

# The Application of Mobile Money and Mobile Banking to Digital Transformation: State of Play in Burundi and within the Countries of the East African Community

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**How to cite this paper:** Bigirimana, A., Ndikumagenge, J., & Tabbane, S. (2024). The Application of Mobile Money and Mobile Banking to Digital Transformation: State of Play in Burundi and within the Countries of the East African Community. *Open Journal of Business and Management*, 12, 1619-1634.

<https://doi.org/10.4236/ojbm.2024.123087>

**Received:** February 1, 2024

**Accepted:** May 18, 2024

**Published:** May 21, 2024

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## Abstract

Mobile Financial Services (MFS) are seen as a new reliable means used by banks, microfinance institutions, telecommunications operators and users to carry out financial transactions in the deposit, withdrawal and electronic transfer of Money. Electronic transactions are a positive consequence of the deployment and coverage of mobile and Internet networks using mobile technologies and the mobile terminal in carrying out and completing of transactions by linking the mobile financial services users, Agent and Super-Agent connected to mobile money (Mm) or mobile banking (Mb) platforms to offer the services. This article looks at the current state of operation and use of mobile financial services, in particular mobile money and mobile banking, using figures to indicate the key indicators relating to the development of this service and the level of penetration among the population in Burundi and the countries of the East African Community (EAC). This article will show the progressive existence of online transactions, e-transaction (e-payment) for payment, declarations and migration services. In conclusion, mobile financial services in EAC countries are a new source of growth in monetary terms and offer advantages in terms of speed of action, security and reliability of transactions. The MFS is an important indicator of the role played by the use of Information and Communication Technologies (ICT) using mobile telephony and the Internet for the digital transformation of banks and other growth sectors in the development of countries in the sub-region.

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## Keywords

Mobile Financial Service (MFS), Mobile Money, Mobile Banking, Mobile Terminal, E-Transaction, Burundi, East African Community (EAC)

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## 1. Introduction

The rapid development of Information and Communication Technologies (ICTs), observed mainly since the 20<sup>th</sup> century<sup>eme</sup>, has been marked by a rapid acceleration in the deployment of mobile and Internet networks worldwide, and a multiplication of the services that are becoming essential in all sectors of human life. Mobile telephony has enabled the development of applications and services such as mobile money (M-m) and mobile banking (M-b) which offer on-line deposit, withdrawals and payments (m-payment), transfers (m-transfers), Internet banking activities (I-banking) and other services.

According to the International Telecommunications Union (ITU), a specialized agency of the United Nations (*About the International Telecommunications Union (ITU)*, n.d.: p. 1), ICTs have played a more important role in development of countries in general and are helping to reduce poverty and hunger, improve health, create new jobs, mitigate the effects of climate change, improve energy efficiency and make cities and communities more sustainable and more prosperous.

The meteoric growth of the Internet has disrupted business models and fuelled the expansion of e-commerce.

According to the World Trade Organization (WTO), technological progress is the main source of economic growth and well-being by improving productivity, which fosters innovation and development. E-commerce is gradually developing in a number of countries, leading to the establishment of digital platforms for services such as online buying and selling, online payment (e-transaction), on-line deposit, withdrawals and money transfers.

Around the world, several countries have been looking at the future of E-commerce. For example, on 25 April, 2017, the Friends of E-commerce for Development (FED), a group comprising Argentina, Chile, Colombia, Costa Rica, Kenya, Mexico, Nigeria, Pakistan, Sri Lanka and Uruguay, held their first ministerial meeting to discuss what they see as the future of the discussion on electronic commerce and in particular its role as a tool to stimulate growth, reduce the digital divide, (*Electronic commerce within the World Trade Organization: Background and latest progress in negotiations under the joint declaration*, n.d.: p. 17).

In Sub-Saharan Africa, in Mozambique, one of the countries of Southern Africa, the use of mobile money in rural areas of Mozambique has reduced the transaction costs of migrants (Batista & Vicente, 2023: p. 10).

In East Africa, according to Ahmad Hassan Ahmad, Christopher Green and

Fei Jiang on “Mobile money, financial inclusion and development: a review with reference to African experience”, their research shows that mobile phones can play a key role in promoting financial inclusion (Ahmad et al., 2020: p. 8).

Research by Asli Demirgüç-Kunt, Leora Klapper, Dorothe Singer, Saniya Ansar, Jake Hess, reveals many potential benefits of financial inclusion. Digital technology alone is not enough to promote digital inclusion but also requires a well-developed payment system, a solid physical infrastructure, and appropriate regulation (Demirgüç-Kunt et al., 2020: p. 8).

Mobile financial services involve two concepts, “mobile money” using mobile networks and terminals, but also “Mobile banking” using platforms to enable customers to access their accounts using their mobile phones. Using these services increases the speed of doing business, reducing the long queues at banks for financial transactions.

Within the East African Community, the example of Kenya confirms that the penetration of the use of mobile financial services, with the M-PESA, which since its creation in 2007, carries out monetary transactions by mobile phones and has had an impact on the economy of this country (Suri, 2017: p. 2).

In Burundi, the use of mobile financial services by financial institutions is a new lever for accelerating innovation through the digital transformation of the services offered, the creation of new jobs and added value for the country’s socio-economic development.

To achieve this, the coverage of mobile networks and the Internet in Burundi has led to a proliferation of services and the creation of new opportunities.

Our contribution is to show the contribution of telecommunications operators in the use of mobile terminals to promote mobile money and mobile banking which contribute to digital transformation thanks to the coverage of mobile and Internet networks in the country. It will show the state of play of mobile financial services in the promotion and provision of online public services, the change in working and living patterns in various areas, and the creation of direct and indirect employment by agents and super agents working in this sector.

Mobile banking is enabling the digital transformation of banks and microfinances institutions by linking traditional banking services to digital platforms.

Finally, our study will help to identify the penetration of mobile financial services in the member countries of the East African Community and will provide decision-makers and new researchers with figures for future work.

## **2. Literature Review on the History of Mobile Money and Mobile Banking**

ICTs have considerably transformed the entire world through the various aspects of socio-economic and technological life, driving social relations between individuals, communications, the transmission of data and knowledge, education, health, public governance and, of course, commerce and trade.

Around the world, a number of researchers have made their observations on

the evolution of mobile financial services and the perceptions of users of Mobile Money and M-Banking services in their daily lives. Some researchers' apprehensions illustrate the literature in this area:

Research in Brazil by Malaquias and Hwang, 2020 states that mobile devices help users manage businesses and achieve greater profitability, as the percentage of use of mobile devices (such as mobile phones and tablets) in rural areas was 17% in 2013, and has risen to 61% in 2017 (Malaquias & Silva, 2020: p. 1).

In Europe and Central Asia, research by Alsi Demirguc-Kunt and Leora Klapper argues that digital technology offers opportunities to improve financial inclusion and that account ownership has increased significantly in many countries and the use of digital payments has accelerated (Demirgüç-Kunt et al., 2019: p. 8).

In Bangladesh, Kazi Abdul Mannan and Khandaker Mursheda Farhana, 2023, argue that the use of digital payment technology, internet money transfer systems and mobile phone technology via digital platforms has made financial systems more accessible. Also, in many developing countries, financial inclusion appears to be a potential transformative agent that can reduce poverty and help create more financial resources (Abdul Mannan & Farhana, 2023: p. 1).

In sub-Saharan Africa, according to Demirgüç-Kunt and Leora Klapper, 2012 research shows that 23% of adults in the Africa region have an account but a variation in account ownership is 24% of adults in Sub-Saharan Africa report having an account with a formal financial institution (Demirgüç-Kunt & Klapper, 2012: p. 6).

In Kenya, research for Bitange Ndemo and Ben Mkalama, 2023 shows that the growth of mobile money in Kenya and Zimbabwe has been driven by a favorable regulatory environment, in which this innovation has been led by dynamic players in technological communication in the private sector rather than by players in the financial system but also that the impact of digitalization through the coordination of decentralized data systems between institutions has yet to be assessed (Ndemo, n.d.: p. 3, 24).

In Burundi, mobile financial services and mobile banking have been in use since 2016 and the development of MFS has been gradually as a result of the deployment and extension of mobile networks and mobile Internet in urban and rural areas. This article illustrates the progression of the Mobile money and Mobile banking services and their penetration among the country's population since 2018. At present, people who do not have bank accounts can use their mobile phone to make money transaction. Mobile money and mobile banking have reduced geographic constraints, reaching the unbanked where over 80% of the Burundi's populations live in rural areas. The research describes the current state of mobile money services and mobile banking platforms, which enable bank customers to carry out electronic transactions.

### 3. Materials and Methods

Quantitative data was collected using a questionnaire that I developed using Kobo Collect Tool software: banking institutions and microfinances institutions

approved in Burundi and operating mobile financial services platforms; public and para-public administrations that use mobile financial services management applications including REGIDESO which has signed agreements with three banks to enable its customers to pay water and electricity bills using mobile banking, the Bujumbura Town Hall in the payment of taxes and property taxes, the Burundian Revenue Office, for the payment of taxes and fees online (e-payment) (*Teledeclaration/ Telepayment, n.d.: p. 1*).

Telecommunications operators operate mobile financial services platforms, in particular LUMICASH, ECOCASH, PESA FLASH; the Agence de Régulation et de Contrôle des Télécommunication (ARCT) (*ARCT, n.d.*). Data can also obtain from the websites of the National Regulatory Authorities of member countries of the East African Communication Organization (*East African Communications Organization, n.d.*).

The data was processed using statistical data management software, including EXCEL to identify trends in the development of mobile financial services.

The results of data processing are interpreted using a comparative method for certain indicators drawn from Mobile Financial Services data in Burundi and the EAC countries.

#### **4. Overview of Mobile, Internet and Mobile Financial Services in Burundi**

The analysis of services offered to the consumers, which is the subject of this study, focuses on mobile financial services. To achieve this, this article presents the state of play for mobile and Internet subscriptions as well as the various data for Mobile money and Mobile banking in **Table 1**.

##### **4.1. Summary Table of Data Collected from 2018-2022**

**Table 1** shows data for mobile and Internet services and mobile financial services from 2018 to 2022.

##### **4.2. Comparisons of Mobile Voice and Internet Communications Service Subscriptions**

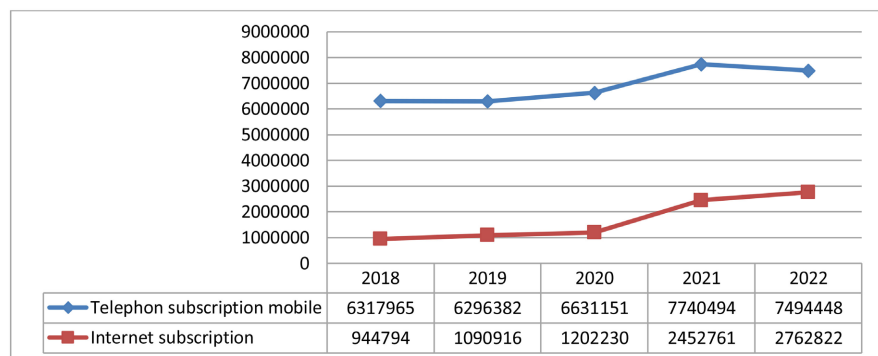
Mobile and Internet subscriptions are growing at different rates. The trends (**Graph 1**) show that mobile telephony making great strides and are more widely used than Internet. This shows that mobile communication is more in demand than an Internet connection.

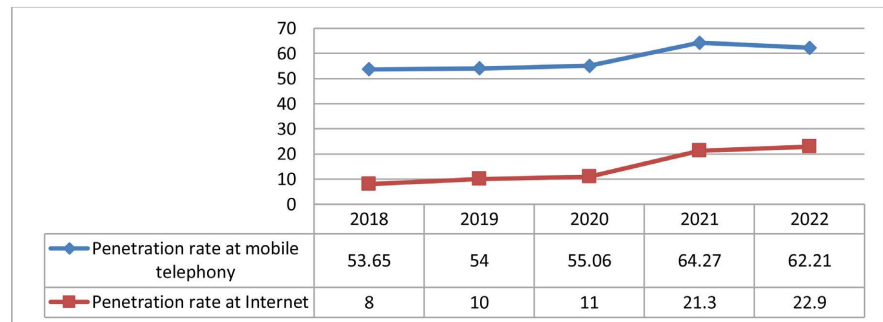
##### **4.3. Comparison of Mobile and Internet Penetration Rate**

The overall penetration rate shows the level of use by the population of mobile telephony and Internet services in Burundi. The diagram **Graph 2** shows that Burundians use mobile telephony more than the Internet. Strategies need to be developed to promote the use of the Internet in the country by ensuring connectivity and digital inclusion.

**Table 1.** Table constructed by myself based on data from the observatory of ICT market and Indicators 2018-2023, (<https://www.arct.gov.bi/>), estimated population of 12,044,164 (ISTEEBU<sup>1</sup>, 2019).

Description	Years				
	2018	2019	2020	2021	2022
Number of Mobile Subscriptions	6,317,965	6,296,382	6,631,151	7,740,494	7,494,448
Number of Internet subscriptions	944,794	1,090,916	1,202,230	2,452,761	2,762,822
Mobile telephony penetration rate (%)	53.65	54	55.06	64.27	62.21
Internet penetration rate as a percentage (%)	8	10	11	21.3	22.9
Number of Deposits	49,802	3,525,110	1,648,817	5,131,147	6,896,163
Number of withdrawals/customers registered	399,508	2,838,179	1,490,741	3,788,406	4,250,173
Number of transfers	228,564	1,391,396	130,662	529,467	634,826
Number of bulk transfers/transactions	0	6958	132,017	71,422	42,240
Number of connected subscribers	2,383,061	3,633,140	13,106,553	1,792,596	5,638,119
Number of active connected subscribers	307,106	1,296,728	2,793,864	1,772,183	2,029,499
Number of super and ordinary agents	14,156	88,863	74,165	112,544	121,751
Number of Merchants	1393	1196	3451	10,189	6932
Amount of Deposits	1,282,872,644	1.03451E+11	40,557,548,946	1.73534E+11	2.33725E+11
Amount of registered withdrawals	12,015,842,824	90,532,633,274	44,547,226,644	1.65063E+11	2.26843E+11
Amount of transfers	5,509,913,130	1.07679E+11	6979456506	11,592,103,888	13,765,943,060
Sales in franc bu	496,525,960	2,189,349,620	1,538,947,750	3,844,537,902	5,296,749,923
Total number of transfers from partner banks to platforms of financial institution	2721	278	15,888	30,378	43,319
Total corresponding amount	215,148,901	8,070,900	1,387,378,578	2,635,200,327	4,109,802,326
Total number of transfers from financial institution to partner banks	199	62	2350	2328	3286
Total corresponding amount	31,268,790	1,517,200	290,554,200	415,270,469	917,390,632
MFS penetration rate in Burundi in percentage	2.7	10.76	22.7	14.71	16.84

**Graph 1.** Constructed by myself on the basis of data obtained from the regulator and telecommunications operators.<sup>1</sup>ISTEEBU: Institute of Statistics and Economic Studies of BURUNDI, currently INSBU.



**Graph 2.** Constructed by myself on the basis of data obtained from the telecommunications regulator.

## 5. Application of E-Transaction and Mobile Money in Burundi: Analysis and Discussion of the Results

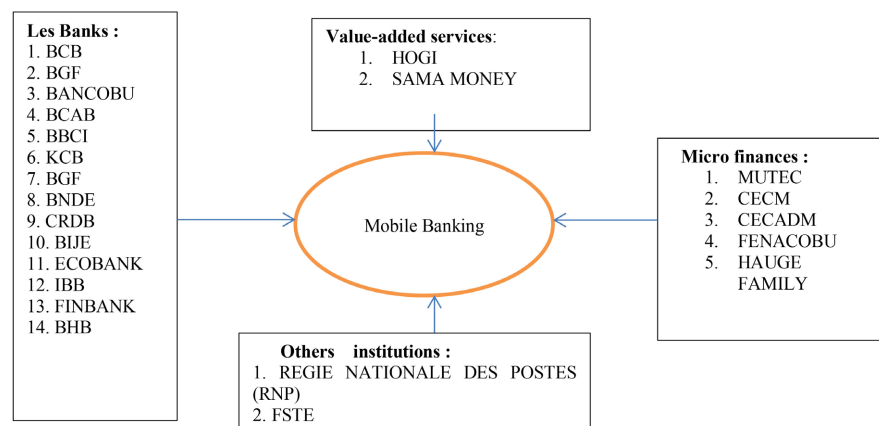
In Burundi, e-commerce is currently dominated by the purchase of products/services from abroad, which further increases deficits in the trade balance and foreign currencies. Using the Internet to buy second-hand vehicles from Japan is the most popular activity in Burundi, followed by import of goods from China.

As many local people involved in commerce in Burundi who connect via the Internet do not have credit cards, they send payments for their online orders by ordinary transfer and via means of rapid transfer of funds. Money like Western Union, Money Grand, Rapid Transfer, but also others pay for their orders via their relatives or friends based abroad.

### 5.1. State of Play of Mobile Banking and Mobile Money in Burundi

#### 5.1.1. Institutions Operating Mobile Banking Services

Identification and analysis showed that thirteen banking institutions, two value-added service institutions, five microfinance institutions and two other institutions have integrated mobile financial services operations by exploiting mobile banking services (**Diagram 1**).



**Diagrams 1.** Based on the data collected.

### 5.1.2. Institutions Operating the Mobile Money Service

The mobile money service (**Diagram 2**) is operated by mobile telecommunications operators and a value-added service operator using a short number granted to it by the Telecommunications Regulation and Control Agency (ARCT).

## 6. Results and Interpretations

### 6.1. Grow in Deposits, Withdrawals and Money Transfers from 2018 to 2022

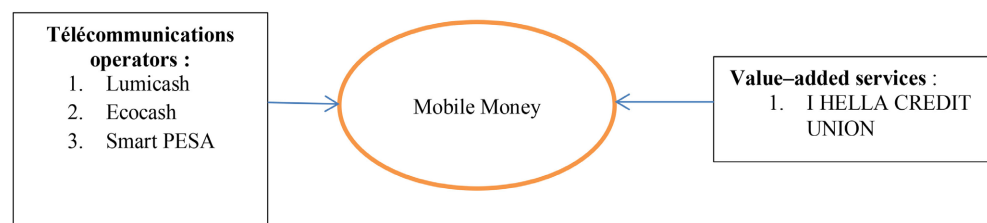
**Graph 3** indicates the evolution of the number of deposits, withdrawals, transfers and mass transactions made by users of Mobile Financial Services from 2018 to 2022. This provides information on the level of gradual appropriation of these services by users in Burundi.

### 6.2. Growth in the Number of Subscribers Connected to Mobile Financial Platforms from 2018 to 2022

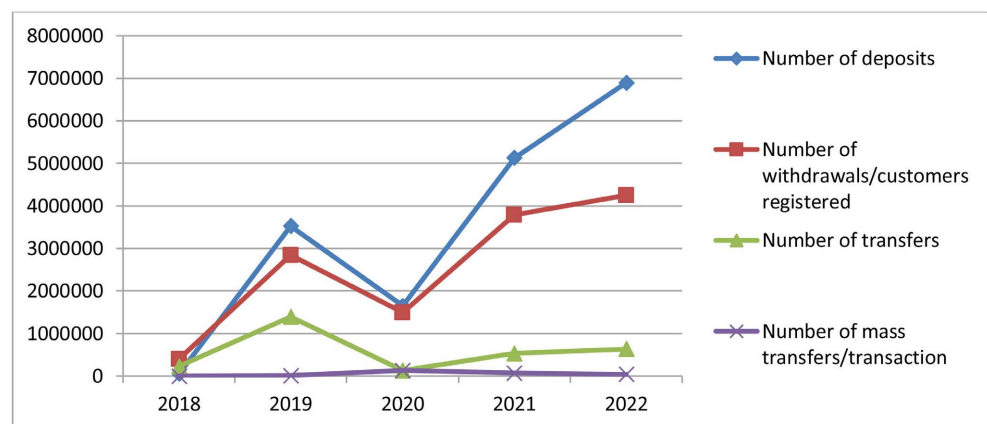
**Graph 4** shows the total number of connected subscriptions and the number of active MFS subscriptions. Between 2020 and 2021, one MFS provider “Smart Pesa”, left the market, subscriptions fell and rising again gradually towards 2022.

### 6.3. Impact of Mobile Financial Services on Employment: Number of Jobs, Points of Sale and Market Services (Graph 5)

Evolution of Agents, Super Agents and Merchant Service

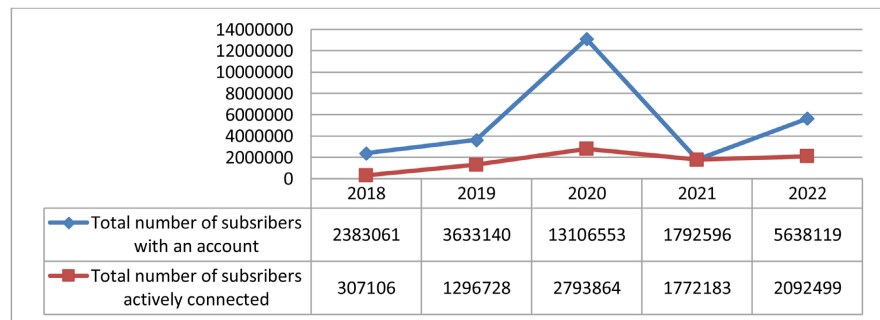


**Diagram 2.** Based on the data collected.

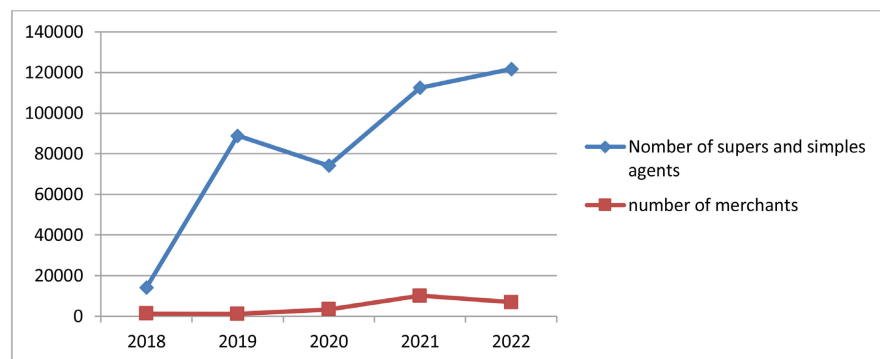


**Graph 3.** Plotted based on data collected by myself.





**Graph 4.** plotted based on data collected by myself.



**Graph 5.** plotted based on data collected by myself.

#### 6.4. Evolution of the Amounts and Revenues from MFS Operations in Burundi (Graph 6)

Amount of Deposits, withdrawals, transfers, turnover and mobile wallet of MFS.

#### 6.5. Trend in the Number of Connections to Banking Platforms towards Financial Platforms and vice versa (Graph 7)

Number of transfers from financial institutions platforms to banks and vice versa.

#### 6.6. Amount Transferred from Financial Platforms to Banks and Vice Versa

Monetary values in transit from financial platforms to banking institutions and from these institutions financial platforms are illustrated by the curves in **Graph 8**.

#### 6.7. Evolution of the Penetration Rate of Mobile Financial Services (MFS) in Burundi

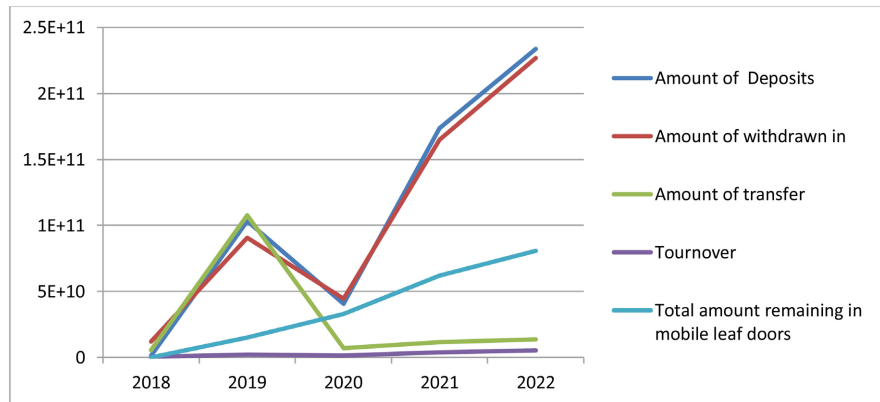
Mobile financial services (MFS) have contributed to financial inclusion because ICT in general and mobile phone services in particular demonstrate the contribution of ICT to financial inclusion (**Graph 9**).

The banking platforms used by mobile telephone operators of Eco-cash, Lumicash, Lacell's Smart-Pesa, and others value-added service providers platforms have boosted the use of MFS from 2018 to 2022 with a penetration rate ranging

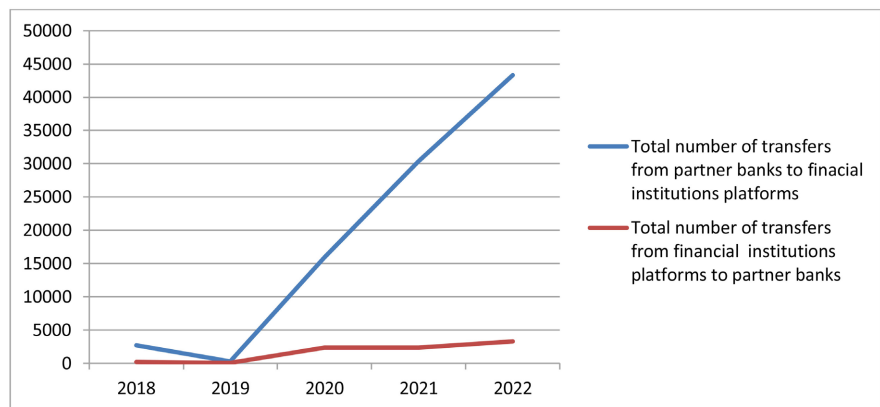
from 2.7% to 16.8%, an increase of 522.2%. This rate indicates the progression and level of appropriation of the population to the use of MFS in the country.

### 7. The Impact of Mobile Money and Mobile Banking on Digital Transformation

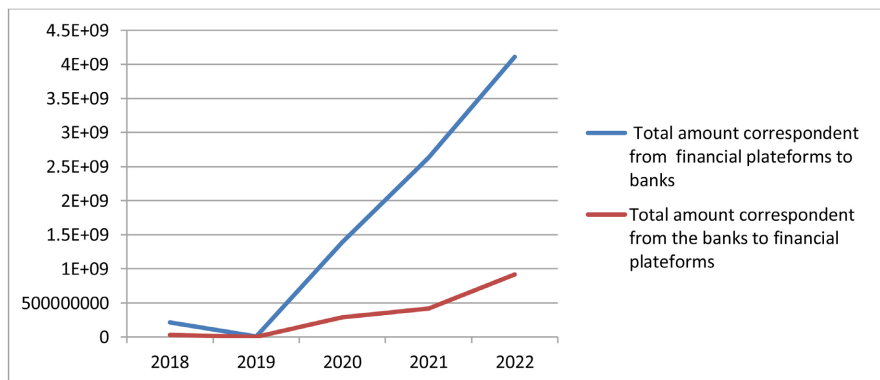
Mobile financial services have played a major role since their introduction and implementation in Burundi. Technically, socially and economically, this new



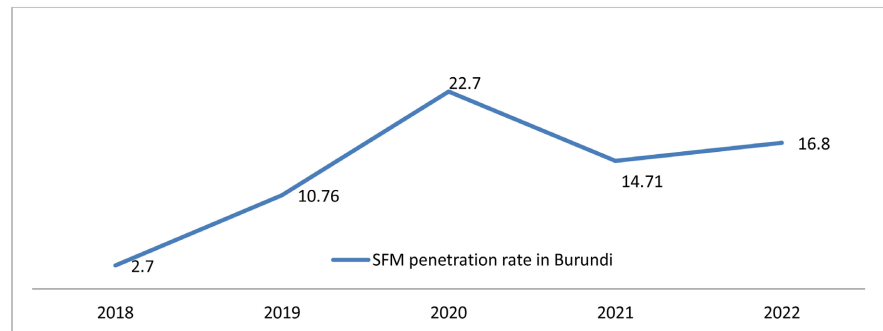
Graph 6. Built by myself.



Graph 7. Plotted based on data collected by myself.



Graph 8. Plotted based on data collected by myself.



**Graph 9.** Plotted based on data collected by myself.

technology has provided opportunities for the population, including speed of action, secure money transactions, accessibility and mobility of services an increased household cash income and direct and indirect job creation, online use of services taxes and duties, modernization and digitalization of services within banks and financial institutions, mentality and easier ordering thanks to mobile banking and mobile money platforms. The data analyzed illustrates the rate of use of mobile, Internet and mobile financial services, showing the level of growth and appropriation of these new technologies in Burundi and within the countries of the East African Community.

## 8. Comparison of Mobile Financial Services in Some East African Community (ECA) Countries

Our study analyzed the evolution of subscriptions connected to mobile financial services (MFS) in certain countries of the East African community of which Burundi is a member.

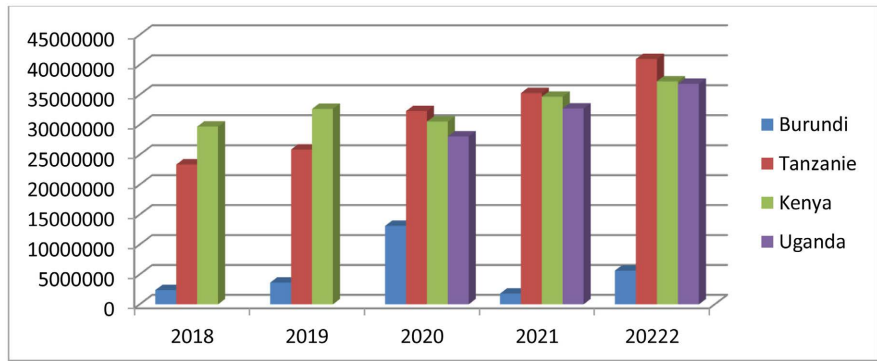
The following graph (**Figure 1**) shows the trend of MFS subscriptions in Burundi compared to Kenya, Tanzania and Uganda, the data for which was collected via the Website of the National Telecommunications Regulatory Authorities.

### 8.1. MFS Trends in Certain ECA Countries

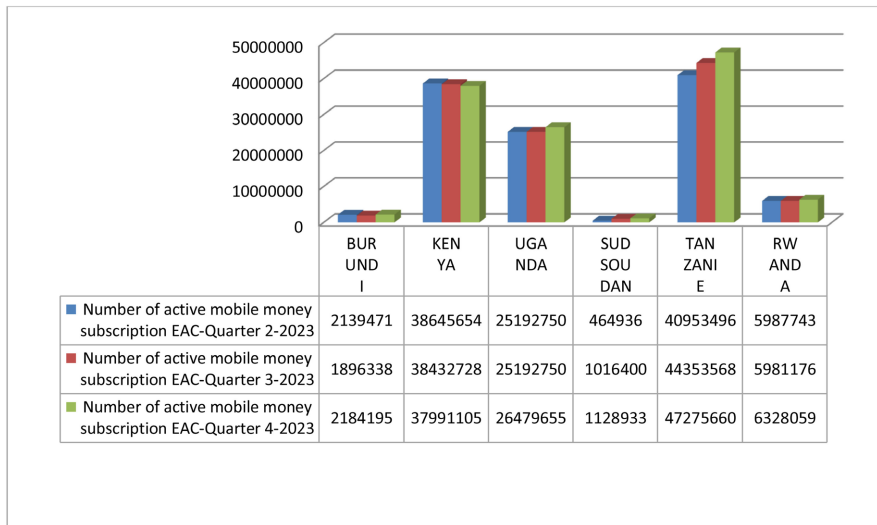
The following figure illustrates a comparison of mobile financial services subscriptions in certain member countries of the East African Community, including Burundi, Kenya, Uganda and Tanzania. The figure presents the overall mobile financial service subscriptions over the period 2018 to 2022 within these countries of the sub-region.

### 8.2. Comparison of Trends in Active Mobile Money Subscriptions in the EAC in 2023 (Figure 2)

**Figure 2** presents a comparison of trends in active mobile money subscriptions in the EAC countries of Burundi, Kenya, Uganda, South Sudan, Rwanda and Tanzania for the second, third and fourth quarters of 2023.



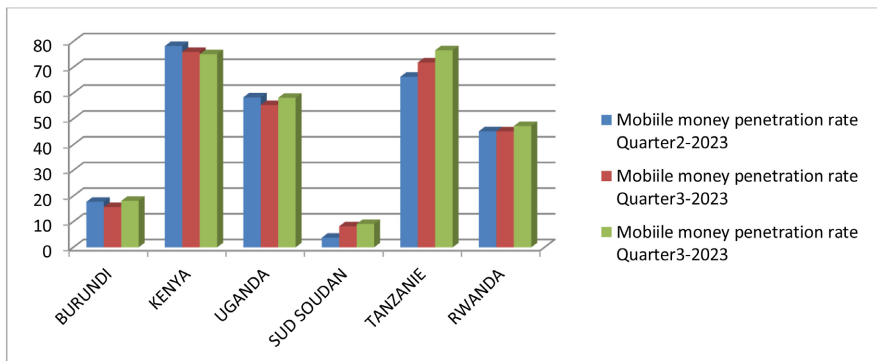
**Figure 1.** Constructed by myself based on data collected from the Websites of the national telecommunications regulatory authorities of the EAC countries.



**Figure 2.** Based on data collected within EAC countries.

### 8.3. Mobile Money Penetration Rate in EAC Member Countries in 2023 (Figure 3)

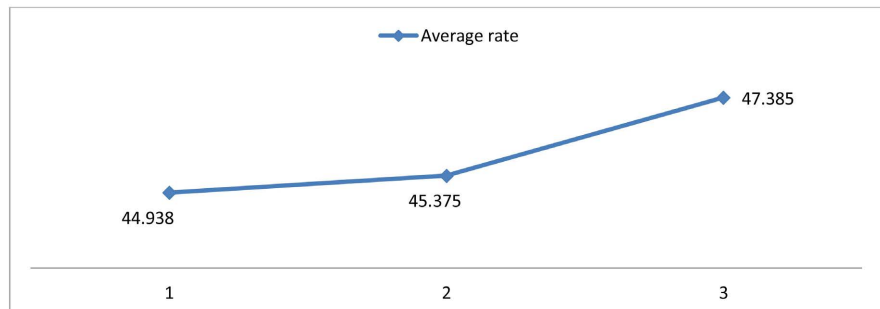
**Figure 3** illustrates the changes in mobile money penetration rates in the EAC member countries of Burundi, Kenya, Uganda, South Sudan, Rwanda and Tanzania for the second, third and fourth quarters of 2023.



**Figure 3.** Based on data collected within EAC countries.

#### 8.4. Representation of the Average Penetration Rate of Mobile Money within the EAC (Figure 4)

**Figure 4** illustrates the average rate of penetration and appropriation of mobile money per capita within the EAC member countries from the second to the fourth quarters of 2023. The observed average penetration rate provides clear evidence of the advancement of mobile financial services within the region.



**Figure 4.** Based on data collected within EAC countries.

### 9. Comments on the Results Obtained

The comparative method within the EAC countries and Burundi shows the following results:

Growth in the number of active subscriptions is highest in Tanzania, followed by Kenya and Uganda. It is lower in South Sudan and Burundi (**Figure 2**).

Penetration is highest in Kenya, followed by Tanzania, Uganda and RWANDA. It is lower in South Sudan (**Figure 3**).

Between the second and fourth quarters of 2023, the average penetration rate of mobile money in the countries of the East African community rose from 44.938% in the second quarter of 2023, to 47.385% in the fourth quarter of 2023. This progression calculated in relation to the sub region's population, indicates the rate of appropriation of mobile money per inhabitants of the EAC member countries (**Figure 4**).

In Burundi, the calculation of the mobile money penetration rate gives an average value of 16.8% in 2022 and 17.21% in 2023. This mobile money penetration is still low compared to that of the sub-region, but it will increase from 2017 to 2023, rising from 2.7% to 16.8% in 2022 (**Graph 9**) and then to 17.21% in December 2023.

The number of deposits, withdrawals and transfers are gradually increasing as indicated by the evolving curve of **Graph 7**.

In terms of banking (M-banking), the analysis shows that banking institutions in Burundi are gradually integrating online services and equipping themselves with Mobile-banking platforms to modernize traditional deposit, withdrawals and monetary transfer services. **Graph 4** shows a positive trend in transfers from financial platforms to banks and vice versa, demonstrating the new trend of appropriation of M-banking services in the country. The use of mobile financial

services is an opportunity to combat unemployment and poverty among many young people and the unemployed active population; **Graph 5** shows the evolutionary growth in the number of jobs for agents, super agents and market services.

Finally, the results, the countries of the East African communities including Burundi have integrated mobile financial services through the development of services, job creation, innovation and economic growth.

## 10. Conclusion

Mobile financial services occupy an important place in the daily life of nations in general and in Burundi in particular, where the number of operators investing in this sector is increasing year on year. This is in line with Joseph A. Nobile's assertion that mobile financial services (fin Tech) can help drive the process of financial inclusion and thus reduce poverty (Nwobike, 2023).

Moreover, the penetration of MFS use in the country is evident, in the ever-increasing trend in deposits, withdrawals and transfers thanks to the mobile terminal, which is helping to modernize and save working time. This is leading to innovation and digital transformation in the service offered by financial institutions as well as user perception and ownership of mobile financial services. Given the evolution of mobile financial services in Burundi, and the research by Nelms Taylor and Rea Stephen which showed that around 20 million Kenyans use M-Pesa, representing 96% of all households, and that before the launch of M-Pesa, only 20% of Kenyans had access to formal financial institutions, compared to 75% after just three years of existence; this finding is in line with the reality of Burundi and other countries of the East African community.

That said, the coverage of mobile networks and the deployment of the Internet throughout the country have had a significant impact in enabling the population to access and include digital services, and to exploit new services, particularly mobile financial services.

The digital transformation of banking in Burundi and others countries in the East African Community has been driven by the use of the mobile terminal to link customers' bank accounts to mobile financial services platforms enabling traditional transactions carried out in financial institutions to be made operational.

This modernity has been made possible by the deployment of 3G and 4G technologies to ensure the digitization of services and offer advantages to banks and institutions that own mobile financial platforms, and to users who are changing their habits and switching to the gradually use of mobile financial services. The availability of mobile financial services in signal-covered areas is a solution to the transaction time constraints of traditional banking, as analysis of the growth in deposits, transfers, withdrawals and turnover in the last five years show that MFS has clearly penetrated the habits of Burundians.

Within the EAC countries, MFS has seen growth in Tanzania, Kenya and

Uganda, reflecting the growing of acceptance of MFS in the daily lives of the people in these countries.

Finally, MFS in Burundi is bringing tangible innovation in the use of tele-declaration and tele-payment services by taxpayers of the Burundian Revenue Office (OBR) in the payment of taxes.

In addition, the payment of rental taxes, transport taxes and other taxes for taxpayers of Bujumbura city council can be made by using Mobile Financial Services, the payment of subscriptions to bouquets and digital television channels from television signal redistributors operators, the registration of incoming and outgoing travelers and the applications for travel documents, particularly passports, and other travel documents, can be made online at the Immigration Department.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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