International Journal of Scientific Engineering and Science
Volume 10, Issue 11, pp. 1-5, November 2026. ISSN (Online): 2456-7361

Challenges of Digital Technology Use by Businesses in Farafangana, Madagascar

MANDRESIMANA Saugue[1], TSIMANGATAKA A Tsimiovalaza[2]
[1]Doctoral Student at the Doctoral School of Life Sciences and Modeling, University of Mahajanga
[2]Professor, EDGVM, University of Mahajanga
Email address: tsimiovalaza@gmail.com

Abstract— *Since the 1990 years, the technology revolution has profoundly transformed communication sustems and digital interactions worldwide, fostering permanent connectivity and instant information exchange. Although digital technology now facilitates rapid access to information, its deployment in Madagascar continues to face major structural challenges. Internet access remains relatively expensive compared with other countries in the region, such as Mauritus and South Africa. world bank.This young population represents a dynamic and potentially productive workforce,despite persistent shortcomings in the education and vocational training systems.This demographic vitality is reflected in the growing adoption of digital tools today,more than 45% of the working population is reportedly engaged in digital activities,particularly online commerce digital service provision,dematerialized business operations and specialized commercial transactions.The use of digital platforms by women in Madagascar to develop their professional activities is also expanding.This emerging trend demonstrates the increasing ability of local economic actors to take advantage of opportunities offered by the digital sector.Digital transformation now affects numerous areas,including e-commerce,healthcare,the economy and particularly,education.However its contribution to economic development depends on several factors including access to digital infrastructure,the affordability of internet service,digital skills,and the institutional environment.Understanding these factors are essential to assessing the opportunities and limitations of digitalization in Madagascar country.*

Keywords— Global, Provision, Service, Digitalization, Economy

I. INTRODUCTION

Currently, digital transformation is a central theme internationally, generating increasing interest and significant investment. Alongside these technological challenges, environmental protection is emerging as a collective responsibility. Faced with the challenges posed by climate change, digitalization appears to be an optimal strategy for streamlining and enhancing various activities.

Madagascar, a country rich in opportunities, is embarking on a decisive phase of its modernization. Digital integration is becoming a strategic lever in key sectors such as mining, healthcare, and commerce, while the government is progressively deploying the necessary infrastructure to support this transition to development. While developed nations now demonstrate advanced technological mastery, many countries, like Madagascar, are still struggling to fully exploit the benefits of the digital transition. Although Madagascar possesses significant resources, particularly in the maritime, tourism, agricultural, and digital sectors, the digital integration rate of its population, which numbers approximately 30 million, remains very low, at around 0.04%. According to economic projections, transparent and rigorous management of national resources would allow Madagascar to establish itself as an economic leader in Africa and the Indian Ocean region.

Under the leadership of the Ministry of Digital Telecommunications and Postal Services, concrete initiatives are being implemented to promote the integration of young people into the digital economy. This momentum is driving significant job creation and, according to the EDBM (Economic Development Board of Madagascar), is resulting in the constant emergence of new businesses in this strategic sector. Digital transformation is a strategic development lever for the country, while also significantly improving students' learning conditions. However, the literacy rate and internet access remain capped at 30%, with connectivity still concentrated in densely populated urban areas, while a significant portion of the population remains without access to electricity and the internet.

Despite government initiatives to reduce connection fees, the cost of digital access remains prohibitive for a large portion of the population. While sectors such as transportation, tourism, agriculture, education, and employment are beginning their digital transition, the Malagasy state faces limited technical and financial resources to support such a large-scale transformation. This challenge is compounded by the need to meet the needs of numerous priority sectors, even as local expertise emerges, offering significant job creation potential. Finally, the energy deficit constitutes a major structural obstacle: according to World Bank data, the household electricity access rate is only 25%. The central problem lies in the limited access to basic infrastructure. Even in southeastern Madagascar, areas located in the immediate vicinity of urban centers (2 to 3 km) remain without access to telecommunications networks, electricity, and running water. This structural deficiency constitutes a major obstacle to digital inclusion. Furthermore, the low level of education observed among the local population, coupled with a marked lack of technological knowledge, underscores the scale of the challenges to be overcome.

II. METHODOLOGIES

2.1 Mixed Methodology

To ensure the rigor and validity of the results, a structured research strategy was implemented. The methodology adopted is based on a participatory approach, fostering direct interaction with all stakeholders, including citizens, institutional

http://ijses.com/
All rights reserved

representatives, and faculty. Given the diversity of individual perspectives, we developed a tailored research methodology, grounded in the qualitative analysis of collected testimonies, to obtain evidence-based data. This approach aims to produce tangible results with significant added value for the country's development. Our work relies on a mixed-methods approach, combining quantitative data analysis with structured discussions.

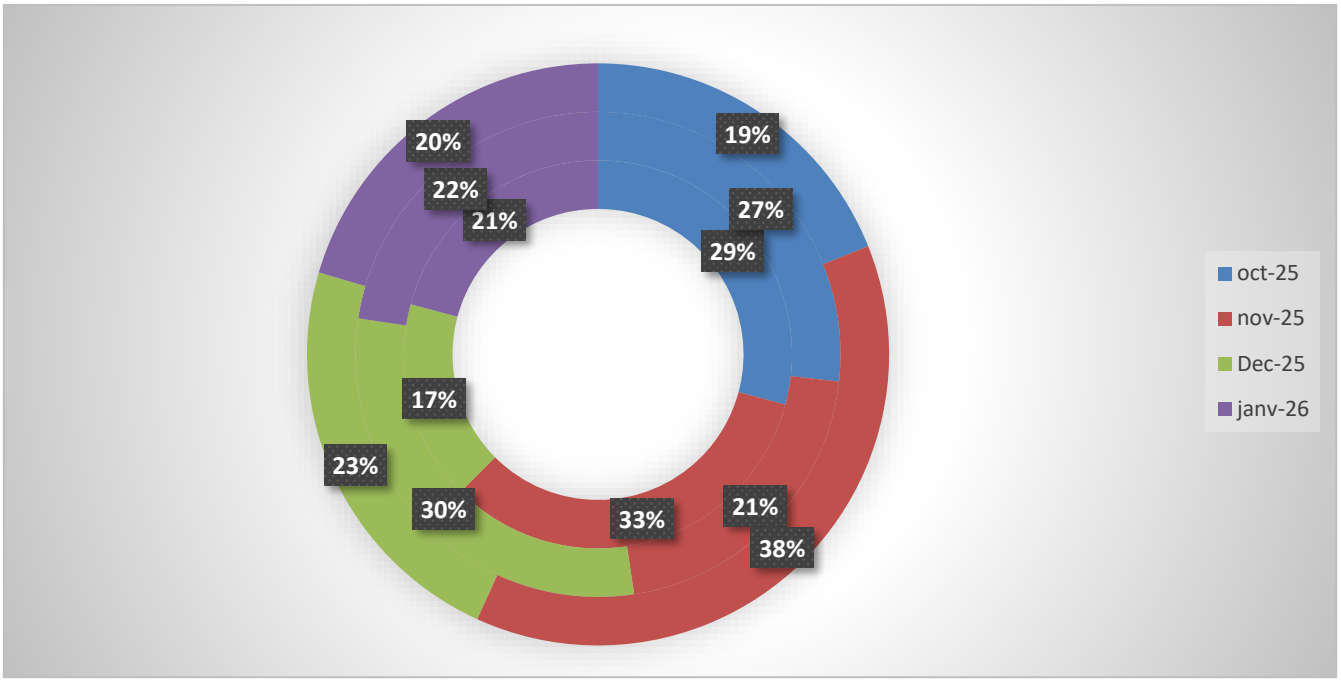
A major focus of this study is to assess the pool of digital skills in Madagascar. In this emerging sector, we took care to distinguish between the segment of the population already digitally savvy and those still needing to learn. To this end, a targeted communication strategy was implemented to ensure the rigor and scope of our research. The objective of this study is to produce concrete, high-value results for the country. Our approach is based on a rigorous methodology, structured around the analysis of quantitative data and qualitative discussions.

It is imperative to accurately assess the level of digital maturity of the Malagasy population. Given the relative emergence of this sector, a significant portion of the population remains in a phase of technological acculturation. In parallel, we incorporated into our analysis the rate of digital penetration among segments already initiated. To this end, a targeted public communication strategy was deployed to ensure the reliability and comprehensiveness of our research. Furthermore, fieldwork required travel to isolated areas to collect research data, particularly in the following districts and regions:

Fenorivo-Est, Sainte-Marie, Farafangana, Vangaindrano, Mananjary, Manakara, Toliara, Morondava, Matsiatra Ambony, Fianarantsoa, Fandriana, Ilakaka, Boeny, Mahajanga, Melaky, Maintirano, Sofia, Mampikony, Antsohihy, Diana, Ambilobe, Nosy Be and Antsiranana.

In parallel, a comparative analysis of scientific works and articles by various authors was conducted to broaden the scope of this study. This documentation was further enriched by the papers presented at an international conference dedicated to the preservation of natural and digital heritage.

2.2 Survey and observation of the situation of digital activities in the cities mentioned.



Source: Author's survey and observation over 6 months, 2026

TABLE 1: The establishment that exists in the city of Farafangana in the different sector

Name of Establishment	Number	domain	digital system	traditional system	Bank	Species	Mobile banking
MSP	1	Export	40% stains	60% stains	93%	1%	2%
University	1	Teacher	30% stains	70% stains	90%	0%	10%
high school	6	education	10% stains	90% stains	1%	98%	1%
Ceg	7	education	1% of stains	99% stains	1%	99%	0%
Training center	4	Professional training	10% Stains	90% stains	0%	100%	0%
Hotel	14	service	15% stains	85% stains	2%	88%	10%
Cyber	16	service	70% stains	30% stains	1%	80%	19%
Restaurant	13	Service/sales	15% stains	75% stains	1%	50%	49%
Store	8	sale	20% stains	80% stains	1%	70%	29%

Source: Author 2026

During our research in several cities in Madagascar, such as Farafangana, Sainte-Marie, Maintirano, and Mahajanga, we observed a consistent pattern: the success of digitalization is still far from being a reality. We used quantitative and

http://ijses.com/
All rights reserved

qualitative methods to pinpoint the impact of digital technology in different types of cities. Every company we contacted expressed fear of the current technological revolution. In Sainte-Marie, for example, most people, especially those well-educated about digital technology, observed that over 60% use mobile banking for purchases and bill payments.

2.2. Businesses in the city of Farafangana

Our study aimed to identify the businesses in Farafangana that have already adopted digitalization. This city is rich in diverse resources and teeming with active businesses, such as those selling goods, computer equipment, and kitchenware online. Previously, most businesses operated door-to-door, but with the advent of new technologies, everyone is shifting towards digitalization, implementing online services, online marketing, and even offering distance learning. Farafangana is also a tourist destination, with many visitors coming to Mahabo Mengnanivo Park. Our survey revealed that tourists often prefer to pay service providers and guides digitally for safety reasons.

III. RESULTS

3.1. Investment in digital

These nations possess the potential to support the development of countries such as Japan, the United States, France, China, and especially Russia. In this respect, the increasing participation of many states in local vocational training programs demonstrates a strategic interest. However, a study highlights a low level of digital skills among the Malagasy population. The economic fabric remains predominantly agricultural and pastoral, employing 78% of the working population, while a minority is employed in the service and industrial sectors. The education sector, particularly within public institutions, represents approximately 3% of jobs.

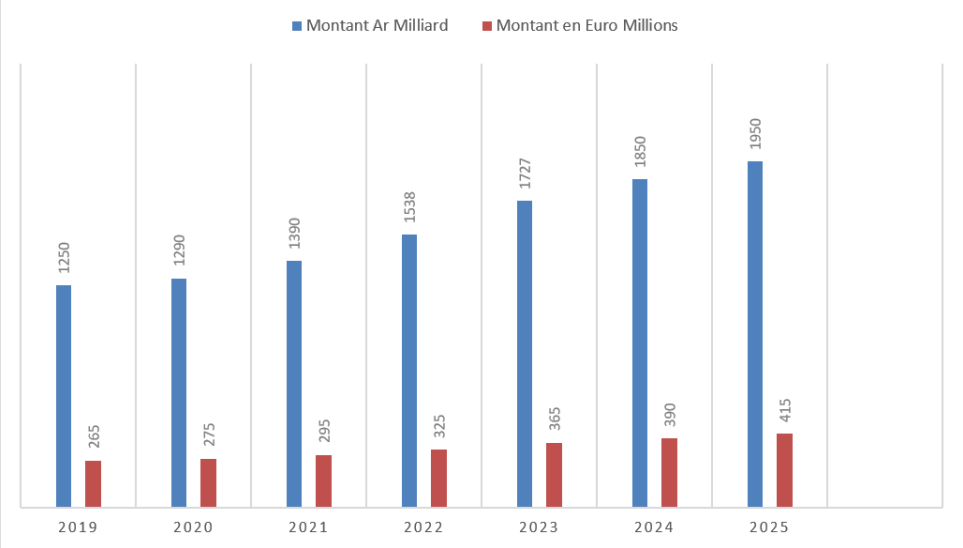
Digital technology has nonetheless had a positive influence on Malagasy SMEs, particularly by optimizing their marketing strategies, which enabled many of them to increase their turnover during the Covid-19 pandemic in 2020. Web development, online quote management, and freelance work have become preferred career paths for young people, a dynamism supported by government initiatives promoting job creation. The rise of digital technology facilitates the acquisition of new customers and the deployment of innovative offerings. One of the major advantages of this transition lies in the facilitation of international trade: the management of financial transactions and the transfer of funds are now carried out electronically, thus simplifying cross-border operations.

In the healthcare sector, the digitization of medical records allows for more responsive patient care. Furthermore, the integration of information technology and artificial intelligence has become essential for optimizing the accuracy of diagnoses.

However, this transformation requires significant investments in equipment and network infrastructure, for both businesses and individuals. Furthermore, access to online information is a major driver of socio-economic inclusion, enabling individuals without formal qualifications to develop professional opportunities and generate substantial income through digital technology. In terms of environmental protection, this greatly contributes to improving the situation. Madagascar, a country still heavily reliant on firewood, uses nearly 70% of its wood and paper for industrial production. Yet, paper consumption is declining.

Paper consumption is declining. Discussion: The limits of digital technology use remain unclear, but in the financial sector, its introduction is proving beneficial. The obstacles and opportunities it presents are the subject of discussion. This raises concerns about the potential loss of personal data. Regarding environmental protection, this transition makes a significant contribution to improving the situation. In Madagascar, where the economy remains heavily dependent on firewood, approximately 70% of wood and paper production is destined for industrial use.

3.2. Digital sector revenues in Madagascar in 2019-2025



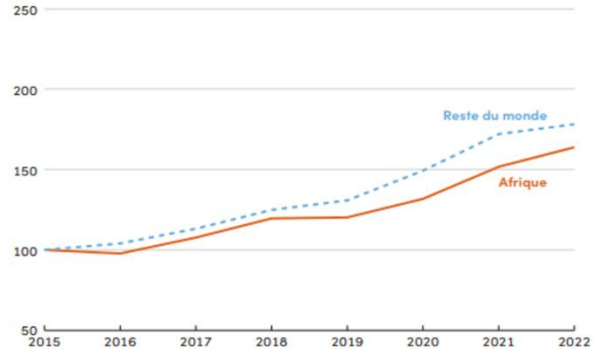
Source: World Bank 2024-2025

http://ijses.com/
All rights reserved

3.3. Digital Commerce

Africa represents a small share of the global trade in digital services. In 2022, Africa accounted for only 0.9% of global exports of digital services. This figure is lower than the continent's share (approximately 3%) of global merchandise exports and global GDP. On average, African exports of digital services have grown by 7.3% annually since 2015 (slightly less than the global average of 8.6%). The growth rate has been relatively low in Africa compared to that recorded in the Middle East.

Tangency of digital service use in Africa



Source: WTO, World Trade Outlook 2023

African exports of digital services have grown by an average of 7.9% annually since 2005, while the continent's merchandise exports increased by 4.7% (Figure 2). Furthermore, Africa's share of global exports of digital services has remained constant, while its share of merchandise trade fell from 3.4% in 2010 to 2.8% in 2022. Export growth is concentrated in a small number of countries. Three of them (South Africa, Ghana, and Morocco) accounted for more than half of Africa's digital services exports in 2022.

IV. Discussion

Although the boundaries of the digital transition are not yet clearly defined, its integration is proving particularly advantageous for the financial sector. The challenges and opportunities inherent in this process are the subject of in-depth analysis, particularly with regard to the risks associated with the protection of personal data in a fully digital environment. The reliability of the new document processing system raises major concerns, particularly because of its dependence on a stable internet connection, any interruption of which could paralyze operations and cause critical malfunctions.

Internationally, IT experts emphasize the imperative of strengthening personal data security. Furthermore, the mobile banking sector faces a degree of mistrust, with users increasingly reluctant to centralize their assets on digital platforms for fear of theft, due to a lack of sufficiently robust security protocols. At the same time, companies are intensifying their use of cryptocurrencies to diversify their revenue streams, actively engaging in financial markets, Forex trading, and strategic acquisitions. Madagascar ranks 26th in Africa, driven by a growing dynamic of startup creation in the financial sector.

While access to digital professions presents an opportunity for professional inclusion independent of educational attainment, its deployment raises significant concerns regarding security risks, particularly cybercrime, fraud, and the facilitation of illicit activities. Simultaneously, the increasing risks associated with digital practices necessitate a structural response. In this context, the Malagasy government aims to expand digital education to all sectors. Since 2019, the gradual adoption of digital tools within the national business community has transformed operational practices, promoting the digitalization of management processes, especially in terms of activity tracking and securing payroll transactions.

V. Conclusion

In conclusion, digitalization is a new system that will bring enormous opportunities to the digital sector. At this moment, almost all secondary activities within companies are being digitized to facilitate the creation of a new gateway to the market. Our study is broader if we look at the city of Farafangana, where people are becoming increasingly interested in investment. Farafangana is located in the capital of the Southeast region of Madagascar, a city with immense value in its assets. It has entered the digitization of products, which aims to control the region's economy. It can improve their visibility and facilitate payment (digital payment methods, either through bank transfers or mobile payments). However, it can only produce sustainable results if it is accompanied by better infrastructure and affordable internet access. The training offered is aimed at entrepreneurs so they have the knowledge to use applications or software for transaction security and receive support adapted to local realities. The sectors to be observed include commerce, services (hospitality and catering), road and river transport, agriculture, fishing, crafts, financial services, and small informal activities. Digital tools can help these businesses communicate with their customers and receive payments. We note that in Madagascar, people are increasingly interested in using services like Mvola and Orange Money to secure their transfers and money. Digitalization presents a positive and real opportunity for regional and national economic development, but its impact depends on adoption tailored to the needs of businesses, local support, and investment in network infrastructure and, above all, skills.

References

[1] Dynamics of Development in Africa 2021: Digital Transformation and Quality of Employment, authored by institutional partners of the African Union Commission and the OECD.
[2] Digital technology and development in Africa: new technology between promises and realities on the ground, Ibrahim MAIDAKOUALE, 2023, page 254
[3] Madagascar Digital Economy Assessment 2022, World Bank Year 2022
[4] Economy and use of the Internet: case of Madagascar, Totojo Nirina RANDRIANARISAINA and Tahirsoa ANDRIAMPARANOKASAINA, scientific article, year 2026
[5] Digitalization: a lever for operational and financial performance in insurance companies, Finaritra RAKOTOBE MAHERISON, Master's thesis, 2025.
[6] RANDRIANARISAINA Tojo Nirina Lucien and ANDRIAMPARANOKASAINA, Tahirisoa (2025) Economy and use of the internet case of Madagascar document Hal Open science hal - 05347373

http://ijses.com/
All rights reserved

[7] RATOMPOMALALA h (year to be verified) publication on training and mobile phones
[8] INSTAT Madagascar and UNICEF 2018, Household Data and Internet Access
[9] Ministry of Digital Development, Digital Transformation of Posts and Telecommunications, 2023 Digital Transformation Plan for Madagascar 2023-2028
[10] GOTICOM Madagascar, ICT Development in Madagascar: Impact and Initiatives of Goticom Antananarivo: Group of Information and Communication Technology Operators.
[11] Research Center for Studies and Support for Economic Analysis in Madagascar, 2013, Monograph of the Atsimo-Atsinanana Region
[12] Ministry of Tourism of Madagascar (SD) directory of accommodation and restaurant establishments
[13] World Bank 2019 Madagascar digital economy assessment
[14] World Bank 2022 Madagascar economic update Navigating financial inclusion and digital transformation washington DC World Bank.
[15] International Finance Corporation 2021 Madagascar country private sector Diagnostic whashington DC IFC.

http://ijses.com/
All rights reserved