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The Digital Silk Road in West Africa: Empowerment, Dependence, and the Agency of Small-Scale Enterprises

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Abstract

China's digital expansion has rapidly reshaped Africa's technological landscape, with over 70 per cent of West Africa's telecom infrastructure now linked to Chinese firms such as Huawei and ZTE. This growing integration is redefining regional digital economies, particularly among small-scale enterprises that depend on affordable connectivity and emerging e-commerce ecosystems. Yet, beneath these advancements lie critical concerns over data privacy, technological dependence, and uneven digital inclusivity, underscoring the urgent need to assess how China's digital influence both empowers and complicates West Africa's pursuit of sustainable digital economic development. Given this rational, this study explores the impact of China's digital expansion on West Africa's digital economic development, focusing on small-scale enterprises. Employing a mixed methods approach encapsulated in qualitative interviews and quantitative structural equation modelling (SEM), to examine the specific contributions of China's digital engagement. The findings reveal China plays a significant role in shaping digital economic development, from supplying technology to active involvement in digital markets. Key adoption factors included cost, education, literacy levels, gender, functionality, and flexibility of technology applications. However, challenges such as trust issues in e-commerce, internet accessibility, infrastructure costs, and security concerns were prominent. Policy recommendations emphasize fostering

knowledge spill overs, reducing digital transition costs, and enhancing trust through robust legal frameworks. Future research should address industry-specific digital technology applications for comprehensive insights.

Keywords: *Digital Economy, Technology Adoption, Small and Medium Enterprises, China's Digital Expansion, West Africa*

1. Introduction

The digital economy is redefining global trade, governance, and societal interaction, with China emerging as a key player in this transformation. Over recent decades, China has extended its digital influence across Africa, with West Africa becoming a focal point for investments stemming from its strategic regional connectivity, expanding youthful tech-savvy population, and rapidly liberalizing ICT policies. Coupled with elite-driven political goodwill, affordable market entry, and resource-based digital corridors, these factors create a conducive ecosystem where China's Digital Silk Road ambitions seamlessly integrate with Africa's modernization aspirations. This engagement has facilitated regional integration into the global digital economy, spurring economic growth through enhanced connectivity, entrepreneurship, and digital financial inclusion (Wang, Jiang and Khaskheli, 2024).

In the assertion of Del-Valle-Soto et al. (2024), China's investments in mobile networks, fibre optics, and data centres have significantly expanded internet access in West Africa, empowering underserved regions with connectivity and innovation. This has enabled businesses to access global markets and fuelled the rise of digital platforms, transforming sectors such as agriculture, healthcare, and finance. Technologies like 4G and 5G, deployed by firms such as Huawei and ZTE, have further accelerated this digitalization, creating opportunities for efficiency and economic inclusion (Omonijo and Zhang, 2024).

Chinese tech giants like Alibaba and Tencent have introduced artificial intelligence (AI)-driven solutions and cloud computing capabilities, enhancing operational scalability for local businesses and governments. These advancements have improved competitiveness and supported the digital economy's growth in West Africa (Qin et al., 2025). Additionally, financial services have undergone a profound transformation, with mobile payment systems, supported by Alipay and local partners, expanding financial inclusion in underserved areas and unlocking avenues for entrepreneurship and trade (Zhang et al., 2024).

Despite these achievements, challenges persist. Limited broadband access in rural areas exacerbates the digital divide, and over-reliance on Chinese digital infrastructure raises concerns about sovereignty and data security. These issues underscore the need for balancing external investments with local capacity-building to ensure sustainable growth (African Union Commission, 2021). Moreover, critics highlight risks associated with governance, technological dependence, and data security, which necessitate careful policy interventions (Ige, Kupa and Ilori, 2024; Al Kez et al., 2024). However, the positive impacts are undeniable, as China's investments have boosted economic opportunities, improved market access, and established West Africa as a growing hub for digital innovation. These developments have enhanced the region's global competitiveness and contributed to its economic transformation (Dong, Zheng and Tang, 2024).

This study investigates the influence of China's digital expansion on West Africa's economic development, analysing the opportunities and challenges of this integration. By exploring the economic, technological, and policy dimensions, it aims to provide a comprehensive understanding of how Chinese investments shape the region's digital ecosystem. The research employs a mixed methods approach, incorporating qualitative interviews and quantitative structural equation modelling (SEM), to examine the specific contributions of China's digital engagement.

The findings bridge critical gaps in existing literature, offering actionable insights for policymakers, enterprises, and investors alike. By highlighting strategies for maximizing benefits while mitigating risks, the study seeks to suggest a balanced approach to navigating West Africa's digital transformation, ensuring sustainable growth and equitable development.

1.1 Overview of China's Digital Expansion and Integration in Africa's Digital Economy

China's digital expansion has been pivotal in shaping Africa's digital economy, particularly in West Africa, where its investments and technological integration have significantly influenced economic development (Arnold, 2024). Leveraging its robust digital infrastructure and thriving technology sector, China has cultivated strong partnerships with African nations, accelerating their digitization journey (Heeks et al., 2024). Through substantial investments in information and communication technology (ICT) infrastructure, training programs, and digital skills development, China has enhanced access to reliable and affordable digital services, enabling African businesses to compete effectively in global markets (Horvey et al., 2024; Hinane El-Kadi, 2024). This transformation has fostered profitability and connectivity for local enterprises (Mlambo et al., 2024).

China's initiatives, such as the "Digital Silk Road", have further promoted digital integration across Africa by enhancing connectivity and optimizing the use of advanced technologies (Rolf and Schindler, 2023). The introduction of diverse digital payment systems has also been instrumental in fostering financial inclusion and economic efficiency (Chinoda and Kapingura, 2024). Moreover, China's leadership in cutting-edge innovations like artificial intelligence (AI) has brought transformative opportunities to the region. Chinese companies have actively developed AI infrastructure, positioning West Africa to harness the benefits of automation and data-driven decision-making (Tapo et al., 2024; Chang, 2023).

Investments in telecommunications infrastructure by Chinese firms like Huawei and ZTE have significantly improved internet connectivity, enabling widespread access to digital services. The deployment of 4G and 5G networks has catalysed technological progress across various sectors (Huang, Gao and Gao, 2023). Complementing these advancements, the establishment of data centres and provision of cloud computing services by tech giants such as Alibaba and Tencent have supported local businesses in their digital transformation. China's digital integration in West Africa has thus emerged as a driving force, facilitating economic progress and technological empowerment while paving the way for sustainable development. The table below highlights some key areas by which China has influenced Africa's digital development.

Table 1. Key areas China has influenced Africa's digital development*

Key Areas (Variable)	Variable Description	Sources
Infrastructure Development	The Chinese government and companies have invested in infrastructure development in Africa, including building fiber optic networks and providing support for 4G/5G networks in some countries. This has enabled African countries to access and use digital technologies in various sectors, including agriculture, health, finance, and education. This has also facilitated e-commerce and digital trade in Africa.	Elaluf-Calderwood, 2024, July; Tang et al., 2024; Uctu and Şahbaz, 2024
Digital Education	China has also invested in digital education in Africa. In 2015, the Chinese government launched the China-Africa Joint Research and Exchange Programme, which aimed to improve science and technology education and research capacity in African countries. China has also provided scholarships for African students to study in China, including in fields related to digital technologies such as computer science and information technology. By 2018, over 81,562 African students were studying in China, a nearly 770 per cent rise since 1996 which was driven by China's scholarship expansion from 18,000 in 2012 to 50,000. Notably, about 40 per cent of these scholarships supported applied sciences, engineering, and digital technology disciplines such as computer science and information technology, reinforcing China's role in shaping Africa's digital talent pipeline.	Legrouri, 2025; Ramontja et al., 2024

Table 1 (continued). Key areas China has influenced Africa's digital development*

Key Areas (Variable)	Variable Description	Sources
Investment	China has invested in various African tech start-ups, particularly in the fintech sector. In 2020, Ant Group, the parent company of Alipay, announced that it had signed agreements with several African mobile payment providers to leverage their digital platforms. This has helped to drive financial inclusion in Africa and provided access to financial services for millions of people who previously had limited access.	Olanrele, 2025; Emuron, van der Nest and Coffie, 2024; Mashamba and Gani, 2024
Digital Partnership	China has established digital partnerships with African countries to promote digital cooperation and exchange. For example, the Belt and Road Digital Economy International Cooperation Initiative, launched in 2019, aims to deepen digital cooperation and collaboration between China and African countries.	Xiaoyu, 2024; Arnold, 2024; Carver, 2024
E-commerce	Chinese e-commerce giant, Alibaba, has also made inroads into the African market through its subsidiary AliExpress. African small business owners, farmers, and traders have been able to use the platform to sell their products to customers across the world.	Morepje et al., 2024; Mkansi Mugurusi and Akenroye, 2024, October

*Author's compilation from the review of literature

1.2 China's Digital Expansion and Integration and its Influence on West Africa's Digital Economy

China's influence given digital expansion and integration have had more than a positive influence on Africa's digital economy, thereby enabling greater access to digital technologies, promoting e-commerce, driving financial inclusion, and fostering digital cooperation between China and African countries. Chinese digital expansion is profoundly transforming West Africa's digital economy, driven by substantial investments and infrastructure projects (Shi and Wei, 2024). Through enhanced internet access, new mobile networks, and e-commerce opportunities, China is accelerating the region's digital transformation and integrating it more closely with the global economy (Cai et al., 2024). This digital revolution has spurred increased mobile phone ownership, fostering innovative business models and more efficient trade systems (Zreik, 2025).

Moreover, Chinese tech giants like Tencent and Alibaba are pioneering digital financial services, including mobile payments, digital

banking, and microloans, which enhance financial inclusion and broaden access to capital for entrepreneurs and citizens alike (Shi and Wei, 2024). These developments are not only creating new financial opportunities but are also reshaping the region's economic landscape. Moreover, the rise of China-backed digital media is revolutionizing how information is consumed and shared. Social media platforms and streaming services are inspiring a new generation of tech-savvy West African consumers, opening channels for engagement and fostering digital literacy. Thus, China's influence is not merely infrastructural; it is economic and cultural, ushering in a new era of growth and prosperity. As Chinese firms deepen their investments, West Africa's digital economy is poised to become a powerful driver of regional development, redefining its economic trajectory and connectivity to global markets (Brühl, 2024).

2. Literature Review and Framework

The rapid expansion of digital technologies in recent years has transformed the way people live, work, and interact with each other (Wanof, 2023). This transformation has not only affected developed economies but also emerging markets, including those in West Africa (Xia, Baghaie and Sajadi, 2024). China's investments in Africa's digital infrastructure and services have been significant, with Chinese companies playing a leading role in the construction of fibre-optic networks and the provision of mobile and internet services. According to a report by McKinsey and Company, Chinese companies have built or contributed to the building of more than two-thirds of sub-Saharan Africa's fibre-optic networks (Afolabi, 2023). Additionally, Chinese companies such as Huawei and ZTE have been instrumental in providing affordable smartphones and mobile internet services to millions of Africans (Javaid et al., 2024).

2.1 China's Digital Expansion

In the context of this study, China's digital expansion refers to the increasing involvement and investment of Chinese companies and the Chinese government in digital technologies, products, and services in foreign countries. This expansion is seen as part of China's broad initiative, which aims to build digital infrastructure, promote e-commerce and digital trade, and enhance digital connectivity between China and other countries, particularly those in Africa (He, 2024). China's digital expansion has been driven by its desire to expand its economic influence globally, as well as its recognition of the growing importance of digital technologies in the global economy (Heeks et al., 2024; He, Song and Ouyang, 2024). On the other hand, its digital integration describes how China incorporates digital technologies, products, and services into developing countries' digital ecosystems. For instance, Chinese companies have been investing in and partnering with West African tech start-ups to gain access to new markets, technologies, and talent (Feng, and Qi, 2024). This integration has been driven by China's recognition of the importance of international collaboration and the need to learn from other countries and regions.

2.2 Drivers of the Integration of China's Digital Expansion

China's digital expansion is driven by a vast consumer market, a skilled workforce, and strategic government policies prioritizing digital development as a pillar of economic growth (World Bank Group, 2016; Amankwah-Amoah, and Lu, 2024). Initiatives like "Internet Plus" and "Made in China 2025" aim to integrate digital technology into traditional industries, fostering innovation and entrepreneurship to fuel economic transformation (Tan, 2024). Prominent companies such as Huawei, Alibaba, Tencent, and Baidu have spearheaded this transformation, reshaping sectors like retail and communication through advanced e-commerce platforms and social media innovations (Tan et al., 2024).

Globally, China's digital integration enhances its economic influence. The Belt and Road Initiative exemplifies this by exporting digital expertise and infrastructure to regions including Asia, Africa, and Latin America, making

Chinese digital firms pivotal players in these markets (Rojo, 2024). This expansion has been especially impactful in West Africa, where Chinese companies drive digital economic activities, reflecting their integral role in global digital transformation (Jiang, 2024).

China's digital economy, marked by the fusion of digital technology and the real economy, has established itself as a cornerstone of the modern global economic framework. This integration accelerates the construction of innovative governance models and economic systems (Wang, Childerhouse and Abareshi, 2024). In 2019, China and the United States led global information technology development, contributing over 40 per cent of the global market.

The growth trajectory of China's digital economy underscores its significance. From 1.57 billion yuan in 2003 to 39.2 billion yuan in 2020, its contribution to GDP rose from 10.3 per cent to 38.6 per cent during the same period, signalling the sector's expanding role in driving national economic growth (Fambo and Ge, 2024). In 2020 alone, the digital economy grew by 3.3 billion yuan, equivalent to a 2.4 per cent GDP increase from the previous year. China's thriving digital sector exemplifies its transformative impact on the global economy, with innovative policies and industry leaders shaping the future of digital economies in both domestic and international landscapes, particularly in emerging regions like West Africa (Al-Zoubi, 2024).

2.3 Digital Economic Development and China's Integration into West African Markets

Digital economic development undoubtedly, leverages technology, particularly digital innovations, to drive economic growth, job creation, and societal prosperity (Wang, Li and Khaskheli, 2024). With the digital economy growing at 10 percent annually, outpacing global economic growth, it has become a critical engine for innovation and development worldwide. China's longstanding relationship with Africa, encompassing trade, diplomacy, and economic assistance, has expanded into the digital realm. This partnership is characterized by significant Chinese investments in Africa's

ICT sector, including cellular networks, fibre-optic cables, AI, big data, and e-commerce (de Kluiver and Neethling, 2025). In West Africa, China has emerged as a dominant player, with companies like Alibaba supporting local platforms such as Jumia, fostering digital economic growth (Soulé, 2025). These efforts have enhanced broadband access, mobile technology, and e-commerce, creating opportunities for businesses to connect regionally and globally (Lewis, 2024).

A noteworthy impact of China's digital investments is the proliferation of financial inclusion. Platforms like Alipay, in partnership with West African firms such as Flutterwave and Cellulant, are addressing the region's banking gaps by offering mobile payment solutions (Mohamed, 2022). This integration is unlocking new avenues for businesses and individuals, bolstering regional economic prospects.

Despite some research on China-Africa relations, existing studies often overlook the specific impacts of China's digital investments in West Africa. Addressing this gap, the literature review underscores the need for a focused analysis of China's digital influence in the region (Feliciano-Cestero et al., 2023). By synthesizing theoretical and empirical findings, it lays the groundwork for understanding the nuanced dynamics of digital integration in emerging markets like West Africa.

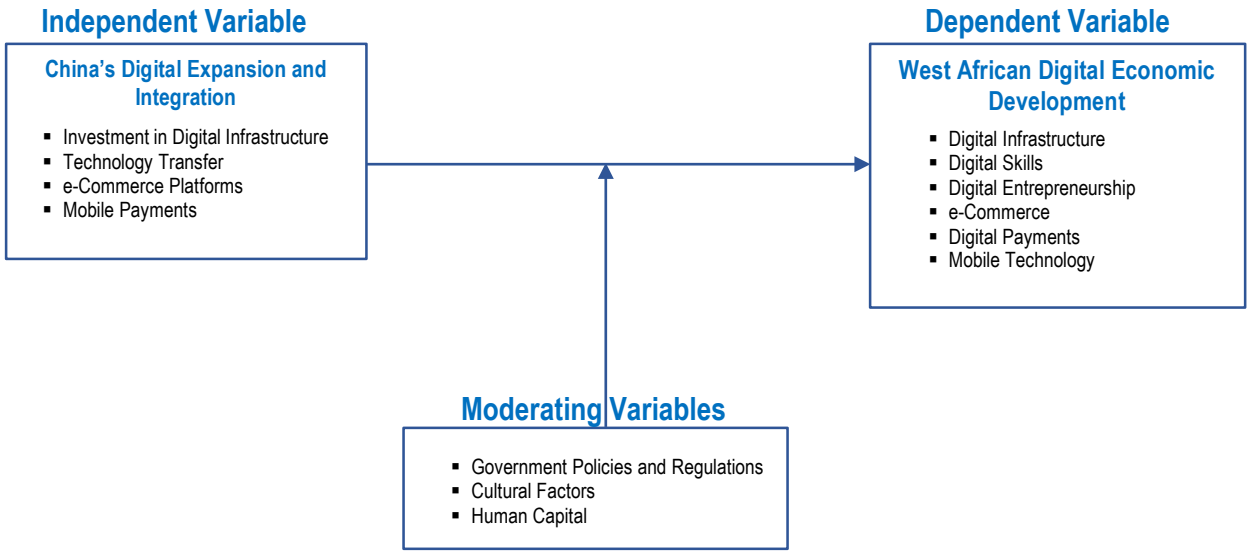
2.4 Conceptual Framework

The study quantitatively and qualitatively analysed China's digital expansion and integration on West Africa's digital economic development. Key factors that are strongly associated to influence China's digital expansion and integration in West Africa's digital economic development by highlighting the dependent (West African digital economic development which is measured by digital infrastructure, digital skills, digital entrepreneurship, e-commerce, digital payments, and mobile technology), independent (China's digital expansion and integration which is also measured by investment in digital infrastructure, knowledge and skills transfer, e-

commerce platforms and mobile payments) and complementing moderating (government policies and regulations, cultural factors and human capital) variables.

In a broader sense, these determinants will be juxtaposed with their role in the overall economic growth agenda of the economies of choice as displayed in Figure 1.

Figure 1: Conceptual Framework for China's Digital Expansion and Integration on West Africa's Digital Economic Development



3. Methodology

For this study on the impact of China's digital integration and expansion on West Africa's digital economic development, a mixed method research technique is applied. Data was gathered for the study at a single point in time, making it cross-sectional in nature. This study's design is appropriate because it enables investigation into the experiences and viewpoints of

digital economic development in determining the impact of China's digital expansion and integration in West Africa as of 2023.

3.1 Data and Method

The study employed a mixed-method approach, combining qualitative and quantitative data to examine China's digital integration and its influence on business and economic development in West Africa. Data were collected from four countries: Benin, Nigeria, Mali, and Ghana. The sample included 80 survey respondents and 10 interview participants, selected using a non-probability sampling method that combined convenience and snowball techniques. Convenience sampling ensured accessibility, while snowball sampling expanded participation through referrals, enabling the inclusion of individuals with relevant experiences as digital entrepreneurs. In this regard, all respondents for both surveys and interviews served as instrumental informants for this study. Qualitative data were obtained through semi-structured interviews, guided by the study's objectives. These interviews explored China's influence, drivers of digital economy participation, and associated challenges and opportunities. Each interview, lasting approximately 200 minutes, was recorded, transcribed, and thematically analysed. Complementing this, a structured survey gathered quantitative data using a Google Form questionnaire. The questionnaire was divided into four sections covering demographics, China's impact, challenges, and solutions, ensuring a robust analysis aligned with the research objectives.

Data collection instruments were carefully designed to maximize reliability and efficiency. The questionnaire employed email authentication to prevent duplicate entries, and was distributed via email and WhatsApp for broad accessibility. This integrated method ensured diverse and rich data, reflecting the perspectives of digital entrepreneurs while adhering to the study's time and budget constraints. This approach provided a comprehensive understanding of China's role in shaping West Africa's digital economy.

3.2 Reliability and Validity

The study integrates qualitative and quantitative data to examine digital entrepreneurship in selected West African countries, offering recommendations to enhance global digital competitiveness and economic growth. Rigorous methodologies, including semi-structured interviews, document analysis, content analysis, and thematic analysis, ensure the reliability and validity of findings (Leon et al., 2023). By capturing detailed perspectives on international competitiveness and economic development, the research provides valuable insights into fostering entrepreneurship (Ishtiaq, 2019). Careful participant selection and appropriate data collection methods further bolster the study's accuracy, paving the way for actionable strategies to advance digital innovation across the region.

3.3 Data Analysis

Both qualitative and quantitative data analyses were used to establish the data analysis methodologies for this project. Content analysis and thematic analysis were used for the qualitative data gathered through in-depth semi-structured interviews and document analysis. While thematic analysis involves identifying and categorizing the experiences and perspectives of how China's digital expansion has influenced integration into West Africa's digital economic development given digital entrepreneurs among the chosen West African countries, content analysis focuses on finding patterns, themes, and trends in the data.

Survey data was also collected to augment the data from the interviews. The data obtained from the survey using questionnaires were evaluated using inferential statistics to draw conclusions about the population. The SEM was used to explore the factors that influence the adoption or decision to participate in the digital economy of West African countries.

3.4 Ethical Considerations

The study adhered to strict ethical standards to ensure participants' rights, dignity, and well-being were upheld. Participants provided informed consent after understanding the study's objectives, methods, and their rights, including the freedom to withdraw at any time. Anonymity and confidentiality were guaranteed, with safeguards to prevent identifying participants in reports or publications, ensuring privacy and comfort in sharing their experiences (Creswell, 2014).

Cultural sensitivity was integral, respecting norms and beliefs across West African countries while addressing power dynamics with respect and dignity. Measures were in place to mitigate emotional discomfort, offering counseling or support resources if needed. The researchers prioritized the ethical use of findings, ensuring no harm to participants or their communities.

4. Findings and Analysis

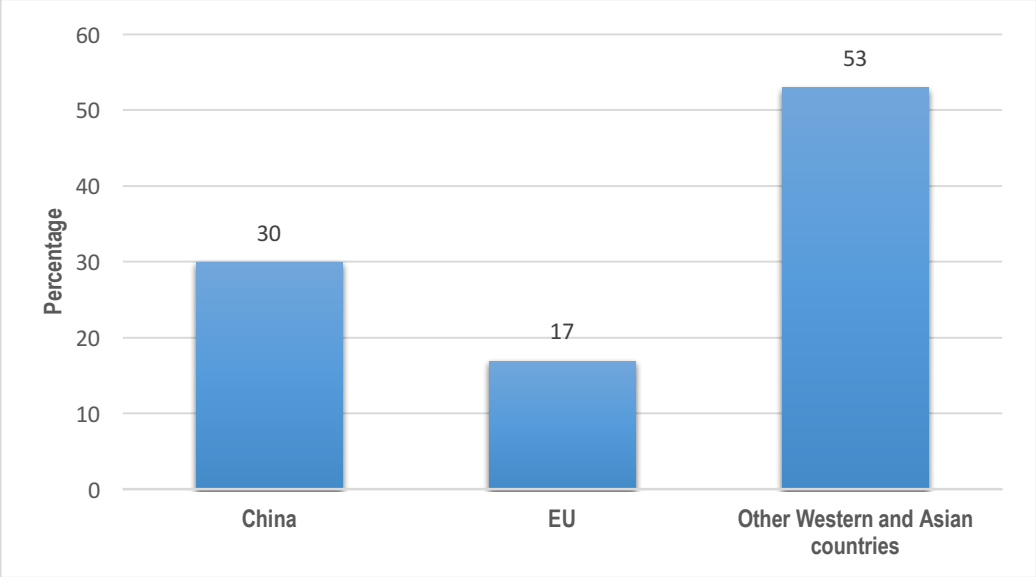
4.1. Nature and Extent of China's influence in West Africa digital economy

The study's first objective was to determine the extent of China's influence on the digital economies in West Africa. This was to help us have a comprehensive view of the role of China and its impact on the economies of choice under this study. We measured the influence and the nature of Chinese digital expansion in West Africa's digital economies space in two ways. First, from the perceptive opinion of the respondents, and second, the source of digital technology used by business owners thus various entrepreneurs of which survey data for the analysis below is sourced from respondents from google form (for instance, internet connection devices, phones, among others).

The source of technology used among the four selected African countries originated from the other Western and Asian countries with 53 per cent of all the business owners interviewed. China constitutes a high power

in the digital economy space of West Africa with about 30 per cent technology share. This has led to an ever-growing impact on the Chinese economy across the globe. This is supported by the general sentiment of analysis, of which 93 per cent of the business owners felt China is an immensely powerful player in the digital space and the digital economy of African economies. This finding is supported by Su, Tao and Wang, (2024) whose study findings revealed that China has massive influence in Africa's e-commerce and fintech. China's digital expansion and integration influence is also seen in the mobile technology businesspersons' use in the selected study area of which data is also sourced from google form questionnaire data.

Figure 2. Origin of technology used by businesses

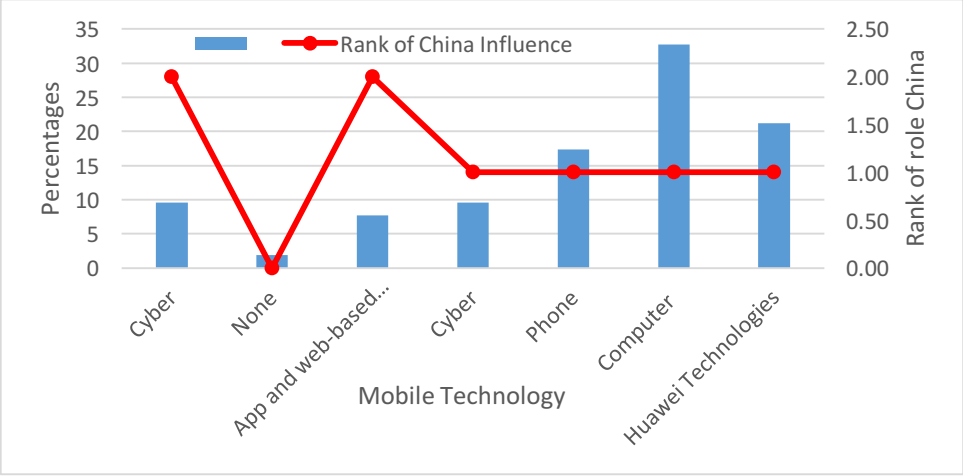


The results indicate that Chinese technology (Huawei Technology) plays a significant role in the digital space in West African countries as it ranked first on China's role or influence in the realm of digital expansion. Regarding computers and mobile phones, China is considered the major

player among business operators in West Africa. The result in Figure 3 further deepens the earlier results from the sentimental analysis of China's role in the African economies. This is no surprise as China has strived to achieve greater dominance in trade relations with Africa than the rest of the world.

To ensure an in-depth understanding of the nature and depth of the Chinese influence on digital expansion, the researchers conducted an interview on the power of China in the digital economy of selected West African economies captured under the study. The results of keywords extracted using the sentimental analysis reveal a general leaning of seeing China as a powerful player in the digital space of the West African economy. The results reveal than business owners and participants of the digital economy space see China as a dominant player. Using natural language processing, the results reveal that Chinese influence in the digital space in West Africa is gradually increasing, as shown in the figure below. The sentiment for rapid growth is about 0.75 out of a positive score of 1. It must be said that the general feeling or sentiment of China in the tech and digital space is positive.

Figure 3. Mobile technology used and ranking on China's influence



As mentioned by one of the respondents: "*Very powerful in my opinion because it's Huawei that control almost the whole telecommunication sector in the West African, making great impact I the economy of African countries.*"

Similarly, "*…most technological gadgets that are used in commercial transactions and other activities that help businesses are produced in China.*"

Thus, China is dominant in the West African (with emphasis on the selected economies of choice for the purpose of this study) digital economy space contributing to e-commerce, and providing technologies that allow for digital expansion and infrastructure development in West African economies.

Table 2. Sentiment around keywords on China's influence

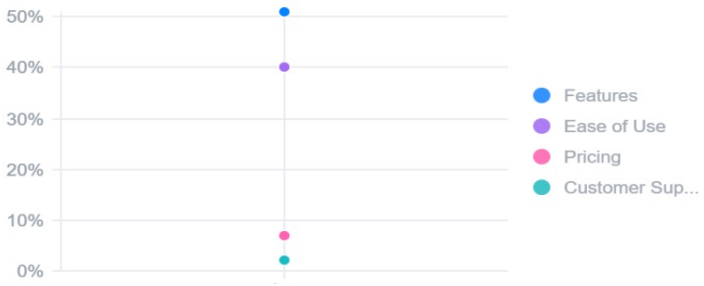
Detected Themes	Magnitude	Sentiment Score
Very Powerful	1.00	+1.000
Rapid Growth	0.99	+0.746
Great Impact	1.00	+0.730
Very Strong	0.94	+0.679
Control Almost Single	0.95	+0.613
Been Significant	0.75	+0.575
Every Household in Africa	0.60	+0.532
Everything in Africa	0.62	+0.528

4.2 Factors that affect the adoption of the digital economy

It is believed that positive sentiment affects the use and participation of any product or service that is available on the market. In the same view, this study examined businesses' sentiments toward using digital technologies. The results indicate a strong positive outlook on the ease of use of digital technologies and their features. Both ease of use and features of digital technologies scored above 90 percent on positive sentiment. Interestingly, the features and ease of use among the business community could affect

future adoption or participation in the digital economy space. Price or cost of implications ranked third among the four key factors identified from the responses received. The results support Kim's (2018) assertion that perceived ease of use and usefulness affect the adoption of digital platforms.

Figure 4. Percentage rank of factor based on sentiment



Most of the organisations that participate in the digital economy do so due to their ability to enhance the accounting systems of the organisation and operating systems. One key reason for adopting modern digital platforms, thus participating in the digital economy, is flexibility in operation and efficiency, ease of attracting business and being enterprising. Other minor factors included growth motives, digital inclusion, customer experience, and operating costs. Khuntia et al. (2024) point out the impact of digital transformation on the flexibility of an organisation whereas this flexibility improves the organisation's competitiveness. The reasons shown in the word cloud (see figure 6) are interconnected. For instance, improved accounting results to increase profitability. Ordinarily, digital transformation affects the systems and operations of an organisation, leads to efficiency, and creates more opportunities.

Figure 5. Reasons for adopting digital technology in business

4.3 Factors that affect the adoption of the digital economy

The SEM models use the partial least models on the determinant of participation in the digital economy. The results in Table 3 indicate a direct relationship between foreign investment and digital use. A business with foreign partners is more likely to have a parallel digital service, or part of reaching customers is done through a website or payment platforms. Thus, foreign ownership enhances business participation in the digital economy in West African economies. It was observed that males are more inclined to participate in digital use in their business than females. Education is found to be positively related to digital economy participation among selected West African economies. It was found that an increase in education by a year leads to an increase in digital economic participation by 0.15 percent. The results imply a positive association between years of education and digital economy participation. This result is intuitively accurate since an educated person is more likely to be exposed to digital technologies, understand how to use them and apply them to benefit business performance.

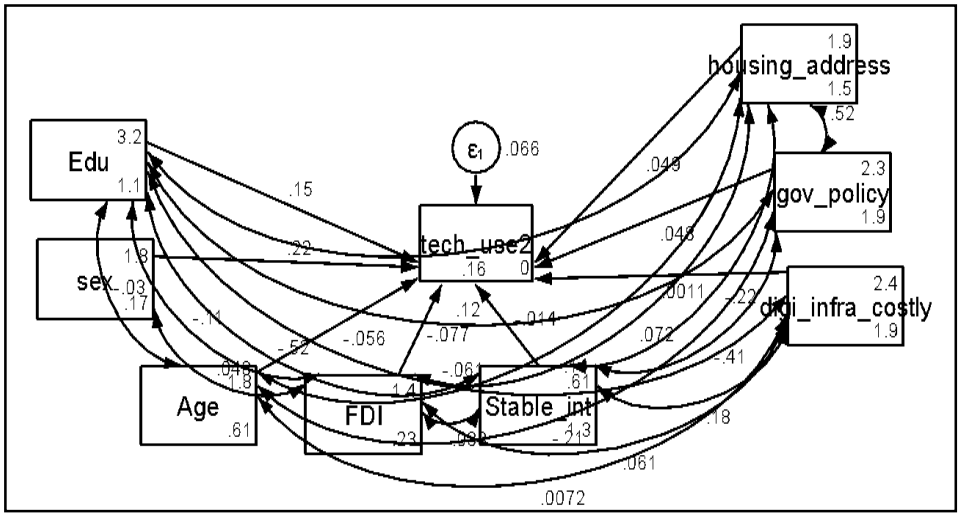
Another factor that was found to be statistically significant in the adoption of the digital economy is government policy. It was found that

government policy is important in influencing the behaviour of businesses in participating in the digital economy in the selected West African economies. Obviously, a favourable policy will lead to the expansion of the digital economy.

Table 3. Results of the SEM Analysis

Variable	β	err.	z	P>z
FDI	0.07711	0.025348	3.04	0.002
Sex	0.223187	0.039676	5.63	0.00
Age	-0.05632	0.027248	-2.07	0.039
Education	0.153816	0.017174	8.96	0.00
Stable interest	-0.0144	0.043946	-0.33	0.743
Digital infra cost	0.001082	0.012161	0.09	0.929
Government policy	0.047711	0.016494	2.89	0.004
Housing address	0.048895	0.018796	2.6	0.009

Figure 6. SEM model for factors that affect technology use



4.3 Challenges

The burgeoning digital economy globally cannot be said to be void of challenges. Commercial users of digital technologies face challenges related to the cost of digital technologies, trust and acceptance of digital technologies due to the low literacy levels among the selected West African economies.

The Table below presents the challenges that were outlined faced by businesses in the digital economy space. The first challenge was the lack of trust among customers for digitally operated businesses among the selected West African economies. In these ratings, the respondents were asked to rate the challenges facing digital economic participation. The ratings ranged from one to five; a rate of five represents that the statement does not relate to the challenges faced in the digital economy space in the selected West African economies. Out of those who have rated five, the mean response for lack of trust of e-services in the digital economy space of West African economies is neutral. The mean of 2.69 suggests some level of indifference to a lack of trust in e-businesses. The test of means shows a statistically significant mean for the lack of trust in e-services. This result defies the existing narratives in academic literature. For instance, Naatu, Naatu and Nassè (2025) pointed out the role of trust as one of the key factors in the future of e-commerce in Ghana.

Data privacy, or privacy, is seen as a major concern in the digital economy space in West Africa. This is corroborated by the results presented in Table 4.2.2. The Table shows a meaning of 2, implying that on average, data privacy is seen as a challenge. Privacy has been proven by numerous studies as a key driver (Alzaidi and Agag, 2022; Amofah and Chai, 2022). This implies that the digital economy in Africa would be affected due to the challenge with privacy or data privacy in the digital space of West African Economies. This is because digital privacy, or data privacy, concerns security and information protection. If this is not guaranteed, this may lead to dwindling or unsustainable growth in the digital economy space in the future.

Table 4. Challenges Faced by Business in the Digital Economy in West Africa

Items	Obs	Mean	Std. dev.	Min	Max	p-value
Lack of trust in e-services	80	2.698413	1.303035	1	5	0.00
digital literacy	80	2.492063	1.424135	1	5	0.00
Stable internet	80	2.238095	1.37623	1	5	0.00
Digital infrastructure	80	2.396825	1.397459	1	5	0.00
Government policy	80	2.253968	1.390849	1	5	0.00
Challenge regulation	80	1.951613	1.220419	1	5	0.00
Data privacy	80	2.032787	1.237837	1	5	0.00
Housing address	80	1.920635	1.222129	1	5	0.00

Stable internet connectivity drives the digital economy across the globe. Therefore, unstable internet connectivity will pose a challenge in the development of the digital economy in the ECOWAS region. The response from the data strongly indicates internet connectivity as a challenge among the selected ECOWAS member countries with a mean score of 2.2. The World Bank (2021) alluded same as it identified low network coverage and quality as one of the challenges facing digital access in the West African region.

One of the main challenges found from the results is the regulation gap. The average ranking of the regulation gap was found below 2 (1.9) and statistically significant at less than one percent. The results imply that businesses in the digital economy see regulation as a threat or challenge in the West African region. Indeed, one of the threats to digital economy, as pointed out by the U.S. Chamber of Commerce, is the unpredictable nature of regulations in Africa.

4.4 Solutions and Opportunities

The solutions to the challenges identified in the study were sought out through an interview section with the businesses from the selected West African economies. The results were grouped under the following three themes: issues on legal and regulatory, infrastructure and cost, and education and promotion.

Legal and Regulatory Issues and Policy. Generally, there is a lack of regulations that govern the digital economy space or at their infancy stage. However, the digital economy is rapidly evolving, and the page of regulations must be commensurate with the rapid changes. Respondent businesses acknowledge the need for regulatory frameworks for the operation of digital economy. As pointed out by a key informant, "there is the need for a strong data governance law to regulate what information can be shared." Issues related to privacy are the major concerns among the business community. In addressing this, it was pointed out that there is the "need for industry-government/lawmakers' joint efforts to come together to bring out workable and applicable laws and frameworks to govern the digital space among selected economies in West Africa."

On the policy level, one respondent put it like this: "Government should give attention to the promotion of digital economy by setting up institutions that would research better ways of doing e-commerce in the ECOWAS region." Thus, there is the need for academia and business players to be supported to find a better way of addressing the existing challenges in the digital economy space. The understanding of the dynamics of the security treats, privacy, and other concerns may be obtained by a conscious collaboration led by government.

Infrastructure and Cost-Related Issues. According to the World Bank, digital economy thrives on four pillars. One of the four is digital infrastructure. Infrastructure for digital economy at an affordable rate is considered key to the participant of the research. A participant of the study said, "Government should provide subsidy to support small and medium enterprises (SMEs) to have access to internet service for the digital economy". Another participant suggested that there is a need for the development of critical infrastructure for digital economic transformation to take place. In other words, the provision of data warehousing, cloud computing services, stable internet, among others, are necessary for digital transformation.

Education and Training/promotion Issues. One obvious solution to the existing challenges in the adoption and participation in the digital economy in West Africa is education, training and promotion of digital technologies. All SME

owners interviewed were unanimous about the role of education and training on digital economies. Once owners and entrepreneurs are trained in digital technology usage, it is easy for them to participate in the digital economy space. Making educational programs on digital economies available to SME.

Governments and Public Perception of China's Digital Infrastructure. In Benin, Nigeria, Mali, and Ghana, governments largely perceive China's digital infrastructure drive as a transformative lever for economic diversification and governance efficiency. Initiatives such as Nigeria's *National Digital Economy Policy (2020–2030)* and Ghana's *Smart Governance Framework* reflect alignment with China's Digital Silk Road vision. Public reception, however, reveals nuanced contrasts, while over 68 per cent of urban dwellers commend improved connectivity and digital inclusion, scepticism persists regarding data privacy and technological dependence. In Benin and Mali, state actors welcome digital investments as catalysts for institutional modernization, yet civil society warns of sovereignty erosion. This duality illustrates Africa's delicate balance between opportunity and autonomy in the digital age.

5. Conclusion and Recommendations

This study explored China's influence on the digital economy in selected West African economies, highlighting key challenges and opportunities. Using a mixed methods design, data were collected from 80 SME owners, and advanced models analysed factors driving the adoption of digital technologies. Findings revealed China's significant role in shaping digital economic development, from supplying technology to active involvement in digital markets. Key adoption factors included cost, education, literacy levels, gender, functionality, and flexibility of technology applications. However, challenges such as trust issues in e-commerce, internet accessibility, infrastructure costs, and security concerns were prominent.

The findings underscore the need for trust-building in digital activities through robust legal frameworks and cybersecurity protocols. Governments should foster SME training on digital technologies, reduce internet access costs,

and lower platform usage fees to ease participation in the digital economy. Partnerships between governments, fintech players, and Chinese stakeholders could facilitate technological and managerial spill overs, benefiting SMEs. Strengthening national cybersecurity and privacy frameworks would attract foreign investment, enhance trust, and mitigate fraudulent activities, laying a foundation for sustained growth.

Policy recommendations emphasize leveraging China's dominant role in digital development to create mutually beneficial frameworks between China and West African governments. Strategies include enhancing diplomacy and fostering environments that promote training, collaboration, and the adoption of digital technologies. Addressing infrastructure challenges and ensuring equitable access to the digital economy remain critical for maximizing economic potential in the region.

Although the study provides valuable insights, it lacked sector-specific analysis. Future research should examine industrial diversity and sector-specific challenges to deepen understanding. Expanding the sample size and exploring the conditions necessary for technology adoption would inform policymakers of the minimum requirements for advancing digital integration. This approach would support strategic decision-making, ensuring that digital economies in West Africa achieve inclusive and sustainable growth.

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