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Promoting Financial Inclusion Through Mobile Payments: A Case Study of Mauritanian Bank

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ABSTRACT

In the digital age, physical distancing no longer hinders financial transactions, as an increasing number of individuals and businesses are adopting digital financial services, including mobile payments. An IBM Bank survey of 150 people highlights the importance of digitalization in remote service delivery and demonstrates the growing popularity of mobile payments, particularly in the wake of the pandemic. This study analyses the integration of new technology into daily life, examining both its benefits and risks. It provides an in-depth analysis of E-payment and financial inclusion, along with an empirical assessment of the mobile payments landscape in Mauritania. By focusing on these key aspects, the study explores trends, challenges, and opportunities in the financial sector, while also shedding light on the potential risks associated with technological advancements and changing payment practices.

I. INTRODUCTION

In an increasingly interconnected world, electronic payments and financial inclusion are converging to create a more inclusive and accessible financial landscape. Electronic payments, offering fast and secure transaction solutions, play a central role in this evolution. Meanwhile, financial inclusion aims to ensure equitable access to financial services for all individuals. New technology has paved the way for various innovative payment methods. Traditional bank card payments require electronic payment terminals (TPE), while more recent methods include contactless mobile payments through applications linked to bank accounts, which necessitate both the buyer and the seller to use compatible apps. Additionally, cryptocurrency payments allow transactions from one digital wallet to another, enabling retailers to use tablets with QR codes to facilitate these exchanges. Mobile financial services are among the most promising applications in the developing world. Mobile money, in particular, has the potential to become a transformative platform that could revolutionize entire economies. According to Donovan (2012), mobile money holds significant benefits and potential impact, especially in promoting financial inclusion in developing regions.

1.1. The impact of electronic payment on consumer behaviour

Contactless payment is a key component of the strategy to dematerialize money, aiming to increase the transparency of exchanges and financial flows. Unlike cash transactions, contactless payments are instantaneous and virtual, significantly altering our shopping habits. The ease of contactless payments can influence consumer behavior, simplifying transactions and subtly impacting decision-making. Technological, environmental, and societal transformations are driving changes in consumer behavior, prompting companies to adapt their sales channels and offerings. With the rise of digital technologies, consumers can now easily compare different offers to find the best fit for their needs. For a seamless online shopping experience, internet users require personalized interactions, transparency, flexibility, and optimal communication. Building consumer confidence in electronic transactions necessitates giving them control over their personal data and privacy preferences. Companies must also consider the impact of extensive data collection on consumer rights. Digital trust, the level of confidence that customers, employees, or the public place in a company's or bank's information system, is crucial. It encompasses two major challenges: cybersecurity and personal data compliance. To ensure digital trust, banks and companies must implement both human and technical resources to provide reliable identification, secure data flows during transactions, and robust data hosting and storage solutions.

1.2. The role of electronic payments in financial inclusion

Electronic payments play a crucial role in promoting financial inclusion by:

- Broadening Access to Financial Services: Expanding access to financial services involves supporting customer usage through interoperability. Ensuring that different platforms, agents, and customers can interact seamlessly is essential. This allows customers of various systems to make payments across different providers, which is particularly vital for those in remote rural areas.
- Reducing Transaction Costs and Overcoming Geographical Barriers: Adopting electronic payments can significantly lower transaction costs and enhance the efficiency of financial operations for both businesses and individuals. This shift helps to overcome geographical barriers, making financial services more accessible to a broader population.

1.3. The use of mobile payment applications in Mauritania

AMWALI is the first digital portal for electronic payment services in the Islamic Republic of Mauritania, launched as part of the Central Bank of Mauritania's (BCM) initiatives for digital transformation. Designed to streamline payment procedures for all government service charges, AMWALI aims to provide a wide range of services through its platform. This initiative saves users time and effort, simplifying the process of obtaining services with ease, efficiency, and security. Over 60% of banks in Mauritania offer mobile payment applications due to the high demand from consumers for daily transactions. The use of these applications is rapidly increasing, providing citizens with a convenient alternative for financial transactions. These apps enable users to transfer money, pay bills, make online purchases, and access banking services without needing to visit a bank physically. They play a crucial role in financial inclusion by allowing those without access to traditional banking services to conduct transactions online. However, despite their growing popularity, challenges remain, particularly regarding transaction security and accessibility for rural or disadvantaged populations who may lack smartphones or a stable internet connection.

1.4. The risks of using the application

Using mobile payment applications in Mauritania poses potential risks in terms of data security and fraud. Users must remain vigilant against phishing attempts, account hacking, and identity theft by only sharing their personal information or login details with trusted sources. Additionally, the reliability of mobile networks and payment systems can be a concern, especially in rural areas with limited connectivity. Authorities and service providers are working to enhance the security and reliability of transactions to ensure the safe and efficient use of mobile payment applications across the country.

The Amwali application, as a mobile payment platform in Mauritania, presents specific risks that users should be aware of:

- Phishing Fraud: Amwali users may be targeted by phishing attempts through fraudulent emails or text messages claiming to be from the application. These attempts can trick users into disclosing their login information or payment details, exposing their accounts to financial fraud.
- Data Security: The Amwali application stores users' financial and personal information. In the event of a security breach or data violation, this information could be compromised, exposing users to the risk of identity theft or financial fraud.
- Application Vulnerabilities: Like any mobile application, Amwali may have security vulnerabilities that cybercriminals could exploit to access users' accounts, carry out unauthorized transactions, or steal sensitive information.
- Transaction Fraud: Amwali users could fall victim to fraud when sending or receiving payments.

To mitigate these risks, it is crucial for Amwali users to take security measures such as protecting their identification information, using strong passwords, activating transaction notifications, and regularly checking their accounts for any suspicious activity. Additionally, it is recommended to keep the application updated with the latest security updates provided by the developer.

The structure of the remaining sections is as follows: Section 2 covers the literature review; Section 3 presents and analyses the survey results; Section 4 provides the conclusion.

II. LITERATURE REVIEW

Vilca Perales et al. (2024) conducted a survey with 20 questions to demonstrate how mobile wallets contribute to economic and financial inclusion development in a specific sector of Peru. Their study concluded that mobile wallets have a significant relationship with the financial inclusion of entrepreneurs in the "Lord of Luren" Shopping Center in Ica. Similarly, Siva Priya and Rao (2024) examined the influences on financial technology services and their impact on financial inclusion, using a questionnaire of 258 respondents. They found that ease of use, usefulness, trust, social influence, personal innovativeness, and convenience positively affect fintech service usage behavior, and that fintech adoption positively influences financial inclusion. Natsir et al. (2023) explored the relationship between financial inclusion and digital banking services in Jakarta, using a questionnaire targeted at mobile banking users. Their results showed that financial knowledge influences financial literacy, which in turn significantly impacts financial inclusion, with financial literacy acting as a mediator. Kenechukwu (2022) analyzed the effect of electronic payment systems on financial inclusion in Nigeria from 2008 to 2021, using Ordinary Least Squares (OLS) regression. He found that internet access, financial literacy, and technological changes significantly impact access to financial services in Nigeria. Alrabei et al. (2022) investigated the impact of mobile payment on financial inclusion rates using a 22-question questionnaire administered to customers of the Arab Bank and the Housing Bank. They found that the price, quality, ease of use, and security of mobile payment services

significantly affect financial inclusion, and concluded that mobile payment systems play a crucial role in increasing financial inclusion rates, recommending their adoption by all banks in Jordan. Awa and Obera (2021) analyzed the impact of electronic banking on promoting financial inclusion in Nigeria using OLS regression. Their study found that while mobile/telephone banking had a positive but non-significant relationship with banking adults, transactions through Point of Sale (POS) machines showed a negative and non-significant relationship with banking adults in Nigeria. Fernandes et al. (2020) studied the contribution of digital financial services to financial inclusion in Mozambique using an ARDL model approach from 2011 to 2019. Their results confirmed the crucial role digital financial services play in financial inclusion, particularly in improving access to and use of services by the underserved population. Son et al. (2020) examined the relationship between mobile money account usage, financial inclusion, and digital payment transactions in Vietnam. They found that the rates of mobile money service usage and account ownership at financial intermediaries in Vietnam are still low. However, owning an account at a financial intermediary facilitates the use of mobile money, and both owning an account and using mobile money services positively affect participation in non-cash transactions. Ene et al. (2019) examined the impact of electronic banking on financial inclusion in Nigeria, using the total number of automated teller machines and point-of-sale devices as proxies for electronic banking. They found that while ATMs do not significantly impact financial inclusion, Singh (2017) noted that technology is a major enabler in providing banking services to a larger section of society in India, particularly underprivileged communities. Lal and Sachdev (2015) analyzed the role of mobile money services in financial inclusion, examining successful and less successful deployments worldwide. They concluded that factors such as service design and development significantly affect the success of mobile money services. Etim (2014) investigated the impact of mobile banking and mobile money adoption on financial inclusion in Sub-Saharan Africa, finding that while basic mobile phones are widely adopted for communication, they are rarely used for mobile banking or money transfers. Finally, Ndlovu and Ndlovu (2013) studied the role of mobile banking in rural financial inclusion in Zimbabwe, concluding that mobile banking has the potential to reduce poverty by integrating previously excluded rural communities into mainstream economic activities.

III. PRESENTATION AND ANALYSIS OF SURVEY RESULTS

3.1. Methodology and presentation of the sample

A form was designed and administered as part of an in-depth study of payment habits and attitudes towards mobile transactions in Mauritania. A sample of 150 people was selected to represent a variety of demographic, economic, and geographic profiles, ensuring a balanced representation of the Mauritanian population. Efforts were made to ensure diversity in the sample, considering factors such as age, education level, socio-economic status, and geographical location. This approach yielded comprehensive and representative data, reflecting the diversity of the Mauritanian population and enabling accurate analyses of mobile payment trends and behaviours.

Special attention was given to including participants from different regions of the country, both urban and rural, to capture regional nuances in the adoption and use of mobile payment services. Standardized data collection methods were employed to ensure the quality and reliability of the responses obtained.

3.2. Analysis of the results

This section analyzes the relationship between mobile payments and financial inclusion in Mauritania. It concludes by identifying the challenges and opportunities. We conducted a survey of 150 IBM customers in Mauritania, using a questionnaire with 12 questions. The key findings from this survey are summarized below:

Table1: Sample description

7Characteristics of the sample		**%**
Gender	Male	66.4%
	Female	33.6%
Age	Uunder18 years	10%
	Between 18-23years	40%
	Between23-30 years	38.7%
	Between 30-40	8.7%
	Over 40	2.7%
Profession	Student	52%
	Stagiaire	0.7%
	Daily worker	9.3%
	Employee	37.3%
	Private work	0.7%
	None	26%
	Less than 6000MRO	22.7%

Income per month	Between 6000-15000 MRO	30.7%
	Between 15000-30000 MRO	11.3%
	More than 30000 MRO	9.2%
Use of mobile payments services	Yes	95.3
	No	4.7
Type of mobile phone of the users	Basic phone	16.7%
	Smartphone	83.3%
Frequency of mobile payment services usage	Nerver	1.3%
	Daily	54%
	Weekly	30.7%
	Monthly	12%
Reduce in the need for traditional bank account	Yes	81.3%
	No	18.7
Challenge faced by users	Limited network	46%
	User experience	0.7%
	Lack of trust	30%
	High transaction fees	21.3%
Usage level of mobile payment services	Very easy	16%
	Easy	46%
	Neutral	29.3%
	Difficult	7.3%
	Very difficult	1.3%
Encourage for usage	Lower transaction fees	30.7%
	Easier user interface	15.3%
	Improved security	24.7%
	Better network coverage	29.3%
Area	Rural	24.7%
	Urban	75.5%

Source: author

Half of the sample is under 23 years old, indicating a relatively young user base. Understanding this demographic is crucial for tailoring content and services to meet the needs and preferences of this age group. The majority of users are students, comprising 52% of the total. Employees account for 37.3%, daily workers for 9.3%, and the remaining users are interns or involved in private work. This demographic distribution highlights a significant portion of users who are either in education or employment, with a smaller segment engaged in more temporary or private work. The data suggests that a significant portion of users have lower to moderate incomes, while a smaller segment reports higher earnings. Additionally, over a quarter of users either have unreported or unspecified incomes, suggesting various financial situations not captured in the specified ranges. Similar findings by Mago and Chitokwindo (2014) indicate that low-income individuals are willing to adopt mobile banking because it is accessible, convenient, affordable, easy to use, and secure.

Mobile payment services are used by 95.3% of the population, demonstrating widespread adoption likely due to convenience. However, this high usage may also result from distrust in traditional banking or limited internet access. In Mauritania, barriers to financial services include high costs, cumbersome documentation requirements, high transportation costs, long distances to access points, and unemployment. While 16.7% of users have basic phones, the vast majority, 83.3%, use smartphones, indicating a predominant preference for advanced mobile technology. This trend suggests greater access to mobile internet and apps. However, many unbanked Mauritanians, particularly in rural areas, remain unfamiliar with electronic and mobile banking. For instance, Onyeka (2017) noted that significant infrastructural deficits and low literacy levels, especially in rural areas, hinder the promotion of financial inclusion through electronic banking in Nigeria.

Mobile payment services are widely used, with 54% of users utilizing them daily, 30.7% weekly, 12% monthly, and only 1.3% never using them. This high frequency of usage underscores the importance and integration of mobile payment services into users' daily and weekly routines. Additionally, 81.3% of users feel that mobile payment services have reduced their need for a traditional bank account, indicating a significant shift away from conventional banking for most people.

Among the challenges faced by users, 46% cite limited network access, 30% mention a lack of trust, 21.3% point to high transaction fees, and the remaining percentage experience other challenges. These findings contrast with Howcroft et al. (2002), who found that lower fees and reduced human error were key factors encouraging consumers to use online banking. Most users find the service

easy to use, although a smaller portion experiences some difficulties, suggesting generally positive usability but indicating room for improvement.

The results indicate improved cost efficiency, user experience, security, and network reach, making mobile payment services an attractive option for users seeking affordable and secure services. Similarly, Siddik et al. (2014) noted that perceived financial cost, perceived risk, and subjective norms are the most influential factors affecting people's intention to adopt mobile banking in Bangladesh. The findings also show that a significant majority of people live in urban areas, with a smaller proportion residing in rural areas, suggesting a higher population density in urban settings. This contrasts with the findings of Andrianiaivo and Kpodar (2011), who identified a positive and significant interaction between mobile phone penetration and financial inclusion. However, Dollar and Kraay (2002) found results similar to ours, noting that financial development does not significantly affect the poor.

IV. CONCLUSION AND RECOMMENDATION

Mobile financial services hold significant promise in the developing world, with the potential to transform entire economies. However, there is still a gap in understanding the contribution of mobile payment services to financial inclusion in Mauritania. Few studies have explored the impact of these services in this context. Using nationally representative survey data, the results reveal that mobile payment services have gained substantial traction, particularly among younger individuals, predominantly students. A notable percentage of users engage with mobile payments daily, indicating high integration into their routine financial activities. This adoption is facilitated by widespread smartphone use and access to traditional banking services, though users are increasingly moving away from relying solely on conventional banks. Despite challenges such as limited network coverage and high transaction fees, many users find mobile payments convenient and user-friendly. The perceived ease of using mobile payments, along with the potential for lower transaction costs, drives further adoption. Additionally, the majority of users reside in urban areas, highlighting a concentration of mobile payment usage in more developed regions. These findings align with Donovan's (2012) research, which evaluates the benefits and potential impact of mobile money, especially in promoting financial inclusion in the developing world. Therefore, the Mauritanian government should enhance the use of electronic methods to promote greater financial inclusion. Mauritanian Islamic banks should invest in educational programs to inform the public about the advantages and functionalities of mobile banking and collaborate with government agencies to align their strategies with broader financial inclusion initiatives, especially in rural areas.

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