©IDOSR PUBLICATIONS ISSN: 2579-0803

International Digital Organization for Scientific Research IDOSRJCAS11100

IDOSR JOURNAL OF COMPUTER AND APPLIED SCIENCES 11(1):6-9, 2026.
https://doi.org/10.59298/JCAS/2026/11169

Developing Android Apps for Mobile Money in Uganda: A Case Study

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ABSTRACT

Mobile money services have transformed financial inclusion in Uganda, particularly for underserved populations, including those in rural and remote areas. This review examines the development and impact of Android applications designed for mobile money in Uganda, highlighting their role in enhancing access to financial services. The proliferation of Android smartphones has facilitated the development of user-friendly applications that enable Ugandans to perform a wide range of financial transactions, such as money transfers, bill payments, and savings. However, challenges such as security concerns, limited digital literacy, and regulatory complexities continue to hinder the full potential of mobile money. Despite these challenges, innovations such as open APIs and digital payment aggregators have contributed to the expansion of mobile money services, further driving financial inclusion. The review also explores the broader impact of mobile money on Uganda's economy and its potential to foster entrepreneurship, empower individuals, and reduce economic inequalities. The development of mobile money applications remains crucial for shaping Uganda's financial landscape and improving overall economic development.
Keywords: Mobile money, financial inclusion, Uganda, Android applications, mobile payments, digital literacy.

INTRODUCTION

Mobile money has emerged as one of the most transformative innovations in financial technology in Uganda and across sub-Saharan Africa. Before the introduction of mobile money services, a significant proportion of the Ugandan population, particularly in rural areas, lacked access to traditional banking services [1]. According to the Bank of Uganda, by 2009, less than 30% of the adult population had access to formal financial institutions, limiting opportunities for savings, credit, and secure money transfers. The launch of mobile money platforms such as MTN Mobile Money, Airtel Money, and Vodafone M-Pesa has addressed this gap, enabling millions of Ugandans to perform financial transactions through their mobile phones [2]. The widespread adoption of these services has not only enhanced financial inclusion but has also facilitated economic activities, empowered small and medium enterprises (SMEs), and supported social transfers in a more efficient manner.

The evolution of mobile money has been closely linked to the proliferation of Android smartphones in Uganda. As affordability and access to smartphones have improved, developers have increasingly focused on creating Android applications that enhance mobile money functionality. These applications provide users with services such as person-to-person transfers, bill payments, merchant payments, airtime top-ups, and savings options, often within a user-friendly interface that accommodates low digital literacy [3]. By leveraging the Android platform, developers can reach a wider audience and integrate additional services such as biometric authentication, USSD integration, and mobile banking analytics, enhancing security and convenience for users.

Despite the rapid growth of mobile money and Android applications, several challenges remain. These include issues of security, such as fraud and phishing attacks; limited interoperability between different mobile money platforms; network connectivity limitations, particularly in rural and semi-urban areas; and the need to adapt applications to meet the diverse needs of users with varying levels of literacy and technological competence [4]. Moreover, the development of mobile money applications is influenced by regulatory frameworks established by the Bank of

Uganda, which seek to protect users, maintain financial stability, and encourage innovation. Balancing user needs, technological capabilities, and regulatory compliance poses ongoing challenges for application developers.

Uganda's mobile money industry began in 2009 with the introduction of MTN Mobile Money, followed shortly by Airtel Money and other platforms. Initially, mobile money services were limited to basic functions, primarily sending and receiving money. Over time, the services expanded to include merchant payments, bill payments, microloans, and savings schemes. The rapid adoption of mobile money has been fueled by several factors: widespread mobile phone penetration, limited access to conventional banking, high remittance flows within families, and the need for secure, convenient financial transactions. By 2020, over 25 million Ugandans were actively using mobile money services, with billions of dollars transacted monthly, highlighting the critical role of mobile money in the national economy [5].

Parallel to this, the Android operating system has become the dominant smartphone platform in Uganda due to its affordability, accessibility, and flexibility. Android smartphones provide a conducive environment for mobile money developers to innovate and design applications that cater to the evolving needs of users. These applications are increasingly incorporating features such as QR code payments, integration with government social protection schemes, savings wallets, and transaction analytics [6]. This synergy between mobile money services and Android applications presents a significant opportunity for enhancing financial inclusion, promoting entrepreneurship, and fostering economic development in Uganda.

Mobile money services have significantly contributed to financial inclusion in Uganda, yet the development of Android applications that fully leverage their potential remains largely unexplored. Existing mobile money applications face a range of challenges that hinder their effectiveness, particularly regarding user interface design, security vulnerabilities, and limited interoperability. These issues are exacerbated by the varying levels of digital literacy among users, which often leads to a poor user experience. Additionally, developers of mobile money applications in Uganda must contend with complex regulatory requirements, which can limit design flexibility and functionality. These challenges can reduce the adoption and overall impact of mobile money services, especially among vulnerable populations who stand to benefit the most. As mobile money continues to play a central role in Uganda's financial landscape, it becomes crucial to examine the development processes of Android applications designed for these services. Such an examination can help identify key innovations, barriers, and user impacts that affect application adoption. Moreover, a deeper understanding of the regulatory environment and its influence on application design is essential. Addressing these gaps through research will not only inform better design practices and technological improvements but also provide valuable insights for policymakers, developers, and users, ultimately enhancing the effectiveness, security, and inclusivity of mobile money applications.

The Mobile Money Landscape in Uganda

Uganda stands out as a leader in mobile money adoption in Africa, with one of the highest penetration rates across the continent. By 2021, mobile money transactions accounted for a staggering 94% of the country's GDP, according to the International Monetary Fund (IMF). This remarkable achievement can be largely attributed to several key factors that have shaped the country's mobile money landscape [7]. First, Uganda's limited access to traditional banking services, particularly in rural and remote areas, has made mobile money a vital alternative for financial inclusion. With a large portion of the population unable to access formal banking infrastructure, mobile money has filled this gap by providing an accessible, cost-effective means of conducting financial transactions. Additionally, the widespread use of mobile phones in Uganda has played a critical role in the adoption of mobile money services. As mobile phones have become more affordable and accessible, people across various demographics have been able to engage in financial activities such as sending money, paying bills, and even accessing loans directly through their phones. Furthermore, the flexibility offered by mobile money, including the ease of transactions, low costs, and ability to operate without the need for a bank account, has greatly contributed to its success, positioning mobile money as a cornerstone of Uganda's financial ecosystem [8].

Android as a Platform for Mobile Money Apps

Android has become the dominant platform for mobile money applications in Uganda due to its open-source nature, affordability, and broad accessibility. The platform's flexibility allows developers to create applications that meet the diverse needs of Ugandan users, making it an ideal choice for mobile money solutions [9]. One of the key features of these apps is the integration with USSD codes, which enables users without smartphones or reliable internet connections to access mobile money services. This inclusion ensures that even those in remote areas can perform financial transactions easily. Additionally, mobile money apps in Uganda support multiple local languages, catering to the country's linguistic diversity and ensuring that users from different regions can navigate the services comfortably. Another important feature is the agent locator, which helps users find nearby mobile money agents, thus improving the reach and accessibility of mobile money services. Given the sensitive nature of financial transactions, these apps also incorporate robust security measures such as encryption, authentication protocols, and fraud detection systems to safeguard user data and funds. With these features, Android-based mobile money

applications provide a reliable, secure, and user-friendly platform for financial inclusion in Uganda, serving as an essential tool for everyday transactions across the country [10].

Challenges in Developing Mobile Money Apps

Developing mobile money apps presents a series of challenges that developers must address to ensure usability, security, and compliance. One of the most critical challenges is security concerns. Users remain highly apprehensive about the safety of their financial data due to incidents of unauthorized access, hacking, and fraud [11]. This concern is amplified by the increasing sophistication of cyber threats, making robust encryption and fraud prevention mechanisms crucial. Another significant hurdle is limited digital literacy. A large portion of the population, particularly in developing countries, lacks the necessary digital skills to navigate complex mobile applications. This highlights the importance of designing intuitive, user-friendly interfaces and implementing extensive user education programs to bridge the knowledge gap. Additionally, network reliability is a major issue in mobile money app development. Intermittent connectivity or poor network coverage can disrupt financial transactions, leading to user frustration and potential financial losses, especially in rural or underserved areas [12]. Finally, regulatory compliance adds another layer of complexity. Mobile money developers must navigate diverse and frequently changing financial regulations and data protection laws. Adhering to these rules is vital to prevent legal issues, but it requires a deep understanding of local and international regulatory landscapes. These challenges, though significant, present opportunities for innovation in mobile money solutions [13].

Innovations and Success Stories

Innovations in the fintech sector in Uganda have led to the development of solutions that address both the challenges and the growing demand for accessible financial services. MTN Uganda, a leading telecommunications company, introduced Mobile Money Open APIs, a groundbreaking move aimed at fostering fintech innovation. These open APIs allow third-party developers to create integrated financial services, expanding the scope and functionality of mobile money platforms beyond traditional banking [14]. This initiative has facilitated the development of various financial tools, enabling businesses and individuals to access a wide array of services, including payments, savings, and loans. Moreover, it has encouraged collaboration between tech developers and financial service providers, creating a more dynamic and inclusive financial ecosystem in Uganda. Another notable innovation is Pebuu, a digital payment aggregator designed to streamline financial transactions across different service providers, including telecoms and utilities [15]. By offering a versatile platform that accommodates multiple types of payments, Pebuu enhances the efficiency and accessibility of mobile money services. This service simplifies the process for users, reducing friction in transactions and providing a unified experience. Collectively, these innovations showcase Uganda's potential to transform its financial sector, offering practical solutions to overcome barriers and improve financial inclusion for both urban and rural populations [16].

Impact on Financial Inclusion

Mobile money applications have played a transformative role in enhancing financial inclusion in Uganda, particularly benefiting underserved populations. In Kampala District, a study revealed that mobile money services have significantly expanded access to formal financial services, especially among low-income earners and individuals engaged in the informal sector. Traditionally, these groups faced considerable barriers to accessing financial services, such as limited physical bank branches, high transaction fees, and a lack of formal identification required for opening bank accounts [17]. However, mobile money platforms have removed many of these obstacles by allowing users to conduct financial transactions via mobile phones, without needing a bank account or physical bank visits. This has enabled individuals in rural and urban areas to engage in savings, transfers, and even micro-insurance services, which were previously out of reach. Additionally, mobile money has fostered greater financial literacy and encouraged entrepreneurial activities, as users can easily receive payments for goods and services, access credit, and manage their finances. The widespread adoption of mobile money has also strengthened Uganda's financial ecosystem, creating a more inclusive and resilient economy. As mobile money services continue to grow, they are expected to further bridge gaps in financial access, promoting economic empowerment and reducing inequalities [18].

CONCLUSION

In conclusion, mobile money applications have revolutionized financial inclusion in Uganda, particularly for underserved populations in both urban and rural areas. Through the widespread adoption of mobile money services, millions of Ugandans, especially those in the informal sector and low-income groups, have gained access to essential financial services that were previously out of reach. The integration of Android-based mobile applications has played a crucial role in this transformation, offering secure, user-friendly, and affordable solutions that cater to the diverse needs of Ugandan users. These applications have significantly facilitated financial transactions, ranging from simple money transfers to bill payments, savings, and even microloans. Despite the remarkable progress, challenges such as security concerns, limited digital literacy, network connectivity issues, and regulatory complexities continue to hinder the full potential of these services. Nonetheless, innovations such as open APIs and digital payment aggregators show promise in addressing these obstacles and further enhancing the efficiency and accessibility of

mobile money. The ongoing development of mobile money applications holds the potential to drive Uganda's economic growth, empower individuals, and reduce inequalities across the country.

REFERENCES

1. Nagaaba, N., Batamuriza, R., Basuta, J., Owomugisha, M.: Conceptualizing digital finance as a precursor for financial inclusion and financial service usage in Uganda. Cogent Business & Management. 12, 2448285 (2025). https://doi.org/10.1080/23311975.2024.2448285
2. Katusiime, L.: Mobile Money Use: The Impact of Macroeconomic Policy and Regulation. Economies. 9, 51 (2021). https://doi.org/10.3390/economies9020051
3. Echegu D. A., Aleke J. U., Alum B. N. Mobile Money Adoption in Uganda. 2024: 9(2) 10-16. IDOSR JOURNAL OF COMPUTER AND APPLIED SCIENCES https://doi.org/10.59298/JCAS/2024/92.1016
4. Mogaji, E., Nguyen, N.P.: The dark side of mobile money: Perspectives from an emerging economy. Technological Forecasting and Social Change. 185, 122045 (2022). https://doi.org/10.1016/j.techfore.2022.122045
5. Hornuf, L., Safari, K., Voshaar, J.: Mobile fintech adoption in Sub-Saharan Africa: A systematic literature review and meta-analysis. Research in International Business and Finance. 73, 102529 (2025). https://doi.org/10.1016/j.ribaf.2024.102529
6. Agbeyangi, A., Suleman, H.: Advances and Challenges in Low-Resource-Environment Software Systems: A Survey. Informatics. 11, 90 (2024). https://doi.org/10.3390/informatics11040090
7. Echegu D. A., Examining Mobile-First Database Solutions for East African Markets in Detail. 2024: 3(3) 23-28. https://rijournals.com/wp-content/uploads/2024/06/RIJEP-3323-28-2024.pdf
8. Hamdan, J.S., Lehmann-Uschner, K., Menkhoff, L.: Mobile Money, Financial Inclusion, and Unmet Opportunities: Evidence from Uganda. The Journal of Development Studies. 58, 671–691 (2022). https://doi.org/10.1080/00220388.2021.1988078
9. The Next Stage of Uganda's Digital Economy will be Powered by Open APIs - UN Capital Development Fund (UNCDF), https://www.uncdf.org/article/5281/the-next-stage-of-ugandas-digital-economy-will-be-powered-by-open-apis
10. Clara Mramba, NNN Nditi (2018). Legal regulation of mobile money transfer service in Tanzania. *The Eastern African Law Review, 42, (2), 90-103.*
11. Riasat, I., Shah, M., Gonul, M.S.: Strengthening Cybersecurity Resilience: An Investigation of Customers' Adoption of Emerging Security Tools in Mobile Banking Apps. Computers. 14, 129 (2025). https://doi.org/10.3390/computers14040129
12. Ali, A., Raza, A.A., Qazi, I.A.: Validated digital literacy measures for populations with low levels of internet experiences. Development Engineering. 8, 100107 (2023). https://doi.org/10.1016/j.deveng.2023.100107
13. Vijayagopal, P., Jain, B., Ayinippully Viswanathan, S.: Regulations and Fintech: A Comparative Study of the Developed and Developing Countries. Journal of Risk and Financial Management. 17, 324 (2024). https://doi.org/10.3390/jrfm17080324
14. Echegu D. A., A thorough examination of Open Data Initiatives in East Africa, focusing on how they improve the accessibility of data. 2024: 3(1) 30-37 https://rijournals.com/wp-content/uploads/2024/06/RIJSES-3130-37-2024.pdf
15. Yang, J., Jung, S.-U.: Harnessing FinTech for Sustainable Finance in Developing Countries: An Integrated SWOT–Multi-Level Perspective Analysis of Mongolia. Sustainability. 16, 4102 (2024). https://doi.org/10.3390/su16104102
16. Baganzi, R., Lau, A.K.W.: Examining Trust and Risk in Mobile Money Acceptance in Uganda. Sustainability. 9, 2233 (2017). https://doi.org/10.3390/su9122233
17. Ebong, J., George, B.: Financial Inclusion through Digital Financial Services (DFS): A Study in Uganda. Journal of Risk and Financial Management. 14, 393 (2021). https://doi.org/10.3390/jrfm14090393
18. Osabutey, E.L.C., Jackson, T.: Mobile money and financial inclusion in Africa: Emerging themes, challenges and policy implications. Technological Forecasting and Social Change. 202, 123339 (2024). https://doi.org/10.1016/j.techfore.2024.123339

CITE AS: Mugisha Emmanuel K. (2026). Developing Android Apps for Mobile Money in Uganda: A Case Study. IDOSR JOURNAL OF COMPUTER AND APPLIED SCIENCES 11(1):6-9. https://doi.org/10.59298/JCAS/2026/11169