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# The African Mobile Wallets: An empirical analysis of the services and the anticipated trends.

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# Abstract

The delivery of financial services in Africa has undergone a transformation thanks to the widespread usage of mobile technology. With their quick and economical methods for people to access financial services, make payments, and transfer money, mobile wallets have become a significant breakthrough in the financial industry. This thesis examines the market of mobile wallets in Africa with an emphasis on factors that distinguishes the different players in the different regions of Africa. This thesis examines the mobile wallet market in Africa with an emphasis on the key players, technology, and services offered. The research employs a mixed-methods approach, utilizing a literature review and secondary data sources analysis. According to the data, M-Pesa, Airtel Money, and Orange Money are a few of the top players in the African mobile wallet sector. These service providers offer a range of services, including money transfers, bill payments, and mobile banking, using a number of technologies, including USSD, NFC and QR codes. The lack of traditional banking infrastructure, high mobile penetration rates, and the demand for affordable and accessible financial services are some of the major characteristics the study identifies as being responsible for the acceptance and success of mobile wallets in Africa. Overall, the thesis presents insightful information about the African mobile wallet market as well as suggestions for further study and regulatory changes.

**Key-words:** Mobile wallets, financial services, Africa, Technology, USSD, NFC, QR code, accessibility, affordability, Regulatory changes.

# Abstract in lingua Italiana

La consegna dei servizi finanziari in Africa ha subito una trasformazione grazie all'ampia diffusione della tecnologia mobile. Con i loro metodi rapidi ed economici per le persone di accedere ai servizi finanziari, effettuare pagamenti e trasferire denaro, i portafogli mobili sono diventati una svolta significativa nel settore finanziario. Questa tesi esamina il mercato dei portafogli mobili in Africa con un'attenzione ai fattori che distinguono i diversi attori nelle diverse regioni dell'Africa. La ricerca utilizza un approccio misto, utilizzando una revisione della letteratura e l'analisi di fonti di dati secondari. Secondo i dati, M-Pesa, Airtel Money e Orange Money sono alcuni dei principali operatori nel settore dei portafogli mobili africani. Questi fornitori di servizi offrono una serie di servizi, tra cui trasferimenti di denaro, pagamenti di bollette e banca mobile, utilizzando diverse tecnologie, tra cui USSD, NFC e codici QR. La mancanza di infrastrutture bancarie tradizionali, l'elevata penetrazione mobile e la domanda di servizi finanziari accessibili ed economici sono alcune delle principali caratteristiche identificate dallo studio come responsabili dell'accettazione e del successo dei portafogli mobili in Africa. Nel complesso, la tesi presenta informazioni perspicaci sul mercato dei portafogli mobili africani e suggerimenti per ulteriori studi e cambiamenti normativi.

**Parole chiave:** portafogli mobili, Africa, servizi finanziari, tecnologia mobile, trasferimenti di denaro, banca mobile, USSD, NFC, codici QR, infrastrutture bancarie tradizionali, penetrazione mobile, accessibilità finanziaria, cambiamenti normativi.

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# 1 Executive Summary

## 1.1 Context and Literature review

In recent years, the world has seen a significant increase in the number of transactions being conducted daily, both online and offline. These transactions involve the purchase of goods, services, and financial assets, among other things. Along with this increase in transactions, there has been a change in the technology and payment instruments used to facilitate them. As noted by Kazan and Damsagaard (2013), traditional cash is gradually being replaced by digital payment systems due to a number of factors, such as their inefficiency, high cost of use, and security concerns associated with physical handling. In addition, more and more consumers are using mobile devices in their day-to-day activities, including planning and entertainment. This has led to a growing demand for mobile payment systems that can be used to facilitate transactions using smartphones and other mobile devices. The Mobile Payment & Commerce Observatory has developed a framework for classifying the different types of digital payment systems that are currently available. This framework is based on two main factors: the purchase opportunities available (proximity and remote) and the payment activation device (PC, mobile, and card). The eight categories of digital payment systems that are identified by this framework include eCommerce, ePayment, mobile payment and commerce, contactless payment, and mobile point of sale. This report's focus is on mobile payments, which Mallat describes as the use of a mobile device to transmit money between a payer and a receiver either with or without the involvement of a middleman. In order to promote quick, easy, secure, and straightforward payments and transactions between two parties, regardless of location or time, mobile payments largely entail the use of a mobile device.

Mobile payments have emerged as a result of technological advancements in recent years. The evolution of software, hardware, and internet technologies has transformed the traditional mobile phone into a smartphone, which is a sophisticated device with multiple capabilities enabled by numerous apps. Moreover, the growing demand for communication and commerce services over the past few decades has led to significant changes in related industries and supporting technologies. These developments have resulted in a new product that offers unprecedented capabilities and the flexibility to conduct commerce in ways that were previously not possible. This innovative product is known as mobile payments, according to the Smart Card Alliance (2011).

The popularity of smartphones, coupled with the convenience of carrying both a mobile device and financial cards, has led to the emergence of digital wallets as a promising trend for payments, personal identification, marketing, and digital tickets. A digital wallet is a software, electronic device, or online service that enables individuals or businesses to make electronic transactions. It stores users' payment information for various payment modes on different websites, as well as items such as gift coupons and driver's licenses. This type of wallet is also



known as an e-wallet, according to Julia Kagan. Based on the definition of a digital wallet, it is evident that only the categories of mobile proximity commerce, mobile proximity payment, mobile remote payment, mobile remote commerce, ePayment, and eCommerce in the Mobile Payment & Commerce Observatory's framework are available as payment solutions for digital wallets.

Digital wallets can be classified, according to Corporate Finance Institute, on the basis of two main variables that are showed in the Table 1 below:

	Category	Description
<b>Accessibility</b>	Closed	Users of a closed wallet can use the funds stored to make transactions with only the issuer of the wallet.
	Semi-closed	A semi-closed wallet allows users to make transactions at listed merchants and locations. Merchants need to enter into agreements or contracts with the issuers for accepting payments from the wallet.
	Open	Users with open wallets can use them for all transactions allowed with a semi-closed wallet in addition to withdrawal funds from banks and ATMs.
<b>Technology</b>	NFC	When both reader and payment devices are close together and activated: then there is an exchange of encrypted data from the NFC chips which complete the payment
	QR-code	Transactions can be made by scanning QR-code that is provided by merchants using the user's device
	Internet	Created for online uses, payments in app or in a website

Table 1-1: Digital wallets classification

Digital wallets have emerged as a promising trend for payments, personal identification, marketing, and digital tickets, thanks to the widespread adoption of smartphones and the convenience of carrying financial cards on mobile devices. Essentially, a digital wallet is software, an electronic device, or an online service that enables individuals or businesses to conduct electronic transactions. It stores users' payment information for various payment modes across different websites, as well as other items like gift coupons and driver's licenses. The term "e-wallet" is also used interchangeably with digital wallet, as per Julia Kagan. Only the categories of mobile proximity commerce, mobile proximity payment, mobile remote payment, mobile remote commerce, ePayment, and eCommerce in the Mobile Payment & Commerce Observatory's framework are available as payment solutions for digital wallets. In terms of the market, there are four types of digital wallet providers: Financial institutions, Telecommunications firms, Makers of smartphones and other digital devices (sometimes known as Big Tech firms), and Service Providers (also known as Fintech).

Via a mobile wallet, various stakeholders are included in a transaction. The two actors through which an exchange takes place during a transaction are the merchant and the customer. The use of digital wallets has many benefits for their users, including time savings, usability, increased security, and the ability to record transactions. There are still some obstacles in their way, though. Usage; for instance, the worry that private banking information may be lost if the phone is lost or stolen, inadequate internet connection, especially in rural regions, and

usage restriction because a wallet might not be accepted everywhere by all businesses. Digital wallets offer a frictionless payment experience that can attract more customers and increase customer loyalty. However, the presence of fees charged to merchants can be a disadvantage. Mobile proximity payments are defined by the European Payments Council (EPC) as payments made through a mobile device in which the payer and the payee are in the same location. These payments are facilitated by proximity technologies such as NFC or QR codes. Mobile remote payments refer to transactions in which a payer uses a smartphone or mobile device to make purchases without physically interacting with a merchant's POS system. This can include making purchases from a web merchant, paying a merchant without traditional acceptance capabilities, paying for digital goods, or sending money to another individual (known as P2P transactions).

P2P payments are electronic transactions between two parties with separate bank accounts, facilitated by a third-party website or mobile app. On the other hand, Buy Now Pay Later (BNPL) is a service that allows consumers to purchase goods or services immediately and pay for them in installments, originating credit directly at the point of sale. While BNPL and consumer credit may seem similar, there are some differences. BNPL involves payment by a small number of installments (usually 3 or 4) for low amounts and is usually interest-free. In contrast, consumer credit involves longer time periods, flexible numbers of installments, higher amounts, and interest charges.

The global mobile wallet market is rapidly expanding, driven by the increasing adoption of smartphones and the convenience of digital payments. Asia-Pacific leads the market due to the high smartphone penetration rates, with China, India, and Japan being the key players. Europe and North America also have significant markets. There are different types of mobile wallets available, such as open, semi-closed, and closed wallets. The major players in the market include Google Pay, Apple Pay, Samsung Pay, Alipay, PayPal, and WeChat Pay, among others. The market is expected to continue to grow, with the global mobile wallet market projected to reach USD 7.58 trillion by 2027, at a CAGR of 29.0% during the forecast period.

The evolution of payment methods in the world has seen a significant shift from cash-based transactions to digital payments. Mobile wallets have become increasingly popular, especially in Africa, due to the high adoption of mobile phones and the convenience of making payments using mobile devices. In the past, cash was the dominant payment method in many parts of the world. However, the rise of technology and the internet has led to the emergence of various digital payment methods such as credit/debit cards, online banking, and mobile wallets. Mobile wallets have become particularly popular in Africa because they offer a convenient way to access financial services, especially for people who previously had limited access to traditional banking services. Mobile wallets have evolved from simple payment platforms to sophisticated financial services that offer features such as bill payments, money transfers, and savings accounts. This evolution has been driven by the need to provide financial services to the unbanked population in Africa, which is estimated to be around 350 million people.

Several mobile wallet providers have emerged in Africa, such as M-Pesa, Airtel Money, and MTN Mobile Money. These providers have partnered with banks, merchants, and other financial institutions to offer a wide range of financial services to their users. Overall, the evolution of payment methods towards mobile wallets in Africa has been driven by the need for financial inclusion and the convenience of making payments using mobile devices. As more people gain access to smartphones, the adoption of mobile wallets is expected to continue to grow, leading to further innovation in the sector.

## 1.2 Methodology

In this chapter, the methodology followed to build the thesis was explained. The first chapter of the thesis served to establish the context of the research by presenting relevant theoretical concepts and literature analysis. In particular, the chapter covered topics such as digital payments, mobile payments, and mobile wallets, providing definitions, historical background, and market insights. The literature analysis is conducted through a systematic review of existing studies and reports related to the European mobile wallet market, with the aim of identifying knowledge gaps and potential research questions. Additionally, the chapter provided an overview of the research methodology, outlining the research questions, objectives, and hypotheses. This helped to frame the subsequent chapters and serves as a guide for the research process. Overall, the first chapter laid the groundwork for the rest of the thesis by providing a comprehensive understanding of the context and scope of the research. By doing so, it sets the stage for the subsequent chapters, which delve deeper into the various aspects of the European mobile wallet market, including demand, available services, and potential barriers. Through the structured workflow of the thesis, the research findings are presented in a logical and cohesive manner, allowing for a better understanding of the market dynamics and trends.

The census has tested the following macro areas in order to fulfill the purpose of this work and to conduct the empirical analysis:

- Type of company
- Accessibility
- Technology1
- Technology 2
- Founded date
- Release date
- Headquarter
- Served Areas
- Services offered
- Associated payment method

- Fees
- Diffusion of customers
- Merchant diffusion
- Rank

## 1.3 Empirical Analysis

The empirical analysis of the thesis is structured into two main parts: the general analysis and the technology and accessibility analysis. The general analysis chapter utilizes data from the census to examine the African mobile wallet market from different perspectives. Specifically, the chapter looks at the major players in the market, the geographic distribution of the market, the supporting technologies used by mobile wallets, and the services provided by these wallets. To begin, the chapter explores the diffusion of digital wallet offerings across various African countries and over time. This analysis provides insights into how mobile wallet usage has grown and spread throughout the continent. Additionally, the chapter examines the different payment methods used by these wallets and identifies the providers operating in the market. This allows for a comprehensive understanding of the competition and market dynamics. The second part of the empirical analysis focuses on the technology and accessibility of African mobile wallets. This chapter delves deeper into the different technologies adopted by mobile wallets to accomplish their functions. This includes examining the security features, transaction speeds, and ease of use of the various wallets. Additionally, the chapter explores the relationship between the mobile wallets and their networks in terms of allowed transactions and the ability to withdraw money. The empirical analysis provides a detailed examination of the African mobile wallet market. By utilizing data from the census and other sources, the analysis provides insights into the market's major players, geographic distribution, supporting technologies, and services provided. Through a structured approach, the thesis presents a comprehensive understanding of the African mobile wallet market, offering valuable insights for stakeholders and policymakers.

According to the empirical analysis, the adoption of mobile wallets in Africa has been growing rapidly over the past decade, driven by factors such as the high rate of mobile phone penetration, low banking infrastructure, and the need for financial inclusion. In this context, it is important to understand the geographical distribution. The adoption of mobile wallets in Africa is not uniform, with certain regions and countries showing higher adoption rates than others. East Africa, for example, has been a leader in mobile wallet adoption, with Kenya, Tanzania, and Uganda showing some of the highest mobile money usage rates in the world. In West Africa, countries such as Ghana and Nigeria are also experiencing rapid growth in mobile wallet usage. The factors driving this adoption include the lack of access to traditional banking services, the need for convenient and affordable payment options, and the growth of e-commerce. In terms of technology, mobile wallets in Africa are often based on USSD

(Unstructured Supplementary Service Data) technology, which allows for simple, low-cost transactions that can be accessed on any mobile phone, even those without internet connectivity. However, there is also a growing trend towards the use of smartphones and mobile apps for mobile wallet transactions, which offer a more user-friendly experience and access to additional services. In addition to facilitating basic financial transactions such as sending and receiving money, mobile wallets in Africa are also being used to provide other financial services, such as savings, insurance, and credit. For example, M-Pesa allows users to save money in a virtual account, earn interest on their savings, and access microcredit. Similarly, Orange Money offers insurance products and credit services to its users. These additional services are helping to drive the adoption of mobile wallets in Africa and provide a pathway to financial inclusion for the unbanked population.

In conclusion, the mobile wallet landscape in Africa is dynamic and rapidly evolving, driven by the need for financial inclusion and the growth of e-commerce. Safaricom's M-Pesa, MTN Mobile Money, and Orange Money are the dominant players, with different strengths and weaknesses in terms of market share and services provided. The geographical distribution of mobile wallets in Africa is not uniform, with certain regions and countries showing higher adoption rates than others. The adoption of mobile wallets in Africa is also accompanied by a growing trend towards the use of smartphones and mobile apps for mobile wallet transactions, which offer a more user-friendly experience and access to additional services.

## 2 Context and Literature review

### 2.1 Premise

In this opening chapter, the initial stage of the literature research will involve establishing the scope of the analysis. The definition of mobile payments will be provided, along with the New Digital Payments framework, which categorizes and describes clusters to present the ecosystem within which mobile wallets operate. Furthermore, the concept of mobile wallets will be defined, including a classification and description of the various types of mobile wallets available in terms of accessibility, technologies utilized, and the players offering this payment solution. This will enable a deeper understanding of this payment service. Subsequently, the chapter will discuss the advantages and challenges of using mobile wallets for both users and merchants. Additionally, the payment services provided by mobile wallets (which will be examined in the census) will be elucidated to comprehend the unique features that a digital wallet is expected to possess. Lastly, an overview of the mobile wallet market will be given and the expected evolution of payment methods in Africa.

### 2.2 Mobile Payment introduction and classification

It's critical to define mobile payments and digital wallets to establish a foundation for the report. With the development of mobile payments technology, literature has changed throughout time. Mobile payments, either with or without an intermediary, are the exchange of money between payers and receivers using a mobile device, according to Mallat (2007). Mobile payments are described in another definition by Francisco Liébana-Cabanillas, Juan Sánchez-Fernández, and Francisco Muz-Leiva (2014) as any financial transaction carried out using an electronic device connected to a mobile network. This makes it possible for parties to make payments to one another quickly, easily, safely, and wherever they are. The term "digital payments" refers to mobile payments. The Mobile Payment & Commerce Observatory makes a distinction between "new digital payments" and "old digital payments," which are made using modern POS terminals without cards and fall outside the purview of this research. Payments made for products and services using electronic payment instruments, payment cards, mobile wallets, or direct charges on bank accounts are referred to as "new digital payments"; digital content is not included. Home and mobile banking transactions are not considered new digital payments (Observatory Mobile Payment & Commerce, 2017). **As illustrated in Figure 2-1**, The Observatory offers a framework for categorizing different payment options based on the context of the purchase (local or distant) and the device activation (PC and tablet, mobile, and card on POS). While conducting a proximity transaction, such one between a smartphone and a smart POS, the two devices must be near one another; this is not necessary for remote transactions.



Figure 2-1: Digital Payments classification framework

Let's analyze each figure presented in the matrix shown in Figure 2-1:

- E-commerce services fall under this category since they give clients a systematic way to buy actual products or services online. Consumers can use their computers or tablets to make purchases, and credit/prepaid cards or mobile wallets can be used for payment.
- E-Payment: This category comprises products and services that let customers use their computers or tablets to pay for items like prescriptions, bills, taxes, and fines. Mobile wallets or credit/prepaid cards can be used to make payments. Home banking services are not included in this category, though.
- Mobile remote commerce refers to transactions that take place via a mobile app or mobile website and involve the use of a payment card or mobile wallet for both the transaction and the payment itself.
- Mobile remote payment: This category includes using a mobile phone to pay for recharges, bills, invoices, parking, tickets for public transportation, vehicle rentals, taxis, and other similar services. Payment is done with a credit or debit card, a mobile wallet, or another payment method that is comparable.
- Mobile remote payment: This category includes using a mobile phone to pay for recharges, bills, invoices, parking, tickets for public transportation, vehicle rentals, taxis, and other similar services. Payment is done with a credit or debit card, a mobile wallet, or another payment method that is comparable.
- Mobile proximity commerce refers to products and services that improve in-store shopping, such as the use of coupons, loyalty programs, and NFC tags to access information consultancy services.
- Contactless payments: Payments made with credit cards, debit cards, or pre-paid cards that feature contactless technology and enable payment by just passing the card in front of a payment terminal fall under this category.



- **Mobile Point of Sale:** This class of products comprises both hardware and software options that let smartphones accept different kinds of electronic payments. Merchants can utilize these solutions to process payments from clients who are using mobile devices.
- **P2P payments:** Although not having a clear connection to the acquisition of tangible goods or services, P2P payments are substantial in terms of transaction volume. Hence, based on Mallat's definition of mobile payments, even if they are not specifically included in the framework, they will be considered in the report.

(Observatory Mobile Payment & Commerce, 2017)

## 2.3 Mobile Wallets

A Mobile wallet is a payment tool designed to operate on connected devices, such as smartphones or PCs, that allows you to initiate a payment transaction based on a card (credit, debit, prepaid) or electronic money, or to issue a payment order based on a transfer (including instant), Innovative Payments Observatory (2023), "Innovative Payments: don't look back". Customers are increasingly using mobile wallets as a payment method because they provide a more practical alternative to using cash or real credit cards when making in-store purchases. Customers can search for stores that accept payment through their cell service provider to use a mobile wallet. Popular mobile wallets like Google Pay, Apple Pay, and Samsung Pay are all readily available. These wallets can either be downloaded as standalone apps from app stores or integrated into mobile devices.

Mobile wallets utilize encryption to safeguard the data they save, making it challenging for hackers to use them for fraudulent purposes. Mobile wallets are more secure than actual credit and debit cards since they are connected to encrypted keys that do not divulge sensitive information. Installing the app on their mobile device and entering their credit card information, reward card information, and coupon information are prerequisites for using a mobile wallet. Then, this data is connected to a special form of personal identity, like a key or a scannable QR code.

The mobile app employs near-field communication (NFC) technology to communicate across devices when processing a payment in-store. To process the payment at the point-of-service terminal, the NFC technology uses a QR code, key, or other personal identification format. The user merely needs to tap or wave their NFC-enabled device at the terminal of the merchant to start the transaction.



## 2.4 Digital Wallet classification

Digital wallets are applications designed to exploit the abilities of mobile devices to improve access to financial products and services. A digital wallet essentially eliminates the need to bring a physical wallet by storing all consumer's payment information in a secure and compact way. Digital wallets can be classified according to diverse features, specifically: (1) accessibility and (2) technology used. 23 1. In terms of accessibility, according to the classification provided by Corporate Finance institute there are three different types of e-wallets exist which are closed e-wallet, semi-closed e-wallet, and open e-wallet. Users of closed e-wallets can perform transactions with only the specific e-wallet providers, semi-closed e-wallet allows the users to purchase goods and services from merchants who contract with the e-wallet providers, consumers of open e-wallet are enabled to conduct transactions in stores, apps, or web. Only banks can be the issuer of open e-wallet, which works like credit cards, up to pre-funded amounts. 2. In addition, e-wallet services can be clustered according to the technology on which they are based on. Some e-wallet only requires an internet connection to reach their customer, but transactions can only be conducted online rather than on-site. NFC and QR-code based technologies are widely used via the smartphone. NFC is a technology that allows two smart devices to connect and transfer information using electromagnetic signals and it requires two devices to be within about an inch and a half (4 centimeters) from each other to connect: NFC-based e-wallets works via radiofrequencies, and rapidly communicate with the merchants' RFID terminal upon physical contact with the NFC-enabled smartphone. Meanwhile, QR-code-based e-wallets operate through QR image scans (printed or displayed) to make payments without physical contact. This classification is summarized in Table below:

	Category	Description	Example
<b>Accessibility</b>	Closed	A company selling products and/or services can develop a closed wallet for customers. Users of a closed wallet can use the funds stored to make transactions with only the issuer of the wallet. The money from cancellations, returns, or refunds is stored in the wallets.	Amazon Pay
	Semi-closed	A semi-closed wallet allows users to make transactions at listed merchants and locations. Although the coverage area of such wallets is restricted, both online and offline buying can be done through the wallets. However, merchants need to enter into agreements or contracts with the issuers for accepting payments from the mobile wallets.	Paypal, Google Pay
	Open	Banks or institutes partnered with banks issue open wallets. Users with open wallets can use them for all transactions allowed with a semi-closed wallet in addition to withdrawal of funds from banks and ATMs and transfer of funds.	Neteller, MBWAY
<b>Technology</b>	NFC	E-wallet that includes secure element either inserted in the device or employ HCE (Host Card Emulation) in the cloud	ApplePay, Samsung Pay
	QR-code	Transactions can be made by scanning Qr-code that provided by merchants or in the user's device	Mobilepay, MBWAY
	Internet	Created for online uses, payments in app or in a website	Paypal

Table 2-1: Mobile Wallets classification framework

- Open wallets are an innovative solution that allows banks to offer mobile wallet services directly or through a third party. This approach provides customers with greater flexibility in managing their funds and making payments. One example of an open mobile wallet is PayPal, which is widely used by customers worldwide to make payments for both in-person and online goods, as well as to cash out their balances. When using an open mobile wallet, customers can easily make payments for transactions by simply selecting the appropriate payment method and tapping their mobile device at the point-of-sale terminal. The payment is processed quickly and securely, with the funds deducted from the customer's account and transferred to the merchant's account. This approach eliminates the need for physical payment methods, such as cash or credit cards, and provides a more streamlined payment experience. In addition to making payments, customers can also withdraw funds from their open mobile wallet using cash-out services. This is particularly useful in situations where cash is required, such as when traveling or in areas where electronic payment methods are not widely accepted. With open wallets, customers have the flexibility to access their funds in a variety of ways, making it a popular option for many consumers.

- **Semi-open:** Semi-Open wallets are another type of mobile wallet that offers a unique set of features and benefits to customers. Unlike open wallets, semi-open wallets can only be used for specific purposes or at specific merchant locations, but they still offer a range of convenient payment options. Semi-open wallets are typically issued by specific merchants, such as supermarkets or gas stations, and can only be used to make payments at their respective locations. For example, a semi-open wallet issued by a grocery store can only be used to make payments at that store or at other stores in the same chain. While semi-open wallets have limited functionality compared to open wallets, they still offer a number of advantages to customers. One of the main benefits of using a semi-open wallet is the ability to earn rewards or cashback for purchases made at specific merchants. This can be particularly appealing for customers who frequent specific stores or chains and want to maximize their rewards or discounts. Semi-open wallets also offer a high level of security, as they are typically linked to a specific merchant or chain and cannot be used for unauthorized purchases. This provides customers with peace of mind when making transactions, as they can be confident that their funds are secure and protected from fraud or theft.
- **Closed Wallets:** Closed wallets are a specific type of mobile wallet that are linked to a specific retailer or service provider, and the funds stored inside can only be used to pay for purchases made from that specific entity. Users are not permitted to take cash withdrawals from the account or use the funds to pay for purchases made from other merchants or outside service providers. One of the key benefits of a closed wallet is the convenience and ease of use that it offers. For example, Amazon Pay is a popular closed wallet that allows customers to use their Amazon account to make purchases from other retailers, as well as from Amazon's own online store. This eliminates the need for customers to create and manage multiple accounts across different retailers, making it a convenient solution for those who frequently shop online. Another benefit of closed wallets is the added layer of security that they offer. By limiting the use of funds to a specific retailer or service provider, closed wallets reduce the risk of fraudulent transactions or unauthorized use of funds. Additionally, many closed wallets require users to enter a PIN or password before completing a transaction, providing an extra layer of protection for users' funds. While closed wallets offer a number of benefits, they may not be suitable for all customers or use cases. For example, customers who frequently shop at multiple retailers or prefer to have more flexibility in how they use their funds may find a closed wallet too limiting. Additionally, closed wallets may not be a suitable option for customers who need to withdraw cash from their account or use their funds for purposes other than making purchases.
- **Semi-closed Wallets:** Semi-closed mobile wallets are a type of mobile payment solution that offers users a certain degree of flexibility when it comes to making payments for purchases. Unlike closed wallets, semi-closed wallets can be used to make purchases from multiple merchants, as long as the merchant has a contract in place with the mobile wallet provider. This allows users to use the money they have on hand to pay

for purchases from a variety of different merchants, making it a convenient solution for those who frequently shop online or in-person. In addition to making payments for purchases, users of semi-closed mobile wallets can also transfer the money they have on hand to a linked bank account. This allows users to easily transfer funds from their mobile wallet to their bank account, providing a convenient solution for those who need to manage their finances across multiple accounts. While semi-closed mobile wallets offer a number of benefits, it's important to note that cash withdrawals are typically not supported. This means that users cannot withdraw cash directly from their mobile wallet account, which may be a limitation for some users. However, many semi-closed mobile wallets offer other ways to access funds, such as through transfers to linked bank accounts or through the use of physical prepaid cards.

- **NFC technology:** An improved kind of RFID technology called Near Field Communication (NFC) combines a smartphone interface and reader on a single gadget. NFC chips operate at a specific RFID frequency of 13.56MHz, and they only function when both chips are positioned within around 10 cm of one another. Due to the incredibly quick checkout process made possible by this, NFC payments are among the safest and most practical payment options. The three operating modes for NFC devices are read/write, peer-to-peer, and card emulation. An NFC-enabled phone can read or write data in a standard NFC data format to any supported tag types when it is in read/write mode. Two NFC-enabled devices can exchange data like virtual business cards or digital photographs in peer-to-peer mode. The NFC-enabled phone impersonates a contactless card or chip-based credit card to a payment terminal or reader in card emulation. NFC mobile payment is more practical compared to utilizing contactless smart cards equipped with NFC technology because it may be used without a PIN, signature, or issuing a paper receipt, which decreases waiting times in checkout lines. When compared to Bluetooth, NFC technology offers a speedier connection, prevents any interferences, and offers more security in congested areas. Even when the device is off, you can still use it.
- **QR codes:** QR codes are 2D matrix codes that may store a lot of data and are easily deciphered by mobile devices like smartphones. They were created in Japan by Denso Wave, a Toyota affiliate, and are now well-known all over the world. High data storage capacity, quick scanning, omnidirectional reading, and error-correction capabilities are just a few of the benefits that QR codes provide. They are frequently utilized in numerous application streams, including those linked to marketing, security, and education. The ease of QR codes is one of their key benefits. Without a card terminal, they enable users to carry out purchases and other financial operations swiftly and conveniently. This is particularly useful for businesses that sell products since they can easily embed the code on their merchandise or website so that customers can purchase it without using a credit card. In addition to payments, utilities, fines, taxes, and even money transfers, QR codes are frequently used.

## 2.5 Owners and Benefits of Digital Wallets

In addition to the previous classification digital wallets can be classified even according to the ownership category:

- Banks have been adapting to the changing landscape of digital payments by integrating mobile wallet features into their existing mobile applications. This move has been driven by the desire to improve the overall user experience, which includes simplifying the on-boarding process and increasing messaging opportunities with customers. By integrating mobile wallet features into their mobile applications, banks can provide a seamless and convenient experience for their customers, allowing them to access a range of payment options and manage their finances more easily. This can include features such as contactless payments, mobile payments, and peer-to-peer payments, which are becoming increasingly popular among consumers. One of the key benefits of integrating mobile wallet features into their mobile applications is the ability to simplify the on-boarding process for new customers. By leveraging existing customer data and integrating with other financial institutions, banks can streamline the account opening process and provide a more personalized experience for new users. Additionally, integrating mobile wallet features into their mobile applications allows banks to increase messaging opportunities with their customers. By leveraging in-app messaging and push notifications, banks can communicate with customers more effectively and provide real-time updates on their account activity, promotions, and other important information.
- Telecommunication providers are actively entering the mobile wallet market by introducing multiple initiatives to offer mobile wallet services to their customers. With the growing demand for mobile payments, these providers are recognizing the need to offer more comprehensive services to their customers, including digital payment options. To achieve this, telecommunication providers are forming partnerships with various card issuers, such as Visa and Mastercard, to develop mobile wallets for their customers. These mobile wallets can be developed for both business-to-business and business-to-customer models, allowing customers to make payments with ease and convenience. One of the primary benefits of these partnerships is that they allow telecommunication providers to leverage the established payment infrastructure of the card issuers, enabling them to offer secure and reliable payment options to their customers. By integrating with these payment networks, telecommunication providers can offer a range of services, such as contactless payments, mobile payments, and peer-to-peer payments, all through their mobile wallet. Additionally, integrating mobile wallet features into their mobile applications allows banks to increase messaging opportunities with their customers. By leveraging in-app messaging and push notifications, banks can communicate with customers more effectively and provide real-time updates on their account activity, promotions, and other important information.

- Service providers, also known as Fintech, are recognizing the immense potential of the mobile wallet market and are actively introducing their own mobile wallet applications to capitalize on growth opportunities and gain an edge over their competitors. These service providers are leveraging innovative technologies to develop mobile wallet applications that offer unique and differentiated features, such as biometric authentication, social media integration, and loyalty rewards programs. By introducing these features, service providers are enhancing the user experience, making it easier and more convenient for customers to make payments using their mobile wallets. One of the key advantages of service providers in the mobile wallet market is their agility and flexibility. As relatively new entrants to the market, these providers can quickly develop and deploy new mobile wallet features, allowing them to respond quickly to changes in customer preferences and market trends. Moreover, these service providers are often able to offer lower fees and more competitive pricing models than traditional financial institutions, making their mobile wallet applications attractive to a wider range of customers. This competitive pricing model also helps service providers to gain market share and establish themselves as leaders in the mobile wallet space. Another advantage of service providers in the mobile wallet market is their ability to integrate with other financial technology services. By integrating with other fintech services, such as robo-advisory platforms and online lending marketplaces, service providers can offer a more comprehensive range of services to customers, further differentiating themselves from traditional financial institutions.
- Device and operating system manufacturers are recognizing the potential of the mobile wallet market and are investing heavily in the development of mobile wallet technology. By offering a secure and user-friendly way for customers to conduct financial transactions, these manufacturers are positioning themselves as key players in the mobile payments space. One of the key advantages of device and operating system manufacturers in the mobile wallet market is their ability to leverage their existing hardware and software ecosystems. By integrating mobile wallet functionality directly into their devices and operating systems, manufacturers can provide a seamless user experience that is both intuitive and secure. Moreover, these manufacturers are able to work closely with financial institutions and other partners to develop mobile wallet applications that are tailored to their specific hardware and software platforms. By working closely with partners, manufacturers can ensure that their mobile wallet applications are optimized for the unique features of their devices and operating systems, providing a superior user experience for their customers. In addition to providing a seamless user experience, device and operating system manufacturers are also investing in advanced security features to ensure the safety and privacy of their customers' financial data. These security features include biometric authentication, device-level encryption, and tokenization, which provide an additional layer of protection against fraud and other malicious activities. Another advantage of

device and operating system manufacturers in the mobile wallet market is their ability to leverage their existing customer base. By offering mobile wallet functionality as part of their devices and operating systems, manufacturers can reach a large and established customer base, making it easier to promote and distribute their mobile wallet applications.

E-wallets offer to customer several advantages in term of:

- **Time saving:** Digital wallets reduce the amount of time needed to perform a transaction. Digital wallets facilitate to keep amount in electronic mode, that it will be comfortable to make online payments without enter the card details, they keep an amount in electronic form and the user can make payment without much time. Digital payments are more time-saving than the 29 conventional cash system: the process in cash payment involves counting the cash and the seller must place them in the cash register and pay the balance, therefore this payment mode is time saving for both parties.
- **Ease of use:** E-wallet is like one click pay with no need to fill details about card every time the user wants to make a payment. It allows user to link digital wallet to accounts and pay immediately without the effort to enter the details each time, this is a great advantage for online merchants because customers sometimes abandon online purchases if they feel that the order and payment process is too complex, confusing, or frustrating. Moreover, e-wallet users can pay the same receipt separately due to the possibility offered to split the bills.
- **Security:** Digital wallet can increase the transaction security since the wallet does not communicate the payment card details to the website. Digital wallet allows users to lock their wallets. Most of the digital wallet service provides extra security to keep money secure from unauthorized access. For instance, the user's information in the e-wallet account is typically encrypted and not saved on the mobile phone. In addition to that, all the payment transactions are stored automatically to be easy for the consumers to refer to his historical payment register.
- **Transaction records:** All the transactions are recorded in the digital payment process, contrariwise in cash payment is hard to track and needs to be noted down which makes budgeting a tiring task. In the same way, the payment receipts in digital mode are in the form of e-bills that are easier to save whereas the cash bills must be collected and saved for future references. By these considerations using e-wallet keeping the flow of money under control is easier for the user.
- **Convenient and information stored under one roof:** Digital wallet helps to eliminate need to carry the physical wallet. From the ecological view, reducing paper use promotes a lesser risk of environmental waste and pollution. That means the users have no longer carrying a pocketful of items wherever they go. There will be no need to issue costly cards to people since all the transactions will be carried out on the digital interface.

- **Attractive Discount:** Digital wallet providers offer discount, but for this the users must make payment process only with digital wallet. To obtain consumers' attention, the providers commonly offer different kind of incentives as a reward for the usage of their services, as discounts or cashbacks. However, there are also some disadvantages that users should understand before using them.
- **Confidentiality:** Consumers fear that their confidential banking information would be leaked and severely compromised if their phones are lost or stolen. Smartphone confidentiality depends on the setting used, if it is not protected, then there is chance that someone can access the cash from the wallet.
- **Accessibility:** Consumers' attraction for the usage of e-wallet may be discouraged due to internet access unavailability. This barrier about e-wallet adoption is particularly significant in rural areas, as any e-wallet is fundamentally supported by an internet connection. There is also the disadvantage that a digital wallet requires to have a charged device (usually the 31 smartphone) to run it, with the utilization of a traditional wallet, there is not any need to worry about phone battery. To deal with these problems consumers have the only choice to reuse the cash when no internet coverage in the area or the phone is out of battery.
- **Requirement to carry something with you is not eliminated.** There is no way to complete a transaction if the user does not have his mobile device with him. Moreover, these wallets do not store identification and other products needed (as the identity card for example), the users are still obliged to bring with them a traditional wallet.
- **Usage restriction:** each nation has different services; therefore, it is not granted that we can use the digital wallet of one nation to pay in another country. This issue is particularly relevant for those who often need to travel distinct nations. Moreover, nowadays not all the sellers accept the payments through digital wallet.

Digital wallets offer some advantages even for merchants, as:

- **New potential customers:** mobile wallets can allow companies to be perceived as reliable, trustworthy partners. Clients worldwide will simply love the new functionalities behind a contactless payment app and will migrate over to the main company, leaving the competition behind.
- **Proved frictionless transactions:** Experts define the term "frictionless" as "a method of using data from devices, apps, and websites to integrate buying opportunities as simply and seamlessly as possible into consumers' everyday 32 activities and natural environments." According to the latest data from Statista, frictionless payments will grow by over 200% since 2024, reaching a whopping \$8 trillion from \$4 trillion at the end of 2020. With a mobile wallet app, companies can allow users to store their credit and debit cards while performing daily transactions with just a few taps of the screen. Best of all, they can do all that in real-time, without having to invest any extra amount of energy or time. Since



most people carry their phones with them everywhere, an e-wallet app could really come in handy for the everyday user who needs to integrate his/her financial transactions into everyday tasks.

- Increase lifespan of customers: An e-wallet does not expire; users will be more than willing to keep using the app in the long term. This improves customer retention and allows the company to focus more on the beginning of the funnel instead of trying to loyalize customers.
- Budgeting and analytics feature: Most users love the fact that they can perform analytics inside their e-wallet apps. digital wallet solutions can allow users to create budgeting categories and see how they have spent money in the past. A good e-wallet app can also generate reports that shows specific transactions or assign a fixed budget to certain spending categories. Keeping tabs on their spending habits is a feature highly appreciated by a growing number of customers, thus making the digital wallet an invaluable marketing tool. The main disadvantage for the merchant is represented by the fees that are requested for the usage of mobile wallets.

## 2.6 Mobile Wallets in the world

Globally, mobile money has grown dramatically, especially in developing nations where traditional banking services are harder to reach. In 2020, there were 1.2 billion active mobile money accounts, and the overall transaction value of mobile money services increased to \$4.5 trillion, according to the GSMA State of the Industry Report on Mobile Money 2021. Many countries' adoption of mobile money has been hastened by the COVID-19 pandemic as individuals look for safer and more practical ways to make payments and manage their funds. Sub-Saharan Africa alone will have 548 million active mobile money accounts in 2020, making Africa one of the regions with the fastest-growing mobile money adoption rates. Mobile money usage has increased significantly across Asia, led by nations like China, India, and Indonesia. As more individuals have access to mobile phones and internet connectivity and as governments and businesses look for ways to encourage financial inclusion and digital payments, the expansion of mobile money is predicted to continue.



Figure 2-2: Number of live mobile services in 2012 by country from GSMA. (GSMA report 2021)



Figure 2-3: Number of live mobile services in 2021 by country from GSMA (GSMA Report 2021).

Mobile wallets are becoming increasingly popular around the world as they offer a convenient and secure way for users to store their money and make transactions. With so many different mobile wallet solutions available in different areas, it's essential for customers to carefully consider their options before choosing one that best meets their needs. One of the most well-known mobile wallets in the world is WeChat Pay, which was created by the Chinese company Tencent. With over a billion active users, WeChat Pay offers a wide range of features, including in-app payments, bill payments, and peer-to-peer transfers. It also has integrated social networking functions, allowing users to share payments and send money to friends. Another popular mobile wallet in China is Alipay, which was created by Alibaba. With over 700 million active users, Alipay is also a multifunctional platform that offers various features, including bill payments, online shopping, and investments. In India, Paytm is a well-known mobile wallet that provides peer-to-peer payments, bill payments, and mobile recharges. It has over 450 million registered users and offers various cashback and discounts on transactions. In Kenya, Vodafone created the mobile wallet M-Pesa, which has over 41 million active users. M-Pesa allows users to send and receive money, pay bills, and buy airtime. It's especially popular in rural areas where traditional banking services may be unavailable. In the US, Venmo and Cash App are two popular mobile wallets that provide bill splitting, peer-to-peer payments, and other features. Venmo is owned by PayPal and has over 70 million active users, while

Cash App is owned by Square and has over 30 million users. Both mobile wallets offer a free service for sending and receiving money, but they charge fees for instant transfers and other premium features. There is Apple Pay, a mobile wallet created by Apple that supports contactless payments with compatible devices. It allows users to make transactions at physical stores, online shops, and in-app purchases. Apple Pay also offers additional security features, such as Touch ID or Face ID verification, and a unique device account number to protect user data. Google Pay is a mobile wallet created by Google that allows users to make peer-to-peer payments and pay at certain shops. It also offers a range of other features, including rewards and cashback on transactions. Google Pay also integrates with other Google services, such as Gmail and Google Assistant.



Figure 2-4: Main Mobile Wallets in the world (source: Thunes)

## 2.7 Africa Payments trends

With an exceptional annual growth rate of 26% in the e-commerce market between 2017 and 2021, Africa is expected to experience a slightly slower but still impressive growth rate of 20% CAGR through 2025. Nigeria and South Africa are projected to lead the growth, each with a 23% CAGR, while other markets such as Saudi Arabia are expected to experience more modest growth rates of 12%. The addressable e-commerce market in these four markets is forecast to more than double in size from US\$52 billion to US\$108 billion between 2021 and 2025. Africa is considered mobile-first as mobile commerce sales are expected to account for over 70% of e-

commerce transaction value by 2025. Credit cards are the largest e-commerce payment method in Africa, accounting for 31.3% of the 2021 transaction value and projected to represent one third of e-commerce spending by 2025. Digital wallets are the fastest-growing payment method in Africa, with a share of 17.3% of 2021 e-commerce spending and projected to account for 25.6% of transaction value by 2025. PayPal and KongaPay are leading digital wallets in Nigeria. CASHU is a leading local wallet in the UAE, while M-PESA is increasingly popular in South Africa. Bank transfers accounted for 16.3% of the 2021 regional e-commerce transaction value and are expected to remain steady through 2025, with slight increases in Nigeria but share declines in South Africa. The share of cash on delivery (COD) in Africa is projected to decline to 7% regionally by 2025, with Nigeria projected to maintain an 11% share. Although buy now, pay later (BNPL) options are available across all markets in the report, they account for less than 1% of regional e-commerce spending. POS transaction values in Africa have continued to grow, albeit at an uneven pace across different markets in the region. Nigeria experienced a decline in POS values for two consecutive years, but growth is expected to return in 2022, while South Africa saw the biggest expansion with 22% YoY growth in 2021 after two years of recession. Cash is still the dominant payment method at the POS in Africa, but its use is declining, with digital payments continuing to gain traction. Cash accounted for over 70% of regional POS transaction value in 2019 but fell below 44% in 2021 and is projected to approach 31% of POS value in 2025. All markets in the report are expected to see cash fall below 50% of POS transaction value by 2025. Credit and debit cards are increasingly being used at the POS in Africa, with credit projected to near 22% and debit approaching 14% of regional transaction value in 2025. Credit is the second leading payment method at the POS after cash, accounting for 20% of transaction value in 2021. Other payment methods such as BNPL, local retailer/bank financing, and prepaid cards are also being introduced and used at the POS in Africa, but to a lesser extent than cash and digital payments. BNPL is expected to represent 1.4% of POS transaction value by 2025, while local retailer/bank financing accounted for 6.4% of POS spend and prepaid cards accounted for 5.4% of 2021 POS spend in the region. It appears that the adoption and usage of real-time payments in the African market are still relatively low, despite the availability of such services in several countries. Although there has been significant growth in transaction volume in some countries, the volumes remain comparatively low, with poor uptake rates per capita across the region. However, the use of real-time payments by governments for collection and payout services, such as pensions and benefits, is helping to drive growth in the region. Some countries, such as Ghana, Kenya, and Bahrain, are also offering a suite of services for corporations, including bulk payments and securities trading via mobile phones. In terms of technology, most of the live services in the region offer the use of aliases, request to pay (R2P), and payment initiation through QR codes. Electronic billing and direct debits have also emerged as strong drivers of real-time payments and are operational in some countries. Looking ahead, some African countries, such as Nigeria, are developing new services to boost know your customer (KYC) processes, while others, such as South Africa, are planning to launch modernized real-time clearing services.

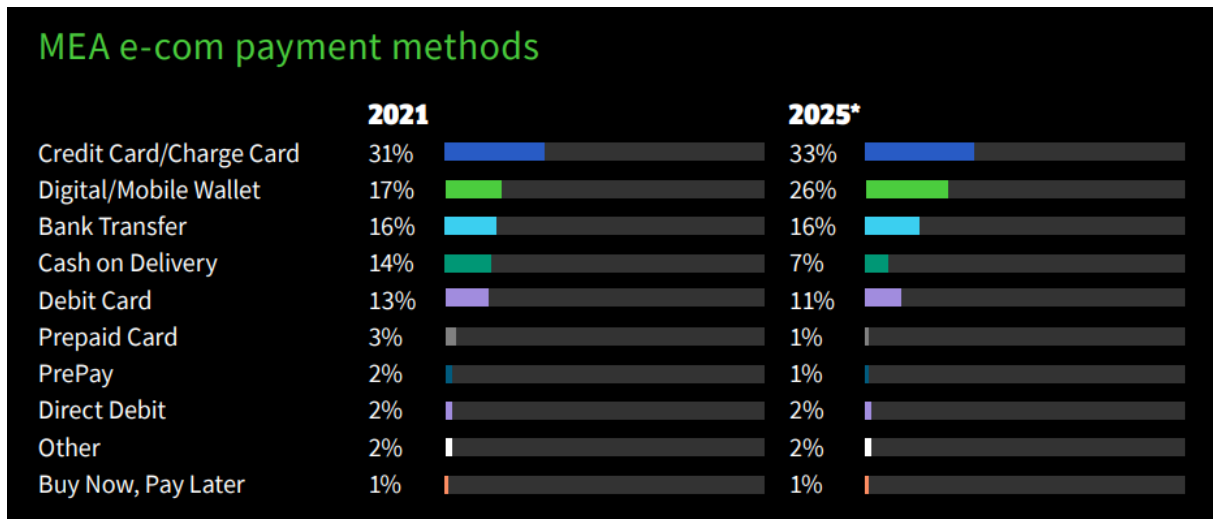


Figure 2-5: Expected Evolution of payment methods in Africa and Middle East.

The expansion of the mobile money market in the region is anticipated to be significantly impacted by the rising use of mobile wallets as a form of payment in Africa. Mobile money providers are anticipated to see an increase in demand for their services as more individuals use digital financial services, which might result in larger revenues and profits. Also, as providers look to stand out from the competition and offer new services to customers, the use of mobile wallets is anticipated to spur innovation in the mobile money sector. Features like loans, insurance, and savings accounts might be included in this, which would improve the value proposition of mobile money. In general, the emergence of mobile wallets in Africa is a development that is favorable for the mobile money industry and is anticipated to spur future growth and innovation.

## 2.8 Drivers of the African mobile wallet growth

The African mobile wallet market has been experiencing rapid growth in recent years, fueled by a combination of factors, including the continent's large unbanked population, the widespread use of mobile phones, and the growth of e-commerce.

Africa is home to some of the world's most diverse nations, cultures, and economies, all of which are in various levels of economic growth. This creates a fantastic setting for fintech, with the African financial technology sector always being one to watch. The banking industry is no different, and by setting the bar for innovation and excellent client services, challenger banks are assisting in the effort to address the present issue of financial inclusion. 95 million Africans, or 57% of the continent's population, lack access to conventional banks. Although there are few economic options available to service its residents, the significant number of unbanked people surely generates issues. Africa's rapidly growing population, combined with a younger generation of tech-savvy workers, has positioned the continent to become the next global market leader. With a current population of over 1.4 billion, Africa is making significant strides in technology advancements to meet the demand and supply requirements and enhance its



competitiveness in the global arena. However, despite improvements in trade, financial accessibility, and communication technologies, a considerable portion of the population remains unbanked, particularly women, according to UN Women data. This lack of access to banking services impedes the traceability of microeconomic aggregates and hinders e-commerce development. The poor infrastructure, low literacy rates, government bureaucracy, and technological barriers contribute significantly to Africa's large unbanked population.

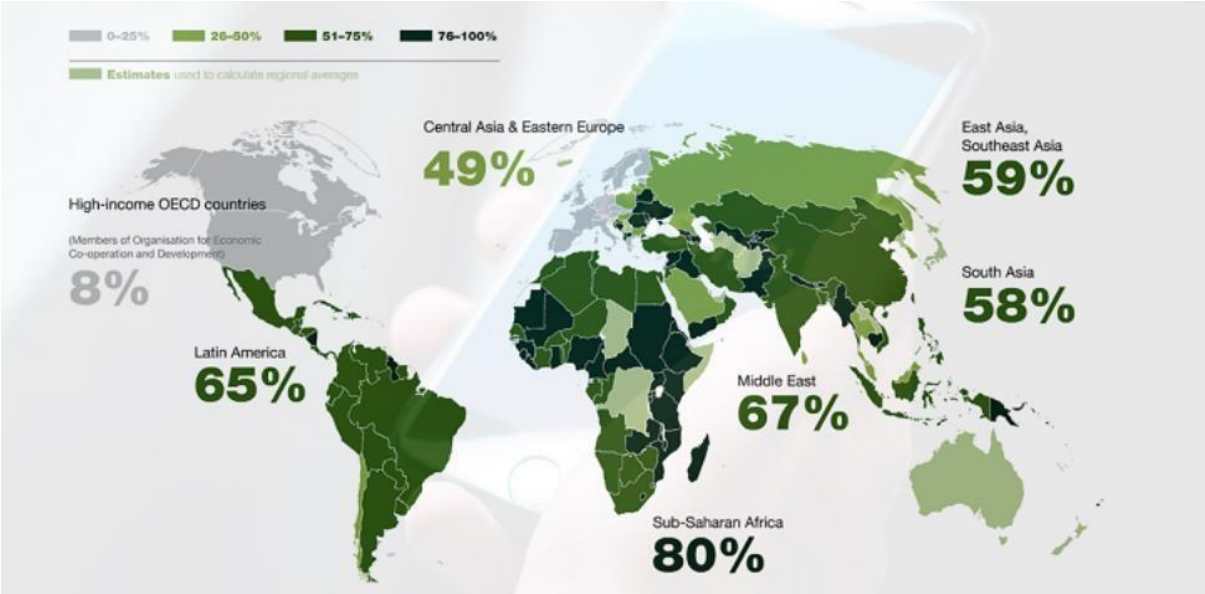


Figure 2-6: Percentage of total adult population who do not use financial services.

In Africa, a large proportion of the population is unbanked, meaning they do not have access to traditional banking services such as savings accounts, credit cards, and loans. According to a report by the World Bank, more than 60% of the population in sub-Saharan Africa is unbanked, which amounts to around 350 million people. This poses a challenge for businesses that want to reach these consumers, as traditional payment methods may not be available to them. However, the rise of mobile technology has provided a solution to this problem, with mobile wallets being a key driver of growth in Africa's digital economy. Mobile wallets are digital payment systems that allow users to store, send, and receive money using their mobile phones. These wallets are often linked to a user's phone number, and transactions can be made by sending a text message or using a mobile app. Mobile wallets have become particularly popular in Africa due to their ease of use and convenience. With a large proportion of the population owning a mobile phone, mobile wallets allow unbanked individuals to participate in the digital economy, without the need for a traditional bank account. This has allowed many people to access financial services such as savings, loans, and insurance for the first time. Mobile wallets have also been successful in Africa due to the limited availability of traditional banking services in rural areas. Many people living in these areas may have to travel long distances to access a bank branch, which can be costly and time-consuming. Mobile wallets allow people in these areas to access financial services from the comfort of their own homes,

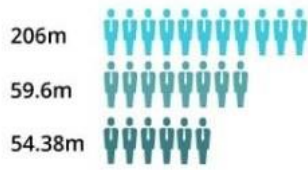
without the need for physical travel. In addition, mobile wallets have been successful in Africa due to the lack of trust in traditional banking services. Many people in Africa are wary of banks due to past experiences with corruption and fraud. Mobile wallets, on the other hand, are often provided by mobile network operators who are seen as more trustworthy by consumers.

The growth of e-commerce in Africa has been significant in recent years, and it is a testament to the continent's evolution in trade practices. The traditional barter system gave way to the use of currencies, which allowed people to trade goods and services for money. The emergence of electronic commerce has revolutionized trade in Africa, providing consumers with a convenient way to shop from the comfort of their homes and have their products delivered to their doorstep. The COVID-19 pandemic has had a major impact on the e-commerce industry, as more people turned to online shopping for their needs. This trend has been especially prevalent in Africa, where the convenience of e-commerce has been a significant driver of growth. The continent's young and tech-savvy population has also been instrumental in driving this growth, as they represent a large and diverse range of digital clients. Nigeria, South Africa, and Kenya are the leading countries driving significant growth in the e-commerce industry in Africa. Nigeria, with a population of 206 million people, has the largest business-to-consumer e-commerce market in terms of both the number of shoppers and revenue. It has 37% e-commerce penetration, 40% internet penetration, and 76.7 million online shoppers. South Africa, with a population of 59.6 million people, has 37% e-commerce penetration, 64.4% internet penetration, and 22 million online shoppers. Kenya, with a population of 54.38 million people, has 25% e-commerce penetration, 40% internet penetration, and an estimated 13 million online shoppers.

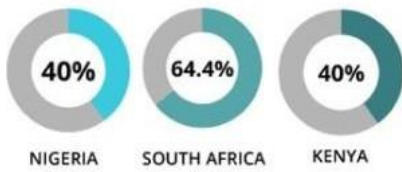
For e-commerce to continue its upward trend in Africa, improvements in logistics, internet availability, and payment platforms are necessary. Consumers need to trust that their data is protected, payments are secure, and products are delivered on time and in good quality. Improved logistics will also ensure that deliveries are made to more remote locations, expanding the reach of e-commerce even further. Financial inclusion is also important, as more people gain access to financial services, they are more likely to engage in online transactions. The e-commerce industry in Africa has enormous potential, and it is expected to continue to grow in the coming years. The convenience of online shopping, along with the young and tech-savvy population, has driven this growth, and countries like Nigeria, South Africa, and Kenya are leading the way. However, sustained growth will require continued improvements in logistics, internet availability, payment platforms, and financial inclusion to ensure that consumers feel safe and satisfied with their e-commerce experiences.

Overall, the unbanked population in Africa is driving the growth of mobile wallets by providing a large market of consumers who are looking for alternative ways to access financial services. As more people gain access to mobile technology, the demand for mobile wallets is likely to continue to grow, making them a key player in Africa's digital economy.

## POPULATION



## INTERNET PENETRATION



## E-COMMERCE PENETRATION

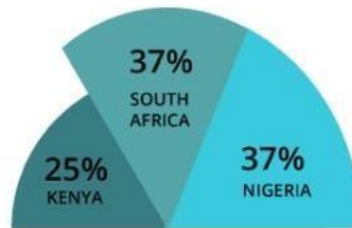


Figure 2-7: Relevant e-commerce and Internet penetration rates in Africa



## 3 Methodology

The methodological note aims to describe in detail the modality through which the thesis is developed, therefore, the objectives of the thesis work, its structure and the material used during its development will be illustrated. The three main parts of the thesis (context and literature, census, and empirical analysis) have been carried out through different approaches. In the following parts, they will be discussed in detail.

### 3.1 Objectives

The growing competition, the innovation in terms of technologies, processes and services provided, and development of the legislation led to a profound transformation of the payment environment. Within this evolving scenario, some innovation guidelines were identified to be monitored in the following years in order to get all the actors ready to react to the changes. They regard mobile wallet, biometrics, p2p e instant payment, mobility, Internet of Things, Artificial Intelligence, voice assistant, chatbot and blockchain. In particular, the start-ups are inexhaustible sources of these kind innovative solutions. For these reasons, the thesis is supposed to analyse the landscape of mobile wallets active in the African market. The research has been carried out with the aim to provide information about the market and context. The existing research on mobile payment offerings has mainly focused on two components: proximity and remote payments for both commerce and payment phases. This pertains to payment services enabled by mobile devices. To build on this research, there is a need to collect a significant amount of data on the mobile wallets that are currently active in Africa and classify them under a shared framework. This will help to identify the main trends in the African mobile wallet market. In this paragraph it will be defined the methodology supporting the data collection process. Specifically, the variables designed to describe the different African mobile wallet existing.

## 3.2 Research structure

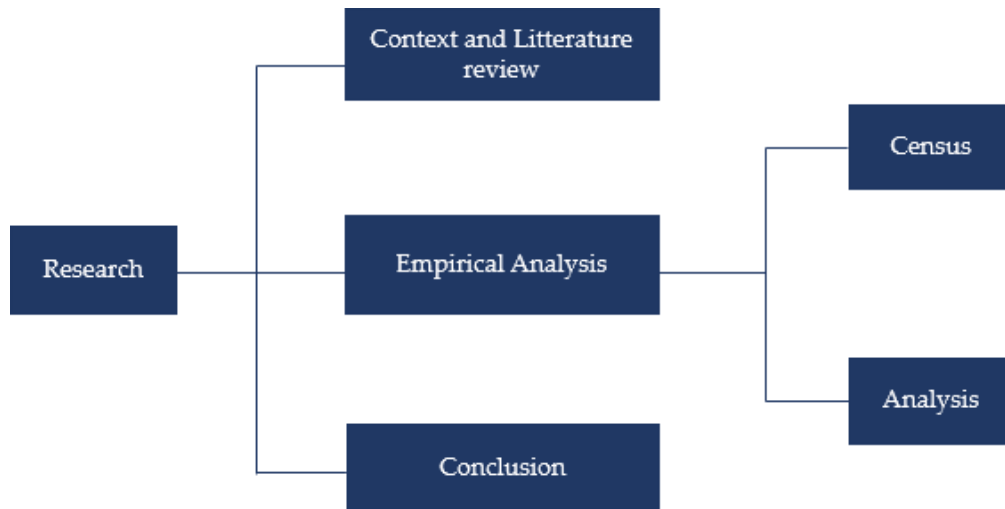


Figure 3-1: Research structure

The initial phase of the research involves exploring the theoretical concepts and reviewing relevant literature to provide a comprehensive understanding of the current state of mobile wallets. The subsequent phase involves conducting an empirical analysis to investigate how the research objectives manifest in practice, identifying commonalities, potential trends, and scenarios. This phase is divided into two parts: firstly, a survey is conducted to identify active mobile wallets in Africa, and secondly, the collected data is analyzed. The final phase is the conclusion, which summarizes the research findings, offers general reflections on the outcomes, presents a critical evaluation of the research methods and results.

### 3.2.1 Literature review

A thorough analysis of digital payment options has been provided in this thesis, with particular attention paid to the classification scheme offered by the Mobile Payment & Commerce Observatory. The Corporate Finance Institute's classification structure, the numerous functionalities of the digital wallet, and its essential role in the empirical study have all been covered in-depth. The leading instruments in the mobile wallet payment situation, NFC payments and QR codes, have also received attention. Both the advantages and drawbacks of using digital wallets have been examined from the viewpoints of users and businesses. Also, a thorough explanation of P2P payments, the Buy Now Pay Later trend, and mobile proximity payments has been given. Lastly, an overview of the mobile e-wallet world market was given as well as the evolution of the payments industry in Africa.

For analyzing the literature and the context of the thesis, different online secondary sources have been studied and reported when cited along the work and gathered in the Bibliography section at the end of the thesis.

- Academic paper

- Reports of the Observatory Mobile Payment & Commerce
- Scientific and Corporate Websites

### 3.2.2 Census

The analysis of African mobile wallets has been developed based on the following variables:

- **Type of company:** For instance, mobile wallet services are provided by financial institutions including banks and microfinance organizations, as well as by mobile network operators (MNOs) like Safaricom, MTN, Airtel, and Orange. Moreover, fintech firms and other non-traditional companies provide mobile wallet services. The ownership structure of the mobile wallet service could also be included in the classification of the kind of firm. While some mobile wallet services are joint ventures or collaborations between several businesses, others are entirely owned ventures of the MNO or financial institution that provides them. The competitive landscape of the mobile wallet market in Africa and the various sorts of businesses who are providing mobile wallet services in the region can be better understood by studying the different forms of company classification. The provider of a mobile wallet has been classified into the following categories:
  - Banks
  - E-commerce platforms.
  - Service providers known as Fintech.
  - Device and operating system manufacturers also addressed as Big Tech companies
  - 50.
  - Telecommunication companies, also addressed as Telco companies.
- **Accessibility:** Accessibility in the context of mobile wallets refers to how simple it is to use the service, the extent of mobile network coverage available in various areas, and the presence of agents or other physical locations where users can conduct transactions. For instance, mobile wallets with a straightforward registration process and user-friendly are likely to be more usable by a wider range of users, including those who might be less tech-savvy. Users who do not have access to traditional banking services can find mobile wallets that include a big network of agents or physical places where customers can deposit or withdraw money more convenient.
- **Technology 1: Online here** refers to accessing and using the mobile wallet service through the internet. The mobile wallet app is available for download from an app store, and users can use a smartphone or other mobile device to access it. To conduct transactions, including sending and receiving money, paying bills, and buying products and services, the app needs an internet connection. NFC (near field communication), on the other hand, is a contactless communication technology that enables users to complete transactions by tapping their mobile device on a point of sale (POS) terminal or another NFC-enabled device. Some mobile wallet services in Africa employ this technology to help customers make payments in person without requiring an Internet connection.

- Technology 2: could be used to describe the various ways that people can utilize their mobile devices to make payments. (NFC vs QR code).
- Foundation date: refers to the year that the business or institution that created the mobile wallet went public. Users who are assessing the legitimacy and dependability of the mobile wallet service may find this information useful in understanding the company's background and experience.
- Release date: refers to the day that the mobile wallet was public for the first time. Those who are curious about the timeline of the mobile wallet's development, or the introduction of features or functionalities may find this information to be useful.
- Headquarters: refers to the location of the headquarters of the business or organization that created the mobile wallet. For consumers who are interested in learning about the legal framework and regulations that apply to the service, as well as the location of customer care and other crucial teams, knowing the headquarters of a mobile wallet service might be helpful.
- Served Area: A mobile wallet is an online service that enables users to transfer, receive, and keep money via a mobile device. Mobile wallet services are frequently provided by mobile network operators and are bound to a particular geographic area or network coverage area. The term "served area" describes the geographic area in which the mobile network operator offers coverage and where customers can utilize the mobile wallet service.
- Services: These include in store payments, Online payments, P2P, Investments, Donations, Pay later buy now.
- Other services: Other than the services above. (Air top-ups, loans...)
- Associated payment method: refers to the payment methods that the mobile wallet accepts. These can include more modern payment options like e-wallets or mobile money, as well as more conventional payment methods like bank transfers and credit or debit cards. Both customers seeking for an easy and accessible way to make payments and business owners who might be interested in accepting payments through the mobile wallet should be aware of the associated payment options.
- Fees: speak of the fees for using the mobile wallet service. Transaction fees, account maintenance fees, and additional costs that the mobile wallet provider may impose are examples of this. For customers searching for a cheap and economical way to make payments as well as for businesses that could be interested in accepting payments through the service, being aware of the fees associated with a mobile wallet service might be crucial.
- Diffusion of customers: relates to how widely or quickly the mobile wallet service has been adopted by the clientele. This may involve elements like the proportion of active users, usage patterns, and user demographics. Users who want to learn more about the popularity and reputation of the mobile wallet service and business owners who might be interested in accepting payments through the service can both benefit from knowing the customer distribution.

- Merchant diffusion: refers to the use of the mobile wallet service by businesses or merchants that accept payments using the service. This can consider elements like the quantity and variety of businesses that accept the mobile wallet, usage volume, and the kinds of goods or services that can be purchased using the service. Users who are interested in the accessibility and convenience of the mobile wallet service for making payments, as well as businesses who could be interested in taking payments through the service, can both benefit from knowing the merchant diffusion.
- Rank: refers to the ranking or position of the mobile wallet service in comparison to other services of a similar nature. The number of users, number of transactions, level of customer happiness, and other indicators can all be used to determine rankings. For consumers who are interested in evaluating numerous possibilities and selecting a service that is well-known and dependable, being aware of a mobile wallet service's ranking can be helpful.

A thorough investigation was conducted after the completion of the list of digital wallets to gain a better understanding of their functionalities, usage features, and peculiarities of services. The primary objective of this census was to provide a comprehensive overview of all digital wallets operating in Europe, ensuring consistency and uniformity of output data. To achieve this goal, certain decisions were made regarding the arrangement of classification variables for all wallets included in the study. To perform the analysis, some services were tested by downloading their app from the app store and assessing the user experience. However, in some cases, this approach was not possible due to various reasons, such as the wallet not being available in Italy or being incompatible with the device or bank account requirements. These wallets were therefore studied through news, corporate website, app store description and even official tutorials showing how the app works in practice. The final step concerns the check of the consistence between the gathered information of each mobile wallet, the classification variables and their relevance according to the main objectives. This activity simplifies the data collected in order to make them better examinable during the empirical analysis. As a result, 37 mobile wallets have been analyzed and mapped.

### 3.2.3 Empirical Analysis

Once explained how the census has been performed and structured, the following section is dedicated to the methodology adopted for running the empirical analysis. The census has the goal to study the availability of mobile wallets at European level. Therefore, next step consists in discovering the current trend about distribution, player involved, technologies adopted, etc., highlighting the main trends.

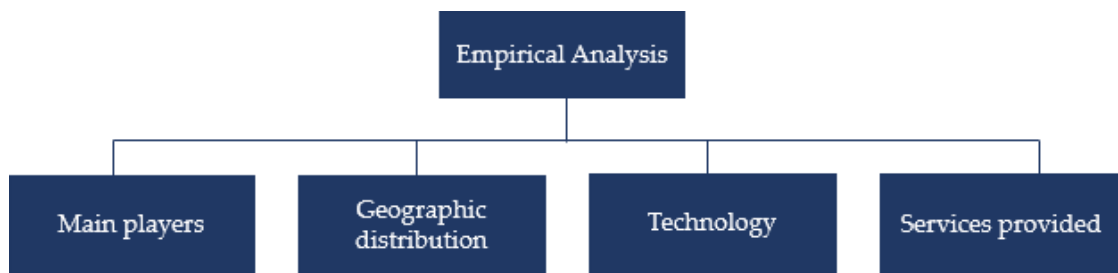


Figure 3-2: Empirical Analysis structure

This empirical analysis will provide a comprehensive overview of the mobile wallet landscape in Africa, focusing on four key areas: main players, geographical distribution, technology, and services provided. To analyze the main players, we will examine the market share and competitive landscape of the leading mobile wallet providers in Africa, including Safaricom's M-Pesa, MTN Mobile Money, and Orange Money. We will also investigate the geographical distribution of mobile wallets in Africa, identifying which countries and regions have the highest adoption rates and exploring the factors driving this adoption. In addition, we will examine the technology that underpins mobile wallets in Africa, including the use of USSD, SMS, and smartphone apps, and assess how these technologies impact user experience and adoption. Finally, we will analyze the range of services provided by mobile wallets in Africa, including payments, remittances, savings, etc

The last part of the empirical analysis is an overview of the main challenges faced by african mobile wallets. Indeed,African mobile wallets face several challenges, including low levels of financial literacy, limited access to digital infrastructure, high transaction costs, limited interoperability between different mobile money systems, and security concerns. Additionally, regulatory barriers and a lack of trust in the financial system also hinder the widespread adoption of mobile wallets. These challenges make it difficult for mobile wallets to reach their full potential in facilitating financial inclusion and driving economic growth in Africa.

# 4 Empirical Analysis

The "Context and Literature Review" chapter included a thorough analysis of the mobile wallet and payment landscape, serving as the thesis's context. The "Methodology" chapter described the procedures followed to carry out the census, as well as the many categories and variables utilized to characterize the digital wallet landscape. Due to the fact that the census results were used to conduct the research, the empirical analysis is strongly related to them.

Innovation in payment systems is typically driven by a combination of three factors: the emergence of new technologies, infrastructure development, and changes in customer behavior. When considering these concepts, it becomes clear that the technologies used by customers to pay for purchases have already been developed and tested. The high rate of smartphone adoption, along with its widespread usage for accessing the internet and performing activities such as online purchases and banking, makes it reasonable to assume that most smartphone owners can access and adopt mobile payment solutions. This is due to the fact that the technology underlying mobile payment systems, such as the camera for scanning QR codes and the NFC function, has been incorporated into most smartphones. As a result, customers have the tools necessary to make mobile payments at their fingertips, and it is up to payment service providers to deliver a seamless and convenient user experience that encourages adoption. Overall, it is evident that the widespread availability and adoption of smartphones have created a ripe environment for the growth and evolution of mobile payment systems. The aim of the empirical analysis is to investigate the offers of mobile wallets in Africa, their characteristics, and their development. In addition to that, an analysis of the market in terms of players operating in this field and the services offered by them has been conducted, to highlight the main trends.

## 4.1 General Analysis of the census findings

### 4.1.1 Mobile money growth

As discussed in the "Methodology" chapter, the census is focused on the analysis of the wallet landscape in African countries. The census identified 37 digital wallets available and active in the area of interest. To start the analysis of the census, it could be interesting to look at how diversified the market offer is, in terms of number of wallets available in each of the country analyzed, to have a quick overview about the possibility of the users to choose among the different mobile wallet players around Africa and to highlight the countries that present the more diversified marketplace.

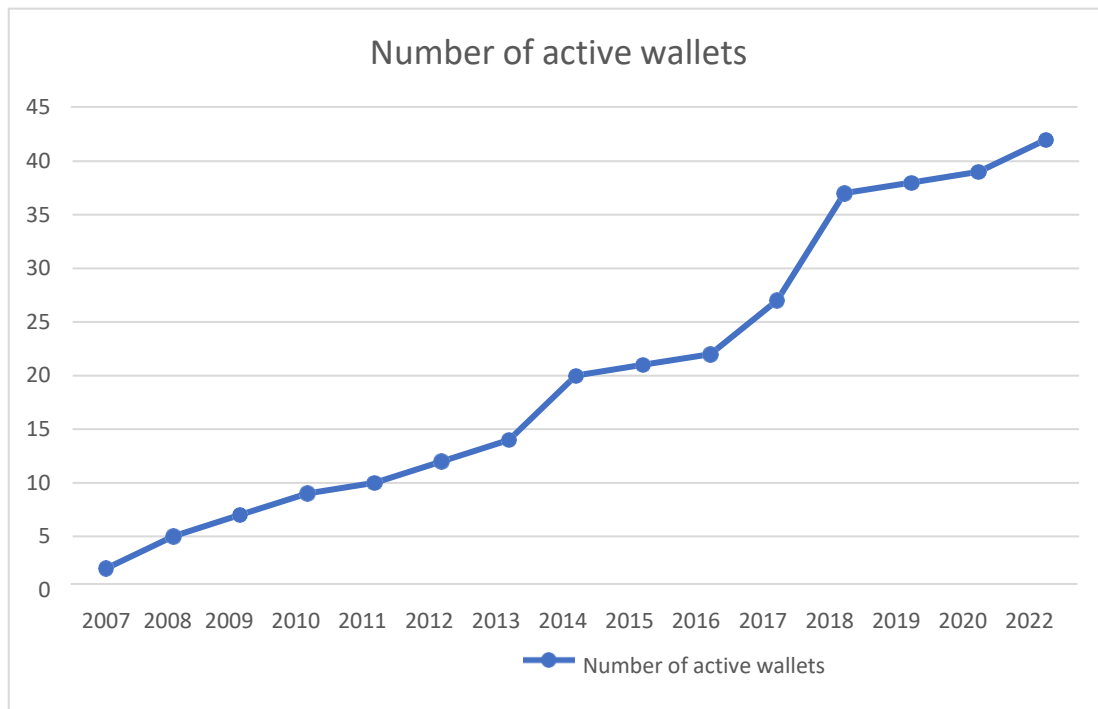


Figure 4-1: Number of active wallets in the census (source: author's elaboration)

The figure shows that the mobile wallet market in Africa has been steadily growing since its inception in the mid-2000's. This trend is also justified by the growing of smartphone usage in the world, the larger internet coverage, and the diffusion of new technologies as NFC and QR-code in the last decade. In 2007, the mobile wallet market in Africa was in its early stages, and mobile money services were just beginning to gain traction. The leading mobile money service at the time was M-Pesa, which was launched in Kenya in 2007 and later expanded to other African countries. M-Pesa, which was initially designed as a way for microfinance institutions to repay and distribute loans, quickly became a popular method for sending and receiving money among individuals. Its success inspired other mobile money services to emerge, and by the end of 2007, several African countries had launched their own mobile money services. By 2010, M-PESA had over 10 million users in Kenya and had expanded to other African countries, including Tanzania and South Africa. Other mobile money services also emerged in Africa in the early 2010s, such as Airtel Money, Tigo Cash, and MTN Mobile Money. These services allowed users to send and receive money, pay bills, and make purchases using their mobile phones. They were particularly popular in rural areas where traditional banking services were scarce.

From the growing curve, there is a noticeable growth in 2018 of the number of active wallets. In fact, there were certainly significant milestones in the growth of the mobile wallet market in Africa in 2018, such as the launch of Whatsapp pay in South Africa and the growth of mobile money services in West Africa. The market had continued to grow and evolve since then.

In fact, the mobile wallet market in Africa has experienced significant growth over the past decade. According to a report by the GSM Association, the number of active mobile money



accounts in Africa reached 469 million in 2020, up from 133 million in 2014. This represents a three-fold increase in just six years. The growth can be attributed to several factors, including increased access to mobile devices, improved mobile networks, and the introduction of new services that have made mobile money more attractive and convenient for consumers. This growth has been due to several drivers. One of the main drivers of growth has been the increasing adoption of mobile devices in Africa. According to the International Telecommunication Union, the number of mobile phone users in Africa has increased from 61 million in 2000 to over 1 billion in 2020. This increase in mobile phone adoption has made it easier for people to access mobile money services, as they no longer need to own a traditional bank account to carry out transactions. Another factor that has contributed to the growth of mobile wallets in Africa is the improvement of mobile networks. With the expansion of 3G and 4G networks across the continent, mobile money providers have been able to offer more reliable and faster services to their customers. This has made it easier for people to carry out transactions on their mobile devices, even in areas with poor access to traditional banking services.

According to a report by the GSM Association, Sub-Saharan Africa has the highest proportion of mobile money accounts per capita in the world. Mobile wallets in Africa are used for a variety of purposes, including person-to-person money transfers, bill payments, and e-commerce transactions.

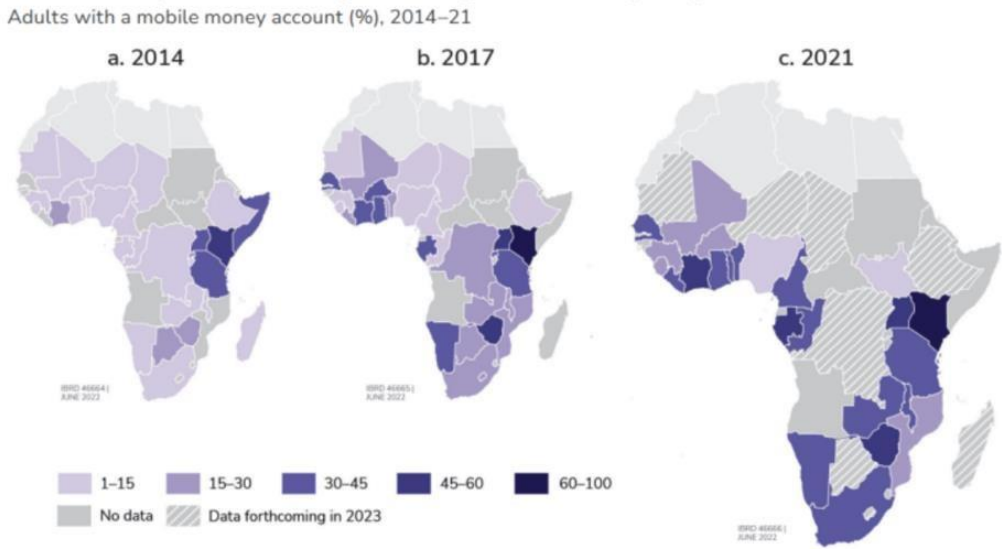


Figure 4-2: Mobile Money Growth and spread across Africa from 2014 to 2021

They have also been increasingly used to facilitate financial inclusion, enabling access to financial services for individuals who were previously unbanked or underbanked. In terms of market players, there are both established financial institutions and newer fintech companies offering mobile wallet services. Overall, the African mobile wallet market has shown strong growth potential and is expected to continue to expand as more individuals gain access to mobile devices and seek alternative ways to access financial services.

The 2020-2022 period is a very interesting one because of the COVID-19 pandemic that accelerated the adoption of mobile wallets in many African countries as people sought to avoid handing cash to reduce the risk of transmitting the virus. Additionally, new players have entered the market such as Flutterwave, Nigerian fintech company that launched its own mobile service in 2021. The COVID-19 pandemic has actually driven the market towards contactless payments and e-commerce and encouraged government support for financial inclusion and digitalization. With the need for safe and convenient payment options, mobile wallets have become a popular payment method for online transactions in Africa. Governments in Africa have also waived fees on mobile money transfers to encourage their use, and the pandemic has accelerated the digital transformation of businesses and financial institutions, making mobile wallets a key digital payment solution. Overall, the pandemic has acted as a catalyst for the growth of mobile wallets in Africa, with more people adopting this payment method for its convenience, safety, and accessibility.

4.1.2 Main African mobile wallets markets

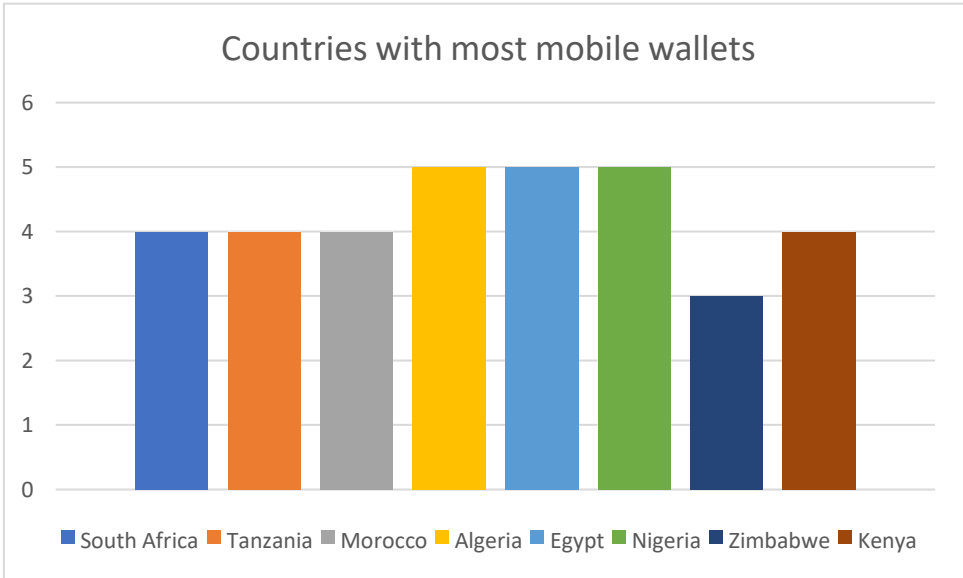


Figure 4-3: Countries with most mobile wallets in the census (source: author's elaboration)

From the census, the countries with most mobile wallets are Kenya, South Africa, Tanzania, Morocco, Algeria, Egypt, Nigeria, and Zimbabwe. These countries represent leading markets in the African mobile money umbrella.

**Kenya the most developed mobile money market:** Kenya is the most developed mobile money market in Africa, with 26.3 million customers (Communications Authority of Kenya, 2016). The mobile money market is highly consolidated, with the dominating company Safaricom controlling over 70% of the market in terms of customers. Although several new, tiny players have recently entered the market, it appears that, at least until 2014, M-Pesa's domination was unaffected. Instead, Safaricom's M-Pesa is expanding in popularity over time, increasing its market share from slightly over 70% to over 80% between 2011 and 2014, indicating that it is gaining many new members. In 2007, M-PESA mobile money transfer

service was launched with 900,000 subscribers. By 2010, the service had grown to about 12 million customers, which is roughly 30% of Kenya's population. During the same period, the number of M-PESA clients increased by 61%, from 7.38 million in July 2009 to 11.89 million in July 2010. This growth rate is higher compared to the current 4.5 million customers of traditional financial institutions in Kenya. As of July 2010, there were 19,500 M-PESA agents, a significant increase from the 1,200 agents in 2007.

The M-PESA services have developed over time, and today businesses can utilize the Bulk Payment function to pay staff salaries, while mobile phone consumers can use the service to send money and pay their utility bills. Also, there are interests in how the M-PESA is run (Jack & Suri, 2010). To start an account with M-Pesa, the Subscriber must first register as a client with an M-PESA agent using a Kenyan national ID card or passport. The subscriber then deposits money into Safaricom using the SIM cards on their mobile devices. A product called "e-float" is provided by Safaricom and has the same value as the customer's cash deposit. Depositing money into a customer's account is free of charge. Safaricom does, however, charge for cash withdrawals. With SMS technology, the e-float commodity can be moved from one customer to another. Subscribers to M-PESA have access to peer-to-peer transfers, utility bill payments, retail purchases, mobile phone purchases, and other financial services.

**South Africa** is by far the country where mobile banking is most widely used on the continent. Some of the main players are:

- The First National Bank (FNB) of South Africa boasts the country's largest user base for mobile banking. Now, it serves over 2 million users and draws roughly 90,000 people each month. Customers of FNB mobile banking completed 56 million transactions in 2009 totaling ZAR7.2 billion. FNB's capacity to let consumers send money to anyone in South Africa is a major factor in the bank's success. Receivers do not need to have a FNB bank account. They are free to use any FNB ATM to withdraw cash. Also, they have the option of withdrawing all or a portion of their funds, which they can keep in a wallet. Senders and recipients have access to additional services, such purchasing airtime, and transferring money to a third party thanks to Money in the Wallet.
- The WIZZIT Scheme Similar to M-Pesa in Kenya, Wizzit was founded in South Africa in 2004. As of the end of 2008, it had 250,000 customers and had signed up 50,000 more. It has also started experimental programs in Zambia, where it plans to grow. Wizzit is anticipated to expand into further African nations, and it has already been contacted by possible partners for joint ventures from Kenya, Botswana, Namibia, Zambia, and Malawi. While sending money to family members, South Africans frequently paid couriers the equivalent of \$30 to \$50 USD every transaction. Using Wizzit mobile bank networks, they can do it right now for USD0.50.
- Eezi's Flash Mobile Cash - The program, known as Flash Mobile Cash, equips small-business owners to serve as the local banks in areas without established official banking infrastructure. In South Africa's rural communities, "Take it Eezi" has created a local vending solution and extended into cooperative banking. The business sells

airtime, payphones, and community service, electricity via a network of more than 42 000 home businesses. Communities can withdraw, deposit, or borrow small amounts of cash from their nearby township dwelling via the shared-phone ATMs at the home shops. The store owner works as the banker and conducts business using a Shared-phone-provided GSM-enabled handset. In addition to offering a vending solution, "Take it Eezi" helps unbanked clients gain access to financial services. It has already produced 15,000 jobs in South Africa's townships and rural areas.

- MTN Mobile: Clients have total access to banking flexibility with the MTN Banking MobileMoney Account. MobileMoney gives clients access to their accounts anytime, anyplace, and through a secure connection using an MTN mobile, giving them control over their finances.
- Vodacom, the leading mobile phone provider in South Africa, has partnered with Nedbank to introduce an M-PESA mobile-based cash transfer service, like the popular one available in Kenya. Users without access to bank accounts will initially be able to transfer money via mobile devices, and eventually they will be able to pay bills and make purchases. Vodacom, the industry leader in mobile phones, and its money transfer service M-PESA may have finally made it possible for less fortunate South Africans to save, pay bills, and send money.

**Zimbabwe:** The structure of the Zimbabwean mobile market is even more extreme than that of Kenya. In Zimbabwe, three MNOs are operating, all of which have a MobileMoney platform. However, the market is heavily dominated by Econet and its MobileMoney platform, Ecocash. Econet had around 65% of the MNO market in terms of subscribers between 2010 and 2014, with very little variability in market shares. The other two competitors Net One and Telecel share the rest of the market between them.

**Tanzania:** Tanzania's market for mobile wallets has expanded significantly in recent years as mobile payments have gained popularity. Tanzania's strong mobile penetration rate is one of the key factors promoting the development of mobile wallets there. Mobile wallets, which already have over 28 million users, are a well-liked substitute for traditional banking services, particularly in rural areas with weak banking infrastructure. M-Pesa, which debuted in Tanzania in 2008 and now has over 20 million registered users, is the most widely used mobile wallet there. Vodacom Tanzania, a member of the Vodafone Group, offers M-Pesa. With over 7 million users, Tigo Pesa, which is offered by Tigo Tanzania, is the second-most used mobile wallet in the nation. With over 6 million users, Airtel Money, which is offered by Airtel Tanzania, is another well-liked mobile wallet in Tanzania. Mobile wallets Halotel HaloPesa and EzyPesa are relatively new in Tanzania, however they are quickly gaining traction. In Tanzania, mobile wallets can be used to send and receive money, pay bills, buy airtime, and conduct online transactions, among other things. They provide a practical way to handle money and make payments, and they are simple to use. While they enable participation in the established financial system for those who had previously limited access to banking services, mobile wallets have also contributed to financial inclusion in Tanzania. Also, the government

has been able to enhance tax collection and lower corruption thanks to mobile wallets. For instance, the Tanzanian government uses mobile wallets to send financial payments to elderly, disabled, and expectant women. This has made it easier to stop leaks and guarantee that the money goes to the right people.

**Morocco:** Morocco has seen a rise in the use of mobile wallets, and there are now several service providers there. The high mobile penetration rate in Morocco is one of the key factors influencing the development of mobile wallets there. Mobile wallets have over 43 million customers, making them a well-liked replacement for conventional financial services. With over 10 million users, Orange Money is the most widely used mobile wallet in Morocco. Both Orange and non-Orange customers can use it to send and receive money, pay bills, buy airtime, and conduct online activities. Another well-liked mobile wallet in the nation is Inwi Money, which is offered by Inwi, Morocco's third-largest telecom provider, and has more than 2 million users. The primary telecom company in Morocco, Maroc Telecom, provides a mobile wallet called M-Wallet, which has more than 1 million users. These mobile wallets provide a practical solution to make payments and handle money that is simple to use. Due to their accessibility and ease, they have become especially well-liked in Morocco. Users of Orange Money can, for instance, utilize a mobile app, a USSD code, or they can go to an Orange Money agent to access the service. This makes using the mobile wallet simple for those who live in rural places who do not have access to regular banking services. Mobile wallets have facilitated financial inclusion in Morocco along with being convenient. They enable participation in the established financial system for those who had previously restricted access to banking services. The government has been able to boost revenue collection and lower corruption thanks to mobile wallets. As an illustration, the Moroccan government has distributed cash payments to vulnerable groups like the unemployed and underprivileged via mobile wallets.

**Egypt:** In Egypt, the use of mobile wallets is growing quickly, and there are several service providers operating there. Vodafone Egypt, one of the biggest mobile operators in the nation, offers Vodafone Cash, the most well-liked mobile wallet in Egypt. More than 10 million people use Vodafone Cash, which enables users to send and receive money, pay bills, and purchase goods and services online. Etisalat Cash, offered by Etisalat Misr, is another well-liked mobile wallet in Egypt and has more than 3 million users. Orange Egypt, which has more than 1 million users, also offers Orange Money in Egypt. In addition to these suppliers, Egypt also offers several other mobile wallet services, such as Fawry, Masary, and Bee, among others. Users can transfer money, pay bills, and make payments using these mobile wallets, among other things. Because to their accessibility and ease, especially in a nation where traditional banking services can be challenging to access, they have grown in popularity in Egypt. The Egyptian government has also made a concerted effort to encourage the usage of mobile wallets there. The Central Bank of Egypt published rules for electronic payment services in 2018, which facilitated the development of mobile wallets in the nation. The government has also started several programs to promote the use of mobile payments, such as the introduction of Meeza, a new mobile payment system that is being marketed as a convenient and secure

way to make payments. Overall, the Egyptian market for mobile wallets is expanding quickly and is anticipated to do so in the future.

**Algeria:** The mobile money market in Algeria is dominated by three main players: Djezzy Cash, Mobilis Money, and Ooredoo Money. These mobile financial services offer similar features, such as bill payments, money transfers, and mobile top-up, and are available to users on both iOS and Android platforms. However, the adoption rate of these services is still relatively low due to the low level of financial inclusion in Algeria. While these mobile financial services have the potential to reach a large number of unbanked individuals in Algeria, they face challenges such as low digital literacy rates, lack of awareness of mobile financial services, and a preference for cash transactions. Despite these challenges, the government of Algeria has taken steps to promote the adoption of mobile financial services, and the COVID-19 pandemic has further accelerated the adoption of digital payments in the country. As a result, the mobile money market in Algeria is expected to grow in the coming years, with more mobile financial services being launched and an increasing number of people adopting these services.

**Nigeria:** In Nigeria, the use of mobile wallets is growing quickly, and there are many service providers there. Paga, which has over 17 million users and enables users to send and receive money, pay bills, and purchase products and services online, is the most widely used mobile wallet in Nigeria. Opay, a global software firm with over 5 million users that is a part of the Opera Group, is another well-liked mobile wallet in Nigeria. Opay enables users to pay bills, send money, and make payments among other things. In addition to these service providers, Nigeria also offers Firstmoney, Quickteller, and Mobile Money, among other mobile wallet options. Users can transfer money, pay bills, and make payments using these mobile wallets, among other things. Because to their accessibility and convenience, they have grown in popularity in Nigeria, especially in a place where traditional financial services can be challenging to use. The Nigerian government has also made a concerted effort to encourage the usage of mobile wallets there. The Shared Agent Network Expansion Facility (SANEF), a new program introduced by the Central Bank of Nigeria in 2019, intends to enhance the number of mobile money agents in the nation. The government has also started a number of additional programs to promote the use of mobile payments, such as the introduction of the NIBSS Instant Payment mobile payment system, which is positioned as a safe and practical method of making payments. Overall, the Nigerian market for mobile wallets is expanding quickly and is predicted to do so in the years to come. Mobile wallets are probably going to play a bigger role in the nation's financial infrastructure in the future because to the rising popularity of smartphones and the government's support for digital payments.

Other countries from where the mobile wallets were found are:

**Ghana:** Ghana's mobile money industry has expanded significantly in recent years. The total value of mobile money transactions in Ghana climbed from GHS 218.4 billion (about USD 38 billion) in 2019 to GHS 380.2 billion (roughly USD 66 billion) in 2020, a growth rate of more



than 73%, according to the Bank of Ghana. Below are some specifics on Ghana's mobile money sector. Four companies dominate the Ghanaian mobile money market: MTN Ghana, Vodafone Ghana, AirtelTigo, and the recently debuted Zeepay. With a market share of over 52% and more than 16 million registered mobile money customers, MTN Ghana is the market leader. Services provided Money transfers are bill payments, airtime top-ups, savings and loans, and merchant payments are all available through mobile money in Ghana. Moreover, some service providers provide mobile banking and overseas remittances. In Ghana, companies that offer mobile money rely on a network of agents to deliver their services. Around 330,000 registered mobile money agents in Ghana, provide access to mobile money services in both urban and rural areas, according to the Bank of Ghana. To guarantee the security and safety of mobile money transactions, the Bank of Ghana, which regulates the Ghanaian mobile money market, has put in place safeguards. Providers must get a license from the Bank of Ghana and abide by regulations governing transaction caps, customer due diligence, and reporting requirements. There are still certain difficulties in Ghana's mobile money industry, such as a large proportion of inactive accounts, a lack of provider interoperability, and concerns of fraud and cybersecurity.

**Ivory Coast:** In recent years, the Cote d'Ivoire (Ivory Coast) mobile money market has also seen rapid expansion. The total value of mobile money transactions in Cote d'Ivoire went from XOF 2.5 trillion (about USD 4.5 billion) in 2019 to XOF 4.2 trillion (around USD 7.6 billion) in 2020, a growth rate of over 67%, according to the Central Bank of West African States. MTN Côte d'Ivoire, Orange Cote d'Ivoire, and Moov Cote d'Ivoire, who together have over 90% of the market share, dominate the mobile money business in Cote d'Ivoire. In Cote d'Ivoire, mobile money services can be used to pay bills, transfer money, top up airtime, and pay merchants. In Cote d'Ivoire, the regulatory climate is also favorable for mobile money, as a result of the government's initiatives to advance financial inclusion and enhance access to financial services. The market still has issues, though, namely the lack of full provider interoperability and the need for greater public awareness and education.

**Uganda:** In recent years, Uganda's mobile money market has expanded dramatically and played a critical role in the development of the nation's financial system. The total value of mobile money transactions in Uganda increased from UGX 70.9 trillion (about USD 19.3 billion) in 2019 to UGX 92.7 trillion (around USD 25.3 billion) in 2020, according to the Bank of Uganda. MTN Uganda, Airtel Uganda, and Africell Uganda, which offer services like money transfers, bill payments, airtime top-ups, savings and loans, and merchant payments, control most of the market. To offer their services in both urban and rural locations, mobile money providers rely on a network of more than 240,000 agents. In Uganda, the regulatory framework is favorable for mobile money, and there are safeguards in place to guarantee the security and privacy of transactions. The market is still confronted with issues like low provider interoperability, high transaction costs, and the need for increased public awareness and education.

### 4.1.3 Geographic distribution

The geographic distribution of African mobile wallets varies across the continent. Generally, mobile wallets are more prevalent in countries with higher rates of mobile phone penetration and a larger unbanked population. The geographic distribution of the mobile wallet market in Africa is diverse, with different countries and regions having varying levels of adoption and usage of mobile money services. East Africa, particularly Kenya and Tanzania, has been a leader in mobile money adoption and usage, thanks in large part to the success of M-PESA. As of 2021, Kenya had over 40 million mobile money users, while Tanzania had over 27 million. Other East African countries, such as Uganda and Rwanda, have also seen significant growth in mobile money adoption in recent years.

West Africa has seen significant growth in mobile money adoption over the past few years, with Nigeria, Ghana, and Senegal being key markets for mobile money providers in the region. In Nigeria, the mobile money market is dominated by players such as Paga, FirstMonie, and Etranzact. The country has a large population of over 200 million people, with over 100 million mobile phone subscribers as of 2020, making it a significant potential market for mobile services. The Central Bank of Nigeria has also taken steps to promote the adoption of mobile money, including the issuance of guidelines and licenses for mobile money operators. Ghana has also emerged as an important market for mobile money, with MTN Mobile Money, AirtelTigo Money, and Vodafone Cash being the most popular mobile payment services in the country. In 2020, the Bank of Ghana launched a mobile money interoperability system, which allows customers to transfer funds across different mobile money platforms. Senegal has seen significant growth in mobile money adoption in recent years, with Orange Money and Wari being the dominant mobile payment services in the country. Senegal's government has also taken steps to promote the adoption of mobile money, including the launch of a national electronic payment system in 2018.

Southern Africa has also seen growth in mobile money adoption in recent years, although the adoption rates are generally lower compared to East and West Africa. Zimbabwe, Zambia, and South Africa are some of the countries in the region where mobile money adoption is gaining traction. In Zimbabwe, the dominant mobile payment service is EcoCash, which has over 11 million registered users. EcoCash allows users to send and receive money, pay bills, and make purchases using their mobile phones. The platform has played a critical role in the country, where access to traditional banking services is limited. In Zambia, mobile money adoption is also growing, with MTN Mobile Money, Airtel Money, and Zamtel Kwacha being the most popular mobile payment services in the country. Mobile money platforms have become an important alternative to traditional banking services, particularly for people living in rural areas. South Africa has a more developed financial sector compared to other countries in the region, but mobile money adoption is still growing, with platforms such as FNB eWallet and MTN Mobile Money being popular among consumers. The South African government has also launched initiatives to promote the adoption of mobile money, including the launch of the South African National Payment System in 2018. while mobile money adoption in Southern



Africa is still relatively low compared to other regions, the market is growing, driven by factors such as high mobile phone penetration rates and a need for more convenient and secure payment options. As more people gain access to digital financial services, the adoption of mobile money is expected to continue to increase in Southern Africa.

M-PESA, Airtel Money, MTN Mobile Money, Orange Money, and EcoCash are just a few of the well-known mobile wallet services available in Africa. One of the most well-known mobile wallets in Africa, especially in East Africa, is M-PESA, created by Safaricom. Airtel Money, provided by Airtel Africa, enables users to send and receive money as well as pay bills. Several African nations are served by MTN Mobile Money, a service provided by the MTN Group, and Orange Money, a service provided by Orange. The largest mobile wallet in Zimbabwe is called EcoCash, and it is provided by Econet, a mobile network provider in that country. These mobile wallets give consumers a practical method to use their phones to send and receive money, pay bills, and make payments.



Figure 4-4: Geographic distribution of main African Mobile Wallets (source: Thunes)

#### 4.1.4 Owners of Mobile Wallets

As discussed in the previous chapters, many different players are active on the market providing different digital wallet solutions. Such players involved in this field can be classified according to owner categories identified in the “Context and literature review” chapter. Indeed, they can be clustered as bank (or bank consortia), smartphone and electronic device manufacturers (or Tech companies), service providers (or Fintech companies) and telecommunication providers (Telco).

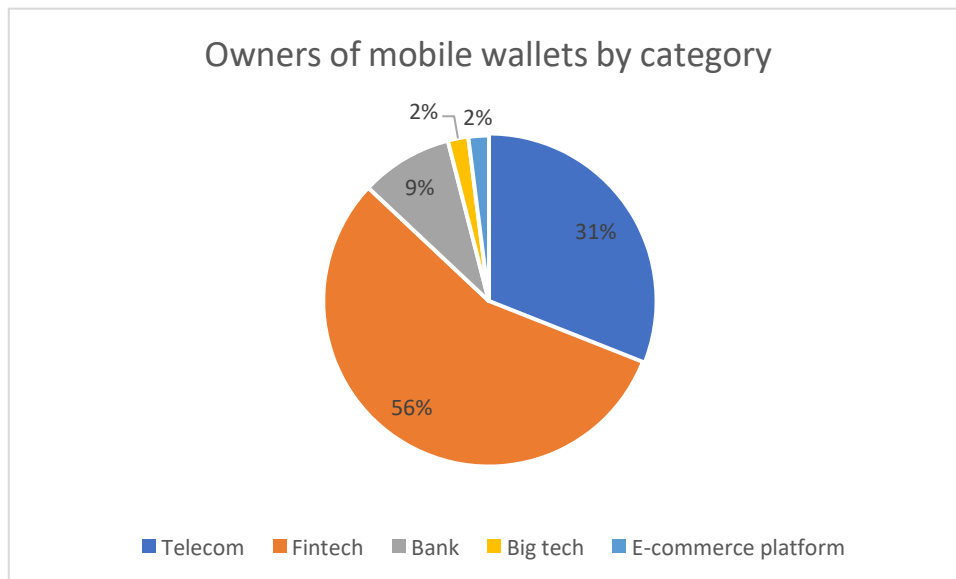


Figure 4-5: Owners of mobile wallets by category (source: author's elaboration)

Figure 4-5 shows who are the owners of wallets included in the census in percentage, from this it is interesting analyzing which are the prevalent actors offering e-wallet application. The figure shows that the mobile market in Africa is largely dominated by Fintech companies and Telecom companies with respectively 56% and 31%.

On the one hand, the mobile market in Africa has experienced significant growth in recent years, driven largely by the rise of fintech and telecom companies. These companies have played a key role in expanding access to financial services and mobile connectivity across the continent. Fintech companies in Africa are particularly prominent in the mobile market, as they have developed innovative solutions that allow users to make payments and access financial services through their mobile devices. These emerging fintech companies are contributing to the growth of mobile wallet services in Africa and helping to increase financial inclusion in the region. With the increasing adoption of smartphones and mobile internet, fintech mobile wallets are expected to continue to grow in popularity in Africa.



Some examples are Paga which is a Nigerian fintech company that offers mobile wallet services. It allows users to send and receive money, pay bills, and purchase goods and services using their mobile phones. Paga also offers other financial services, such as loans and insurance. Opay is another Nigerian fintech company that offers mobile wallet services. It allows users to send and receive money, pay bills, and purchase goods and services using their mobile phones. Opay also offers other services, such as ride-hailing, food delivery, and mobile airtime top-up. Flutterwave is also a fintech company that operates in several African countries, including Nigeria, Kenya, and South Africa. It offers a range of payment solutions, including mobile wallet services, to businesses and individuals. Flutterwave's mobile wallet

service allows users to send and receive money, pay bills, and purchase goods and services using their mobile phones.

In the African tech scene, mobile network operators (MNOs) are the equivalent of megalodons lurking beneath the surface. These behemoth companies, which include the likes of MTN Group, Airtel Africa, Safaricom, Vodacom, and Orange Group, are not only dominant players in the ecosystem but also serve as gatekeepers to crucial industries. Due to their significant size and implicit or explicit backing from native governments, these MNOs are considered "national champions," and as such, they possess immense power to make it challenging for insurgent players to enter the market.

Moreover, these MNOs are astute enough to recognize when they should reorganize themselves to maximize their value. For instance, both MTN and Airtel are spinning off their mobile money units to position their subsidiaries as pure play fintech entities. This maneuver unlocks higher multiples, given the significant value of their mobile money units, with MTN's estimated at \$5 billion and Airtel's at \$2.65 billion. This move can be seen as a direct response to the bottom-up competition posed by fintech insurgents challenging their supremacy in the market. Despite this, MNOs do play nicely with startups when it aligns with their interests. Several of Africa's biggest companies, including one non-MNO organization, have leveraged their positions to create thriving corporate venture capital (VC) funds. This strategic move by these companies allows them to invest in promising startups, while also potentially gaining access to innovative technologies or business models that can further their interests.

In addition to mobile money, fintech companies in Africa are also developing other innovative solutions to address financial inclusion challenges. For example, some companies are using artificial intelligence and machine learning to offer digital credit to underserved populations. Others are developing mobile-based savings and investment solutions to help people build financial resilience.



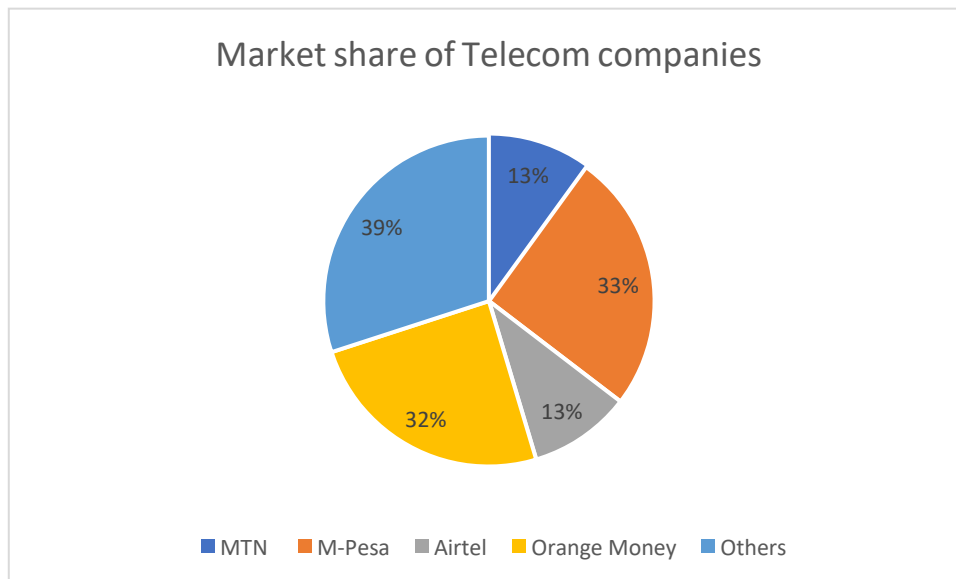


Figure 4-6: Market Share of Telecom companies (source: author's elaboration)

Supposing approximately 150 million mobile wallet users in Africa, it appears that most of the market share is taken by the big telecom companies. M-Pesa has recorded around 50 million users, while Airtel 20.1 million in 2020. Telecom companies have actually played a key role in expanding mobile connectivity across Africa. In many cases, they have invested heavily in expanding network coverage to rural and remote areas, where traditional banking services are often unavailable. This has helped to increase mobile phone penetration rates, which now stand at over 80% in many African countries. Many telecom companies in Africa have also developed their own mobile money solutions. For example, Airtel Money is a popular mobile money service offered by Airtel Africa, which operates in over 14 African countries. Similarly, MTN Mobile Money is offered by MTN Group, which is present in over 20 African countries. The emergence of mobile money solutions offered by telecom companies has helped to drive adoption of digital payments in Africa. By leveraging their existing customer base and extensive distribution networks, telecom companies have been able to reach millions of unbanked individuals and small businesses. The dominance of fintech and telecom companies in the mobile market in Africa reflects the unique challenges and opportunities of the continent. Through innovative solutions like mobile money and extensive network coverage, these companies have been able to drive financial inclusion and expand access to mobile connectivity across Africa.

For what concerns Big tech, the only player present is WhatsApp Pay which is a digital payment service offered by WhatsApp, which allows users to send and receive money through the messaging app. WhatsApp Pay is currently available in a few countries, including India and Brazil, and in recent years it launched in Nigeria. WhatsApp Pay was launched in Nigeria in November 2020, in partnership with several Nigerian banks, including Access Bank, First Bank, UBA, and Zenith Bank. To use WhatsApp Pay in Nigeria, users must link their bank account to their WhatsApp account and then initiate a payment by selecting the "Payments"

option in the app. Users can then enter the amount to be sent and verify the payment using their PIN or biometric authentication. The launch of WhatsApp Pay in Nigeria has been seen as a positive development for the country's financial ecosystem, as it provides a new and convenient way for people to make digital payments. Nigeria has a large unbanked population, and many people rely on cash for their day-to-day transactions. WhatsApp Pay has the potential to help drive financial inclusion in the country by making it easier for people to access digital financial services.

However, there have also been concerns about the security of WhatsApp Pay and the potential for fraud. The Central Bank of Nigeria (CBN) has issued guidelines for the use of WhatsApp Pay in the country, which include limits on transaction amounts and requirements for transaction monitoring and reporting. The CBN has also urged Nigerians to be cautious when using WhatsApp Pay and to report any suspicious activity to their bank or the authorities.

The only e-commerce platform is Jumia Wallet which is a digital payment service offered by Jumia, an e-commerce platform that operates in several African countries, including Morocco. Jumia Wallet allows users to store funds in a digital wallet and use those funds to make payments for goods and services on Jumia's platform. In Morocco, Jumia Wallet offers several services to its users. Firstly, it provides a convenient and secure way for customers to pay for their purchases on Jumia. By storing funds in their Jumia Wallet account, users can avoid the need to enter their payment details for each transaction, making the checkout process faster and more seamless. Additionally, Jumia Wallet offers users a range of payment options, including bank transfer, credit/debit card, and cash-on-delivery, making it easier for customers to pay for their orders in a way that suits them. Jumia Wallet also offers users the ability to receive refunds for canceled orders directly to their Jumia Wallet account. This eliminates the need for users to wait for a refund to be processed through their bank or credit card and allows them to use the funds immediately for other purchases on Jumia. Another benefit of using Jumia Wallet in Morocco is the ability to send and receive money to and from other Jumia Wallet users. This feature allows users to transfer funds to friends and family, pay bills, or make other payments directly from their Jumia Wallet account. Jumia Wallet's services in Morocco provide a convenient, secure, and flexible way for customers to pay for their purchases on Jumia, as well as send and receive money to and from other Jumia Wallet users. With the growing popularity of e-commerce in Morocco, Jumia Wallet's services are helping to drive the adoption of digital payments in the country.

#### 4.1.5 Technology and accessibility

Mobile wallets in Africa typically use one of three technologies: USSD, QR code, or NFC. USSD, which stands for Unstructured Supplementary Service Data, is a technology that allows mobile phones to communicate with a service provider's server via a text message-based interface. USSD is particularly popular in Africa because it is widely supported by basic mobile phones and is cost-effective. By dialing a short code on their mobile phone, users can access their mobile wallet account and perform a range of transactions, including sending and

receiving money, paying bills, and topping up their mobile airtime. According to a report by the GSM Association, USSD-based mobile wallets account for 86% of all mobile money transactions in Africa. QR code technology, on the other hand, uses a two-dimensional barcode that can be scanned using a mobile phone's camera to initiate a transaction. QR code-based mobile wallets are popular in countries like South Africa and Nigeria, where smartphones are more widely used. This technology is particularly convenient for making payments in physical stores, as customers simply need to scan the QR code displayed at the point-of-sale terminal to initiate the payment. According to a report by Frost & Sullivan, QR code-based mobile wallets are expected to grow at a CAGR of 47.1% between 2020 and 2025 in Africa.

Finally, NFC (near-field communication) is a technology that enables two devices to communicate with each other when they are in close proximity. NFC-based mobile wallets are not as common in Africa as USSD and QR code-based mobile wallets, as they require smartphones that are equipped with an NFC chip. However, this technology is becoming more popular as smartphones become more widely available in Africa. NFC-based mobile wallets are particularly useful for making payments in physical stores, as customers simply need to tap their smartphone on the point-of-sale terminal to initiate the payment.

Looking at the technologies adopted by the different wallet, it turned out that the most adopted technologies for mobile payments in Africa, QR and USSD are currently the most widely adopted due to its accessibility and ease of use. QR codes are also gaining popularity due to their low cost of implementation and ease of use, while NFC is still a relatively new technology in the region. QR codes and USSD are widely adopted mobile payment technologies in Africa due to their accessibility and ease of use. These technologies are accessible to most mobile phone users, regardless of whether they have smartphones or feature phones. USSD, for example, is a simple technology that works on feature phones and does not require internet connectivity, making it ideal for use in areas with poor network coverage. It also has a user-friendly interface that allows users to navigate through menus to initiate transactions, and the transactions are completed with a few clicks. QR codes, on the other hand, are gaining popularity due to their low cost of implementation and ease of use. QR codes are easy to generate and do not require expensive hardware, making it a viable option for small and medium-sized businesses. Additionally, QR codes do not require any special software to be installed on the user's phone, as most modern smartphones have built-in QR code readers. In contrast, NFC is still a relatively new technology in the region and has not gained widespread adoption. NFC requires specialized hardware and software, which can be costly to implement, and may not be accessible to users with older phones. Furthermore, NFC transactions require close proximity between devices, which may not be practical in some situations. According to a report by GSMA, as of 2021, USSD and QR code were the most widely used technologies for mobile payments in Africa, accounting for 62% and 21% of mobile money transactions, respectively. NFC accounted for only 2% of transactions. This highlights the preference for accessible and easy-to-use technologies in the region. However,

as technology continues to evolve and smartphone adoption rates increase, it is possible that NFC technology will gain more widespread adoption in Africa.

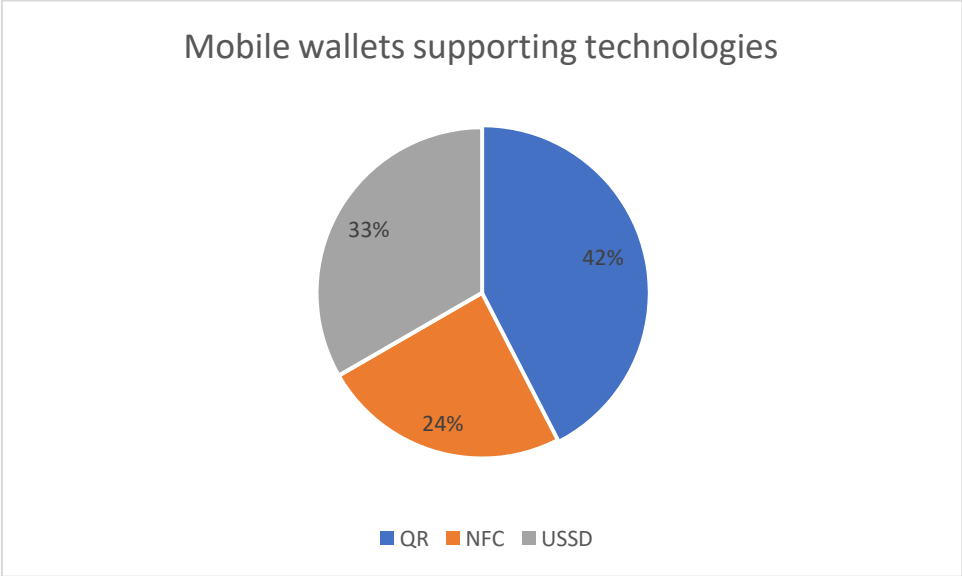


Figure 4-7: Mobile wallets supporting technologies (source: author's elaboration).

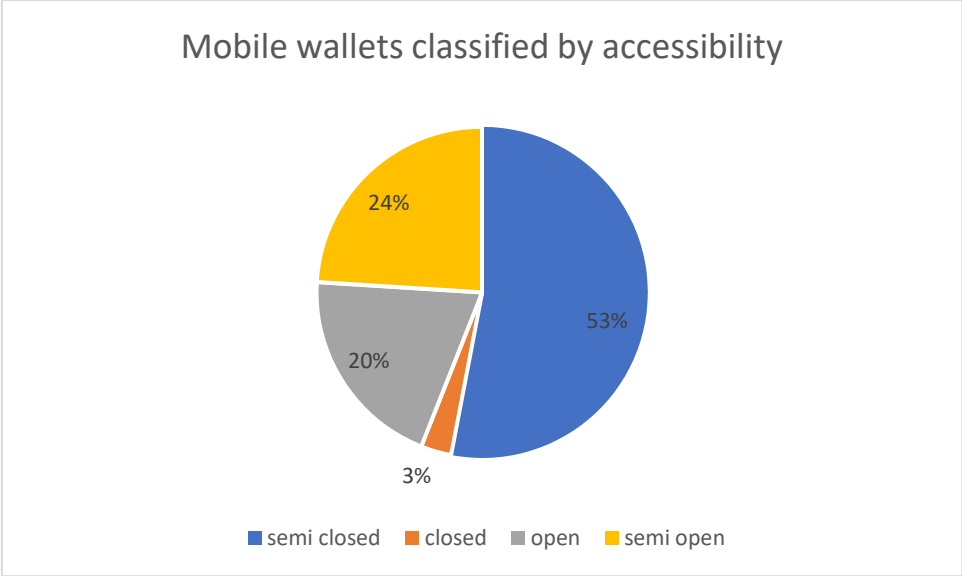


Figure 4-8: Digital wallets classified by accessibility (source: author's elaboration).

In Africa, the most common type of mobile wallet is the semi-closed wallet. Open wallets are less common in Africa, but they are slowly gaining traction in some countries. Semi-closed wallets have become the preferred choice for mobile wallet users in Africa due to several factors. One of the reasons for their popularity is the convenience they offer to users. With semi-closed wallets, users can easily make payments to merchants who are part of the wallet network without having to carry cash or cards. This convenience is particularly important in Africa where the majority of the population is unbanked, and many people do not have access to traditional financial services. Another reason why semi-closed wallets are popular in Africa is that they are often provided by telecom companies who have a wide network of agents and vendors. This allows users to easily deposit or withdraw money from their wallets at any of

these agents, which can be found in almost every corner of the continent. Additionally, many telecom companies offer discounts and other incentives to encourage their customers to use their wallets, further driving adoption. Closed wallets, on the other hand, are more restrictive, as they are usually offered by a single service provider, such as a telecom company, and can only be used for transactions within that network. Closed wallets are mostly used for airtime top-up and bill payments. Closed wallets have some advantages, such as increased security and ease of use. Because the closed wallet is tied to a single service provider, there is less risk of fraudulent activity or unauthorized transactions. Additionally, closed wallets are often pre-loaded with funds, making it easier for users to make quick payments for goods and services without having to add funds to the wallet each time. However, the main disadvantage of closed wallets is their lack of flexibility. Users are limited to using the wallet for transactions within the network of the service provider, which means they may not be able to use the wallet to pay for goods and services from other merchants. This limitation can be frustrating for users who want to make payments to a wider range of merchants, as they will need to have multiple wallets for each service provider they use. Despite their limitations, closed wallets remain popular in some African countries, particularly for airtime top-up and bill payments. Some service providers have also started to expand their closed wallets to include other transactions, such as peer-to-peer transfers and online shopping. However, closed wallets will likely remain a niche product in Africa, with semi-closed and open wallets dominating the mobile wallet market due to their flexibility and ease of use.

Open wallets, which allow users to transact with anyone, anywhere, are relatively new in Africa and are not yet widely adopted. However, some countries, such as Kenya, have seen the emergence of open wallet systems like M-PESA, which have gained widespread adoption and transformed the way people conduct financial transactions. This has significantly increased financial inclusion in Kenya, where many people lacked access to traditional banking services. The service has over 40 million active users and has expanded to other countries in Africa, such as Tanzania, Mozambique, and Ghana. Other open wallets that have gained some traction in Africa include Airtel Money, Tigo Cash, and Orange Money. These services are offered by telecom companies and allow users to transact with anyone, regardless of the network provider. However, the adoption rate of these open wallets is still relatively low compared to semi-closed and closed wallets. One of the main advantages of open wallets is that they promote financial inclusion and increase access to financial services. They allow users to transact with anyone, anywhere, and can be used for a wide range of transactions, from paying for goods and services to sending and receiving money. They are also often used by businesses to make payments to suppliers and employees. However, open wallets also have some disadvantages. They are often more expensive to use compared to closed or semi-closed wallets, as they may charge higher transaction fees or require users to maintain a minimum balance. They are also more vulnerable to fraud and security breaches, as they are more accessible to a wider range of users. While open wallets are still relatively new in Africa, they have the potential to transform the financial landscape and increase financial inclusion.



However, they face several challenges, including higher costs and security risks, that must be addressed to ensure their widespread adoption and success.

#### 4.1.6 Services provided

The findings of the census have revealed that almost all mobile wallets offer the same services which are:

- Online payment: the process of making a payment for goods or services over the internet using a mobile wallet app. This involves linking the mobile wallet to a user's bank account, debit card, or credit card, and using the funds available in the mobile wallet to make the payment. To make a payment using a mobile wallet, the user typically needs to select the mobile wallet as the payment option during the checkout process on a website or mobile app.
- In-store payments refer to transactions where a customer makes a payment for goods or services in a physical store or retail location using a payment method such as cash, credit or debit card, mobile payment, or other electronic forms of payment. This typically involves the customer selecting the items they wish to purchase, taking them to the checkout counter, and then using the payment method to complete the transaction. In-store payments are a crucial part of the retail experience, and retailers invest heavily in payment processing systems to ensure that transactions are secure, fast, and convenient for customers.
- Money transfers: Mobile wallets allow users to send money to other users, even those who don't have a bank account, using just a phone number. This service is particularly useful for remittances and for sending money to family and friends.
- Cash-in: Users can deposit money into their mobile wallets by visiting a local agent, depositing cash at a designated bank account, or by linking their bank account or debit/credit card to their mobile wallet.
- Cash-out: Users can withdraw money from their mobile wallets by visiting a local agent, who will give them cash in exchange for the digital funds.
- Airtime top-up: Users can buy airtime for themselves or others directly from their mobile wallet, eliminating the need to go to a physical store or scratch card vendor.
- Bill payments: Users can pay bills such as utilities, rent, and school fees through their mobile wallet.
- Savings and loans: Some mobile wallets offer savings and loan products, allowing users to earn interest on their savings and access loans at lower interest rates than traditional lenders.
- Merchant payments: Mobile wallets can be used to make payments at merchants that accept mobile payments, such as retailers, restaurants, and transport services.
- Insurance: Some mobile wallets offer insurance products, such as health and life insurance, to their users.
- International transfers: Some mobile wallets allow users to send money internationally, making it easier for people to send money to family and friends in other countries.

#### 4.1.7 Fees

There are several business models and revenue streams for African mobile wallets, which vary depending on the specific mobile wallet provider and the market they are operating in. Here are some of the most common models and revenue streams:

- **Transaction fees:** Many mobile wallet providers charge transaction fees for various services such as money transfers, bill payments, and merchant payments. These fees can range from a flat rate per transaction to a percentage of the transaction amount, and they can be the primary source of revenue for mobile wallet providers.
- **Interest on deposits:** Some mobile wallet providers offer interest on deposits held in users' wallets. This allows providers to earn interest on the deposits while providing users with a safe and convenient place to store their money.
- **Interchange fees:** Mobile wallet providers can earn revenue from interchange fees when users make payments using their mobile wallet at a merchant. Interchange fees are typically a percentage of the transaction value and are paid by the merchant to the mobile wallet provider.
- **Advertising and marketing:** Mobile wallet providers can also generate revenue through advertising and marketing. For example, they may offer sponsored ads or promotions within the mobile wallet app.
- **Partnerships and collaborations:** Mobile wallet providers can enter partnerships and collaborations with other companies to offer value-added services to their users. For example, a mobile wallet provider might partner with an insurance company to offer insurance products to its users, with the mobile wallet provider earning a commission on sales.
- **Data analytics:** Mobile wallet providers can use data analytics to gain insights into their users' behavior and preferences. This information can be sold to third parties, such as advertisers or marketers, to generate additional revenue.

African mobile wallet providers have a variety of business models and revenue streams at their disposal. By leveraging their extensive user base and technology infrastructure, they are well-positioned to continue expanding their offerings and revenue streams in the years to come. The fees charged by African mobile wallets vary depending on the specific mobile wallet provider and the services they offer. Here are some examples of the fees charged by popular African mobile wallet providers:

- **M-Pesa:** M-Pesa is one of the largest and most popular mobile wallet providers in Africa, and its fees vary depending on the country and the service being used. For example, in Kenya, M-Pesa charges a fee of 1% for person-to-person money transfers and bill payments, and a fee of 0.5% for merchant payments. In Tanzania, the fees for person-to-person money transfers are 0.7% for transactions between 1 and 1,000 TZS, and 1% for transactions above 1,000 TZS.

- **Airtel Money:** Airtel Money is another popular mobile wallet provider in Africa, and its fees also vary by country and service. For example, in Nigeria, Airtel Money charges a fee of 1.5% for person-to-person money transfers, while in Uganda, the fee is 0.5% for transactions up to 1,000 UGX, and 1% for transactions above 1,000 UGX.
- **Tigo Cash:** Tigo Cash is a mobile wallet provider in several African countries, and its fees also vary by country and service. For example, in Ghana, Tigo Cash charges a fee of 1% for person-to-person money transfers, while in Tanzania, the fee is 0.8% for transactions up to 500 TZS, and 1% for transactions above 500 TZS.

African mobile wallet fees tend to be lower than those charged by traditional banking institutions, making them a popular and accessible option for many people. However, it's important for users to carefully review the fees and terms and conditions of each mobile wallet provider to ensure that they are getting the best value for their money.

## 4.2 Challenges faced by African mobile wallets.

### 4.2.1 Lack of trust

Mobile money services have become increasingly popular in Africa over the past decade, particularly in areas where traditional banking infrastructure is lacking. However, despite the convenience and benefits that mobile money can provide, many people in Africa remain hesitant to adopt these services due to concerns about security and fraud. One of the main reasons for this lack of trust is the prevalence of scams and fraud schemes that target mobile money users. These scams can take many forms, from fake mobile money agents who steal users' funds to phishing attacks that trick users into revealing their personal information. These incidents have contributed to a general sense of distrust among many people in Africa towards mobile money services. Another factor that contributes to this skepticism is a lack of awareness and understanding of how mobile money works. For many people, particularly those in rural areas, mobile phones are primarily used for making calls and sending text messages, and they may not be familiar with the more advanced features of mobile devices. This lack of familiarity with technology can make people hesitant to adopt mobile money services, as they may not fully understand how they work or how to use them safely. Additionally, concerns about the security of personal information and financial transactions can also contribute to a lack of trust in mobile money services. People may worry that their personal information could be stolen or that their transactions could be intercepted by hackers or other unauthorized parties. These concerns are not unique to Africa, but they can be amplified in regions where cybersecurity infrastructure is less developed.

### 4.2.2 Limited network coverage

Limited mobile network coverage can create significant challenges for people in Africa who rely on mobile money services. Mobile money services are designed to be accessed via mobile phones and require a strong and reliable network connection to function properly. When there is limited mobile network coverage, it can be difficult for people to access these services, which can impact their ability to conduct financial transactions. In rural areas of Africa, where mobile

network coverage may be limited, people may have to travel long distances to find areas with network coverage, such as towns or cities. This can be both time-consuming and expensive, as it requires transportation and other costs. Even if people are able to travel to areas with network coverage, they may still experience difficulty accessing mobile money services due to weak signals or network congestion. Limited mobile network coverage can also impact the reliability and security of mobile money services. When network coverage is limited, transactions may take longer to process or may fail altogether, which can result in financial losses for users. Additionally, weak signals can make it easier for fraudsters to intercept and steal sensitive information, such as personal identification numbers (PINs) or transaction details. To address the challenge of limited mobile network coverage, governments and mobile network operators in Africa are investing in infrastructure to expand network coverage in rural areas. For example, some governments are providing incentives to mobile network operators to build out their networks in rural areas, while others are investing in satellite technology to provide wider coverage. Additionally, mobile network operators are exploring alternative technologies, such as mesh networking or low-power wide-area networks (LPWANs), which can provide network coverage in areas where traditional networks may be difficult to deploy.

#### 4.2.3 limited Financial Literacy

Limited financial literacy is a significant challenge in Africa that affects people's ability to effectively use mobile money services. Many individuals lack basic knowledge and understanding of financial concepts, including savings, loans, and interest rates. As a result, they may struggle to manage their finances, make informed decisions, and access formal financial services. One of the main reasons for limited financial literacy in Africa is the lack of access to formal financial education. Financial education is not widely taught in schools, and many people do not have access to financial training or information. This lack of education and information makes it difficult for individuals to understand how to manage their finances effectively, which can lead to poor financial decisions. In addition to the lack of financial education, there are also cultural barriers that prevent people from understanding financial concepts. For example, in many African cultures, savings are seen as a communal responsibility rather than an individual one. This can make it difficult for individuals to understand the importance of saving for their own future. Furthermore, there is often a language barrier in financial education and information. Many people in Africa speak local languages that may not have terms or concepts for financial concepts such as interest rates, loans, or credit. This language barrier can make it difficult for individuals to understand how financial systems work and how to use them effectively. The limited financial literacy of many people in Africa is a significant barrier to the adoption and use of mobile money services. Mobile money services, such as M-PESA in Kenya, have the potential to transform financial services in Africa by providing a convenient and affordable way for individuals to access financial services. However, without a strong understanding of financial concepts, people may struggle to use these services effectively. To address this issue, governments, non-

governmental organizations, and financial institutions need to invest in financial education programs that are accessible and relevant to the local population. These programs should be delivered in local languages and should focus on practical financial skills, such as budgeting, saving, and borrowing. By improving financial literacy, more people in Africa will be able to access and benefit from mobile money services and improve their financial well-being.

#### 4.2.4 High transaction fees

One of the major challenges facing the mobile money industry in Africa is high transaction fees. These fees can be a significant barrier for low-income customers who rely on mobile money services to meet their day-to-day financial needs. The high transaction fees can be attributed to several factors, including the high cost of operating a mobile money service, regulatory fees, and taxes. In addition, mobile money providers may charge higher fees for transactions that involve cash withdrawals or transfers to non-registered users.

For low-income customers, these fees can quickly add up and eat into their limited financial resources. This can make mobile money services less attractive and push people back to using cash, which can be less secure and more inconvenient. Mobile money service providers and regulators must collaborate to discover solutions for this problem that will lower transaction costs while maintaining the viability of the services. This can entail experimenting with new business models, such as cross-selling other financial services, or using technology to drive down operating costs. In addition, governments could consider reducing or waiving regulatory fees and taxes for mobile money providers, as this could help to lower transaction fees for customers. Mobile money providers could also consider offering discounts or other incentives to low-income customers to encourage them to use the service.

Ultimately, reducing transaction fees will be crucial for ensuring that mobile money services continue to be a viable option for low-income customers in Africa. By making these services more affordable, mobile money providers can help to promote financial inclusion and improve the lives of millions of people across the continent.

#### 4.2.5 Regulatory Challenges

Mobile money has the potential to revolutionize financial inclusion in Africa, but regulatory challenges can pose significant obstacles to the growth and success of mobile money markets. Here are some of the regulatory challenges that mobile money providers face in some African countries:

- **Licensing requirements:** Some African countries require mobile money providers to obtain licenses before they can offer their services. These licensing requirements can be complex and time-consuming, which can deter new entrants from entering the market. Moreover, obtaining a license may require a significant amount of capital, which can be a barrier to entry for smaller providers.
- **Limits on transaction sizes:** Some African countries place limits on the size of mobile money transactions. These limits can restrict the usefulness of mobile money for larger transactions, such as paying school fees or buying a car.

- Restrictions on agent networks: Mobile money providers often rely on a network of agents to distribute their services. However, some African countries restrict the number of agents that mobile money providers can have, or require providers to obtain special licenses for their agents. These restrictions can limit the reach of mobile money services and make it difficult for providers to expand their networks.
- Requirements for partnerships with banks: In some African countries, mobile money providers are required to partner with banks in order to offer their services. This can be a challenge for smaller providers who may not have the resources to establish such partnerships. It can also limit the range of services that mobile money providers can offer.
- Data privacy and security requirements: Mobile money transactions involve sensitive financial information, which can be vulnerable to fraud and cyber-attacks. Some African countries have strict data privacy and security requirements for mobile money providers, which can be difficult and costly to comply with.

In order to overcome these regulatory challenges, mobile money providers in Africa need to work closely with governments and regulators to develop regulations that balance the need for consumer protection with the need for innovation and growth in the mobile money industry. Providers also need to invest in technology and infrastructure to ensure that their services are secure and reliable, and they need to educate consumers about the benefits and risks of using mobile money.

#### 4.2.6 Limited merchant acceptance

Mobile money services have been widely adopted in many African countries as a way to provide financial services to the unbanked population. However, the success of these services relies heavily on the availability of a network of merchants and agents who accept mobile money payments. Unfortunately, in some areas of Africa, there are limited merchants and agents who accept mobile money payments, which poses a significant challenge to the widespread adoption of mobile money services.

The limited acceptance of mobile money payments can be attributed to several factors. Firstly, many merchants and agents may not have the necessary infrastructure to accept mobile money payments. For instance, they may lack the required point-of-sale (POS) terminals or other equipment needed to process mobile money transactions. This can make it difficult for customers to use mobile money services, as they may not have access to merchants or agents who can accept mobile money payments.

Secondly, there may be limited awareness among merchants and agents of the benefits of mobile money services. Some may be hesitant to accept mobile money payments due to a lack of understanding of how the system works, or concerns about security and fraud. This can be addressed through education and training programs that help to raise awareness about the benefits of mobile money services and provide guidance on how to use them securely. Thirdly, the limited acceptance of mobile money payments may also be due to regulatory barriers or



other factors such as high transaction fees or limited interoperability between different mobile money providers. These issues can make it difficult for merchants and agents to accept mobile money payments, as they may face additional costs or administrative burdens. Overall, the limited acceptance of mobile money payments by merchants and agents can be a significant barrier to the widespread adoption of mobile money services in some areas of Africa. Addressing this challenge will require a concerted effort by mobile money providers, governments, and other stakeholders to improve infrastructure, raise awareness, and address regulatory barriers.

#### 4.2.7 Competition from traditional banks

In some African countries, traditional banks offer similar services to mobile money providers, which creates competition for customers and can limit the growth of the mobile money market. Traditional banks in Africa have been in operation for many decades and are well-established in the financial sector. They offer services such as savings accounts, loans, and money transfer services, which are also available through mobile money providers. This means that customers have more options to choose from, and they may prefer to use traditional banking services over mobile money for various reasons.

One of the main reasons that traditional banking services may be preferred over mobile money is trust. Traditional banks are often seen as more reliable and secure than mobile money providers, which can be viewed as less established and more prone to fraud and other risks. Additionally, traditional banks have physical branches that customers can visit, which can give them a sense of security and ease of access to services. Another reason that traditional banking services may be preferred over mobile money is familiarity. Many people in Africa have grown up using traditional banking services and are more comfortable with them than with mobile money. They may be hesitant to switch to mobile money because they are unfamiliar with it or because they do not understand how it works. Competition from traditional banking can limit the growth of mobile money markets because it can reduce the number of customers who use mobile money. This can make it more difficult for mobile money providers to expand their customer base and increase their revenues. Additionally, traditional banks may have larger marketing budgets and more resources to invest in technology, which can give them an advantage over mobile money providers. However, mobile money providers have several advantages over traditional banks that can help them compete. For example, mobile money is often more convenient than traditional banking because it can be accessed from anywhere using a mobile phone. Mobile money is also often cheaper than traditional banking, with lower transaction fees and no minimum balance requirements.

In conclusion, competition from traditional banking is a challenge that mobile money providers in some African countries must face. However, mobile money providers have several advantages that can help them compete, and they can continue to grow by improving their services and building trust with customers.

## 5 Conclusion

In conclusion, African mobile wallets have revolutionized the way people in Africa access financial services. The widespread adoption of mobile phones in Africa has created an opportunity for people who were previously excluded from the formal financial system to access basic financial services, such as savings, credit, and insurance, through their mobile phones. Mobile wallets have proven to be a game-changer in reducing financial exclusion and improving financial inclusion in Africa. They provide an affordable, accessible, and convenient way to save money, pay bills, send and receive money, and access credit. The success of mobile wallets in Africa can be attributed to several factors, including the high penetration of mobile phones, innovative partnerships between mobile network operators and financial institutions, and regulatory support from governments. Mobile wallets have also had a positive impact on the economies of African countries by increasing financial inclusion, reducing the cost of financial transactions, and promoting entrepreneurship and innovation. Based on the analysis of the census of several players in the African mobile wallet market, it can be concluded that mobile wallets have significantly transformed the way people in Africa manage their money. In terms of technology, the mobile wallet market in Africa has seen a rapid expansion in recent years, with significant investments in digital infrastructure. This has led to increased accessibility and usage of mobile wallets, which have become an essential part of the financial landscape in many African countries. The analysis also revealed that there are different types of players in the African mobile wallet market, ranging from telecommunications companies to financial institutions and fintech startups. These players offer a range of services, including mobile payments, money transfers, bill payments, and other financial services. However, there are still challenges that need to be addressed to ensure the continued success of mobile wallets in Africa. These challenges include improving digital literacy and financial education, enhancing cybersecurity and data protection, and expanding the range of financial services offered through mobile wallets. Overall, African mobile wallets have transformed the financial landscape in Africa and have the potential to continue to drive economic growth, reduce poverty, and promote financial inclusion for millions of people across the continent. The analysis of the African mobile wallet market underscores the transformative potential of mobile technology in expanding financial inclusion and providing affordable financial services to people in emerging markets. It also highlights the need for continued investments in digital infrastructure and innovative services to ensure that mobile wallets continue to meet the evolving needs of consumers in Africa.



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