

Bridging Contextual Conditions and the Digital Divide

Professor Joseph Amankwah-Amoah*

Durham University Business School

Durham University, Mill Hill Lane,

Durham, DH1 3LB, UK

E-mail: joseph.amankwah-amoah@durham.ac.uk

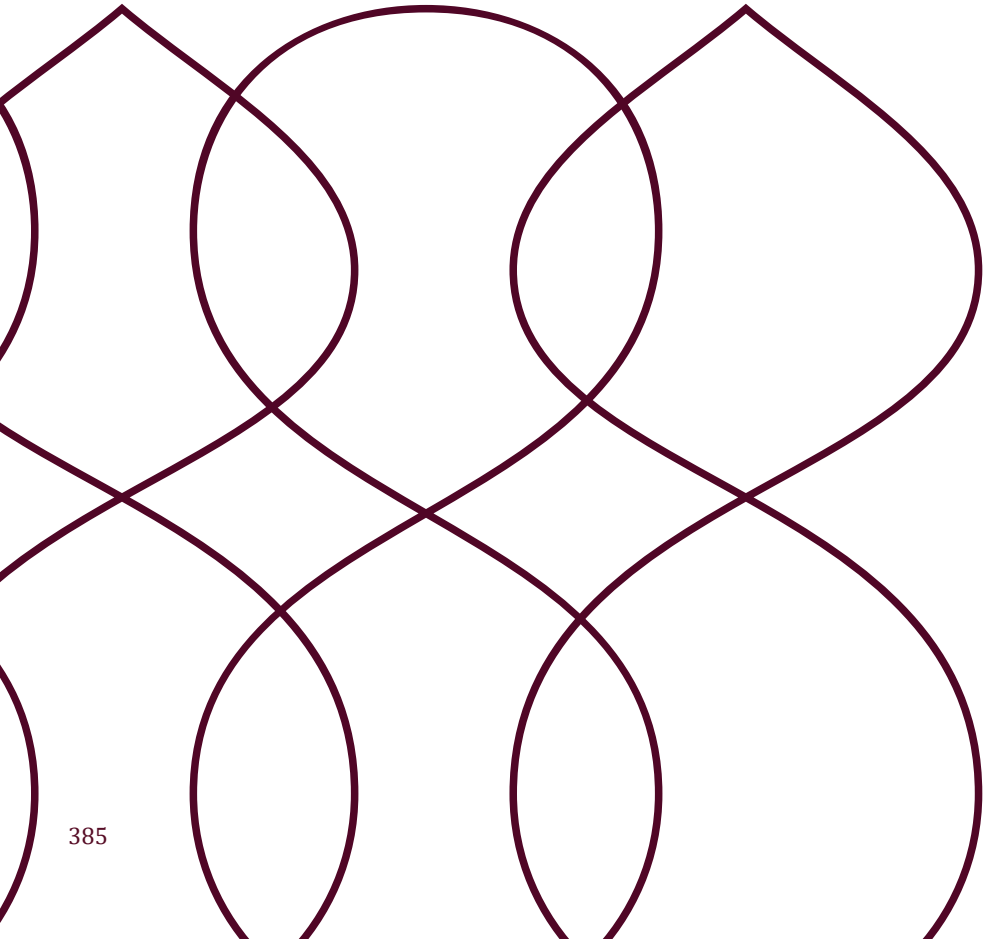
***Corresponding author**

Abstract:

Despite a growing body of research on digital transformations much of the literature remains fragmented and provides limited insight into how contextual conditions shape digital transformation processes. Integrating studies on contextual conditions with research on digital transformation, this paper develops an organizing framework that delineates the dual and differential effects of digital technologies specifically, digital dividends and digital deficits. This further illuminates the environmental conditions under which contextual factors facilitate or impede digital transformation efforts. By conceptualizing contextual conditions (i.e., WEIRD versus non-WEIRD contexts) alongside the dynamics of digital development (i.e., digital inclusion versus digital exclusion), we identify several interconnected and transformative research themes: the urban–rural digital divide, the affordability gap, the gender digital divide, digital globalization, and the decline of legacy industries. Collectively, these themes inform a research agenda designed to bridge theory and practice. The paper concludes by discussing practical implications and outlining directions for future research.

Keywords:

developing countries; digital dividends; digital transformation; digital; technologies; digital innovations..



1. Introduction:

Over the past two decades, digital technologies (DTs) including smart mobile devices, cloud computing, and artificial intelligence (AI) have become indispensable for developing and sustaining competitive advantage across organizations worldwide (World Bank, 2016; Timotheou et al., 2023; Ancillai et al., 2023; Park and Humphry, 2019). These technologies have frequently rendered existing business models and established competitive tools obsolete, displacing numerous incumbent firms (Ancillai et al., 2023). Although DTs and technological breakthroughs are widely recognized as major disruptors across industries (Ancillai et al., 2023; Amankwah-Amoah et al., 2021; Currie et al., 2024), the extant literature remains fragmented, offering limited conceptualizations that adequately account for the effects of contextual conditions such as weak versus strong institutional environments. Prior research underscores the significance of digital transformation for national development and progress (Qureshi, 2023; ElMassah and Mohieldin, 2020).

Although earlier studies have advanced understanding of both diverse market and institutional contexts (Johns, 2024; North, 1990) and the dynamics of digital transformation (Kraus et al., 2021; Vial, 2019), these streams of research have largely evolved in isolation. This disciplinary separation has hindered holistic scholarly comprehension of digital transformation phenomena. The problem is further exacerbated by a prevalent perception among scholars that “context-free” research is inherently more scientific than context-specific inquiry (Johns, 2024; Blair and Hunt, 1986). Despite context’s pivotal importance, scholars across the social sciences have historically downplayed its influence on organizational decisions and societal outcomes (Johns, 2006, 2017, 2024). Against this backdrop, the present study examines the effects of contextual conditions on digital transformation. This current fragmented literature necessitates new conceptualization.

This study integrates contextual conditions specifically, WEIRD (Western, Educated, Industrialized, Rich, Democratic) versus non-WEIRD contexts with the differential and dual effects of digital technologies, namely digital inclusion and digital exclusion (Muthukrishna et al., 2020; Henrich et al., 2010a, 2010b; Cavusgil et al., 2020). The tendency to downplay context is intensified by rapid changes in the global economy, which require revisions to foundational assumptions to better reflect modern realities. The rel-

evance of non-WEIRD contexts is underscored by demographic projections: by 2050, Asia's population is expected to reach approximately 5.28 billion (about 54.64% of the world's population), up from 1.37 billion (54.87%) in 1950; Africa's population is projected to rise to 2.47 billion (25.52%), compared with 230 million (9.14%) in 1950; Europe's share is forecast to decline sharply from 548 million (22.02%) in 1950 to 7% by 2050 (Worldometers, 2025). At the country level, many Western nations are expected to experience population declines, while the global population is projected to reach 10 billion by 2060 (Worldometers, 2025). These trends underscore the critical necessity of incorporating both WEIRD and non-WEIRD contexts in the scholarly inquiry.

This study makes several important contributions to the literature. First, although prior research has provided valuable insights into the effects of new technologies (Ancillai et al., 2023; Meyer, Li, and Brouters, 2023), there remains a pressing need to integrate contextual conditions into the discourse on digital transformation. Building on and extending recent scholarly debates on DTs (Meyer et al., 2023; Cherbib et al., 2021; Hanelt et al., 2021), this study proposes an organizing framework that integrates contextual conditions (i.e., WEIRD versus non-WEIRD contexts) with the differential and dual effects of DTs. Moreover, while existing studies have predominantly emphasized the beneficial outcomes of DT adoption, they often overlook the conditions under which these effects vary. This study addresses this blind spot by articulating a novel typology that advances understanding of the dynamic interplay between DTs and their capacity to generate meaningful social impacts worldwide.

The remainder of the article is organized as follows. Section 2 reviews the relevant literature on context. Section 3 focuses specifically on digital transformation in context. Section 4 delineates the key pillars of the conceptual framework. Section 5 examines the interrelated issues across the four quadrants of the framework. Finally, Section 6 summarizes the conclusions and discusses theoretical and practical implications, as well as directions for future research.

2. Conceptualizing Contextual conditions

The conceptualization is grounded in the literature on context and digital transformation.

2.1. Contextual conditions

Essentially, context is an omnipresent force permeating all scholarly fields (Kahiya, 2020; Johns, 2024). As Mowday and Sutton (1993, p. 198) observed, context can be understood as “stimuli and phenomena that surround and thus exist in the environment external to the individual, most often at a different level of analysis.” Similarly, Johns (2006, pp. 386–408) defined context as “situational opportunities and constraints that affect the occurrence and meaning of organizational behavior as well as functional relationships between variables.” An emerging and expanding body of research identifies context as an essential lens through which leaders interpret opportunities and challenges in the marketplace (Daft and Marcic, 2001; Johns, 2001, 2025). It is well documented that context provides the necessary conditions to explain variations in organizational, policy, and individual actions and their outcomes (Johns, 2006). Thus, context is not merely a backdrop but plays a crucial role in elucidating why certain outcomes emerge within the social sciences (Cappelli and Sherer, 1991; Johns, 2006). Nevertheless, many researchers have perceived context-free research as inherently more scientific than context-specific investigations (Blair and Hunt, 1986). As reflected in institutional theory, context illuminates both formal institutional conditions, such as regulations and legal systems, and informal institutional conditions, including norms, culture, and beliefs (North, 1990).

Within the institutional literature (North, 1990), studies reveal that countries exhibit diverse contextual features—such as weak law enforcement, unstable political leadership, and regulatory ambiguity—which constitute pivotal characteristics of developing economies (Liedong, Peparah, Amartey, and Rajwani, 2020). Recent research further indicates that developing economies are marked by absent or inefficient market-supporting institutions, limited governmental checks and balances, and bureaucratic structures that contrast starkly with those prevalent in many developed economies (Cavusgil, Knight, and Riesenberger, 2020; Hill, 2008; Liedong et al., 2020). By contrast, advanced economies are characterized by high per capita income, highly competitive industries, relatively limited government intervention in business, and well-developed commercial infrastructures (Cavusgil et al., 2020; Hill, 2008).

Building on the framework proposed by Henrich, Heine, and Norenzayan (2010a, 2010b), we categorize countries' contexts and stages of economic development into two broad

groups: WEIRD and non-WEIRD. WEIRD—an acronym for Western, Educated, Industrialized, Rich, and Democratic—contexts are characterized by high levels of formality, strong formal institutional structures, and market-based, liberalized economies. In contrast, non-WEIRD contexts are typified by institutional dysfunctions, including weak governance, inadequate transport infrastructure, and insufficient legal enforcement mechanisms (Henrich et al., 2010a, 2010b; Cavusgil et al., 2020; Julian and Ofori² Dankwa, 2013; Khanna and Palepu, 1999, 2005). In this regard, WEIRD contexts possess well-established broadband networks, advanced digital infrastructures that facilitate the adoption of new technologies, high levels of digital literacy, and regulatory frameworks conducive to technological advancement. High-speed broadband in many urban and suburban areas within WEIRD contexts often creates an enabling environment for innovation and entrepreneurial activities that extend beyond national borders. Bolstered by public investment in education and elevated digital literacy, developed nations have generally secured a competitive advantage over developing countries in generating the conditions necessary for sustained development. Additionally, WEIRD contexts feature competitive industries and robust technology markets that foster innovation and entrepreneurship. Conversely, institutional dysfunctions in developing countries exacerbate digital deficits by impeding the development of critical infrastructure and governance conditions essential for digital transformation. Furthermore, inadequate infrastructure—including limited internet access and scarce digital devices—restricts digital participation. Table 1 presents multiple theoretical perspectives on context relevant to these conceptualizations.

Table 1: Multiple theoretical perspectives on context

Perspectives of context	Core Concepts and arguments	Key Insights and takeaways for the conceptualization
<p>General literature on context (Johns, 2001, 2006)</p>	<ul style="list-style-type: none"> It contends context as an omnipresent force and a salient feature in the situational and organizational setting of actions and managerial decisions. 	<ul style="list-style-type: none"> Provides the grounding and insights for understanding the effects of digital technologies on organizations and wider society.
<p>Institutional theory (North, 1990; Scott, 1995)</p>	<ul style="list-style-type: none"> Institutions are seen as the “rules of the game in a society” (North, 1990, p. 3). Formal and informal institutional structures viewed to explain differences in countries’ business climates conducive for technology adoption. 	<ul style="list-style-type: none"> Focus on dysfunctions of institutions as key barriers to improving access to new technologies. Sheds lights on institutional conditions conducive for new technology adoption.
<p>Industry-based theory (Porter, 1980)</p>	<ul style="list-style-type: none"> Industry conditions, such as competition and demand, can determine the adoption or lack of adoption of digital technology. 	<ul style="list-style-type: none"> Industry conditions and standards such as competition, market entry barriers and demands can play vital roles in technology adoption efforts. Focuses on the roles of new technologies in transforming lives, configuring firms’ activities, and driving innovation.

2.2 Linking Digital Transformation and Contextual Conditions

The concept of the digital divide encompasses issues related to access, skills, and usage (Connolly, Costa-Font, and Srivastava, 2025; Adam and Dzang Alhassan, 2021; Venkatesh and Sykes, 2013). Some scholars define digital human capital as “the knowledge, skills, and abilities of individuals regarding digital technologies such as software coding, AI, or machine learning” (Grimpe, Sofka, and Kaiser, 2023, p. 657). Extant research suggests that digital literacy—which includes computer skills and the ability to use the internet and social media effectively—emerges as a critical factor for future economic development (Park, 2017b; Park and Humphry, 2019). Building on prior studies (Grimpe, Sofka, and Kaiser, 2023; World Bank, 2016; Vu and Asongu, 2023), we argue that two concurrent phenomena underpin modern digital transformation: digital dividends and digital deficits. Unlike the traditional notion of dividends, which is closely tied to financial returns on investments, digital dividends arise from leveraging intangible assets associated with adopting and utilizing digital and emerging technologies (World Bank, 2016; Vu and Asongu, 2023). These benefits include improved access to information and expanded market opportunities, which are further amplified by the scalability of digital assets across borders.

According to the World Development Report, digital dividends result from advantages gained through the use of digital technologies and manifest in various forms, including economic growth, new employment opportunities, and enhanced service delivery for society at large (World Bank, 2016). The concept of digital dividends underscores opportunities to enhance business and governmental efficiency through automating routine procedures, mobilizing and utilizing data, and reducing costs by eliminating resource-intensive manual operations. The adoption of such technologies enables the generation and analysis of high-quality data to inform decision-making, driving business improvements and allowing for the customization of products and services. Embedded within digital infrastructure—such as cloud computing and data analytics—are opportunities for firms to process large datasets, base decisions on robust evidence, tailor products to specific customer needs, and optimize customer service delivery. By contrast, digital deficits reflect structural challenges, technological infrastructure constraints, and institutional barriers that hinder businesses, managers, and executives from capturing the value and benefits inherent in adopting digital technologies (World Bank, 2016; Vu and Asongu, 2023).

3. Digital transformation in context :

In a highly competitive field marked by the rapid development and dissemination of cutting-edge technological innovations and artificial intelligence (AI) models (Kanazawa, Kawaguchi, Shigeoka, and Watanabe, 2025), the ability to outperform rival firms appears to yield only temporary market advantages (Amankwah-Amoah and Appiah, 2025; Li, 2025; Tewari, 2025; Davern and Pinnuck, 2025). These pressures are further compounded by institutional and resource constraints across multiple industries and markets worldwide (Li, 2025). The rise of digital technologies (DTs) has fostered the adoption of digital innovations such as 3D printing for rapid prototyping, smart healthcare devices, biometric security products, and smart solar panels. For example, in the global airline industry, DTs—such as mobile boarding passes, biometric check-in and boarding, and digital twin technology—have transformed airlines' cost structures (Timotheou et al., 2023). These advancements have reduced operational costs, improved security procedures, eliminated paperwork, and enhanced customer experiences. Research also demonstrates that technological advances have enabled firms to mobilize and utilize text, images, and audio to improve decision quality and enhance access to information and knowledge (Fui-Hoon Nah et al., 2023; Lim et al., 2023). Recent studies indicate that generative AI has the potential to undermine incumbent firms' competitiveness by eroding their capabilities (Amankwah-Amoah et al., 2024; Fui-Hoon Nah et al., 2023). A critical feature of this landscape is the fast-changing competitive environment ushered in by DTs.

Over recent decades, the speed of technology diffusion has accelerated, with newer technologies being adopted more rapidly than their predecessors (Comin and Hobijn, 2004; Currie, Weerakkody, and Van Vliet, 2024; You et al., 2019). In the 1800s, it could take as long as 100 years for a new technology to diffuse to 80 percent of the world's countries; by contrast, modern technologies now reach this level of adoption within 20 years (Comin and Hobijn, 2004; World Bank, 2008). Technological breakthroughs coupled with the accelerated pace of global diffusion, have contributed to the decline of industries such as newspaper publishing, record stores, mills, apparel manufacturing, recordable media manufacturing, and appliance repair. In today's knowledge-based economy, data has emerged as a "non-depletable" asset, prompting many nations to allocate resources toward developing digital platforms and capabilities to harness the new data economy (World Bank, 2016). This "data economy" demands capabilities to capture, store, transfer,

analyze, trade, and sell data through DTs (United Nations, 2024). Indeed, the five largest firms in the data economy—Amazon, Apple, Facebook, Google, and Microsoft—had a combined market value nearing \$4 trillion in 2018 (United Nations, 2024).

Within the broader domain of AI, generative AI employs advanced machine learning models to generate content—including text, images, audio, video, and code—by learning patterns and structures embedded in existing data (Lim et al., 2023). The emerging competitive landscape is exemplified by AI systems such as OpenAI's ChatGPT, Google's Gemini, Anthropic's Claude, and, more recently, DeepSeek-R1, introduced in early 2025 (Tewari, 2025; Davern and Pinnuck, 2025; Li, 2025). A distinguishing characteristic of generative AI models is their ability to produce outputs that emulate the data or information used in their training, reflecting elements of human creativity and novelty (Fui-Hoon Nah et al., 2023). Beyond replicating patterns from training data, generative AI models also synthesize knowledge combinations, generating novel insights.

Table 2: Contextual differences in digital technology adoption

Contextual conditions	Data Dividends (WEIRD Context) (e.g., Australia, Canada, Japan, United States, and Western European countries)	Digital Deficits (Non-WEIRD Context) - Global South or emerging economies
Western	<ul style="list-style-type: none"> • High level of investments in technology infrastructure, such as broadband internet access and data centers. • Home countries of major digital technology giants such as Google and Amazon, driving significant changes and financial investments. 	<ul style="list-style-type: none"> • Emerging markets are generally characterized by institutional dysfunction such as burdensome rules, and excessive requirements for licenses and approvals (Khanna & Palepu, 1999, 2005). Non-Western nations tend to lag behind advanced economies in terms of data infrastructure, with some notable exceptions such as China and India.
Educated	<ul style="list-style-type: none"> • High investment in technology education coupled with highly educated populations. 	<ul style="list-style-type: none"> • Lack of technical skills and expertise hampers businesses and governments' ability to leverage digital technologies. • Progress tends to be impeded by limited high-end expertise in data science.
Industrialized	<ul style="list-style-type: none"> • Characterized by highly competitive industries and transitioned or transitioning from predominantly manufacturing to service-based economies. 	<ul style="list-style-type: none"> • Burgeoning manufacturing based and rapid pace of industrialization. • Developing economies, including many in Africa, face major barriers such as inadequate transport infrastructure, unreliable internet connectivity, and a lack of government support for the rapid adoption and scaling up of digital devices.
Rich	<ul style="list-style-type: none"> • Wealthier nations tend to have higher GDP per capita income, industrialization and higher level of R&D. 	<ul style="list-style-type: none"> • Epitomized by low-income countries, low formal employment, limited/rapid pace of industrialization and higher poverty rates.

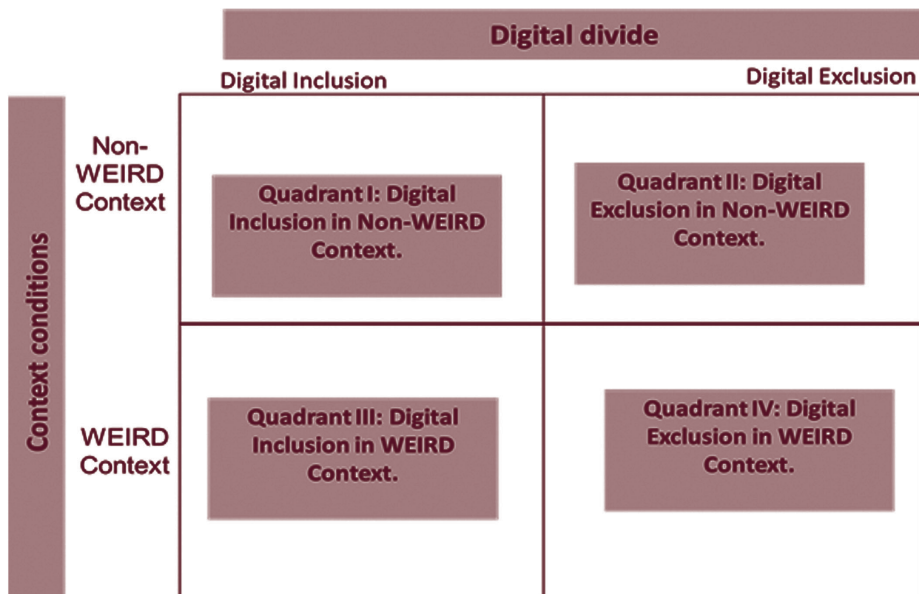
<p>Contextual conditions</p>	<p>Data Dividends (WEIRD Context) (e.g., Australia, Canada, Japan, United States, and Western European countries)</p> <ul style="list-style-type: none"> • Largely enjoy political stability and multiparty systems. • Democratic governance, which pertains to open data and the protection of digital rights, is another key factor. 	<p>Digital Deficits (Non-WEIRD Context) - Global South or emerging economies</p> <ul style="list-style-type: none"> • Weak governance, inadequate regulatory frameworks and poor protection of digital rights can impede digital access.
<p>Democratic</p>		

4. An Organizing Framework:

To develop a comprehensive framework reconciling two seemingly opposing conditions, we propose two critical dimensions: digital transformation and contextual conditions. Specifically, we distinguish between digital inclusion and digital exclusion, as well as between WEIRD (Western, Educated, Industrialized, Rich, and Democratic) and non-WEIRD contexts. Broadly, digital inclusion emphasizes policies and initiatives designed to facilitate equitable access to digital technologies and the associated market opportunities (Asongu et al., 2024). Consequently, underserved or marginalized groups are progressively integrated into broader adoption efforts (Buys et al., 2009).

Digital inclusion entails integrating all individuals and communities into the digital economy, regardless of socioeconomic status, cost, geographic location, or other potential barriers (see, Asongu et al., 2024; Hsieh et al., 2011; Hilbert, 2010). In contrast, digital exclusion demonstrates the disparity between individuals, communities, or groups with access to digital technologies and those without (see, Hsieh et al., 2011; Buys et al., 2009). Conversely, digital exclusion encompasses the barriers that impede the adoption and utilization of new technologies or prevent individuals from accessing and benefiting from digital advancements (Park and Humphry, 2019). Table 2 outlines additional characteristics and contextual conditions. Crossing these pillars yields a 2×2 matrix of cross-border digital transformations, reflecting the effects of varying contextual conditions (see Figure 1). The digital inclusion literature inherently emphasizes two critical dimensions: the digital divide and digital inequalities (Van Dijk, 2005; Wagg and Simeonova, 2022). Scholars have underscored that digital inclusion initiatives encompass affordable access to digital skills development, technologies, and digital devices (Park, Freeman, and Middleton, 2019; Wagg and Simeonova, 2022).

Figure 1: Dimensions of digital transformations



4.1. Quadrant I: Digital Inclusion in Non-WEIRD Context

Quadrant I represents digital inclusion within a non-WEIRD context. This quadrant is characterized by persistent underinvestment in broadband infrastructure development and limited access to digital technology (Cirera, Pacchioni, and Maloney, 2017; Ing and Rodrik, 2025), which contributes to many developing countries lagging behind advanced economies. Additionally, it features low internet penetration and poor digital literacy in rural and marginalized communities. As documented in the literature, non-WEIRD contexts frequently experience limited or intermittent broadband and mobile coverage in rural areas, weak regulatory frameworks concerning data protection and consumer rights, and underdeveloped transportation and telecommunications networks. These factors collectively constrain the pace of economic development and hinder efforts toward digital inclusion.

4.2. Quadrant II: Digital Exclusion in Non-WEIRD Context

Quadrant II captures digital exclusion in a non-WEIRD context, characterized by urban-rural and gender-based disparities in access to formal education, which frequently marginalize rural and low-income populations. Building on prior research addressing unequal access to information and communication technologies globally (Hsieh, Rai, and Keil, 2011), this quadrant highlights accessibility gaps and disparities in knowledge and resource acquisition (Venkatesh and Sykes, 2013), resulting in many citizens and businesses operating outside the digital economy. These conditions further impede the delivery of financial services, thereby obstructing financial inclusion (Agarwal and Asenovna, 2024). Due to historical underinvestment in training, education, new technologies, and technological infrastructure, digital exclusion persists across the Global South. In non-WEIRD contexts, digital exclusion often stems from a lack of physical access to digital technologies (Adam and Dzang Alhassan, 2021). Alongside support from multinational enterprises and local firms, the World Bank actively finances large-scale ICT infrastructure projects (World Bank, 2025). These initiatives include building networks, expanding internet access, and upgrading telecommunications systems through the Information and Communication Technology for Development (ICT4D) program (World Bank, 2025). In essence, both public and private organizations are increasingly involved in efforts to bridge the digital divide in countries such as China and India (Venkatesh and Sykes, 2013). Nevertheless, due to resource and capacity constraints, digital exclusion persists in underserved and isolated communities.

4.3. Quadrant III: Digital Inclusion in WEIRD Context

Quadrant III represents digital inclusion within a WEIRD context, characterized by conditions such as high-quality infrastructure, access to high-speed internet, elevated rates of digital literacy, and the availability of digital public services. Furthermore, WEIRD contexts tend to exhibit widespread, high-quality deployment and national coverage of fifth-generation (5G) cellular network technology. As observed by Gritsenko (2024, 106392),

“To date, the global digital landscape is dominated by private technology companies and a few governments of technologically advanced countries, while less developed countries and civil society actors effectively have no voice.”

In addition, industrialized economies generally possess robust entrepreneurship ecosystems, supported by advanced digital infrastructures and the broad accessibility of digital and smart devices. For example, Espin and Rojas (2024) highlight that affordability policies—such as subsidies—in the United States have significantly contributed to narrowing the digital divide, complementing infrastructure deployment initiatives aimed at expanding coverage.

4.4. Quadrant IV: Digital Exclusion in WEIRD Context

Quadrant IV illustrates digital exclusion within a WEIRD context and encompasses a diverse array of conditions, including the barriers encountered by low-income individuals and marginalized communities, limited access to high-quality internet, and low levels of digital literacy. This quadrant further captures the various types of digital divides and marginalization experienced by underserved groups, manifesting as disparities in access to digital resources and skills. Even in developed economies such as the United States and the United Kingdom, a persistent gap remains between connected and unconnected households, as well as among individuals across different income brackets (Espin and Rojas, 2024; Pew Research Center, 2021). For example, in the United States, the digital divide endures, with lower-income Americans trailing in technology adoption. According to Pew Research Center (2021), adults in households with annual incomes below \$30,000 frequently lack smartphone ownership. Furthermore, approximately 43% of adults in this income group do not have home broadband access, and 41% do not own a desktop or laptop computer (Pew Research Center, 2021). Consequently, the digital experiences of Americans in lower- and higher-income groups remain markedly divergent. Additionally, significant segments of the aging population lack up-to-date digital skills. Accordingly, governments typically implement digital inclusion policies aimed at integrating socioeconomically disadvantaged (SED) populations into the digital economy through targeted support and subsidies.

5. Themes Connecting The Quadrants:

Across diverse contexts, a set of distinct yet interconnected dimensions emerges, challenging prevailing assumptions while simultaneously presenting promising opportunities to advance current scholarly discourse. The cross-quadrant research themes include the urban-rural digital divide, the affordability gap and access divide, and the gender digital divide. These interconnected themes are essential for the progression of scholarship.

5.1. Urban-rural digital divide

One of the primary cross-disciplinary research themes is encapsulated in the urban-rural digital divide (Quadrants II and IV). Compared to urban populations worldwide, rural populations frequently encounter significant barriers to digital access, including limited or nonexistent high-speed internet and infrastructure, inadequate telecommunications, and restricted availability of digital services. Of the 2.6 billion people who do not use the Internet, 1.8 billion reside in rural areas, whereas 800 million live in urban settings (International Telecommunication Union, 2024). These deficits impede both economic development and social activity. In many countries, economic and social disparities are manifest within this divide. In 2024, over 80% of urban residents use the Internet, compared to approximately 48% of those living in rural areas (International Telecommunication Union, 2024). Across the developing world, rural access to high-speed broadband is often unreliable or entirely absent, constraining individuals' capacity to engage in education and other online activities. This situation reflects multiple factors, including disparities in digital literacy, as well as differences in technology adoption and utilization. Digital exclusion disproportionately affects marginalized groups, particularly those in rural areas marked by poor infrastructure, such as the absence of broadband services and inadequate connectivity. As demonstrated by PwC (2016), expanding global internet inclusion could lift approximately 7% of the world's population out of absolute poverty and increase global economic output by an estimated US\$6.7 trillion. Moreover, in rural regions of low-income countries, digital exclusion remains pervasive, with roughly 30% of the population lacking internet access (International Telecommunication Union, 2024). The issue is further exacerbated by the pronounced underdevelopment character-

istic of these areas (Quadrants II and IV). One consequence of these digital deficits is the deepening of inequalities and the exclusion of minority and underserved communities from fully leveraging new technologies to enhance their access to resources, employment, and market opportunities.

6.2. Affordability Gap

Another key issue is the affordability gap (Quadrants II and IV). Developing economies face numerous challenges, including underdeveloped digital infrastructure, limited access to affordable connectivity, and inadequate regulatory and policy environments. Infrastructure deficits—such as the absence of physical assets like broadband networks, mobile towers, and electricity grids—constitute critical constraints that hinder the development and scaling of digital connectivity (Quadrants I and II). Moreover, the affordability gap between highly advanced and minimally digitally connected countries has restricted low-income nations' ability to access digital technologies (DTs) and improve living standards (International Telecommunication Union, 2024). Regarding access quality, approximately 84% of the population in high-income countries has 5G connectivity, whereas only about 4% of the population in developing low-income countries enjoys similar access (International Telecommunication Union, 2024). For example, between 2023 and 2024, the cost of mobile internet in Africa rose to 12 to 14 times that of Europe, thereby impeding access to DTs (International Telecommunication Union, 2024). Over the past two decades, Africa's population has grown to 1.53 billion, representing roughly 18.6% of the world's population; this figure is projected to increase to approximately 2.1 billion by 2040 and 2.47 billion by 2050, accounting for around 25.5% of the global population (Worldometers, 2024).

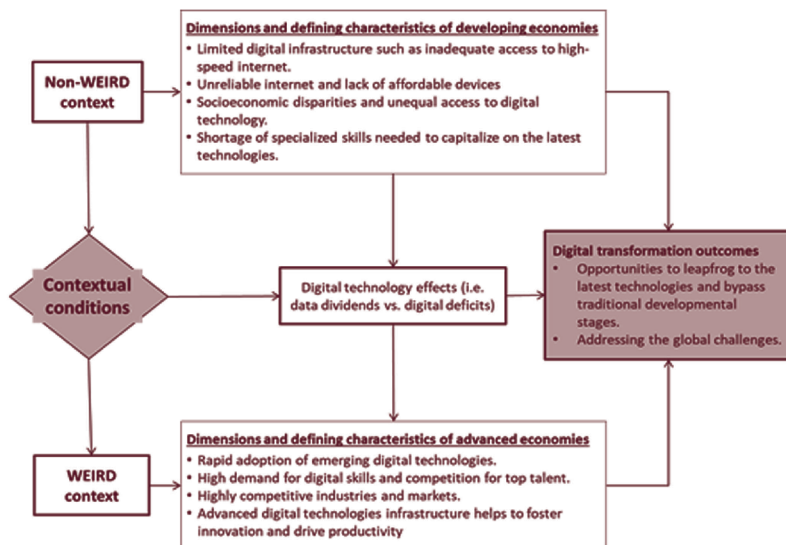
Between 2019 and 2022, approximately 160 million Africans gained broadband internet access, and between 2014 and 2021, 191 million more individuals made or received digital payments (World Bank, 2024). In 2021, roughly 89% of people in sub-Saharan Africa (SSA) lived in areas with 3G service availability, while about 60% had access to 4G mobile coverage (World Bank, 2024). However, in the same year, approximately 470 million individuals in SSA lacked proof of identification, which prevented them from benefiting from government services and activities (World Bank, 2024). Recent analyses indicate that the digital divide has been exacerbated by the high cost of accessing

digital technologies and devices, contributing to the underdevelopment of marginalized and impoverished communities. Between 2016 and 2021, coastal and island nations such as Sierra Leone, Senegal, Côte d'Ivoire, and Togo gained access to new submarine internet cables (World Bank, 2024). Nonetheless, persistent deficiencies in digital infrastructure continue to impede workers' access to remote and flexible employment opportunities.

6.3. Gender digital divide

Another prominent theme concerns the gender digital divide (Quadrants II and IV). Despite the potential benefits of harnessing digital technologies (DTs), this divide persists. Globally, in 2024, approximately 70% of men use the Internet compared to 65% of women (International Telecommunication Union, 2024). In absolute terms, this difference corresponds to roughly 189 million more men than women accessing the Internet—a notable decrease from 277 million in 2021 (International Telecommunication Union, 2024). These figures reflect increasing efforts in developing regions to expand Internet access and targeted initiatives aimed at improving connectivity in rural areas worldwide. As the International Telecommunication Union (2024) observes, achieving gender parity in Internet use can substantially contribute to advancing development across countries. It is noteworthy that developed nations in the Americas and Europe have attained gender parity in Internet usage (International Telecommunication Union, 2024). Nevertheless, despite hundreds of millions gaining Internet access and the proliferation of digital services such as mobile payments and online learning platforms, Africa continues to confront significant challenges. Among these challenges is the limited inclusion of minorities and women in the labor force, a critical factor for fostering economic development (World Bank, 2024). Drawing on this analysis, Figure 2 presents a unified model of the challenges reflected across the quadrants.

Figure 2: Mapping the pathways to outcomes



6. Discussion and implications :

Building upon the literature on context (Johns, 2006; Amankwah-Amoah and Hinson, 2019) and digital transformations (Hanelt et al., 2021; Mühlburger, and Krumay, 2024), this paper proposes an organizing framework (Figure 1) that elucidates how varying contextual conditions differentially influence digital technologies. The 2 x 2 typology offers novel insights into how these contextual factors shape the dynamics and differential effects of digital technologies. Each quadrant highlights the dynamics of digital development efforts—namely, digital inclusion versus digital exclusion—as well as the complex institutional and structural challenges associated with contextual conditions, such as WEIRD versus Non-WEIRD settings. These challenges include underdeveloped digital infrastructure, limited access to affordable connectivity, and inadequate regulatory and policy environments. The insights derived from the four quadrants reveal several transformative and transcendent research themes: the urban-rural digital divide, the affordability gap, and the gender digital divide.

Quadrants I and III demonstrated that digital inclusion extend beyond the mere provision of ICTs, devices, or internet access to include targeted measures designed to address the specific needs of diverse and marginalized populations. Accordingly, this reflected the alignment of key components—such as access to devices, digital skills, affordability, and usability—with broader societal needs. In contrast, Quadrants II and IV highlighted barriers that go beyond access to technology, encompassing interrelated structural inhibitors, including socioeconomic disadvantage, geographic isolation, and institutional constraints. These impediments including as high costs, limited digital literacy, and inadequate or absent telecommunications infrastructure significantly reduce opportunities for participation in the global digital economy. The framework integrated insights of approach to promoting equitable, inclusive, and sustainable access to digital technologies. Thus, the integration of all individuals and communities into the digital landscape, irrespective of background or location appear vital for today's digital global economy.

6.1: Contributions to theory

Several theoretical contributions emerge from this analysis. First, although prior research has made significant strides in elucidating institutions (Khanna and Palepu, 1999, 2005), a critical gap remains in understanding how institutional conditions as contextual factors influence digital transformations. This study builds on and extends the existing literature on context (Johns, 2006, 2024; North, 1990) by examining how variations in institutional strength—specifically weak versus strong institutional conditions—affect the differential impacts of digital technologies. Furthermore, despite well-documented evidence highlighting the importance of context (Johns, 2001), scholarly discourse remains fragmented across multiple disciplines. Although growing academic interest in DTs has yielded valuable insights (Kraus et al., 2021; Timotheou et al., 2023; You et al., 2019), this has also produced divergent and fragmented research streams on the topic. By synthesizing two previously disconnected bodies of literature, this article offers an integrative framework to understand the nexus between institutional effects and digital transformations. The study addresses fragmentation in the extant literature by developing a 2×2 matrix that both organizes and extends prior work while revealing new avenues for exploring the intersection of digital transformation and contextual institutional conditions.

6.2. Contributions to practice and future research agenda

Notwithstanding the analysis, several recommendations emerge for practitioners. First, the findings highlight the imperative of investing in the enhancement of workers' digital skills and the development of digital infrastructures to meet future demands. In developing economies, government support and subsidies for digital skills acquisition, alongside investments in broadband networks targeting underserved communities, are essential to improve connectivity, accessibility, and affordability. The analysis further underscores that effectively addressing digital exclusion necessitates multi-stakeholder collaboration involving governments, industry bodies, small and medium-sized enterprises (SMEs), and multinational enterprises (MNEs). Such collaboration is critical for fostering skill development and expanding access to digital technologies. This effort must be complemented by targeted financial investments in digital infrastructure to enhance affordability and bridge the various digital divides discussed above. In sum, although prior research offers valuable insights into digital transformations, it remains insufficient in explicating the effects of contextual conditions. In this regard, Table 3 summarizes key research themes and proposes future research questions. It is hoped that this paper will inspire renewed and critical scholarly discourse surrounding digital technologies.

References

1. Adam, I. O., & Dzang Alhassan, M. (2021). Bridging the global digital divide through digital inclusion: the role of ICT access and ICT use. *Transforming Government: People, Process and Policy*, 15(4), 580-596.
2. Agarwal, A., & Assenova, V. A. (2024). Mobile money as a stepping stone to financial inclusion: How digital multisided platforms fill institutional voids. *Organization Science*, 35(3), 769-787.
3. Alge, B. J., Ballinger, G. A., Tangirala, S., & Oakley, J. L. (2006). Information privacy in organizations: empowering creative and extrarole performance. *Journal of applied psychology*, 91(1), 221.
4. Amankwah-Amoah, J., & Appiah, G. (2025). Unmasking the silent threat: AI-induced human capital obsolescence and business failure. *Journal of Managerial Psychology*.
5. Amankwah-Amoah, J., & Hinson, R. E. (2019). Contextual influences on new technology ventures: A study of domestic firms in Ghana. *Technological Forecasting and Social Change*, 143, 289-296.
6. Amankwah-Amoah, J., Abdalla, S., Mogaji, E., Elbanna, A., & Dwivedi, Y. K. (2024). The impending disruption of creative industries by generative AI: Opportunities, challenges, and research agenda. *International Journal of Information Management*, 102759.
7. Amankwah-Amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and digitalization: The great acceleration. *Journal of business research*, 136, 602-611.
8. Ancillai, C., Sabatini, A., Gatti, M., & Perna, A. (2023). Digital technology and business model innovation: A systematic literature review and future research agenda. *Technological Forecasting and Social Change*, 188, 122307.
9. Apicella, C., Norenzayan, A., & Henrich, J. (2020). Beyond WEIRD: A review of the last decade and a look ahead to the global laboratory of the future. *Evolution and Human Behavior*, 41(5), 319-329.
10. Arikan, I., & Shenkar, O. (2021). Neglected elements: What we should cover more of in international business research. *Journal of International Business Studies*, 53(7), 1484.

11. Asongu, S. A., Agyemang-Mintah, P., Nnanna, J., & Ngoungou, Y. E. (2024). Mobile money innovations, income inequality and gender inclusion in sub-Saharan Africa. *Financial Innovation*, 10(1), 11.
12. Blair JD, Hunt JG. 1986. Getting inside the head of the management researcher one more time: context-free and context-specific orientations in research. *Journal of Management* 12: 147-166.
13. Buys, P., Dasgupta, S., Thomas, T. S., & Wheeler, D. (2009). Determinants of a digital divide in Sub-Saharan Africa: A spatial econometric analysis of cell phone coverage. *World Development*, 37(9), 1494-1505.
14. Cappelli P, Sherer PD. 1991. The missing role of context in OB: the need for a meso-level approach. *Research Organizational Behavior* 13: 55-
15. Cavusgil, S. T., Ghauri, P. N., & Liu, L. A. (2021). *Doing Business in Emerging Markets* (3rd ed.). Sage Publications Ltd.
16. Cavusgil, S. T., Knight, G., & Riesenberger, J. 2020. *International business: The new realities*. Harlow, U.K.: Pearson Education.
17. Cherbib, J., Chebbi, H., Yahiaoui, D., Thrassou, A., & Sakka, G. (2021). Digital technologies and learning within asymmetric alliances: The role of collaborative context. *Journal of Business Research*, 125, 214-226.
18. Cirera, X., Pacchioni, E. A. G., & Maloney, W. (2017). Why poor countries invest too little in R&D. VOX, Center for Economic Policy Research, <https://voxeu.org/article/why-poor-countries-invest-too-little-rd>.
19. Comin, D., & Hobijn, B. (2004). Cross-country technology adoption: making the theories face the facts. *Journal of monetary Economics*, 51(1), 39-83.
20. Comin, D., & Hobijn, B. (2010). An exploration of technology diffusion. *American Economic Review*, 100(5), 2031-59.
21. Connolly, G., Costa-Font, J., & Srivastava, D. (2025). Did COVID-19 reduce the digital divide? A systematic review. *Health Policy and Technology*, 100979.
22. Currie, W. L., Weerakkody, V., & Van Vliet, B. (2024). Digital transformation: The geopolitical-organizational nexus. *Journal of Information Technology*, 39(4), 618-629.

23. Daft, R. L., & Marcic, D. (2001). *Understanding management*. Fort Worth, Texas: Harcourt College Publishers.
24. Davern, M. J., & Pinnuck, M. (2025, January 29). DeepSeek shatters beliefs about the cost of AI, leaving US tech giants reeling. *The Conversation*. Retrieved 30.1.2025, from: <https://theconversation.com/deepseek-shatters-beliefs-about-the-cost-of-ai-leaving-us-tech-giants-reeling-248424>.
25. Debrah, Y. A., & Ofori, G. (2005). Emerging managerial competencies of professionals in the Tanzanian construction industry. *The International Journal of Human Resource Management*, 16(8), 1399-1414.
26. ElMassah, S., & Mohieldin, M. (2020). Digital transformation and localizing the sustainable development goals (SDGs). *Ecological Economics*, 169, 106490.
27. Espin, A., & Rojas, C. (2024). Bridging the digital divide in the US. *International Journal of Industrial Organization*, 93, 103053.
28. Fui-Hoon Nah, F., Zheng, R., Cai, J., Siau, K., & Chen, L. (2023). Generative AI and ChatGPT: Applications, challenges, and AI-human collaboration. *Journal of Information Technology Case and Application Research*, 25(3), 277-304.
29. Grimpe, C., Sofka, W., & Kaiser, U. (2023). Competing for digital human capital: The retention effect of digital expertise in MNC subsidiaries. *Journal of International Business Studies*, 54(4), 657-685.
30. Gritsenko, D. (2024). Advancing UN digital cooperation: Lessons from environmental policy and governance. *World Development*, 173, 106392.
31. Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of management studies*, 58(5), 1159-1197.
32. Henrich, J., Heine, S. J., & Norenzayan, A. (2010a). The weirdest people in the world?. *Behavioral and brain sciences*, 33(2-3), 61-83.
33. Henrich, J., Heine, S. J., & Norenzayan, A. (2010b). Most people are not WEIRD. *Nature*, 466(7302), 29-29.
34. Hilbert, M. (2010). When is cheap, cheap enough to bridge the digital divide? Mod-

- eling income related structural challenges of technology diffusion in Latin America. *World Development*, 38(5), 756-770.
35. Hill, C. W. (2008). *Global business today*, 5e. New York: McGraw-Hill/Irwin.
 36. Hsieh, J. P. A., Rai, A., & Keil, M. (2011). Addressing digital inequality for the socio-economically disadvantaged through government initiatives: Forms of capital that affect ICT utilization. *Information Systems Research*, 22(2), 233-253.
 37. Ing, L. Y., & Rodrik, D. (Eds.). (2025). *The New Global Economic Order*. Taylor & Francis.
 38. International Telecommunication Union (2024). *Measuring digital development: Facts and Figures 2024*. Geneva: International Telecommunication Union.
 39. Johns, G. (2001). In praise of context. *Journal of organizational behavior*, 31-42.
 40. Johns, G. (2006). The essential impact of context on organizational behavior. *Academy of management review*, 31(2), 386-408.
 41. Johns, G. (2017). Reflections on the 2016 decade award: Incorporating context in organizational research. *Academy of Management Review*, 42(4), 577-595.
 42. Johns, G. (2018). Advances in the treatment of context in organizational research. *Annual Review of Organizational Psychology and Organizational Behavior*, 5, 21-46.
 43. Johns, G. (2024). The context deficit in leadership research. *The Leadership Quarterly*, 35(1), 101755.
 44. Julian, S. D., Ofori² Dankwa, J. C., 2013. Financial Resource Availability and Corporate Social Responsibility Expenditures In A Sub² Saharan Economy: The Institutional Difference Hypothesis. *Strategic Management Journal*, 34(11), 1314-1330.
 45. Kahiya, E. T. (2020). Context in international business: Entrepreneurial internationalization from a distant small open economy. *International Business Review*, 29(1), 101621.
 46. Kanazawa, K., Kawaguchi, D., Shigeoka, H., & Watanabe, Y. (2025). AI, skill, and productivity: The case of taxi drivers. *Management Science*.
 47. Khanna, T., & Palepu, K. (1999). Policy shocks, market intermediaries, and corporate strategy: The evolution of business groups in Chile and India. *Journal of Economics*

- & Management Strategy, 8(2), 271-310.
48. Khanna, T., Palepu, K., 2005. Spotting institutional voids in emerging markets. Watertown, MA, U.S.A. Harvard Business School Press.
 49. Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital transformation: An overview of the current state of the art of research. Sage Open, 11(3), 21582440211047576.
 50. Li, F. (2025, January 28). DeepSeek: China's game-changing AI system has big implications for UK tech development. The Conversation. Retrieved 30.1.2025, from: <https://theconversation.com/deepseek-chinas-gamechanging-ai-system-has-big-implications-for-uk-tech-development-248387>
 51. Liedong, T. A., Peprah, A. A., Amartey, A. O., & Rajwani, T. (2020). Institutional voids and firms' resource commitment in emerging markets: A review and future research agenda. Journal of International Management, 26(3), 100756.
 52. Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. The international journal of management education, 21(2), 100790.
 53. McKinsey. (2014). Global flows in a digital age: How trade, finance, people and data connect the world economy. McKinsey Global Institute. A
 54. Meyer, K. E., Li, J., & Brouthers, K. D. (2023). International business in the digital age: Global strategies in a world of national institutions. Journal of International Business Studies, 54(4), 577.
 55. Mühlburger, M., & Krumay, B. (2024). Towards a context-sensitive conceptualisation of digital transformation. Journal of Information Technology, 39(4), 716-731.
 56. Muthukrishna, M., Bell, A. V., Henrich, J., Curtin, C. M., Gedranovich, A., McInerney, J., & Thue, B. (2020). Beyond Western, Educated, Industrial, Rich, and Democratic (WEIRD) psychology: Measuring and mapping scales of cultural and psychological distance. Psychological science, 31(6), 678-701.
 57. North, D. C. (1990). Institutions, institutional change and economic performance. Cambridge, MA: University Press.

58. OECD 2018. Financial Markets, Insurance and Private Pensions: Digitalisation and Finance. Paris: OECD.
59. Park, S. (2017a). Digital inequalities in rural Australia: A double jeopardy of remoteness and social exclusion. *Journal of Rural Studies*, 54, 399-407.
60. Park, S. (2017b). Digital capital (pp. 63-82). London, UK: Palgrave Macmillan UK.
61. Park, S., & Humphry, J. (2019). Exclusion by design: intersections of social, digital and data exclusion. *Information, Communication & Society*, 22(7), 934-953.
62. Park, S., Freeman, J., & Middleton, C. (2019). Intersections between connectivity and digital inclusion in rural communities. *Communication Research and Practice*, 5(2), 139-155.
63. Pew Research Center (2021). Digital divide persists even as Americans with lower incomes make gains in tech adoption Retrieved 07.07.2025, from: <https://www.pewresearch.org/short-reads/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-make-gains-in-tech-adoption/>
64. PwC. (2016). Connecting the world: Ten mechanisms for global inclusion. Retrieved 07.07.2025, from: <https://www.pwc.com/gr/en/publications/telecoms-technology/connecting-the-world-mechanisms-for-global-inclusion.html>
65. Qureshi, S. (2023). Digital transformation for development: a human capital key or system of oppression?. *Information Technology for Development*, 29(4), 423-434.
66. Scott, W. R. (1995). *Institutions and organizations*. Thousand Oaks, CA: Sage.
67. Tewari, A. (2025). Why building big AIs costs billions – and how Chinese startup DeepSeek dramatically changed the calculus. *The Conversation*. Retrieved 30.1.2025, from: <https://theconversation.com/why-building-big-ais-costs-billions-and-how-chinese-startup-deepseek-dramatically-changed-the-calculus-248431>.
68. The Economist. (2024). How businesses are actually using generative AI. *The Economist*. <https://www.economist.com/business/2024/02/29/how-businesses-are-actually-using-generative-ai>
69. Timotheou, S., Miliou, O., Dimitriadis, Y., Sobrino, S. V., Giannoutsou, N., Cachia, R., ... & Ioannou, A. (2023). Impacts of digital technologies on education and factors influencing schools' digital capacity and transformation: A literature review. *Education and information technologies*, 28(6), 6695-6726.

70. UN (2024). Data Economy: path to prosperity or a dystopian future? Retrieved 02.01.2025, from: <https://www.un.org/uk/desa/data-economy-path-prosperity-or-dystopian-future#:~:text=These%20digital%20footprints%2C%20left%20behind,nearly%20%244%20trillion%20in%202018.>
71. Van Dijk, J.A.G.M. (2005), *The Deepening Divide: Inequality in the Information Society*. London: SAGE.
72. Venkatesh, V., & Sykes, T. A. (2013). Digital divide initiative success in developing countries: A longitudinal field study in a village in India. *Information Systems Research*, 24(2), 239-260.
73. Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems*, 28(2), 118-144.
74. Vu, K., & Asongu, S. (2023). Patterns and drivers of financial sector growth in the digital age: Insights from a study of industrialized economies. *Research in International Business and Finance*, 66, 102075.
75. Wagg, S., & Simeonova, B. (2022). A policy-level perspective to tackle rural digital inclusion. *Information Technology & People*, 35(7), 1884-1911.
76. World Bank (2008). *Global Economic Prospects: Technology Diffusion in the Developing World*. Washington, DC: World Bank.
77. World Bank (2016). *World development report 2016: Digital dividends*. World Bank Publications.
78. World Bank (2021). *World Development Report 2021: Data for Better Lives*. Washington, DC: World Bank.
79. World Bank (2024a). *Digital Transformation Drives Development in Africa*. Retrieved 02.01.2025, from: <https://www.worldbank.org/en/results/2024/01/18/digital-transformation-drives-development-in-afe-afw-africa>.
80. World Bank (2024b). *Transport*. Retrieved December 19, 2024, from https://www.worldbank.org/en/topic/transport/overview?intcid=ecr_hp_trendingdata_en_ext
81. World Bank (2025). *Practical Insights on World Bank*. Retrieved 02.01.2025, from: <https://www.ictworks.org/tag/world-bank/>

82. World Health Organization, 2023. WHO health workforce support and safeguards list 2023. Geneva: World Health Organization.
83. Worldometers (2024). Regions in the world by population (2024). Retrieved 19.12.2024, from: <https://www.worldometers.info/world-population/population-by-region/>
84. Worldometers (2025). Regions in the world by population (2025). Retrieved 23.07.25, from: <https://www.worldometers.info/world-population/population-by-region/>.
85. You, K., Dal Bianco, S., Lin, Z., (2019). Bridging technology divide to improve business environment: Insights from African nations. *Journal of Business Research*, 97, 268-280.

Data sources: The data and insights were gathered and aggregated by the authors from a wide range of sources, including Asongu et al. (2024), Henrich et al. (2010a, 2010b), Cavusgil, Knight, and Riesenberger (2020), Khanna and Palepu (1999, 2005), Apicella et al. (2020), Cavusgil, Ghauri, and Liu (2021), and the World Bank (2008, 2016, 2021, 2024a, 2024b), Vu and Asongu, (2023).