crucial for innovation and business development [44] [45].

# CHAPTER 3

# Methodology

## 3.1 Research Approach

In this thesis, qualitative research is used as it will assist in exploring and identifying changes and perceptions in organizations and enterprises [46] [47]. Qualitative research approach will be used to comprehensively explore and interpret the organizational responses to digitalization in the context of Ethiopian, focusing on understanding the complexities of resistance, organizational strategies, and the socio-cultural impacts on employees. The research will include Intergovernmental Organizations (IGO), Financial Institutes, Governmental Organizations, and Startups to thoroughly understand the impact of digitalization on Ethiopian organizations. The research would benefit a range of sectors since it plans to aid by identifying the underlying issues and support the decision-making necessary to achieve the desired results, as one company's experience would benefit the others.

Undertaking a qualitative research approach, this thesis explores the intricate shifts and perspectives within Ethiopian organizations and enterprises, explicitly focusing on "The Impact of Digitalization on Organizations in Ethiopia." Through the application of qualitative methods, this study endeavors to thoroughly examine and interpret the responses of Ethiopian organizations to digitalization. It aims to explore organizational strategies, the complexities of resistance, and the socio-cultural impacts on employees. Encompassing IGOs, Financial Institutes, Governmental Organizations, and Startups, this research offers a comprehensive understanding of digitalization's implications across various sectors in Ethiopia.

The anticipated outcomes of this research are poised to offer valuable insights to a broad spectrum of stakeholders by pinpointing underlying issues and guiding decision-making processes toward achieving sustainable digital transformation. By sharing insights from diverse organizational experiences, this study strives to facilitate knowledge exchange

and promote strategic enhancements in digital adoption within the Ethiopian business landscape.

## 3.2 Semi-Structured Interviews

Qualitative research is a methodology that yields insights without relying on quantitative measurement or statistical analysis. It involves observing, documenting, analyzing, and interpreting a specific concept's characteristics, patterns, properties, and meanings. This approach stands out for its focus on understanding social phenomena and its preference for qualitative data, which consists of words rather than numerical data [46] [47].

Before applying qualitative research, it is crucial to determine its suitability. This methodology excels in capturing participants' viewpoints, exploring the meanings they attach to phenomena, and examining processes in detail. Qualitative methods are particularly valuable in uncovering the "why" behind people's actions and behaviors, revealing underlying motives, attitudes, and behaviors. Additionally, these methods provide insights from participants' perspectives, informing the development of future surveys [48].

Defining clear research questions is essential when developing a research protocol as they guide the study design and methodology. Qualitative methods such as one-on-one interviews, small group discussions, and focus groups effectively gather insights and opinions on a phenomenon. These methods primarily generate qualitative data, focusing on textual interpretation through observation and in-depth interviews [46] [47].

Semi-structured interviews are instrumental in capturing the perspectives of key stakeholders and understanding their insights into specific issues. These stakeholders, such as community members, entrepreneurs, and policymakers, play crucial roles in program design and implementation within organizations. Engaging stakeholders in qualitative research processes enhances understanding and facilitates comprehensive assessments [49] [50].

Technological advancements have expanded qualitative research methods beyond traditional face-to-face interviews. Internet-based platforms, smartphone applications, video conferencing tools, email, and telephone interviews provide alternative qualitative research methods, especially when in-person meetings are impractical due to geographic or logistical constraints. Video conferencing, in particular, offers a cost-effective and convenient substitute for face-to-face interviews, allowing for real-time discussions and broader participant inclusion [51] [52].

Focus groups, comprising carefully selected individuals discussing a specific topic, offer insights into group dynamics and collective perspectives on implementation strategies. These structured discussions facilitate understanding practices, procedures, and contextual factors influencing interventions. However, conducting focus groups can be complex due to group dynamics and the need for careful participant selection to ensure diverse perspectives [46] [51].

## 3.3 Procedure

During the data collection phase of this research, a series of interviews were conducted with representatives from various organizations. The interviews used note-taking and recording approaches. The video conferencing tool Zoom facilitated seamless interactions, which allowed the research-based in Austria to engage with participants in Ethiopia. Using Zoom's features, such as high-quality audio and video recordings, effectively bridges geographic distances and ensures comprehensive data collection through recorded and transcribed interviews. These recordings became a valuable resource for subsequent analysis, enhancing the reliability and depth of the research findings [53] [54]. In addition to the recordings, background surveys were used to gather supplementary information and deepen the understanding of each participant's perspective.

As part of the interview process, an information letter and verbal consent were provided to participants to address any questions they might have and to ensure they were fully informed about the research process.

The interviews were designed to gather in-depth insights into the digitalization process within organizations. Each interview started with general questions to understand the participants' organizational roles. This introductory segment included inquiries regarding the participants' perceptions of digitalization and its significance to their organizations.In addition to these general questions, specific inquiries were used for participants at the managerial level. These questions focused on their roles in the digitalization journey and to identify employee responses to digital initiatives. Separate interviews with employees were structured to understand their opinions on managerial actions related to digitalization and their perceptions of the overall process.

Furthermore, both managerial and employee participants were asked to share their views on the current state of digitalization in Ethiopia. They discussed their perspectives on the country's digital transformation journey and offered suggestions for improvements and potential challenges to avoid in order to ensure the successful implementation of digitalization initiatives.

Focus group interviews were conducted with participants from IGO, which constituted the largest group of interviewees in the research. The discussions centered on three primary questions designed to elicit detailed responses and encourage interactive dialogue among participants. Follow-up questions were included to stimulate conversation, enabling participants to expand on their insights and share various perspectives. This format facilitated a rich exchange of ideas, providing valuable qualitative data that contributed significantly to the overall research findings and deepened the understanding of the subject matter.

## 3.4 Participants

The organizations that were part of the research were selected to reflect a diverse range of perspectives. Given that each sector possesses unique objectives, operational structures, availability, and stakeholder dynamics, this diversity enables a more comprehensive understanding of the issues focused on the research. A total of 15 participants were interviewed, with the distribution among organizational types as follows:

- **7 participants from IGO**: Representing the largest group, these participants offered insights from a non-profit perspective, often highlighting social impact and community-driven goals.
- **4 participants from Financial Institution**: These interviews provided a finance-centered perspective, focusing on investment, economic stability, and risk management.
- **2 participants from Governmental Organization**: Their insights helped better understand policymaking, regulatory frameworks, and public sector objectives.
- **2 participants from Startup**: As representatives of small, often innovative businesses, these individuals offered a distinctive viewpoint on agility, entrepreneurship, and the challenges of market growth.

The background questionnaire comprised 19 questions designed to collect essential demographic and professional information, including age group, professional background, and level of IT expertise. Additionally, it explored participants' perceptions of their organization's level of digitalization and assessed the impact of digitalization on their work environment.

The questionnaire also addressed key areas, including participants' views on the barriers that hinder their organization from fully embracing digital trends.

As illustrated in Figure 3.1 below, 66.7% of the interviewees fall within the age range of 33 to 45. Among these participants, 53.3% have an IT background and show a high level of technological expertise. Furthermore, 23.5% of the participants are employed as IT staff, indicating a significant presence of professionals engaged in technical operations.

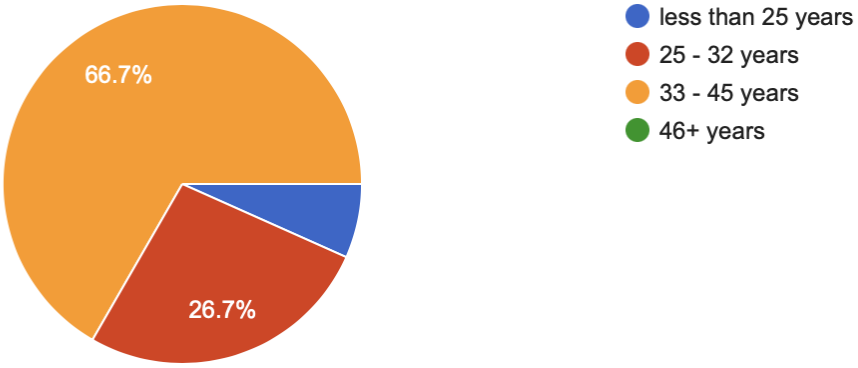


Figure 3.1: Age Group

The gender distribution among participants indicates that only 13.3% are female, as shown in Figure 3.2 below. This highlights the importance of addressing gender representation in the field. Overall, this research highlights a significant concentration of experienced professionals in the 33 to 45 age group, suggesting a strong presence of technological knowledge within this demographic.

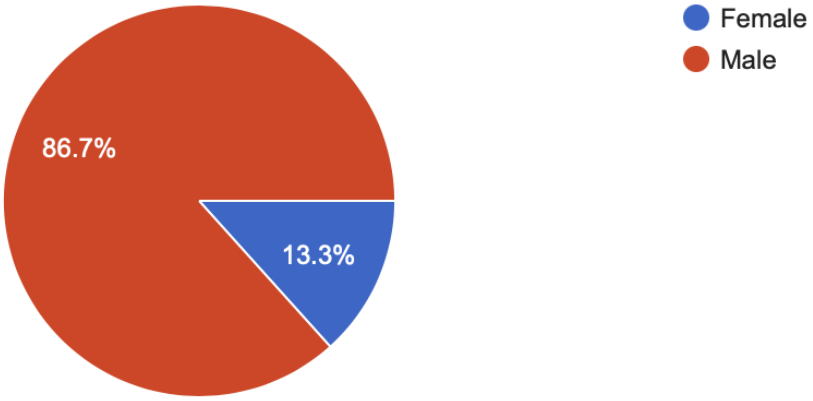


Figure 3.2: Gender Distribution

## 3.5 Introduction to Participating Organizations

In developed countries, the integration of digital technology has progressed rapidly, supported by robust infrastructure and high levels of digital literacy. However, this transformation has been markedly uneven globally, revealing significant differences, particularly in developing countries. Like other nations, Ethiopia faces numerous challenges in meeting the swift demands of the digital age. Key obstacles include inadequate Internet connectivity and outdated technological resources hindering progress. Additionally, Ethiopia's deeply rooted social norms and cultural traditions often clash with the rapid adoption of digital technologies, creating resistance that complicates the transition. Organizations in Ethiopia strive to adapt, they must devise strategies that address these specific, contextual challenges. This research explores unique difficulties in their digital transformation journey. It focuses on how they develop solutions to overcome cultural resistance and infrastructure limitations. This investigation aims to illuminate the complex dynamics of digital transformation within the organization's context.

This chapter presents the research findings, focusing on the impact of digitalization across various organizations in Ethiopia, including government entities, financial institutions, IGOs, and entrepreneurs. The research utilizes qualitative analysis, utilizing semi-structured interviews as the primary data collection method. This method enables a deeper understanding of how these organizations experience digital transformation, highlighting shared and unique challenges they encounter and the role of infrastructure and culture in shaping their digital practices. The findings provide a comprehensive overview of digitization across these sectors, illustrating how organizations Ethiopia are navigating and adapting to the demands of the digital age.

The interviewed organizations included in this research are:

- **IGO**: United Nations World Food Programme
- **Financial Institution**: Awash Bank
- **Governmental Organization**: Addis Ababa City Administration Civil Registration and Residency Service Agency
- **Startup**: Ahun

### 3.5.1 United Nations World Food Programme

The World Food Programme (WFP) is recognized as the most prominent global humanitarian organization, dedicated to saving lives in emergencies and using food assistance to promote peace, stability, and prosperity for communities recovering from conflict, disasters, and the effects of climate change. With a workforce of over 23,000 personnel worldwide, WFP operates in more than 120 countries and territories, providing essential food aid to those displaced by conflict and affected by disasters.

Beyond immediate relief efforts, WFP empowers communities to address challenges by enhancing nutrition for women and children, assisting smallholder farmers in improving productivity, and helping nations build resilience against climate change. Its initiatives also include school feeding programs to improve human capital and foster stability. Awarded the Nobel Peace Prize in 2020, WFP plays a vital role in humanitarian crises, mobilizing a fleet of 6,500 trucks, 20 ships, and 140 aircraft daily to deliver emergency aid while supporting recovery and development in regions impacted by conflict, drought, and natural disasters. Following emergencies, WFP remains committed to rebuilding lives and strengthening community resilience.

As an integral part of the United Nations, WFP operates globally to provide food assistance and advance sustainable development. Established in 1961 and headquartered in Rome, WFP maintains offices in 80 countries, reaching over 128 million people across diverse regions and contexts as of 2021, with approximately 1,600 staff members in the Ethiopia office [55] [56].

The research focuses on the WFP Ethiopia Country Office in Addis Ababa. WFP Ethiopia is vital in providing life-saving food assistance to vulnerable individuals in regions affected by drought and conflict. Additionally, the organization collaborates with communities to promote nutrition and enhance resilience [56]. The data collection explored various digitalization goals set at the organizational level, as well as specific digital initiatives implemented by Headquarters (HQ) in Rome. This comprehensive approach allows for an in-depth analysis of local and global digitalization strategies and their implications in the Ethiopian context.

### 3.5.2 Awash Bank

Awash Bank, the first private banking institution in Ethiopia, was established on November 10, 1994. The establishment of the bank involved 486 shareholders who contributed a paid-up capital of Birr 24.2 million, and the bank officially commenced operations on February 13, 1995. Since its inception, Awash Bank has experienced remarkable growth. Despite facing various global and domestic challenges, it has consistently outperformed other private banks in Ethiopia regarding operational and financial performance. The bank is committed to strengthening its capital base, advancing technology, developing human resources, and expanding its customer base. Moreover, Awash Bank plays a crucial role in Ethiopia's socio-economic development by encouraging savings, providing credit facilities, and facilitating effective payment systems.

A core value of Awash Bank is accessibility. The bank continually seeks to enhance accessibility through diverse service delivery channels, currently positioning itself as the most accessible private bank in Ethiopia with an extensive branch network. In addition to its physical branches, Awash Bank offers the convenience of 24/7 services through Automated Teller Machine (ATM), Point-of-sale (POS) terminals, and internet, mobile, and agency banking options.

Since its foundation, corporate social responsibility has been essential to Awash Bank's mission. The bank aims to improve the socio-economic conditions of the communities in which it operates by reinvesting in education, healthcare, and disadvantaged groups' social and environmental welfare. The positive impact of these initiatives is evident in numerous elementary schools built in collaboration with NGOs, along with enhancements to health facilities and reforestation efforts across the country.

Awash Bank aspires to be among the Top Ten African Banks by 2030, reflecting its ambition and commitment to growth. The bank has developed a strategic plan to achieve this vision and is actively investing in the necessary resources and capabilities to ensure its success [57].

This research specifically focuses on the Head Office of Awash Bank in Addis Ababa, Ethiopia, while examining various nationwide initiatives undertaken at several branches. Interviews conducted at the Head Office aimed to explore the different digitalization objectives established at the organizational level and the specific digital initiatives implemented by the bank's headquarters.

### 3.5.3 Addis Ababa City Administration Civil Registration and Residency Service Agency

The Addis Ababa City Administration Civil Registration and Residency Service Agency is one of Ethiopia's most prominent government institutions. The agency has been delivering essential services to the Ethiopian population for many years and oversees the development of a civil registration system in the city.

The agency has opened 73 health centers and offices dedicated to facilitating birth and death registration services to support this initiative. Initially founded in 1824 and restructured as the Addis Ababa Civil Registration and Residency Service Agency in 2001, this government organization operates with a well-defined mission, vision, and purpose. The Civil Registration and Residency Services Agency (CRRSA) documents significant life events, including births, marriages, divorces, and deaths in Addis Ababa, Ethiopia. Its objectives include:

- Enhancing the efficiency of governmental planning.
- Optimizing resource allocation and assistance.
- Improving the monitoring of progress toward the Sustainable Development Goals.

With a vision for 2025, the agency aims to establish a modern and secure information system that will serve as the primary source of information for legal, administrative, and statistical purposes. The agency's core values include readiness for change, accountability, transparency, and a steadfast commitment to ensuring information security and confidentiality [58].

This research examines Nefas Silk Lafto, an Addis Ababa, Ethiopia sub-city. The aim is to explore the digitalization process within the sub-city, analyze experiences related to this digitalization, and discuss both the successes and challenges encountered during its implementation.

### 3.5.4 Ahun

Ahun aims to develop meaningful connections in today's interconnected world by linking individuals through various channels. The platform facilitates connections between users and like-minded individuals, introduces them to new locations, and offers activities that align with their interests. As a social media platform, Ahun is dedicated to providing engaging experiences for users and businesses seeking to enhance their presence in a competitive market. This user-friendly and application (App) serves the dual purpose of supporting business owners and boosting consumer engagement.

Ahun aspires to be a leading, user-centric platform that inspires individuals to pursue their interests by offering seamless convenience across all aspects of their experience. Since its beginning, Ahun's mission has focused on creating a space where users can discover and connect with individuals with similar interests, explore new places, and find events that resonate with their preferences, all while empowering local businesses to expand their reach within the community. Currently, Ahun offers users easy access to a wide range of locations, from dining establishments to boutique shops, with detailed service information available within the App. It also provides a variety of events and enables users to connect with others who share similar interests at their favorite venues. Guided by its core values of reliability, convenience, and versatility, Ahun is focused on enhancing the experiences of both users and businesses alike.

Ahun provides customized services for local businesses and customers, enhancing visibility and building community connections. Local businesses benefit from increased reach and customer engagement through push notifications about special offers and events and seamless online payment integration. For customers, Ahun helps users discover new venues, events, and exclusive offers through real-time notifications tailored to their interests [59]. The platform also allows for convenient online payments for purchases or reservations using the Telebirr (a mobile money service that enables digital financial transactions using Ethio Telecom's mobile Smart Card (SIM card)) [59] [60].

The research explored Ahun's journey in digital transformation and its impact on society. It examined the challenges and strategies that the company employs to implement digitization. Interviews provided valuable insights into Ethiopia's ongoing digitization process, highlighting Ethiopia's challenges and opportunities faced by IT companies.

# CHAPTER 4

# Results

The results presented in this section were derived using an inductive approach to qualitative data analysis. This approach allows findings to emerge naturally from the raw data without being constrained by predefined frameworks or structured methodologies. This approach ensures that the analysis remains closely aligned with the research objectives while accommodating the complexity and richness inherent in qualitative data.

In this thesis, the raw data consisted of audio recordings from interviews, which were transcribed to facilitate detailed analysis. The inductive approach was employed to systematically filter the extensive raw text into a manageable and meaningful summary, establish clear connections between research objectives and findings, and identify patterns or structures underlying the experiences and processes shared by participants.

The analysis began with thoroughly examining the transcriptions to understand the impact of digitalization and identify recurring themes. Segments containing key reflections from participants were labeled and categorized, each reflecting a distinct aspect of their experiences or perspectives. Descriptive notes and memos were formulated to convey the significance of each category, and the relationships between them were analyzed.

The themes identified during this process were systematically organized into distinct categories: Strategies, Implementation, and Impact Across Sectors; Digital Processes in Respective Organization; Advantages and Challenges of Digitalization in the Respective Organization; and the Impact of COVID-19. This integration involved thoroughly evaluating each theme's scope and content to show how they contributed to the overarching categories. For example, themes related to planning, execution, and sector-wide implications were consolidated under "Strategies, Implementation, and Impact Across Sectors." At the same time, those focusing on organizational workflows and processes were aligned with "Digital Processes in Respective Organizations." Additionally, reflections on the benefits and challenges of digitalization were categorized under "Advantages and Challenges of Digitalization in the Respective Organization." At the same time, themes discussing

the pandemic's influence on the acceleration or obstacle of digital transformation fell under the "Impact of COVID-19."

The analysis focused on refining the category system by identifying subtopics and merging similar categories to improve clarity and coherence. The primary objective was to distill the findings into a summary of key themes, thereby providing valuable insights into the impact of digitalization on organizations in Ethiopia [61].

## 4.1 Strategies, Implementation, and Impact Across Sectors

### 4.1.1 WFP

The digital transformation initiative of WFP is a strategic priority established by the Executive Director, leading to significant investments across headquarters, regional bureaus, country offices, and sub-offices. The Digital Transformation Unit, created in 2020 within the Ethiopia Country Office, gathers demands and requirements from all office sectors. It works closely with regional and headquarters teams to address needs that cannot be met locally, ensuring that headquarters initiatives align with the specific needs and challenges facing sub-offices in Ethiopia for a context-sensitive approach to digital transformation.

Based in Addis Ababa, the WFP Ethiopia Digital Transformation Unit operates under the Technology Unit in each sub-office nationwide. It collaborates with various teams, such as the program and supply chain units, to identify opportunities for digitalization and implement customized solutions. The unit has shifted from reactive to proactive, working strategically with units to integrate digital solutions into their business strategies. To ensure the success of digital initiatives, the unit strongly emphasizes change management by providing training and support to ensure that solutions are user-friendly and adapted to the unique needs and challenges faced by sub-offices.

WFP's digital transformation initiative in Ethiopia has two primary goals:

1. **Improving WFP's internal processes**: This includes making the organization more efficient, effective, and data-driven. WFP has identified four foundational pillars for applying digital transformation in its Multi-Country Office (MCO), which includes Ethiopia:
    - Using data and analytics to drive decisions, programs, and interventions.
    - Automating offline processes to become more efficient, saving time and resources.
    - Creating an App ecosystem where all systems can talk to each other.
    - Aligning business and digital strategies.

2. **To support the Ethiopian government's digital transformation efforts**: This includes providing advice and linking the government to the right stakeholders to help them identify the right solutions. WFP is working with the Ethiopian government, specifically the Ministry of Innovation and Technology, to incentivize nationwide digital literacy and capacity-building. WFP is positioning itself as a digital advisor to the government, providing advice and linking them to the right stakeholders to help them identify the right solutions.

The four foundational pillars of the digital transformation strategy for WFP Ethiopia serve as guiding frameworks for the organization's digitalization initiatives. Developed at MCO level, these pillars are now being implemented across the country office and its sub-offices throughout Ethiopia. The pillars are described as follows:

1. **Data and Analytics**: This pillar emphasizes the importance of accessing and utilizing reliable data to ensure the WFP's data-driven decisions, programs, and interventions. This emphasis on data-driven decision-making has resulted in significant investments in platforms such as Dots, WFP's corporate system that integrates all its operations and facilitates access to information collected throughout the organization. Furthermore, the organization has invested in data analytics software like Tableau, which enhances data visualization and provides valuable insights through interactive dashboards.

2. **Automation**: The main objective of this pillar is to improve efficiency by automating offline processes. This approach encompasses not just the digitization of existing procedures but also a comprehensive rethinking and redesign to capitalize on the benefits of digital solutions fully. The aim is to establish streamlined processes that save time and resources. An example of this automation effort is the implementation of Easy Vista, a ticketing and case management system utilized across WFP to manage requests from staff and partners effectively.

3. **App Ecosystem**: This pillar focuses on establishing an interconnected environment where all WFP systems can communicate seamlessly. The objective is to move away from large, monolithic applications that function in isolation and transition to a more integrated ecosystem of smaller, interoperable systems. This transformation will facilitate smoother data flow, enhance collaboration, and support more comprehensive analysis and decision-making.

4. **Aligning business and digital strategies**: This pillar is essential for establishing an overarching strategic direction distinct from the more specific technological implementations found in the other three pillars by concentrating on three key areas: data and analytics, automation, and the development of an integrated app ecosystem. The WFP Ethiopia office seeks to enhance its operational efficiency, improve data-driven decision-making, and ultimately fulfill its mission of saving and transforming lives.

WFP's digital transformation unit focuses on understanding the Country Strategic Plan and Annual Performance Plan, which outline WFP's annual strategic priorities and management objectives. It leverages technology to develop strategies aligned with these goals. Extending beyond internal processes, WFP's digital transformation initiative also supports the Ethiopian government's digital transformation efforts. The unit is dedicated to improving efficiency, effectiveness, and impact through a proactive approach, a strong focus on change management, and its role as a digital advisor to the government. This commitment aligns with WFP's mission in Ethiopia.

WFP is concentrating on digital transformation by investing in two key areas to ensure success:

1. Aligning Digital and Technology Implementation with Needs: This investment focuses on bridging the gap between headquarters initiatives and the specific needs and challenges sub-offices face in the field. To facilitate this alignment, WFP has established structures, such as digital strategy pillars, business engagement functions at the headquarters and regional levels, and dedicated teams at the country office level.

2. Change Management: This investment supports staff adoption and effective use of new solutions. WFP emphasizes the importance of training, support, and addressing contextual limitations to adopt new technologies successfully. The Ethiopia Country Office is committed to providing users the assistance they need to feel comfortable and motivated to embrace these new solutions.

These investments reflect WFP's commitment to implementing new technologies and ensuring effective integration within the organization. WFP understands that successful digital transformation relies on strategic alignment with the organization's needs and fostering an environment that empowers individuals to adopt and utilize new tools effectively.

In summary, the WFP Ethiopia Digital Transformation Unit is vital in aligning global digital initiatives with the specific needs of sub-offices. This ensures that technology implementation is strategic and context-sensitive, backed by appropriate training and resources. Its key objectives include identifying technology demands, collaborating with regional and headquarters teams to develop solutions, promoting corporate digital platforms like Dots and Tableau, and automating data processes to enhance efficiency. Additionally, the unit focuses on ensuring alignment and security in technology, facilitating change management and technology adoption, and working in partnership with the Ethiopian government to advance digital literacy and capacity building.

### 4.1.2 Awash Bank

Awash Bank, one of Ethiopia's leading financial institutions, has embarked on a transformative digital journey, implementing various strategies and overcoming challenges to modernize its banking operations and services. The bank's digital transformation began around 2014-2015, focusing on upgrading its core banking systems and introducing several vital digital channels, including internet banking, mobile banking and agency banking.

These initiatives have enhanced service delivery and modernized the bank's operations. Awash Bank has prioritized improving customer experience throughout its digitalization strategy, particularly by automating essential banking products and services. Key processes that have been transformed includes bill payments, fund transfers and loan origination. To successfully implement its digital strategy, Awash Bank undertook several critical initiatives, including:

1. Assessing market readiness, technological capabilities, and infrastructure requirements.
2. Ensuring regulatory compliance.
3. Collaborating with technology partners, particularly Financial technology (fintech) companies, to expedite the transformation.

Digitalization has significantly impacted both the internal processes of Awash Bank and the experiences of its employees. Key impacts include:

- Efficiency Gains: Reducing manual processes has minimized branch queues, allowing staff to focus more on marketing and customer engagement efforts.
- Improved Decision-Making: Real-time transaction monitoring and enhanced reporting systems have given management better visibility, enabling timely decision-making.
- Work Process Restructuring: The introduction of digital services has necessitated restructuring employee performance metrics to align with new operational goals.
- Cybersecurity Enhancements: The bank has implemented robust cybersecurity measures to protect customer data and prevent fraud.
- Cultural Transformation: Adapting to new technologies has posed challenges, which have been addressed through comprehensive employee training programs.

External factors have driven Awash Bank's digital transformation, working alongside its internal strategies. Key external influences include:

- Competitive Pressure: Competition from other banks and fintech firms prompted innovation and the enhancement of digital services.
- Regulatory Support: Supportive government policies promoting financial inclusion and digital payments created a facilitative environment for transformation.
- Market Dynamics: The entry of telecom operators, such as Safaricom, and the potential opening of the banking sector to foreign firms added dynamism to the market, prompting further digitalization efforts.

### 4.1.3 CRRSA

The digitalization journey at CRRSA began following directives from higher levels of government, reflecting a top-down approach to this nationwide initiative. This strategy aligns with the government's national policy to promote digitalization, which requires organizations to adapt and incorporate technology into their operations.

The initiative is led by the organization's manager, who oversees the implementation process and ensures compliance with government directives. A key focus has been placed on training programs designed to equip employees with the necessary technological skills, as many office workers initially needed to gain familiarity with digital tools. These extensive training efforts facilitate a smoother transition to a digital work environment.

The sub-city has significantly invested in improving its IT infrastructure and providing ongoing technical support to enhance digitalization efforts. This support includes troubleshooting technical issues, assisting with the use of new software and addressing any concerns or challenges employees face during the transition.

Team leaders are crucial in monitoring employees' progress in adopting digital tools and systems. They offer guidance, identify areas where additional training is needed, and ensure that employees use technology effectively in their daily tasks.

The sub-city is dedicated to continuous improvement by actively gathering employee and customer feedback. This feedback is utilized to refine processes and better address the needs of the workforce and the community.

The digitalization process in CRRSA shows a structured and evolving approach that emphasizes leadership, training, and support. This focus helps to overcome challenges and ensure ongoing improvement.

### 4.1.4 Ahun

For Ahun, digitalization is at the core of its mission. The startup is dedicated to helping businesses operate online by digitizing their information, facilitating online sales and transactions, and connecting them with customers digitally. This emphasizes Ahun's commitment to creating a digitally driven ecosystem. The scope of digitalization at Ahun ranges from basic automation to complex systems integration. This approach ensures that digitalization strategies are tailored to meet the specific needs of each organization and the industry in which it operates.

Ahun's digitalization process demonstrates a strategic and multifaceted approach to creating a digital platform in a rapidly changing technological environment. By tackling challenges such as regulatory barriers and user adoption while utilizing tools like cloud computing and analytics, Ahun is significantly contributing to Ethiopia's digital transformation.

Key Aspects of Ahun's Digitalization Process include:

1. **Data Collection as a Foundational Step**

   Ahun's digitalization journey started with an extensive data collection effort focused on businesses in Addis Ababa. The startup collected verified and unverified information using a developed mobile app. This app includes details about restaurants, shops, and their products and services. This foundational data collection process has been crucial in creating a digital ecosystem that enables users to discover businesses, events, and locations on the platform.

2. **Integration with Payment Providers**

   Understanding the significance of digital transactions, Ahun has integrated with multiple payment providers, including CBE Birr[1], AMOLE[2], Visa, Mastercard, and PayPal [62] [63]. This collaboration allows users to easily make purchases, such as buying event tickets or ordering delivery services. As a result, users can enjoy a seamless digital experience, highlighting the increasing importance of digital payment solutions in Ethiopia.

[1] a mobile money service the Commercial Bank of Ethiopia provides. It operates through a network of authorized mobile money agents. Customers with mobile phones and SIM cards can easily sign up and create CBE Birr accounts at these agents or branches.

[2] a seamless omni-channel banking solution that allows customers to interact with the bank through multiple channels, including mobile, internet, and unstructured supplementary service data (USSD), all using a single username and password. Dashen Bank provides Amole as a premium payment and commerce platform for its valued customers.

3. **Internal Tool Development and Adoption**

   Ahun has developed internal tools in addition to using industry-standard platforms to manage operations effectively. For example, Ahun created a platform to handle payouts and track transactions, streamlining financial management for the finance team. Furthermore, Ahun utilizes JIRA for project management and collaboration across various departments. Using JIRA enhances productivity by improving team workflows and providing transparency in task management.

4. **Collaborative Problem Solving and Digital Solutions**

   Ahun encourages a collaborative approach among departments to improve internal processes. For example, the marketing team initially faced challenges tracking deliveries with traditional methods like sticky notes. To address this issue, the development team uses JIRA as a digital solution to enhance task management and overall efficiency. This demonstrates Ahun's proactive mindset in utilizing digital tools to tackle operational challenges and boost team productivity.

5. **Leveraging Cloud Computing and Analytics**

   Ahun utilizes cloud computing services, including Amazon Web Services (AWS), to host its backend systems. This setup provides a scalable and reliable infrastructure for Ahun's growing needs. Additionally, Ahun employs analytics platforms such as Firebase and Google Analytics to collect insights about user behavior and platform performance. This data-driven approach allows Ahun to optimize its platform and improve user experiences.

## 4.2 Digital Processes in the Respective Organization

### 4.2.1 WFP

Since its start in 2020, the WFP Ethiopia Digital Transformation Unit has significantly evolved its roles and responsibilities. In recent years, the unit has shifted its focus from solely managing internal operations to actively engaging with external stakeholders, particularly the Ethiopian government. Although WFP is not a technology company, the unit serves as a digital advisor to governmental counterparts, particularly the Ministry of Innovation and Technology, to promote digital literacy and enhancement. This support focuses on:

- Providing advice: Instead of directly creating solutions for the government, the unit offers specialized advice on identifying suitable technologies and strategies.
- Linking to stakeholders: The unit assists government organizations in connecting with relevant stakeholders, including potential technology providers and partners.

- Concentrating on key areas: The unit prioritizes support in areas where digital transformation can significantly impact early warning systems and resilience, thereby contributing to the sustainability of the systems in place.

The collaboration between the unit and the Ethiopian government represents a significant advancement. This partnership allows WFP to support national digital transformation efforts by aligning closely with the government's objectives and identifying solutions utilizing WFP's resources or external partnerships. The engagement is customized to address the specific needs and context of the Ethiopian government, promoting sustainable digital development across various sectors.

WFP Ethiopia's Digital Transformation Unit utilizes a collaborative approach to address the specific needs of sub-offices. This includes:

1. **Mapping Technology Use**: The unit collaborates with various departments to map existing technology and assess its functionality, standardization, and potential for decommissioning. This step ensures a comprehensive understanding of the technology landscape before implementing new solutions.
2. **Aligning with Business Objectives**: The technology mapping is complemented by business objectives, which range from high-level strategic plans to team-level goals. This alignment ensures that technology implementation directly supports the operational needs of the sub-offices.
3. **Providing Tailored Advice and Solutions**: Based on the mapping and alignment process, the unit advises sub-offices on the most suitable technological solutions. This may involve utilizing existing in-house solutions, procuring new technologies, or developing custom solutions to meet specific needs.
4. **Addressing Contextual Limitations**: The unit considers the unique challenges sub-offices face, such as emergencies, and ensures that deployed solutions are user-friendly and adapted to these limitations. For instance, in areas with low literacy rates, they prioritize intuitive and easy-to-use solutions.
5. **Providing Support and Training**: Understanding that introducing new technologies requires shifts in working practices, the unit offers comprehensive training and support to users in sub-offices. This ensures staff feel comfortable and confident in adopting and utilizing new solutions effectively.

### Participants View of Digitalization

The interviews provided valuable insights into the digital transformation process at WFP Ethiopia, highlighting its impacts, strategies, benefits, and challenges. Digitalization at WFP Ethiopia is viewed as more than just adopting new technologies; it represents a fundamental shift in organizational culture and operational processes to improve efficiency and effectiveness in humanitarian operations.

WFP Ethiopia interview participants see digitalization as a crucial tool for transforming their work by replacing traditional paper-based systems with digital platforms and automated workflows. As one interviewee stated, "Digitalization will make our lives easier by providing many inputs as easily as possible." This shift is evident through electronic data collection tools, online dashboards, and automated approval systems, all of which streamline work processes and enhance operational efficiency. Additionally, digitalization enables WFP Ethiopia to utilize better data for program design, monitoring, and evaluation. Mobile data collection tools, cloud-based storage, and real-time dashboards allow the organization to make quicker, more informed decisions. WFP Ethiopia is also increasingly adopting digital cash transfers and partnering with financial institutions to give beneficiaries greater control over their assistance. This strategy enhances financial inclusion and prioritizes the empowerment of women and vulnerable groups.

Several strategies have been implemented to facilitate this transformation, including establishing the Digital Transformation Unit. This unit is central to coordinating digital projects, offering technical support, and driving the adoption of new technologies across the organization.

### Impact of COVID-19

The COVID-19 pandemic significantly accelerated WFP Ethiopia's digitalization efforts, rapidly adopting digital tools and workflows necessary to maintain operations and minimize physical contact. While some digital initiatives were already in place, the pandemic made their implementation essential, particularly in response to the need for remote work and operational continuity.

- **Increased Reliance on Digital Tools and Remote Work**: Before the pandemic, WFP Ethiopia had been using tools such as Office 365, SharePoint, and Teams, but the urgency led to a much quicker adoption of these resources. The need for social distancing and reduced physical presence prompted a swift transition to remote work. WFP Ethiopia quickly provided the necessary infrastructure, including equipment, to support this shift. The experience demonstrated that many tasks could be effectively carried out remotely, likely fostering a more positive perception of digitalization and remote work among employees.

- **Acceleration of Digitalization Initiatives**: The pandemic also expedited pre-existing digitalization initiatives. For instance, the formal establishment of the Digital Transformation Unit in September 2020 marked a significant step in WFP Ethiopia's commitment to digital transformation. The urgency of the pandemic prompted the organization to solidify its digitalization strategy and create a dedicated unit to oversee these efforts.
- **Impact on Beneficiary Services**: Although the specific effects on beneficiary services were not explicitly addressed, it can be inferred that the transition to digital cash transfers and mobile data collection tools became increasingly crucial during the pandemic. These digital approaches were essential for minimizing physical contact and ensuring the continuity of aid distribution, which became vital during this period.

The pandemic highlighted several key challenges and opportunities for WFP Ethiopia's digitalization:

1. Addressing the Digital Divide: The pandemic emphasized the importance of bridging the digital divide, especially for beneficiaries in remote areas with limited connectivity. Ensuring equitable access to technology and internet connectivity is essential for reaching all intended beneficiaries.
2. Investing in Digital Infrastructure: The shift to remote work and digital service delivery emphasized the necessity for robust digital infrastructure. Continued investment in equipment, internet access, and reliable connectivity is necessary to support a more digital-centric organization.
3. Promoting Digital Literacy: Providing training and support for staff to use digital tools effectively has become more critical than ever. Improving digital literacy among employees is essential for maximizing the benefits of digitalization and addressing any resistance to change.

Overall, the pandemic was pivotal for WFP Ethiopia's digital transformation. The organization was forced to adapt quickly to new challenges, accelerating digital tools and reshaping work practices. While challenges such as digital equity and literacy remain, the lasting impact of COVID-19 will likely continue to influence WFP Ethiopia's digitalization journey and its ability to meet humanitarian goals.

### 4.2.2 Awash Bank

Since the bank's digitalization journey began between 2012 and 2014, the foundation was laid with critical initiatives such as upgrading the core banking system and launching ATM and POS services. By 2015-2016, the bank achieved a significant milestone by introducing Internet and mobile banking, followed by agency banking in 2017. This

period marked a clear shift toward a customer-centric digital strategy. In 2019, the bank partnered with a Kenyan consultancy firm to develop a comprehensive Digital Financial Services (DFS) plan. Although this initiative experienced delays due to the COVID-19 pandemic, it demonstrated the bank's commitment to accelerating its digital transformation.

The bank implemented a multi-faceted approach to digitalization that included:

1. **Assessment and Prioritization**: The bank carefully assessed its existing products and services to identify those that could be digitized to enhance customer experience and operational efficiency. This process involved analyzing market trends, technological advancements, and regulatory requirements.

2. **Infrastructure Development**: To support its digital initiatives, the bank invested significantly in IT infrastructure, including fiber optic networks and data centers, ensuring reliable and secure connectivity.

3. **Collaboration with Fintechs**: Understanding the importance of strategic partnerships, the bank collaborated with both local and international fintech companies. These partnerships provided access to cutting-edge technologies and helped expedite the implementation of its digital strategy.

4. **Focus on Customer Service**: The bank's digitalization strategy centered on enhancing customer experience. It prioritized the development of convenient, accessible, and user-friendly digital channels, automating processes, streamlining workflows, and introducing features catering to diverse customer needs.

5. **Change Management and Employee Training**: Cultural transformation was critical to the bank's digitalization journey. Comprehensive training programs were established to equip employees with the necessary skills and knowledge to adapt to the new digital environment. These programs included raising awareness about digital products and services, addressing employee concerns, and providing technical support.

### Participants View of Digitalization

The participants' perspectives provide a comprehensive understanding of the digitalization process at the bank. The majority of participants expressed a positive outlook on the impact of digitalization, recognizing its role in enhancing efficiency and improving customer service. They highlight how digitalization has streamlined various processes, reduced reliance on manual work, and minimized customer wait times. For instance, one participant noted that automating merchant management tasks has significantly decreased customer complaints and improved service delivery.

A shared view among participants is the importance of leveraging digitalization to enhance the customer experience. They emphasize the convenience and accessibility offered by

digital channels, such as mobile and internet banking, which enable customers to access banking services from anywhere, anytime, thus improving customer satisfaction and contributing to overall business growth.

Government policies play a crucial role in advancing the digitalization agenda. Participants advocate for regulatory frameworks that foster innovation, facilitate competition, and promote financial inclusion. There is a concurrence that a supportive government framework is essential for successfully implementing digitalization in the banking sector, with regulations encouraging innovation and ensuring a level playing field for all market participants.

Participants also emphasized raising public awareness about digital banking and its benefits. They argue that widespread awareness campaigns are necessary to educate the public, especially the unbanked population, and to bridge the digital divide. These efforts are essential for ensuring equitable access to digital financial services across different segments of society.

The views of individual participants provide additional insight into these broader themes. One interviewee emphasizes the importance of viewing digitalization as more than just providing online banking services. The participant stresses the need to focus on the overall customer experience and ensure that all digital platforms are seamlessly integrated to create a unified approach. The participant acknowledges that the bank still has "a long way to go" in achieving a genuinely customer-centric digital ecosystem, underscoring the need for ongoing improvement. Another interviewee highlights the significant progress in onboarding customers onto digital channels, automating payment systems, and enhancing interoperability. However, the participant also underscores the need for strong cybersecurity measures to protect customer data. The participant views digitalization as a "do or die" situation for the bank and stresses the importance of enabling regulatory frameworks for continued innovation and new opportunities. Another interviewee discusses the bank's strategic approach to digital transformation, mentioning engagement with a Kenyan consultancy firm to develop a 5-year digital financial services plan. The participant outlines the phases of the plan, which began with customer-facing processes and are now expanding to back-end operations. Despite acknowledging the negative impact of system interruptions, the participant emphasizes the efficiency gains and improvements in customer service resulting from digitalization.

### Impact of COVID-19

Interviews with employees at Awash Bank highlight the positive impacts of the COVID-19 pandemic on the bank's digitalization efforts. During the pandemic, customers exhibited a noticeable reluctance to visit physical bank branches, resulting in a significant increase in the adoption of digital banking services, particularly mobile banking. This shift was crucial in advancing Awash Bank's digital transformation, as more customers began using digital platforms to access banking services remotely.

Additionally, the Ethiopian government played a vital role in supporting digitalization during this time. Various policy initiatives were introduced to encourage the use of digital banking services, aligning with the bank's ongoing goals for digital transformation. These policies facilitated the expansion of digital banking and promoted financial inclusion across the country, further accelerating the adoption of digital banking solutions.

While the interviews primarily emphasize the positive aspects of digitalization during the pandemic, one interviewee argued some potential challenges. Specifically, the transition to remote work may have affected the performance of staff working from home. The participant suggested that remote work made it more challenging to maintain employee productivity and could have placed pressure on staff, affecting their work-life balance and overall efficiency; while the pandemic spurred digital adoption, it also presented challenges related to employee productivity and changes in work dynamics.

### 4.2.3 CRRSA

Government directives drive the digital process in CRRSA and emphasize employee training, IT support, and customer feedback.

1. **Top-Down Mandate and Managerial Leadership**: The digitalization initiative is based on national policy and follows a top-down approach, where directives are issued by higher levels of government and implemented by organizations such as CRRSA. Leadership at the sub-city level is crucial, with the manager leading the initiative, ensuring compliance with directives, and guiding the organization through the digitalization journey.
2. **Training as a Cornerstone**:
    - Addressing Technological Literacy: Training programs are prioritized to address the limited technological skills of many employees, equipping them with the necessary competencies for digital operations.
    - Structured Training Programs: Initial sessions introduce basic digital concepts and their relevance to the workplace, followed by specialized training on specific software and departmental systems.
    - Building Workforce Confidence: Training initiatives aim to reduce concerns about job displacement, boost employee confidence in using technology, and create an adaptable workforce ready for digital transformation.
3. **Investment in IT Infrastructure and Support**:
    - Upgraded IT Infrastructure: Investments include updating computers, improving internet connectivity, and implementing strong digital systems.
    - Technical Support: A dedicated IT team provides ongoing support by, troubleshooting technical issues, assisting employees with software usage and addressing challenges encountered during the transition.

4. **Active Monitoring and Evaluation**:
    - Monitoring Progress: Team leaders actively oversee employees' adoption of digital tools, identifying areas where additional support or training may be needed.
    - Customer Feedback as a Metric: Feedback from community meetings is a crucial tool for evaluating the success of digitalization. It offers insights into service quality and highlights areas for improvement.
    - Iterative Refinement: By incorporating employee and citizen feedback, the digitalization process is continually refined, demonstrating an iterative approach to improvement.
5. **Phased Implementation for a Smoother Transition**: CRRSA suggests a strategy to minimize disruption and manage resistance. This approach involves:
    - Initially, focus on specific departments or areas.
    - Gradually scaling up after addressing challenges and refining the process.

The digitalization process in CRRSA is an ongoing journey that necessitates adaptation, investment, and improvements based on feedback. Despite facing challenges such as resistance to change, the sub-city's focus on training, technical support, and customer engagement demonstrates a strong commitment to modernizing public services and creating a more efficient and responsive government.

### Participants View of Digitalization

The digitalization process at CRRSA reveals the participants' perspectives, indicating initial fears, eventual acceptance, and its wider influence on the workforce and community.

Initial Apprehensions and Evolving Perception:

1. Fear of Job Displacement: Employees initially worried that digital systems would take over their jobs, especially those used to paper-based processes. One interviewee noted that some individuals viewed training as "pointless," believing technology would make their positions obsolete. Additionally, another interviewee observed concerns about technology disrupting daily routines.
2. Skepticism Towards Technology: One interviewee expressed doubts about the reliability of digital systems compared to traditional paper records, indicating a preference for established practices and a need for familiarity.
3. Shifting Opinions with Tangible Benefits: Over time, employees started to recognize the benefits of digitalization, including reduced paperwork and improved customer satisfaction. Both interview participants noted this shift in perception, as employees came to appreciate how technology enhanced efficiency rather than viewing it as a threat.

The transition from paper-based systems has minimized chaos, improved organization, and created a more efficient work environment. One interviewee argued that this shift led to faster service delivery, which resulted in greater citizen satisfaction and positive feedback.

Digital systems established formal communication channels, enhancing record-keeping, facilitating more apparent requests, and promoting accountability. However, the other interviewee pointed out that while communication had improved, the decrease in informal interactions had impacted workplace connection.

#### Impact of COVID-19

The COVID-19 pandemic significantly impacted digitalization efforts, affecting public service delivery in Ethiopia both immediately and in the long term. During the pandemic, it was essential for employees to be physically present in the office to ensure that public services continued without interruption for citizens. This situation suggests that COVID-19 hindered the adoption of remote work options, which are typically aligned with digitalization initiatives. CRRSA prioritized in-person services during this period, potentially limiting opportunities to explore remote work arrangements that digital tools could have supported.

The reliance on paper-based processes and the necessity for physical office attendance exposed vulnerabilities in existing systems. This experience likely underscored the importance of transitioning to a more resilient digital infrastructure to ensure service continuity during crises.

Globally, COVID-19 accelerated the adoption of digital platforms across various sectors, demonstrating the potential of technology to maintain operations during disruptions. In Ethiopia, this global trend may have led to increased attention on digital public services, aligning with the government's broader digitalization initiatives. The pandemic presented both challenges and opportunities for digitalization in Ethiopia. Initially, it restricted the adoption of remote work because in-person service delivery was essential. However, it also revealed the inefficiencies of traditional systems and highlighted the need for strong digital solutions, driving the ongoing drive for modernization.

### 4.2.4 Ahun

The digital processes implemented by Ahun, as outlined in the Digitalization Process, showcase several vital areas:

1. Leveraging Jira for Project Management, Agile Methodology, and Transparency: Ahun utilizes Jira, a project management and issue-tracking software, to streamline workflows. This signifies Jira's widespread adoption in Ethiopia as a tool for improving collaboration and efficiency. Agile methodology, emphasizing iterative development, flexibility, and continuous feedback, is increasingly popular in the

technology industry, enabling teams to rapidly adapt to changing needs and priorities. Jira facilitates this approach by allowing the teams to track tasks, assign responsibilities, and monitor progress effectively.

2. Data Collection and Analysis: To understand market trends, user behavior, and business opportunities, Ahun employs various tools and strategies for effective data gathering and interpretation. They use a CRM tool alongside a custom-built mobile application to collect data from businesses in Addis Ababa. This data is managed and analyzed through a dashboard visually representing key metrics and trends. Such a data-driven approach enables informed decision-making regarding service offerings and marketing strategies.

3. Analytics Tools for User Insights: Ahun gathers insights into user behavior on their platform using Firebase and Google Analytics. These tools track metrics such as user engagement, screen usage, and traffic sources, providing valuable data that can be used to optimize the platform and enhance the user experience.

4. Digital Payments: Ahun integrates with several payment providers, including CBEbirr, AMOLE, VISA, Mastercard, and PayPal. This integration offers users a wide range of payment options, catering to different preferences and varying levels of familiarity with digital platforms.

These digital processes reflect Ahun's commitment to leveraging technology for improved management, data analysis, user insights, and payment solutions.

### Participants View of Digitalization

The interviewees' perspectives shed light on digital transformation's positive impacts and challenges in their organizations and the broader Ethiopian society.

Positive Impacts of Digitalization include enhanced efficiency, productivity, and social connection. Participants recognize the significant role of digitalization in improving efficiency and productivity within their organizations. One interviewee highlights how digital tools like Jira and Telegram have streamlined task management and team communication, leading to smoother workflows and quicker task completions. Similarly, the other interviewee emphasizes the central importance of Jira in managing projects, tracking progress across departments, and onboarding new employees. The participant also mentions that Ahun has developed internal digital platforms for managing payouts and monitoring transactions, further enhancing their financial operations' efficiency.

Beyond organizational benefits, one interviewee views digitalization as enhancing social connections. The participant believes that platforms like Ahun, which incorporate social features and focus on connecting users with local events and businesses, encourage individuals to explore their cities and engage in social activities. The participant argues that this ultimately strengthens social bonds rather than leads to isolation.

While both interviewees acknowledge the benefits of digitalization, they also express concerns about challenges such as user adoption, government policies, and ethical considerations.

#### Impact of COVID-19

The COVID-19 pandemic accelerated the adoption of digital processes in Ethiopia, particularly in digital payments, remote work, and project management tools.

- Digital Payments: The pandemic's emphasis on contactless transactions led to a significant increase in the adoption of digital payments. With restrictions on physical cash, businesses such as Ahun's platform integrated multiple payment providers, including CBE Birr, AMOLE, Visa, and PayPal, which enabled seamless online transactions.
- Remote Work and Digital Tools: The transition to remote work has increased dependence on digital tools such as Jira for project management and collaboration. Jira has enabled agile workflows, allowing teams to sustain productivity and transparency while working remotely. Furthermore, cloud services and analytics tools like AWS, Firebase, and Google Analytics have become essential for monitoring performance and user engagement.

Despite the increase in digital adoption, several challenges still need to be addressed, including security concerns, gaps in digital literacy, and a preference for cash transactions. The shift to remote work has also raised questions about the long-term sustainability of these practices in Ethiopia, as outdated regulations further complicate the digital landscape.

## 4.3 Advantages and Challenges of Digitalization in Respective Organization

### 4.3.1 WFP

#### Advantages

Implementing digitalization at WFP Ethiopia has led to many benefits, including improved efficiency, enhanced beneficiary services, strengthened organizational capacity, and a positive impact on employee experiences. One of the most significant advantages of digitalization is increased efficiency and effectiveness. By transitioning from paper-based systems to digital tools, WFP Ethiopia has streamlined its internal workflows, significantly reducing the time and effort required for data collection, reporting, and approvals. For instance, one interviewee notes that the time needed for staff separation clearance has been reduced from 5-7 days to 2-3 days. Additionally, another interviewee highlights that automating reporting processes has allowed staff to focus more on data analysis and

insights. Furthermore, digitalization has reduced errors typically associated with manual data entry, resulting in more reliable data for decision-making and program monitoring. Cloud-based platforms and online dashboards also provide real-time access to crucial information, enabling faster and more informed decision-making. This is particularly valuable for field operations, where timely data is essential for responding to emergencies and adjusting program implementation effectively.

Digitalization also has a positive impact on beneficiary services. The shift towards digital cash transfers has given beneficiaries more flexibility, choice, and control over how they receive assistance. They can access their funds through banks or financial service providers, eliminating the need to travel long distances to receive aid. This change has particularly benefited women and marginalized groups, promoting financial inclusion. Furthermore, digital platforms have improved communication with beneficiaries, facilitating the dissemination of information about programs and enabling feedback. This two-way communication channel strengthens accountability and ensures that programs remain responsive to beneficiary needs.

Another critical benefit of digitalization is the strengthening of organizational capacity. With digital data collection and analysis tools, WFP Ethiopia can now gather more detailed and accurate data, leading to better-informed program design, monitoring, and evaluation. Cloud-based storage and real-time dashboards further enhance data management, providing a more evidence-based approach to humanitarian assistance. Moreover, digital platforms such as Microsoft Teams and SharePoint have improved communication and collaboration across WFP's teams within the country office and with regional and global teams. This enhanced connectivity fosters knowledge sharing and more effective problem-solving, improving program implementation.

The positive impact on employee experience is another significant benefit of digitalization. The ability to work remotely has provided many employees with increased flexibility and work-life balance, saving time and resources. WFP has also invested in online training platforms and resources, enabling staff to develop new digital skills and stay current with technological advancements. This commitment to professional development empowers employees and fosters a culture of continuous learning within the organization.

While the benefits are clear, ongoing challenges must be addressed. These include bridging the digital divide, ensuring equitable access to digital technologies, particularly for beneficiaries in remote areas with limited connectivity, and addressing resistance to change. Some employees would prefer to adopt new digital tools and workflows, which can hinder the success of digital transformation. Continuous training, support, and communication efforts are essential to overcome these challenges. Furthermore, WFP Ethiopia must prioritize data security to protect sensitive beneficiary data stored on digital platforms and comply with relevant regulations. In conclusion, digitalization at WFP Ethiopia has significantly improved operations and its ability to deliver humanitarian assistance effectively. By addressing the remaining challenges, including ensuring equitable access to digital technologies, overcoming resistance to change, and strengthening data

security, WFP can continue leveraging digitalization's benefits to enhance its impact and achieve its strategic goals.

### Challenges

The interviews demonstrated that, while digital transformation at WFP Ethiopia is generally viewed positively, there are challenges, particularly resistance to change. This resistance emerged as a recurring theme, highlighting the challenges of implementing digital initiatives within a large and diverse organization. During the interviews, several factors contributing to this resistance were identified.

One key factor is the preference for familiar workflows. Some employees are reluctant to abandon established, paper-based processes as they find comfort and familiarity in traditional working methods. One interviewee noted that "people don't really get comfortable to get out of what they are used to." This resistance can stem from a need for more understanding of the benefits of digitalization or fear of the unknown. Another concern is the perceived bureaucracy and delays associated with the new digital systems. Employees have raised issues about introducing new digital approval processes, which they believe add unnecessary complexity and could slow down workflows. The participant also expressed concerns that digitalization might "contribute to delaying transfers to the beneficiaries." These perceptions are often linked to inadequate training or clarity about the new processes.

Although not directly mentioned in the interviews, there is also a fear of job displacement due to automation. Employees worry that their roles may be eliminated or their skills may become obsolete as technology takes over specific tasks. Technological barriers, such as limited access to reliable internet connectivity, particularly in field offices, further complicate the implementation of digital solutions. This lack of infrastructure can hinder the adoption of new technologies and frustrate employees. Data security concerns were also raised, with some employees expressing reservations about the security of sensitive beneficiary data stored on digital platforms. These concerns highlight the importance of robust data protection policies, secure infrastructure, and comprehensive training on data handling procedures.

To mitigate resistance, WFP Ethiopia has implemented several strategies to facilitate the transition to digital work processes:

1. **Comprehensive Training and Support**: The organization emphasizes providing thorough training programs, mentoring initiatives, and ongoing technical support to equip employees with the necessary skills and knowledge to navigate new digital tools effectively, bridging knowledge gaps.

2. **Demonstrating Tangible Benefits**: WFP Ethiopia aims to build employee buy-in by showcasing how digitalization increases efficiency, reduces errors, and improves program outcomes. Highlighting success stories and demonstrating the positive impact on beneficiary services helps shift perceptions and encourage acceptance.

3. **Open Communication**: By fostering a culture of transparency and dialogue about the challenges and opportunities of digital transformation, WFP creates a more inclusive environment. Addressing concerns directly and seeking feedback from employees helps build trust and ownership.

4. **Phased Implementation**: WFP employs a gradual approach, starting with pilot projects that allow time for adaptation. This strategy reduces disruptions and provides opportunities to gather feedback, refine processes, and enhance the overall transition.

5. **Role of Leadership**: Senior Managers at WFP Ethiopia are crucial in mitigating resistance. Establishing a Dedicated Digital Transformation Unit has been a significant step in centralizing resources, coordinating digital initiatives, and providing technical expertise across the organization. Furthermore, senior leadership has invested in training and change management, demonstrating their commitment to equipping staff with the necessary skills to adapt to new technologies.

6. **Communicating a Clear Vision**: Articulating a compelling vision for digital transformation that aligns with WFP's broader strategic goals helps inspire staff and create a sense of shared purpose. Additionally, when senior managers actively use digital tools and demonstrate their effectiveness, it sends a strong message to employees, encouraging wider adoption.

7. **Recognizing and Rewarding Success**: Acknowledging the efforts of those who champion digital initiatives reinforces positive behaviors and motivates others to embrace change.

### Focus Group Discussion

Digital technologies have the potential to fundamentally transform how people work within organizations, as emphasized in a focus group discussion with employees of WFP. Key points from the discussion include:

- **Remote Work Enablement**: Digital technologies facilitate remote work, as demonstrated during the pandemic. They allow employees to collaborate, access documents, and work efficiently without being physically present in the office.

- **Improved Data Collection and Analysis**: Digital tools simplify data collection, aggregation, and timely analysis. Data collection applications save time, reduce errors, and eliminate manual processes.

- **Real-Time Monitoring and Impact Measurement**: Technologies like drones and applications such as School Connect, used in Ethiopia's school feeding program, facilitate real-time monitoring and measurement of program impact.

- **Improved collaboration and communication**: Tools like Microsoft Teams and SharePoint enhance virtual meetings and document sharing, fostering better collaboration within the organization and with external partners.
- **Streamlined Processes**: Digitizing processes, like the Human Resource (HR) leave request system, reduces paperwork, automates workflows, and enhances communication between employees and supervisors.
- **Future Vision**: In the next five to ten years, WFP envisions becoming a fully digital organization that enhances efficiency, disseminates real-time data, and improves beneficiary support through digital assistance.
- **Capacity Building and Digitalization**: WFP recognizes the importance of investing in training and capacity-building initiatives to ensure employees and partners can effectively use digital technologies.

Despite the significant potential of digital technologies, the participants also identified challenges that need to be addressed:

- Learning Curve and User Acceptance: Adopting new technologies may encounter resistance and challenges due to the learning curve that users must navigate.
- Infrastructure Dependence: The success of digital transformation relies on having a robust infrastructure, which includes reliable internet connectivity and a consistent power supply.
- Data Security and Misuse Risks: Digitalization introduces risks associated with data security breaches and potentially misusing systems and data.

Insights from the focus group discussion suggest that WFP's digitalization efforts can be rated around 7 or 8 out of 10. This rating is derived from the following observations:

**Positive Aspects**:

WFP's success stories and positive impacts include several examples demonstrating the effective use of digital technologies to improve processes. One example is the successful implementation of remote work capabilities during the pandemic, which allowed employees to collaborate and access documents without being physically present in the office. Digital tools have also facilitated efficient data aggregation and real-time analysis, significantly reducing manual processes. Furthermore, technologies like drones are utilized for impact measurement and real-time monitoring of WFP's programs, as seen in the School Connect application that monitors school feeding programs. The digitization of HR processes, such as the leave request system, has minimized paperwork and enhanced efficiency.

These advancements reflect WFP's strong commitment to digital transformation through investments in essential infrastructure, such as high-speed internet, and the consistent

exploration of digital solutions across its various units. Moreover, the organization recognizes the importance of training and capacity building to ensure the effective adoption of digital technologies, which is crucial for overcoming the learning curve associated with new tools.

**Areas for Improvement**:

While digital tools offer significant benefits, some employees struggle to adapt to these resources, necessitating additional support and training for complete adoption. The effectiveness of digital initiatives also largely depends on reliable internet connectivity and a stable power supply. Disruptions to these services can create significant obstacles to progress. Furthermore, as digital technologies continue to evolve, the organization must take proactive measures to mitigate risks associated with data security and the potential misuse of digital systems. Although digital solutions have been successfully implemented in various areas, the level of digitalization differs across departments and programs, highlighting the need for improved uniform adoption.

**Justification for the Rating**:

WFP's initiatives in digitalization have resulted in substantial improvements in efficiency, data management, and program monitoring. The benefits of digital technologies are evident, especially in enhancing remote work, streamlining data collection, and improving human resources processes. However, challenges such as user adoption, reliance on infrastructure, data security, and inconsistent implementation still need to be addressed. Addressing these challenges is essential for achieving more comprehensive success.

**Further Considerations**:

- Providing more specific data on the extent of digitalization across WFP's departments and programs would enable a more accurate assessment.
- Evaluating user satisfaction with the digital tools and the effectiveness of the training programs would yield valuable insights into areas for improvement.
- Assessing the impact of digitalization on key performance indicators, such as cost savings, efficiency improvements, and beneficiary outreach, is essential for a comprehensive understanding of the initiative's success.

Digitalization is essential for WFP, both now and in the future. The focus group discussion revealed a strong consensus among employees about the transformative potential of digital technologies in their work.

The table below outlines the current status of digital technologies at WFP, their anticipated developments over the next 5 years, and potential trends for the following 10 years. Digital technologies are already deeply integrated into the organization, and WFP plans to enhance this integration further in the next 5 years. While specific predictions

for the next decade were not explicitly discussed, emerging trends indicate continued advancements and an increasing reliance on digital solutions.

| **Now** | **In 5 Years** | **In 10 Years** |
|---|---|---|
| Facilitating remote work, improving data collection and analysis, enhancing collaboration, and streamlining processes. | A fully digital organization that enhances efficiency, facilitates real-time data sharing, and provides expanded digital support for beneficiaries. | Ongoing reliance on digital technologies and their increasing integration into WFP's operations. |
| Successfully implementing tools like Microsoft Teams, SharePoint, and various data collection applications, which are currently enhancing efficiency within the WFP. | Digital technologies will be integrated into all areas of operations, improving the quality of life by enabling flexible work arrangements, fostering real-time collaboration, and streamlining reporting processes. | The continuous automation of business processes and adopting new digital tools aim to transform the organization further. |
| Ongoing investments in infrastructure, including high-speed internet, and a commitment to building employee capacity to utilize these digital tools fully. | The demand for digital solutions will grow, leading to further automation of business processes and the adoption of new technologies. | Continuous innovation in digital tools is driving improvements in operational efficiency and program impact. |

Table 4.1: Digitalization Status and Future Projections at WFP

### 4.3.2 Awash Bank

#### Advantages

The interview results provide valuable insights into the perceived advantages of the bank's digitalization efforts. These advantages can be categorized into several key areas:

1. **Enhanced Efficiency and Productivity**: Digitalization has led to automating various banking processes, eliminating the need for manual tasks and paperwork. This reduction in turnaround time has enhanced operational agility and improved customer satisfaction. Furthermore, the adoption of digital tools, along with data analytics and reporting capabilities, has provided management with valuable insights into customer behavior, market trends, and operational performance. As a result, decision-making has become more data-driven, empowering the bank to optimize strategies and improve overall business efficiency.

2. **Improved Customer Experience**: Digitalization has dramatically enhanced the customer experience by offering greater convenience and accessibility. Digital channels, such as mobile and internet banking, allow customers to access banking services 24/7, eliminating the need to visit physical branches. This mainly benefits customers in remote areas with limited access to traditional banking infrastructure. Additionally, digital platforms enable the bank to offer personalized services tailored to individual customer preferences, fostering higher engagement and customer loyalty. Another notable benefit highlighted by participants is the potential for reduced customer costs. Adopting digital channels reduces the operational costs associated with physical branches and manual processes, allowing banks to lower transaction fees and service charges.

3. **Business Growth and Expansion**: The shift to digital platforms has contributed to significant business growth and expansion. Digitalization has opened new avenues for financial inclusion, particularly by reaching the unbanked population. Mobile banking and agency banking models provide a cost-effective way to offer services in remote areas with limited infrastructure. Furthermore, digitalization has created new revenue streams for the bank, facilitating the introduction of innovative products and services, such as online lending platforms, digital payment solutions, and personalized financial management tools. By embracing digital transformation, the bank has enhanced its competitiveness and stayed ahead in a rapidly evolving industry. Offering modern and convenient services has allowed the bank to attract new customers, retain existing ones, and maintain a competitive edge in the market.

4. **Positive Societal Impact**: The digitalization of banking services has also had a positive societal impact. It has facilitated financial literacy promotion by providing customers with easy access to information about financial products and services. This has encouraged responsible financial behavior and contributed to financial literacy within the community. Additionally, the convenience and accessibility of

digital banking have supported economic growth by empowering businesses and individuals, leading to increased investment, job creation, and improved living standards within the broader economy.

Overall, the participants' perspectives emphasize the transformative potential of digitalization in reshaping the banking sector. Digitalization can enhance customer experiences, improve operational efficiency, and positively impact societal well-being. Participants stressed the need for a strategic and holistic approach to digitalization, involving continuous innovation, customer-centricity, and collaboration with all stakeholders to ensure its long-term success and sustainability.

**Challenges**

While the benefits of digitalization are widely acknowledged, participants also recognize several challenges encountered during the bank's digital transformation journey. These challenges range from infrastructure limitations to cultural resistance and security concerns.

1. **Infrastructure Limitations and Technological Constraints**: A significant challenge to digitalization in Ethiopia is the country's limited infrastructure. One of the main barriers to the widespread adoption of digital banking services is unreliable internet access, particularly in rural areas. One interviewee highlights that limited internet penetration restricts the reach and effectiveness of digital platforms, hindering efforts to achieve financial inclusion. Additionally, frequent power outages pose challenges to the continuous operation of digital banking systems, disrupting service delivery and potentially inconveniencing customers. As he states, unreliable electricity services are a major external factor hindering the smooth implementation of digitalization. Participants also acknowledge the adverse effects of system interruptions and software limitations, with the Technology Director pointing out that system downtime can discontinue the bank's services entirely. This emphasizes the critical need for robust infrastructure and reliable software solutions to ensure seamless and uninterrupted service delivery.

2. **Cultural Resistance and Adaptability Issues**: Alongside infrastructure challenges, cultural resistance to change significantly impacts the bank's digital transformation journey. Participants comment that while general acceptance of digitalization exists, some employees and customers resist due to misunderstandings or a lack of trust in new technologies. One interviewee observes that some employees hold misconceptions about digitalization, fearing it will lead to complete automation and make their roles obsolete. This fear creates anxiety and reluctance to embrace digital tools. Employees may also find adapting to new systems, workflows, and digital tools frustrating, mainly when insufficient training or support exists.

   This resistance is wider than employees; customers, particularly from older generations, may also hesitate to adopt new technologies. Their reluctance often

stems from unfamiliarity with digital platforms, security concerns, and a need for more trust in online banking systems. Addressing these issues requires a strategic approach to engage both employees and customers.

- **For employees**: Proactive change management is essential. One interviewee emphasizes the importance of establishing a dedicated change management team for each project to address concerns, provide training, and ensure a smooth transition to new digital systems. Transparent communication is vital in dispelling misconceptions and alleviating fears about job security. It is crucial to convey that digital tools are intended to enhance, rather than replace, employees. Moreover, adequate training and support mechanisms can empower employees to confidently use new technologies and adapt to changing workflows.
- **For customers**: Targeted awareness campaigns and educational programs are necessary to alleviate fears and promote understanding of the benefits and security features of digital banking. Simplifying user interfaces and offering multi-lingual support can help make digital platforms more accessible, especially for those less familiar with technology.

3. **Security Concerns and Data Privacy**: As digital banking becomes more prevalent, so do cybersecurity threats. One interviewee emphasizes prioritizing cybersecurity measures to protect customer data and ensure secure transactions. With the rise of cyberattacks and fraud, banks must invest in robust security protocols, continuous monitoring, and awareness campaigns to educate customers about potential threats and preventive measures. Furthermore, maintaining customer data privacy is a critical concern. The participants stressed the need for employees to have strong data protection policies, ensure compliance with relevant regulations, and maintain transparency in data handling practices. This is essential for maintaining customer trust and confidence in digital banking systems.

4. **Regulatory Framework and Policy Implementation**: The regulatory environment also plays a significant role in shaping the digitalization process at the bank. Participants advocate for supportive government policies that encourage innovation and promote financial inclusion. One interviewee suggests a shift toward "enabling" regulatory frameworks that welcome new ideas and solutions rather than imposing restrictive requirements that could hinder innovation. On the other hand, another interviewee points out the challenges of enforcing policies, noting that such policies could unintentionally create advantages for some groups while disadvantaging others. Therefore, policy implementation should be carefully considered to ensure equitable access to digital financial services and avoid creating disparities within the market.

5. **Balancing Work-Life Integration**: While digitalization offers several operational benefits, it also affects employee work-life balance. Two interview participants raise concerns about digitalization's impact on employees' social lives. The constant availability required to support digital platforms, especially in customer service

roles, can blur the boundaries between work and personal time. This could lead to burnout and stress among employees, highlighting the need for strategies promoting work-life balance. Implementing flexible work arrangements and clear boundaries for after-hours communication could mitigate these concerns and ensure employee well-being during the digital transformation process.

### 4.3.3 CRRSA

**Advantages**

Interviews with participants at CRRSA provide valuable insights into the benefits of digitalization in public service delivery in Ethiopia. These benefits are categorized into key areas as follows:

1. **Enhanced Efficiency and Streamlined Processes**:

   Digitalization allows organizations to move away from paper-based systems, significantly reducing paperwork and creating a more organized, less cluttered work environment. One interviewee emphasizes that this transition lightens the load of managing large volumes of physical files, resulting in a more efficient and pleasant workspace.

   Utilizing digital tools and systems speeds up processing information and service requests. This reduction in turnaround times allows for more responsive service delivery to citizens.

   The other interviewee highlights implementing centralized digital systems, which standardize service delivery across various sub-cities. This consistency ensures all citizens receive equal services, promoting fairness and accessibility.

2. **Improved Accuracy and Reliability**:

   Digital systems minimize human error and data loss by automating data management processes. This improves the accuracy of government records and services.

   Digital platforms offer secure storage and backup solutions for sensitive information, protecting it from physical damage or unauthorized access. This ensures data preservation and business continuity, enhancing the reliability of services.

3. **Enhanced Communication and Collaboration**:

   Digital tools create formal communication channels, improving team record-keeping, accountability, and transparency. This organized approach to communication fosters more explicit workflows and enhances overall organizational efficiency.

   Digital systems improve access to information and collaboration across departments and locations. This enhancement promotes knowledge sharing and supports informed decision-making.

4. **Improved Citizen Satisfaction and Social Impact**:

   Digitalization enhances service delivery by reducing waiting times and streamlining processes, making services more convenient for citizens and increasing satisfaction.

   Digital platforms promote greater transparency by allowing citizens to track the progress of their requests and access relevant information. This builds trust and strengthens the accountability between the government and its citizens.

   Improved service delivery and government responsiveness contribute to a more positive view of public services. Citizens appreciate these modernization efforts, which in turn boosts trust and enhances the government's social credit.

5. **Empowering Employees and Fostering Growth**:

   The digitalization process includes training and upskilling employees, creating opportunities for professional development and career advancement. As employees acquire new digital skills, they become more adaptable to technological changes.

   Digital tools enable employees by giving them the resources and information necessary to perform their tasks efficiently. This leads to increased employee engagement, motivation, and job satisfaction.

   The advantages discussed by CRRSA participants can be applied to other government organizations and sectors. Insights from the participants emphasize the transformative potential of digitalization to improve efficiency, enhance citizen satisfaction, foster employee growth, and create a more responsive and modern public service environment.

### Challenges

The participants of CRRSA discussed various challenges that hinder digitalization efforts in Ethiopia. These challenges can be categorized into key themes, offering a thorough understanding of the barriers employees and organizations face.

### Resistance to Digitalization

- Limited Understanding of Technology: Many employees and managers, especially senior staff, need help to use basic technological tools. One interviewee argued that office workers need additional training to close this knowledge gap.
- Fear of Job Displacement: Concerns about job security drive resistance among employees. Both interview participants note that some staff fear digitalization may make their roles redundant, leading to negative attitudes towards new systems.
- Preference for Paper-Based Systems: Many employees prefer paper records and distrust digital systems. One interviewee notes that skepticism about the reliability of technology leads to hesitation in making the transition.

- Challenges in Adapting to Change: Public service employees, particularly those with long tenures, encounter challenges adapting to new systems. Established routines and bureaucratic processes can disrupt the transition to digitalization, leading to passive or overt resistance.

**Technological and Infrastructure Barriers**

- Quality and Reliability of Technology: Challenges such as slow internet speeds, outdated computers, and unreliable infrastructure significantly hinder the implementation of digital solutions. These limitations reduce the efficiency and effectiveness of digital systems.
- Training Gaps: The absence of systematic training programs leaves employees unprepared to use new technologies confidently. This knowledge gap increases resistance and prevents the full utilization of digital tools.

CRRSA proposed solutions and strategies to overcome barriers to digitalization in Ethiopia, emphasizing a tailored approach. Some key solutions are:

- Education for Technological Literacy: Early investment in education is crucial to address gaps in familiarity with technology. Building technological literacy from a young age is a long-term strategy that can prepare a future workforce for the demands of a digital economy.
- Phased Implementation: Gradual digitalization that begins on a smaller scale enables organizations to tackle challenges incrementally. This method reduces disruption and facilitates the smoother adoption of digital systems.
- Ongoing Training Programs: Consistent training sessions, similar to the focus on political training, are advised to enhance employees' confidence and competence in using digital tools. These programs should address specific needs and concerns, promoting acceptance of technology.
- Customer Service as a Drive: Enhancing customer service through digitalization can lead to positive feedback. Emphasizing these advantages may foster acceptance of digital systems among employees and the public.

### 4.3.4 Ahun

**Advantages**

The participants identified multiple advantages of digitalization within the Ethiopian business landscape, emphasizing its benefits to their operations and the wider society.

Digital tools significantly enhance productivity and efficiency by automating tasks and streamlining processes. This leads to quicker completion of work and a more effective use

of time. Furthermore, integrating cloud services and extensions can help organizations scale their operations and complete tasks more rapidly.

Digitalization enables more effective communication and collaboration within teams and across organizations. Platforms like Telegram and Jira facilitate information exchange, making it easier for teams to work together, regardless of their locations. This is particularly important in remote work, which has become increasingly common in recent years.

Digital tools enable organizations to collect and analyze data more effectively, which leads to improved decision-making and services. For instance, Ahun employs a mobile app and dashboard to gather and verify business information, ensuring users have accurate and up-to-date details. Additionally, they utilize analytics platforms such as Firebase and Google Analytics to monitor user behavior and trends, allowing them to customize their services to meet user needs better.

Digital platforms can help businesses reach a wider audience and engage customers more effectively. Ahun allows businesses and event organizers to connect with a more extensive customer base and sell their products and services online. By leveraging social media and other digital channels, they can reach a broader audience and create a more engaging user experience.

Digitalization has improved communication and connections, positively impacting social life. Through various digital platforms, individuals can connect with friends and family, share ideas, access learning opportunities, and stay informed. While there are concerns about the potential negative impacts of social media, evidence suggests that when used appropriately, digitalization can enhance social interactions and foster a sense of community.

### Challenges

The interviews highlighted several challenges that hinder fully realizing digitalization's potential. These challenges are:

1. **User Adoption and Digital Literacy**: A significant barrier to adopting digital tools is many individuals' reluctance to embrace digital platforms. This resistance arises from several factors:
    - Lack of Trust and Fear of Scams: Many individuals are concerned about the security of digital platforms, especially regarding digital payments. The fear of scams and fraud prevents them from using digital wallets and online transaction services.
    - Unfamiliarity with Digital Tools: Limited exposure to digital technologies creates a barrier, preventing individuals from confidently navigating the digital world. This unfamiliarity often leads to a preference for traditional methods.

- Absence of Compelling Incentives: Some people do not see tangible benefits in adopting digital tools, especially when traditional methods seem sufficient. This lack of motivation acts as a significant obstacle to digital adoption.

2. **Policy and Regulatory Gaps**: Inadequate government policies and regulations present significant challenges to digitalization in Ethiopia:

   - Outdated Regulations: The existing legal frameworks must adequately address the complexities associated with digital transactions, which creates difficulties for businesses. For instance, the provision for e-receipts forces companies to rely on manual workarounds, complicating financial processes.
   - Limited Access to Essential Data: The lack of a centralized, publicly accessible repository for business data interferes with market research and decision-making. This makes it challenging for businesses to form informed strategies.
   - Insufficient Understanding of the Digital Economy: Government policymakers frequently need a comprehensive understanding of the digital economy, leading to ineffective policies that do not adequately support the growth of digital businesses.

3. **Infrastructure Limitations**: Ethiopia's digital infrastructure faces several challenges:

   - Reliance on a Single Telecom Provider: The historical dependence on Ethio Telecom has restricted internet access and quality. Although the introduction of competition has positively impacted the situation, further efforts are required to ensure that digital services are affordable and reliable.
   - Uneven Internet Penetration: Limited and inconsistent internet connectivity, especially in underserved regions, exacerbates digital payment adoption and literacy issues.

4. **Resistance to Change**: Resistance to digitalization is observed not only among individuals but also within businesses and among policymakers:

   - Individual Resistance: Many people hesitate to adopt digital tools due to fear of the unknown and need more trust in digital platforms. Additionally, they may favor traditional methods, especially when looking for a clear advantage in switching to digital alternatives.
   - Business Resistance: Businesses often encounter internal resistance arising from limited digital literacy among employees, as well as the costs associated with implementing and integrating digital technologies. The financial investment needed for software, hardware, and training can encourage businesses to adopt new digital tools.
   - Government Resistance: Policymakers often need help to grasp the complexities of the digital landscape, and the slow pace of policy reform contributes to

resistance at the government level. Additionally, the regulations explicitly addressing digital payments and access to business data need to be revised for the digital transformation.

Ahun proposed several strategies for overcoming resistance and addressing the challenges related to digitalization.

- Building Trust and Promoting Digital Literacy: It is crucial to address security, fraud, and privacy concerns to build trust in digital platforms. Public awareness campaigns, strong security measures, and transparent communication can help alleviate these fears. Additionally, comprehensive digital literacy programs can empower individuals to navigate the digital world confidently.
- Encouraging Digital Adoption: Providing incentives, like cashback rewards for digital payments and discounts for online purchases, can motivate users to adopt digital platforms. It is essential to emphasize the convenience and advantages of using digital tools to make this transition more attractive.
- Updating Policies and Regulations: The government should revise existing laws to accommodate the complexities of digital transactions better, creating a more supportive environment for digital businesses. Additionally, providing access to business data through a centralized repository can further empower these businesses. It is also essential to actively engage with stakeholders in the digital ecosystem to develop effective policies that promote innovation.
- Investing in Digital Infrastructure: It is crucial for expanding Internet access and enhancing network reliability, particularly in underserved areas. This is essential for increasing participation in the digital economy. Encouraging competition within the Telecom sector can lead to more affordable and higher-quality internet services.

## 4.4 Government Role in Digitalization

The success of digitalization efforts relies on aligning them with Ethiopia's unique societal and workforce dynamics. To implement these strategies effectively, it is crucial to tailor them to the Ethiopian workforce's specific challenges and cultural attitudes. Engaging employees and proactively addressing their concerns can minimize resistance and create a more supportive environment for digital transformation.

Following in-depth interviews with representatives from IGO, Governmental Organization, Financial Institute, and Startup, an overview of the Ethiopian government's role in supporting digitalization has emerged. These organizations provided valuable insights into their perceptions of governmental support and their challenges in the digital landscape. The findings highlight the importance of government policies, regulatory frameworks, infrastructure investments, and initiatives designed to promote competition and financial

inclusion. Below is an overview of the government's role in advancing digitalization, as observed by the organizations interviewed:

- **Policy Formulation and Regulation**: The Ethiopian government has taken a proactive approach to developing policies and regulations that guide the digital transformation process. Key initiatives such as the establishment of the National Digital Strategy, which serves as a roadmap for digital transformation across various sectors. Additionally, the government has implemented regulations for mobile money, agency banking, and payment systems. These measures ensure that digitalization aligns with the country's national development goals.
- **Promoting Financial Inclusion**: Digitalization is considered a vital tool for achieving financial inclusion, especially for the unbanked population in rural areas. The government has encouraged the use of mobile money services and has leveraged the National ID system to enhance Know Your Customer processes. This approach has made it easier to open accounts and has improved financial access for underserved communities.
- **Promoting Competition and Liberalization**: The Ethiopian government is actively encouraging competition and innovation in the financial sector. Recent policies have allowed foreign companies, such as Safaricom, to enter the mobile money transfer and Telecommunications markets. This change is expected to drive further digitalization. Additionally, there is ongoing consideration to open the banking sector to foreign banks, which is likely to promote innovation and accelerate the digital transformation.
- **Infrastructure Development**: The government understands that strong infrastructure is vital for digitalization. As a result, it has made substantial investments to expand internet access and improve banking infrastructure, including the promotion of fiber optics. These investments are essential for facilitating the widespread adoption of digital banking services throughout the country.

Despite the government's efforts, policy implementation still needs to address challenges. Some vital issues are:

- **Balancing Protection and Competition**: The government promotes digitalization while protecting local banks. This balance is challenged by the decision to grant licenses to foreign entities, which has raised concerns among some local banks about potential market disruptions. These banks feel pressured to adapt quickly to remain competitive.
- **Ensuring Equitable Access and Addressing the Digital Divide**: Efforts to bridge the digital divide are ongoing, yet challenges remain. To ensure that all members of society regardless of income, location, or technological proficiency

can access digital financial services, we must focus on expanding internet access, promoting digital literacy, and creating user-friendly services.

## 4.5 Organizations Contribution to Ethiopia

### WFP

WFP Ethiopia's digitalization strategy aligns with the organization's overarching objectives, extending its impact beyond internal operations to foster national development and enhance government capacity. The critical components of this strategy encompass capacity building, data-driven decision-making, operational efficiency, and support for various programmatic areas.

- Capacity Building and Government Collaboration: WFP Ethiopia works with the Ethiopian Ministry of Innovation and Technology to strengthen digital capacity and literacy within the Ethiopian government, which aligns with WFP's commitment to promoting sustainable development. This collaboration involves serving as a digital advisor, connecting the government with relevant stakeholders, and advancing digital literacy. Rather than constructing solutions directly for the government, WFP's digital transformation unit offers guidance to support the government's digitalization goals, particularly in areas like early warning systems and resilience building, which contribute to system sustainability.
- Data-Driven Decision Making: Data and analytics are core to WFP Ethiopia's digitalization strategy, significantly improving the organization's ability to make informed programmatic decisions. By enhancing data collection, processing, and analysis, WFP ensures that its decision-making is grounded in robust evidence, leading to more effective interventions.

### Awash Bank

The digital transformation in Ethiopia, especially in the financial sector, has been greatly influenced by the collaborative efforts of the government and banks. The government has been instrumental in formulating policies, developing infrastructure, and promoting financial inclusion. Meanwhile, banks have focused on implementing digital services, improving customer experiences, and investing in technology.

- Implementing Digital Solutions and Services: Banks in Ethiopia have been proactive in adopting digital solutions to enhance customer experience and improve operational efficiency. Initiatives such as mobile banking, internet banking, agency banking, and the automation of processes like loan origination and CRM have helped extend the reach of banking services, particularly to underserved areas.

- Investing in Infrastructure and Technology: Banks have significantly invested in their IT infrastructure to support digital platforms. This includes building data centers, establishing secure networks, and implementing cybersecurity measures. These investments ensure secure transactions and allow banks to collaborate with fintech companies to adopt innovative digital solutions.
- Promoting Customer Awareness and Adoption: Banks have implemented awareness campaigns and training programs to educate customers about the benefits of digital banking services. Key strategies for building customer trust and encouraging adoption include simplifying user interfaces, providing multilingual support, and addressing security concerns.
- Adapting to Regulatory Changes: Banks need to adjust to new regulations and compliance requirements as government policies change. By aligning their strategies with the National Digital Strategy, banks can ensure that their digital services meet regulatory standards while taking advantage of growth opportunities in the digital landscape.

By partnering, the government and banks can address digitalization challenges and harness its transformative potential, creating Ethiopia's more inclusive, efficient, and digitally empowered financial ecosystem. Key areas for collaboration include:

1. Open Dialogue and Feedback Mechanisms: Effective collaboration between the government and banks is crucial for addressing challenges and ensuring policies align with the digitalization agenda. Establishing open channels for dialogue and feedback can facilitate timely responses to emerging issues and ensure that regulations promote innovation and financial inclusion.
2. Joint Awareness Campaigns and Education Initiatives: Collaborating on customer education is essential for promoting digital adoption. Joint awareness campaigns and educational programs can reach a broader audience; these will help customers understand the benefits and security features of digital banking while addressing their concerns about privacy and accessibility.
3. Public-Private Partnerships: Exploring public-private partnerships can improve infrastructure development, promote innovation, and increase access to digital financial services for underserved communities. Collaborative efforts can harness the strengths of both sectors to advance digital transformation and ensure that no one is left behind.

### CRRSA

The Ethiopian government and its regional offices are crucial in advancing the country's digitalization efforts. Their actions, including policy implementation, infrastructure investment, and efforts to overcome resistance, are essential for modernizing public services and promoting a digital economy. However, addressing challenges such as resistance to change and ensuring inclusivity will be vital for the long-term success of these initiatives.

- Investing in Infrastructure and Training: The CRRSA has prioritized upgrading technology by acquiring better computers and ensuring faster internet connectivity. Training initiatives are being implemented to help employees adapt to digital tools, address skill gaps, and facilitate smoother transitions.
- Improving Public Service Delivery: Government offices' adoption of digital systems has resulted in faster processing times, enhanced accessibility, and improved customer satisfaction. Digital tools promote transparency by creating a digital record of transactions, which reduces opportunities for errors or misconduct and fosters greater trust in public services. By implementing these digital systems, CRRSA can provide faster, more accessible, and more reliable services to citizens.
- Addressing Employee Resistance and Concerns: Employee resistance, often rooted in concerns about job displacement or unfamiliarity with technology, is being addressed through targeted training and ongoing support.

### Ahun

Ahun has contributed to digitalization in Ethiopia by leveraging digital tools and platforms to enhance user experience and address existing challenges.

- Driving Digital Tool Adoption: Ahun uses digital tools and platforms to improve its operations in communication, task management, customer engagement, and financial transactions. They illustrate how embracing digital tools can streamline processes, enhance operational efficiency, and transform business models.
- Enhancing User Experience: The Ahun App integrated digital payment systems and online event ticketing features, simplifying processes and improving user accessibility. By prioritizing user-centric digital innovations, Ahun contributes to creating a more seamless digital environment.
- Promoting Digital Literacy and Trust: Ahun actively encourages the use of digital tools by educating users about their benefits and addressing concerns related to security and privacy. For instance, during the interview, the company emphasized its efforts to build trust among users by demonstrating the tangible advantages of digitalization.

- Advocating for Policy Reform: Ahun emphasizes the necessity for updated regulations and offers critical feedback to the government regarding outdated policies that impede digital progress. They also advocate for creating centralized business data repositories to facilitate informed decision-making and effective market strategies.
- Showcasing Best Practices: Ahun is showcasing best practices by effectively implementing digital solutions. They serve as a role model for others in the industry, illustrating how digitalization can promote business growth and innovation. By actively sharing their success stories, they encourage nationwide adoption of digital practices.
- Collaborating with Stakeholders: Ahun emphasizes the importance of partnerships between private organizations and government agencies. They advocate for collaboration in developing digital literacy programs, raising public awareness, and streamlining policies.

Ethiopian startups, such as Ahun, are leading initiatives encouraging the practical adoption and implementation of digital tools. Their efforts are crucial in Ethiopia's transition to a more digital economy. These contributions provide a roadmap for other businesses and institutions, highlighting the transformative potential of embracing digital innovation.

CHAPTER 5

# Conclusion

The thesis explores the dynamics of digital transformation in four organizations: WFP, Awash Bank, CRRSA, and Ahun. It uses a qualitative study approach to emphasize the dual nature of digitalization, highlighting its advantages and challenges, specifically within the Ethiopian context.

The findings indicated that digitalization provides significant advantages. The organizations that were part of the study reported enhancements in their processes, the development of employees' technological skills, and improved customer engagement. In today's landscape, digital strategies have become crucial for business evolution, with remote work proving beneficial for work-life balance in some instances. Additionally, the study emphasized the contribution of these organizations to the advancement of Ethiopia's digital landscape and their influence on policy development.

Nevertheless, challenges persist. While most organizations acknowledged the significant influence of COVID-19 in creating new digital opportunities, such as digital banking, cash transfers for WFP beneficiaries, and digital payments for Ahun, only WFP and Ahun highlighted the unique advantages it provided for supporting remote operations. In contrast, Awash Bank and CRRSA perceived remote work as challenging, mentioning difficulties in maintaining productivity and achieving work-life balance. CRRSA, in particular, identified further obstacles, such as the organization's dependence on paper-based processes and the need for physical office attendance, which exposed considerable vulnerabilities within existing systems. The impact of digitalization was particularly transformative for WFP, facilitating the transition from paper-based systems to digital platforms. This contrasts with governmental organizations, which rely heavily on paper processes despite acknowledging the inefficiencies of traditional methods. Such recognition underscores the urgent need for robust digital solutions and drives a movement toward modernization.

Resistance to change, steep learning curves, inadequate tools, and infrastructure deficits are common obstacles organizations face. In particular, the banking industry's demand for continuous 24/7 customer service complicates work-life balance. Employees at WFP, Awash Bank, and CRRSA have expressed concerns regarding job security and the potential for job displacement as digitalization increases. Contrarily, such worries are absent at Ahun, likely due to its nature as a digital app-based organization, where the emphasis is on digital services and job security is less of a concern. On the contrary, WFP, Awash Bank, and CRRSA employees may perceive that technological advancements in their fields could diminish the need for certain positions. For Ahun, the primary challenge lies in ensuring user adaptation to the digital platform rather than fears of employment loss. These challenges, stemming from infrastructural limitations and social attitudes, have impeded the progress of digital transformation adoption.

Despite these challenges, the organizations have identified and implemented several strategies to navigate these obstacles. These strategies include promoting digital adoption among employees, aligning government policies and regulations to support digitalization, and investing in infrastructure. Such initiatives not only address organizational issues but also significantly contribute to advancing Ethiopia's broader digitalization efforts.

This research suggests encouraging a culture that values innovation to enhance digital adoption among organizations and stakeholders to accelerate digital transformation and address existing challenges. Strong collaboration between governments and organizations is crucial to ensure that policies align with digital transformation demands. This involves addressing governance gaps and ensuring that regulations support technological advancements. Furthermore, prioritizing the development of digital infrastructure will aid in the seamless integration of technologies and help eliminate technical barriers. Finally, it is essential to nurture the next generation by investing in digital literacy programs and education.

By adopting the lessons and strategies highlighted by the examined organizations and leveraging the insights presented in this research, Ethiopia tackles its current challenges, improves infrastructure, and paves the way for a digitally transformed, economically advanced future. These initiatives can create a solid foundation for a future where digital transformation drives national development and positions the country for success in an increasingly digital environment.

## 5.1 Theoretical Insights

The term "resistance to change" has evolved from a systemic perspective to a psychological one. Kurt Lewin initially viewed resistance to change as a force that impacted managers and employees equally. However, over time, the phrase gradually got personalized, focusing on the conflict between employees and management. This change in emphasis has led to an overemphasis on human resistance, often neglecting the structural factors that can impede change. The belief that individuals inherently resist change can lead to unproductive organizational behaviors. This mindset can lead to a self-fulfilling prophecy

in which managers expect resistance, plan for it, and eventually face the resistance they hoped to avoid. Consequently, this focus on overcoming resistance can divert attention from addressing the underlying causes of implementation challenges [64] [65] [66].

The concept of "overcoming resistance to change" frequently misidentifies the root of the problem. Many researchers and managers tend to blame subordinates for resisting change, overlooking the contributions of supervisors and management to the issue. For instance, ineffective communication regarding change initiatives, a lack of employee involvement, and changes that threaten employees' status or job security can all contribute to the appearance of resistance.

Presenting change initiatives as challenges against resistance can be counterproductive to effective change management. Instead, the focus should be understanding why employees react to change and responding constructively. This could include ensuring clear communication about the nature and reasons for the change, allowing for employee participation in the design and implementation of the change, addressing concerns about potential negative impacts on employees' status, job security, or workload, and recognizing and valuing the expertise of employees at all levels [67] [68] [69].

Emerging alternative methods of change management extend beyond the focus on resistance. These models often emphasize a systems perspective, considering the complex relations of components that influence the dynamics of change. Modern models also recognize that organizations are nonlinear structures capable of adapting to change when functioning in non-equilibrium environments. By addressing individual concerns, such as loss of status or job security, rather than labeling them as "resistance to change," organizations can develop more effective change management strategies. This enables the development of customized solutions that address the particular challenges of each change initiative [64].

While digitalization offers a range of opportunities, it also presents considerable challenges. Efforts to modernize may face obstacles such as limited awareness, limited equipment, and unfamiliarity with systems. This aligns with the concept of change resistance, wherein individuals oppose changes they perceive as threatening. The expansion of the Gig economy and the increasing reliance on freelancers may raise concerns about job security for regular employees [70]. Such changes can initiate resistance, especially when they impact an individual's economic stability or organizational status. Therefore, developing digital skills is essential for effectively navigating the constantly evolving work environment [71].

This highlights the importance of providing employees with sufficient training and assistance to help them develop the necessary skills and clear communication regarding the nature and advantages of digitization. Employees may resist changes due to feelings of unpreparedness or being overwhelmed. Some challenges associated with digital infrastructure include the demand for increased bandwidth frequency and faster connectivity. Despite the fact that individual employees may not be actively opposing the change, these systemic concerns may hinder the successful adoption of digitalization [70] [72].

In addition to acknowledging potential opposition, it is essential to highlight the advantages and opportunities associated with digitization. According to Singh and Pathak, these advantages include increased productivity, the rise of new job opportunities such as those within the gig economy, and advancements across various sectors, including healthcare, education, and finance. By emphasizing these advantages, resistance can be mitigated, fostering a more receptive attitude toward change.

By implementing the principles of resistance to change theory, organizations can effectively anticipate and tackle the challenges associated with digital transformation. This approach includes:

- Openly acknowledge concerns related to job security and address them through retraining programs, initiatives for skill development, and support for transitioning to new roles.
- Invest in a robust digital infrastructure to ensure the necessary technology and support systems are firmly in place.
- Actively engaging employees in the change process by offering opportunities for input, feedback, and participation in decision-making.
- Celebrating successes and showcasing the positive impacts of digitalization to build momentum and foster a culture of innovation.

By proactively addressing these factors, organizations can minimize resistance and enhance the benefits of digitalization [70].

## 5.2 Limitations

Qualitative research approaches are valuable for gaining insights into complex phenomena, allowing researchers to explore perspectives and understand more profound meanings. However, these methods have limitations, as issues such as subjectivity, limited generalizability, and potential biases can impact the reliability and validity of findings. In this research, the qualitative method also encountered limitations that affirm the need for careful consideration.

While this research offers valuable insights into the digital transformation journeys of organizations in Ethiopia, several limitations need to be acknowledged. The study examined four organizations across different sectors, including Intergovernmental Organization, Financial Institute, Governmental Organization, and Startup. Although this diversity provides a well-rounded perspective, it may not fully encapsulate the experiences of all organizations in Ethiopia, thus limiting the generalizability of the findings to the entire country. Additionally, there was a significant gender imbalance among participants, with only 13.3% being female (two out of 15), which reflects the broader underrepresentation

of women in the IT sector. This gender disparity may have restricted the inclusivity of perspectives and left gaps in understanding gender-specific challenges.

Additionally, the age distribution of participants represented a limitation, with 66.7% of interviewees aged between 33 and 45. This uneven representation may not fully capture the perspectives of younger or older professionals, potentially introducing biases or overlooking insights from other age demographics. There were also geographical and technological challenges, as the study was conducted in Austria while participants were located in Ethiopia. The online format for interviews led to occasional internet connectivity issues that may have impacted the depth and flow of discussions.

Language barriers further limited the research, particularly as one interview was conducted in Amharic, Ethiopia's national language, and subsequently translated into English during transcription. Despite efforts to ensure accuracy, the translation process may have altered certain details of the participant's responses, which could affect the interpretation of their views. Additionally, as is common in qualitative research, the findings are context-specific and may not be broadly applicable to other populations or regions. The use of non-probability sampling methods and the limited geographical scope of the study also constrained the range of perspectives considered.

Ultimately, qualitative research is inherently dependent on the researcher's interpretation, which presents challenges for verification and replicability. Unlike quantitative methods, the lack of controlled conditions and standardized reporting can introduce subjectivity into the findings. To address this issue, the study offers comprehensive descriptions of its methodology and recognizes potential biases, allowing readers to critically evaluate its reliability. Despite these limitations, the research offers valuable insights and provides a foundation for future studies to expand upon, addressing the identified gaps and improving the understanding of digital transformation in Ethiopia and other similar contexts [73] [74].

# List of Figures

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# Appendix A: Interview Questions

## Individual Interviews Questions

### General Questions

1. Please introduce yourself and your role in the company.
2. What is digitalization for your organization?
3. Please explain the strategy proposed and followed by your organization.
4. When did the digitalization journey start?
5. How do you personally feel towards the digitalization implementation by your organization?
6. Do you feel different about this topic currently (compared to the beginning)?
7. What is the opinion of your colleagues (higher management and other employees)?
8. Do they feel any different compared to the beginning?

### Questions for Senior Level Managers

1. What actions or roles have you taken towards digitalization as a senior manager?
2. What was the response from the employees?
3. What steps were taken to fulfill the needs of the employees (if comments were given)?
4. What external factors have played a role in implementing digitalization in the organization?

5. What does government policy look like within the sector your organization operates in?

6. How do your organization's goals (with respect to digitalization and other goals) align with the digitalization strategy that Ethiopia is following and plans to follow?

### Questions for Employees

1. What actions or roles have been taken by senior managers toward digitalization?

2. What was the response from the employees?

3. What steps were taken to fulfill the needs of the employees (if comments were given)?

### What Are the Effects on Employees and Management

1. How has digitalization impacted your social life?

2. What are the positive and negative impacts of such adaptations on your social life?

### Conclusion

1. In your opinion, how should policies be enforced in industry sectors to accelerate the digitalization journey in Ethiopia?

2. In your opinion, what actions and strategies should be taken to smoothen the digitalization journey?

3. What can be done to minimize the negative impact of digitalization on social life?

## Focus Group Questions

1. Do you believe digital technologies have the potential to fundamentally transform the way people in your organization work?

2. For instance, your organization is employing digitalization by using digital technologies, etc., to improve processes across the organization. How would you rate it on a scale of 1–10, and explain why? (where 1 = "Not good" and 10 = "Very good").

3. How important is digitalization to your organization? (Now, In 5 years and In 10 years)

# Appendix B: Background Questioner

## Background of Interviewees

1. Age

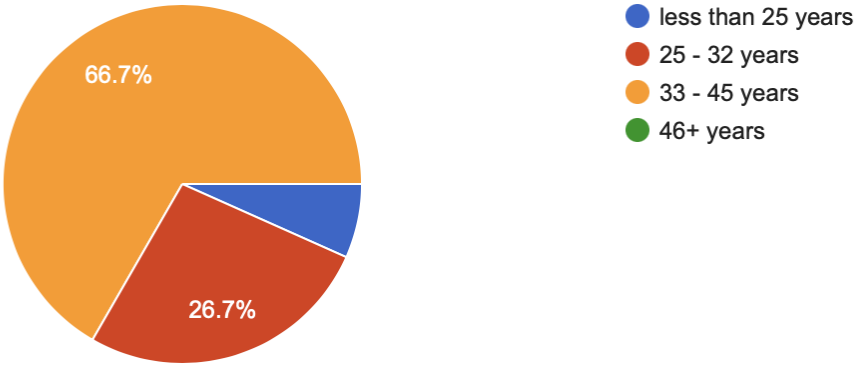


Figure 1: B1

2. Gender

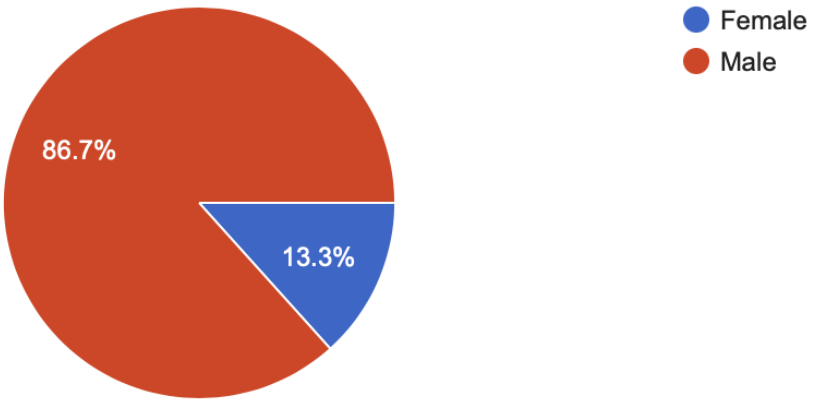


Figure 2: B2

3. Educational Background

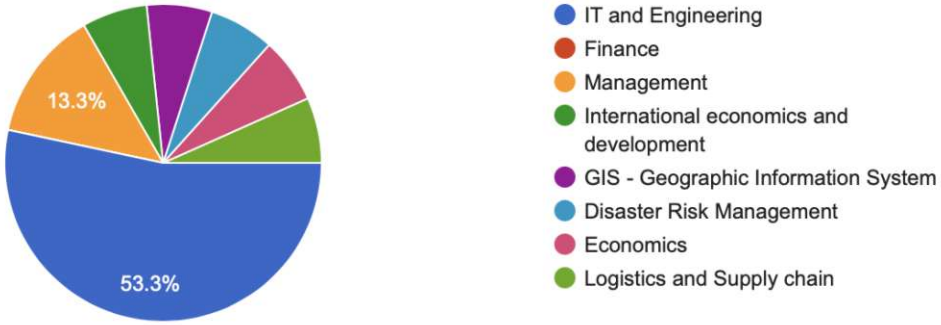


Figure 3: B3

4. Technological Expertise

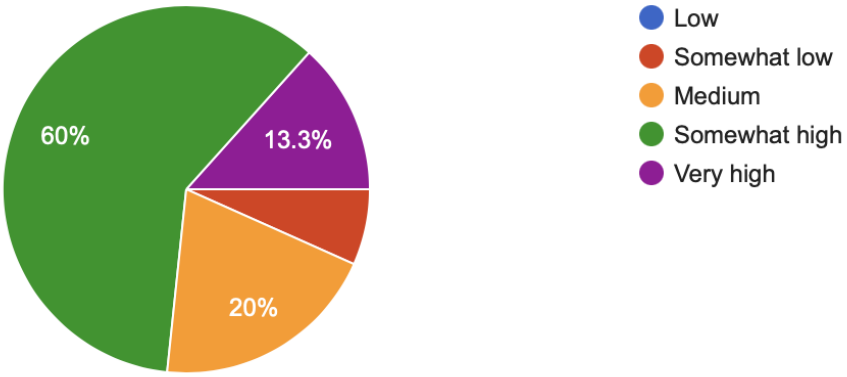


Figure 4: B4

5. Type of Organization

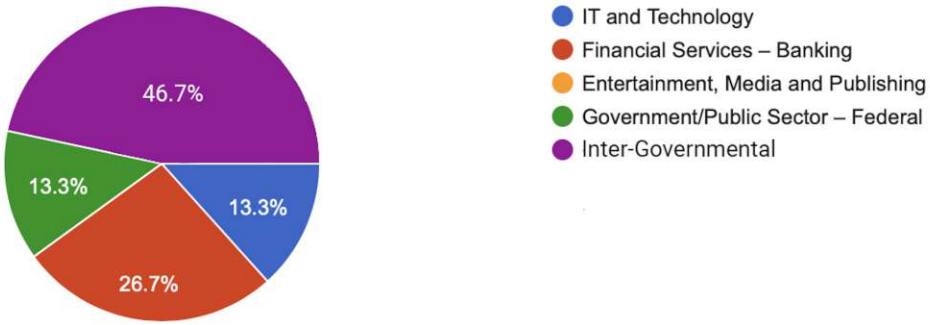


Figure 5: B5

6. Employees Headcount

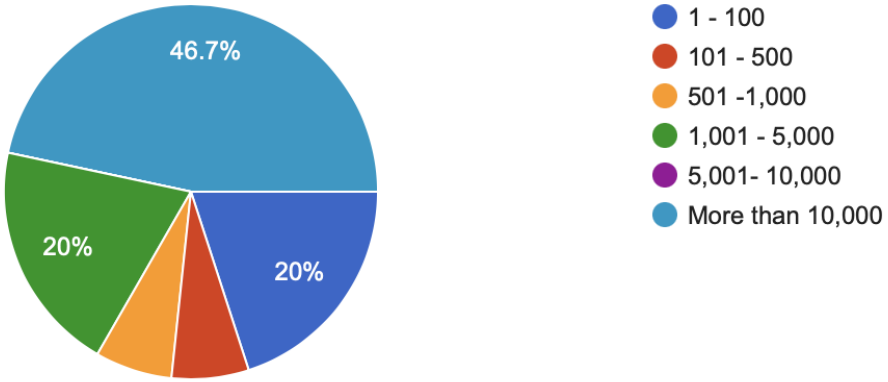


Figure 6: B6

7. Role of Interviewees


Figure 7: B7

8. Understanding of Digital Technology in the organization

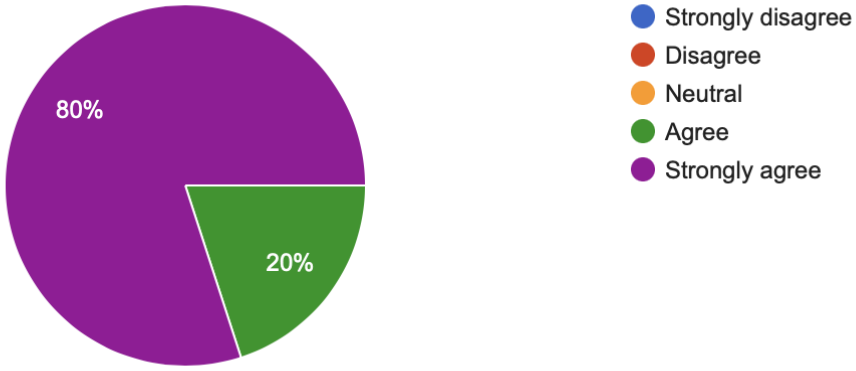


Figure 8: B8

9. The organization has well-defined digital strategy

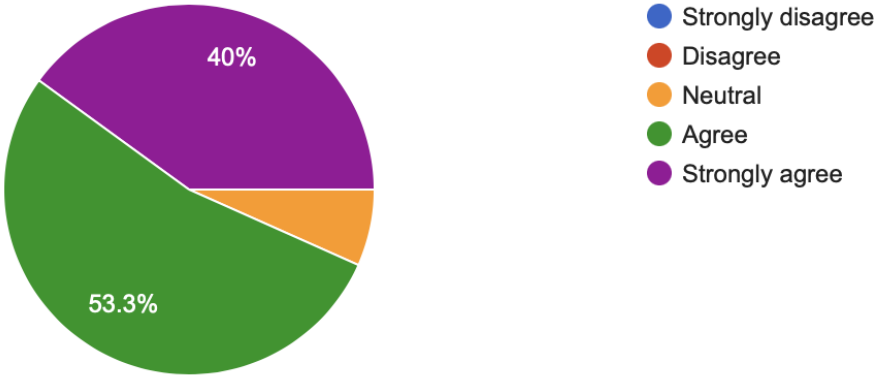


Figure 9: B9

10. Operation of people in the organization could be significantly changed by digital technologies

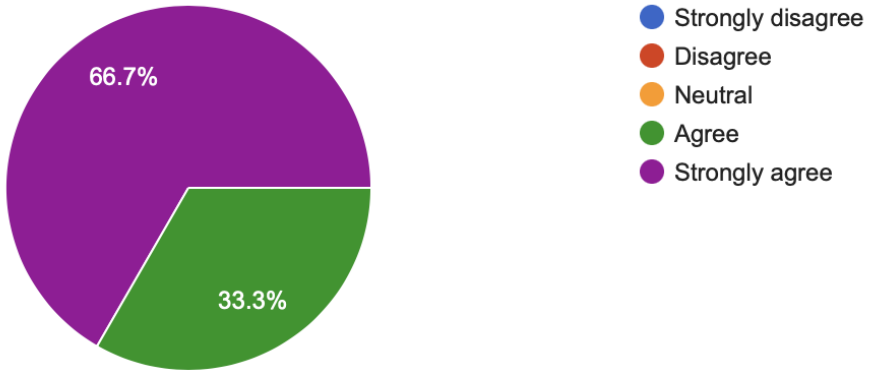


Figure 10: B10

11. Digital technologies utilize by the organization

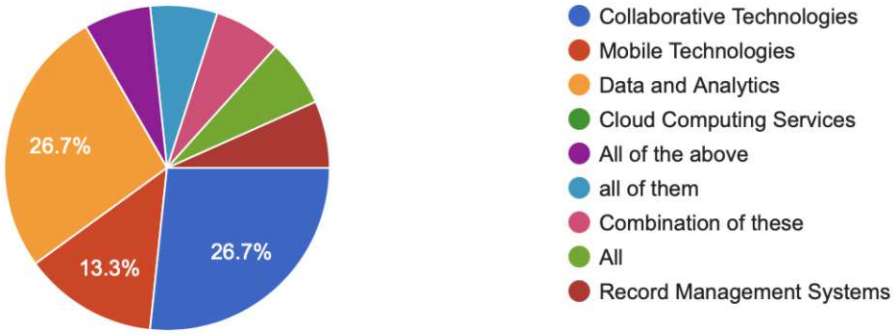


Figure 11: B11

12. To what extent have digital technologies disrupted the industry (1= Small and 5= Great extent)?

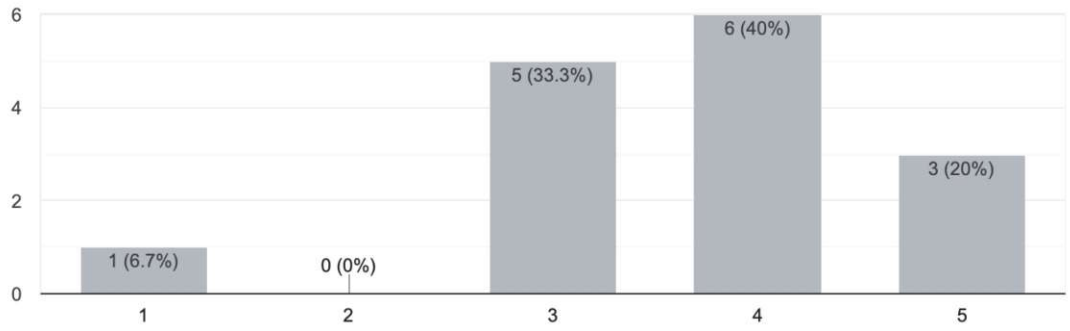


Figure 12: B12

13. I am satisfied with my organization's current reaction to digital trends

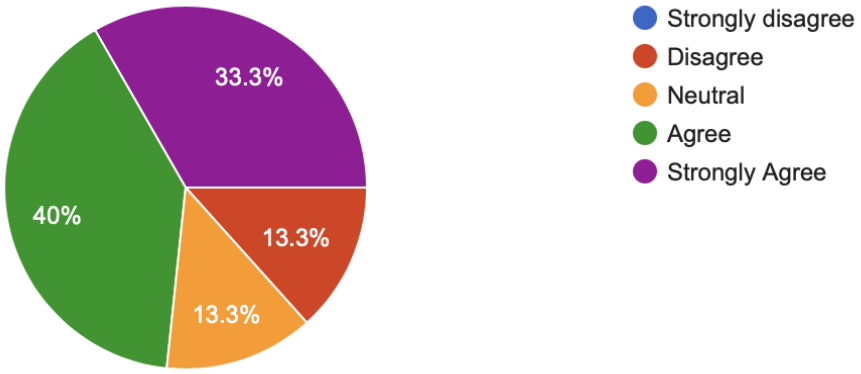


Figure 13: B13

14. I am optimistic about my organization's readiness to respond to digital trends

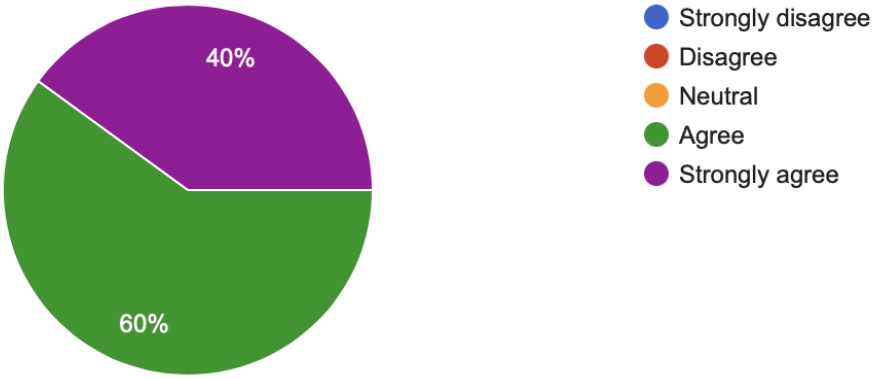


Figure 14: B14

15. What barriers are impeding your organization from taking advantage of digital trends

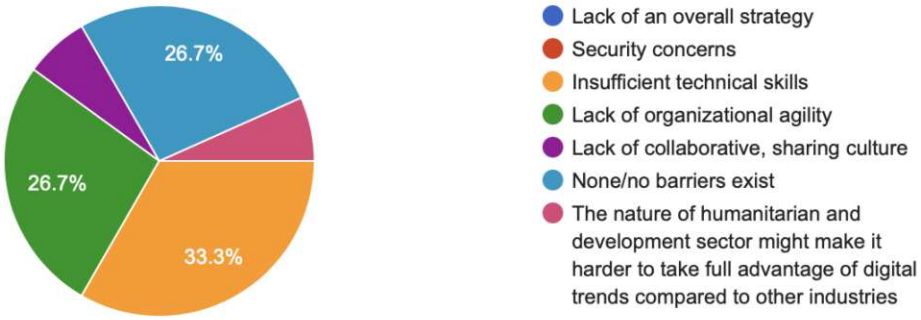


Figure 15: B15

16. Does any single person or group have the responsibility for overseeing/managing your organization's digital strategy?

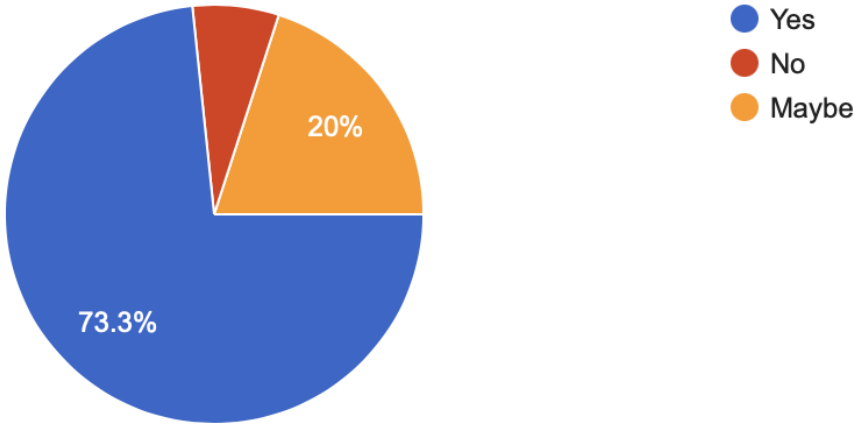


Figure 16: B16

17. How is your organization implementing digital initiatives?

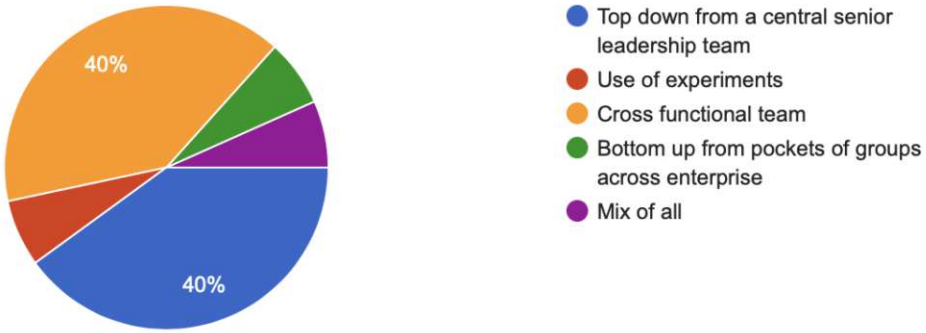


Figure 17: B17

18. My organization provides me or my co-workers with the resources or opportunities to obtain the right skills to take advantage of digital trends.

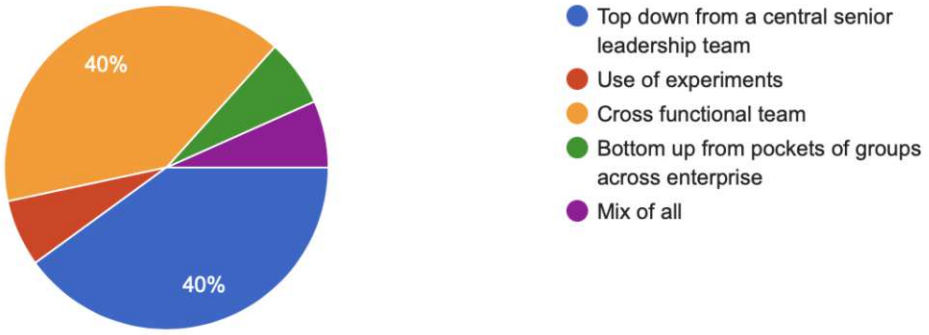


Figure 18: B18

19. How important to you is it to work for an organization that is digitally enabled or is a digital leader?

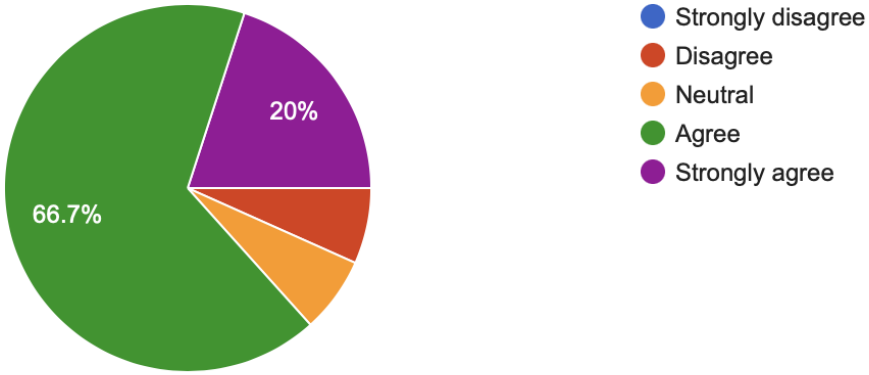


Figure 19: B19