

## Mobile Money Adoption in Africa: A Literature-Based Analysis

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### **Abstract**

*The study sought to assess the factors that influence the adoption of mobile money banking and financial services in Africa. Despite the growth in the mobile money industry and its potential for the future, studies suggest that mobile money banking/financial services adoption remains low across sub-Saharan Africa. This research work employed a systematic literature review methodology, specifically, a literature-based analysis for the investigation. The researcher, for the purposes of this study, identified, selected, and critically reviewed only secondary data, which refers to data that has already been collected for some other. Twenty (20) recent articles on mobile money banking/financial services and external/internal factors, modeled by various theories concerning technology/innovation adoption, were gathered from highly recognized and profiled research databases, including Google Scholar, Research Gate, Emerald (database), Elsevier (database), Pro-quest, Scopus, and Springer. From the 20 articles reviewed, analyzed, and discussed, the number of external factors that influence mobile money adoption positively or negatively is twenty (20), while the count of internal factors that influence mobile money adoption positively or negatively is eight (8). In conclusion, the external factors outnumber the internal factors, but the internal factors are more grievous and have a significant impact on the mobile money service. The results of this research work also revealed the top five external factors researchers seem to encounter in their studies. The study provides significant insight into both external and internal factors affecting the adoption of mobile money services in Africa.*

**Keywords:** *Africa, Databases, Mobile Money Banking/Financial services, Systematic.*

### **Introduction**

Technology has, by virtue of the convenience and advantages it provides, become ubiquitous in our lives. Chief amongst the various technological advancements is the telephone and, more recently, the mobile phone. Mobile phone usage and telecommunication networks have permeated the African continent at a rapid pace for over a decade. Recent mobile phone usage statistics show a significant increase in the rate of adoption of mobile phones and other mobile devices across sub-Saharan Africa over the period from 2013 to 2017, especially in countries such as Ghana, South Africa, Nigeria, and Kenya [1]. According to Silver and Johnson [2], in a Pew Research Center report of 2018, approximately 91% of adults in South Africa

possess mobile phones, with 51% of them having smartphones and the remaining 40% having non-smartphones, also known as feature phones. Similarly, 80% of Ghanaians have mobile phones, while Senegal follows closely behind, with 79% of the population reported as owning mobile phones. In Nigeria and Kenya, 80% of persons own a mobile phone, while in Tanzania, 75% of adults also reported owning a mobile phone. Building on the popularity of the phenomenon that is the mobile phone came to the introduction of a second phenomenon, that is mobile money banking services [3]. Commonly referred to as mobile money, mobile money banking or financial services consist of services such as transferring money from person to person, paying bills and salaries, and purchasing

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of goods, all without having to physically visit the traditional banking hall [4]. Historically, the mobile phone as a means of commerce (m-commerce) or financial service may have started as early as 1997 when mobile money-accepting Coca-Cola vending machines and other mobile money banking services were introduced in Finland [5]. Following that, there are documented cases of mobile money used for commercial services, including a Philippine mobile operator's launch of SMART money in 1999, the launch of G-cash by GLOBE Telecom in 2004 [6], and Bharti Airtel introducing a mobile money transfer pilot project in India in 2007 [7].

The growth of the mobile money service, made possible due to the high adoption of the mobile phone, has transformed the financial services of most African countries to include large sections of the society who were previously unbanked or under-banked – terms used to describe sections of a country's population that do not have access to formal banking services whatsoever or have limited access, respectively [8].

It was estimated that about 364 million unbanked and under-banked Africans will have adopted mobile money by 2012, generating over 7.8 billion US dollars in revenues for the mobile phone services industry through transaction fees and other charges [4]. However, research suggests that despite the promising future of mobile money financial services within sub-Saharan Africa, adoption rates of mobile money financial services still appear to be below par across the region [9], with over 60% of the adult population in sub-Saharan Africa still not using mobile money banking/financial services [10].

In sub-Saharan Africa, mobile money has transformed the banking and financial sector by allowing for the inclusion of the poor, unbanked, and underbanked [11]. According to [12], the adoption and usage rates of mobile money services across the region continue to rise in spite of the industry challenges. For instance, according to a global mobile money survey, out

of over 80 million registered customers of mobile money banking/financial services globally, almost 40% of them were active users who completed over 220 million transactions with their mobile phones to the tune of over 4 billion US dollars: a figure which represents twice as many mobile money users than Facebook users in Sub-Saharan Africa [13]. With over half a million registered mobile money agents across the region, the service is on par with the widely known Western Union points of sale system [12]. This is evidence and a clear indication of further growth in the future.

### **Statement of the Problem**

Despite this growth in the mobile money industry and the potential it holds for the future, and studies suggest that the adoption of mobile money banking/financial services remains low across sub-Saharan Africa [14-16]. These authors posit that there could be several factors that hinder the adoption of mobile money services across the region. Some of the factors pointed out in the literature include perceived usefulness, ease of use, societal influence, trust and relative advantage [5, 17-19], facilitating conditions [12], and demographics and socio-economic forces [20]. In order to consolidate the knowledge found across the literature on this issue, this paper aims to highlight the factors that influence the adoption of mobile money banking/financial services by systematically reviewing a collection of articles and papers on the subject.

### **Research Objectives**

The main aim of this study is to contribute to the general body of knowledge and research work with regard to mobile money banking/financial services. Specifically, the study aims to:

1. Determine whether the adoption of mobile money services is influenced by external factors.
2. Outline the internal factors that influence the adoption of mobile money services.

## Materials and Methods

This study employed a systematic literature review methodology, specifically, a literature-based analysis aimed at contributing to the literature by investigating the driving forces behind the adoption of mobile money banking/financial services.

A literature-based analysis refers to the systematic review of a specifically and intentionally collected set of research articles and other academic publications, or literature, to discover new associations between or connect the knowledge that already exists from empirical research [21]. This is done by revealing these associations between knowledge in the literature that are implicated and mostly overlooked. The literature-based analysis does not add new knowledge through empirical studies such as through laboratory experiments but, rather, contributes to existing knowledge in literature. The researcher identified, selected, and critically reviewed research from multiple databases in order to answer the study's formulated questions.

### Data Collection

The researcher, for the purposes of this study, used only secondary data, which refers to data that has already been collected for some other purpose [22].

Secondary data is useful for this study's purpose of revealing the influence of internal and external factors on mobile money banking/financial services. Recent articles on mobile money banking/financial services and external/internal factors, modeled by various theories concerning technology/innovation adoption, were gathered from the following research databases: Google Scholar, ResearchGate, Academia.edu, Emerald (database), Elsevier (database), Pro-quest, Scopus, and Springer.

### Data Analysis Procedure

Twenty (20) research articles on mobile money banking/financial services, such as

Ghana's MTN Mobile Money and Kenya's M-PESA, and external factors that influence the adoption of these services, modeled by various theories concerning technology/innovation adoption, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), were picked by the researcher and analyzed using thematic analysis to draw out persistent themes on the adoption of mobile money banking/financial services and the driving forces that influence consumers' intentions to adopt these services. The thematic analysis allows for the analysis of data sets selected from the literature on a particular topic area – in this case, research articles from the literature that focused on mobile money banking/financial services and external/internal factors that influence the adoption of these services [23]. Relevant and prevalent themes that were related to consumers' intentions to adopt these mobile money banking/financial services and the external/internal factors responsible for these intentions were extracted from excerpts of the selected papers.

These themes were then analyzed to extract findings that support the assertion that mobile money banking/financial services were increasingly being adopted by both banking and unbanked sectors of the African region and its countries and to reveal the various factors such as ease of use and relative advantage that served to influence the adoption of mobile money services in these markets.

## Results

From the 20 articles reviewed, a number of key factors that influence the adoption of mobile money services were observed. The results revealed both external factors and internal factors that influence the adoption of mobile money services. Table 1 below shows some of the external factors that influence mobile money adoption positively or negatively. Table 2 below shows some of the internal factors that influence mobile money adoption positively or negatively.

**Table 1.** External Factors that Influence Mobile Money Adoption

<b>Item No</b>	<b>External Factor</b>	<b>Author/s</b>
1	Lack of know-how on the part of users	Rumanyika (2015)
2	Low numbers of mobile money agents	Rumanyika (2015)
3	Age of users	Odumeru (2013); Asravor, R. K., Boakye, A., & Essuman, J. (2021); Bampoe, H. S., 2015; Senou, M. M., Ouattara, W., & Houensou, D. A. (2019)
4	Educational qualification of users	Odumeru (2013); Asravor, R. K., Boakye, A., & Essuman, J. (2021); Senou, M. M., Ouattara, W., & Houensou, D. A. (2019)
5	Easy access	Ndekwa et al. (2018)
6	Social and peer pressures	Ndekwa et al. (2018); Mugambe (2017); Kazi & Mannan (2013); Odoyo, C. O., Liyala, S., Odongo, B. C., & Abeka, S. (2016)
7	Lack of relevance due to the need to have bank accounts and the costs of using mobile money services offered by banks.	Etim (2014)
8	Relevance or usefulness of mobile money, together with perceived trust and perceived risk in mobile money services	Tobbin & Kuwornu, 2011; Kazi & Mannan (2013); Marumbwa & Mutsikiwa (2013); Oyefolahan, I. O., Ahmed, S. A., & Abubakar, A. (2014); Odoyo, C. O., Liyala, S., Odongo, B. C., & Abeka, S. (2016)
9	Habits of potential users	Mugambe (2017)
10	Facilitating or enabling conditions	Mugambe (2017)
11	Ease of use	Kazi & Mannan (2013); Marumbwa & Mutsikiwa (2013); Oyefolahan, I. O., Ahmed, S. A., & Abubakar, A. (2014)
12	Basic mobile phone skills	Kiconco, R. I., Rooks, G., Solano, G., & Matzat, U. (2018)
13	Marital status, household size, farm size, access to electricity, and the type of occupation.	Asravor, R. K., Boakye, A., & Essuman, J. (2021)
14	Distance between the household and the nearest mobile money agent	Asravor, R. K., Boakye, A., & Essuman, J. (2021)
15	Relative advantage of mobile money services over traditional banking services	Adebiyi, A. A., Alabi, E., Ayo, C., & Adebiyi, M. (2013)
16	Time saving and convenience	Chogo, P. J., & Sedoyeka, E. (2014)
17	Income level	Bampoe, H. S. (2015); Senou, M. M., Ouattara, W., & Houensou, D. A. (2019)

18	Market Share	Ngugi, B., Pelowski, M., & Ogembo, J. G. (2010)
19	Spending habit	Cobla, G. M., & Osei-Assibey, E. (2018)
20	Transaction costs	Micheni et al. (2013)

**Table 2.** Internal Factors that Influence Mobile Money Adoption

Item No	External Factor	Author/s
1	Network coverage	Rumanyika (2015); Chogo, P. J., & Sedoyeka, E. (2014)
2	Security of mobile telephony networks	Rumanyika (2015)
3	Complexity and compatibility of mobile money services	Odumeru (2013)
4	Compatibility and trust and security of these services.	Adebiyi, A. A., Alabi, E., Ayo, C., & Adebiyi, M. (2013)
5	Poor customer support	Chogo, P. J., & Sedoyeka, E. (2014)
6	Telephony/network infrastructure	Senou, M. M., Ouattara, W., & Houensou, D. A. (2019)
7	System failure and slow service at peak times, PIN security to protect transaction details, wrong recipients of transfers and inadequate 'float' money among agents of the mobile money service	Ngugi, B., Pelowski, M., & Ogembo, J. G. (2010)
8	Reliable technology and adequate agent network coverage	Micheni, E. M., Lule, I., & Muketha, G. M. (2013)

## Discussion

The discussion and analysis are done in light of the objectives of the study stated below to address them.

1. To determine whether the adoption of mobile money services is influenced by external factors.
2. To outline the internal factors that influence the adoption of mobile money services.

By internal factors, the author is referring to factors relating to Telco's network and services in general. By external factors, the author is referring to factors outside Telco's network and services.

Analysis and discussions are based on 20 current and relevant articles reviewed as stated in the methodology section (See Table 1 for a summary of the 20 articles in the Results section).

## The General Perspectives across the African Region

[16] outlined in the literature some of the factors such as bad network coverage, lack of know-how on the part of users, low numbers of mobile money agents, breakdown and theft of ATM machines, and poor security of mobile telephony networks are the major obstacles that are slowing the rate of adoption of mobile money banking (or m-banking).

To resolve these factors, Governments and telecom operators should expand network coverage to rural areas. Operators and users of mobile money banking should be educated thoroughly using every means possible to enable them to use mobile money services without struggle. Some of the ways to educate users are through the television network, the radio, seminars, customer service points, posters, and

so on. Also, enough mobile money agents should be positioned at vantage points with enough cash to prevent/reduce the need to travel to physical banks to do business. Then, Telecom operators should adopt security measures such as firewalls to safeguard mobile money operators and users from attacks. Touching on the age and educational qualifications of users as external factors, and using simple counts, Cronbach's alpha, and multiple regression, Odumeru [15] showed through analysis of results that age and educational qualification, as well as relative advantage, complexity, and compatibility of mobile money services influence the adoption of mobile money banking. Odumeru [15], thus, recommends that educational campaigns for users with low educational backgrounds and those above 40 years are increased, and mobile money services be made easier to use, more accessible, and with obvious advantages to making mobile money more popular.

Etim [24] reports the results of a study in Nigeria that sought to determine the adoption of mobile money services in developing countries, specifically West Africa, in view of the successes chalked by telecom operators such as Vodafone with the M-Pesa mobile money service in Kenya and East Africa that has allowed the vast majority of people who would otherwise not have banking services, now enjoy mobile money services using second and third generation mobile phones [24]. Etim [24] looked at the perceived ease of use of mobile devices for mobile money transfers and services. The result of the study indicates that mobile device use, especially for communication with family and friends, was highly adopted compared to the use of mobile devices for mobile money services. Some reasons cited for the low adoption rates were lack of relevance due to the need to have bank accounts and the costs of using mobile money services offered by banks. The author compared the situation to that in Ghana, which seemed to have better policies encouraging a higher rate of adoption of mobile money services. [25] employ cluster analysis and

logistic regression on the country and individual-level data from the World Bank to ascertain the major influences on the adoption of mobile money services that have made it difficult for governments of the countries of the West African Economic and Monetary Union (WAEMU) to narrow the gap between banking and unbanked populations of these countries. On the country level, the study shows that factors such as literacy rate, labour force, mobile telephony/network infrastructure as well as banking infrastructure (number of ATM machines per a million people) are the main driving forces of mobile money adoption in WAEMU countries; while on the individual or microeconomic level, the results show that being young, male, educated, relatively wealthier and banked increases the likelihood of adopting mobile money in WAEMU countries.

Mugambe [19] looks at the rise in the rate of adoption of mobile money services by customers of Micro, Small, and Medium Enterprises (MSMEs) due to the proliferation of mobile telephony handsets and infrastructure as well as low coverage of consumers by banks and other financial outfits. Mugambe [19] makes use of the Unified theory of acceptance and use of technology (UTAUT) [26] to explain the adoption of mobile money services. According to Mugambe [19], the results of the study indicated that influence from society (such as peers and colleagues), habits of potential users, and facilitating or enabling conditions are the major factors that influence the adoption of mobile money services by MSMEs' customers.

Using a survey design built on the Technology Acceptance Model (TAM), comprising the constructs: of perceived ease of use, perceived usefulness as well as social influence and perceived risk, Kazi and Mannan [18] sought to ascertain with empirical the factors that influenced the adoption of mobile money services among under-banked and unbanked persons in the Saharan region. The study results revealed that perceived ease of use, perceived usefulness, and social influence were

the factors with a positive influence on consumers' intentions to adopt mobile money services, with social influence having the most significant impact on swaying the adoption rates of mobile money banking services. Kazi and Mannan [18] recommended that stakeholders to ensure mobile money banking services are relatively easy to use and relevant to users while leveraging the influence of family and friends on potential adopters of their services.

### **The Tanzania Perspective**

Chogo and Sedoyeka [27] investigated the determining factors that are responsible for the low rates of adoption of mobile money services in Tanzania. According to the authors, consumers need mobile money services due to their time-saving and convenience in usage. It is, therefore, crucial that the barriers to the adoption of these services are known by stakeholders. The authors report that poor agent network by the mobile money service provider is the most significant barrier to the adoption of mobile money services. This is followed by poor customer support, lack of awareness on the part of consumers, and poor usability of mobile money systems. Chogo and Sedoyeka [27] consequently recommend a more widely distributed agent network, improved customer support, and more advertisements and awareness campaigns.

Through a quantitative survey designed to investigate factors that influence the adoption of mobile money banking services by university students in Tanzania, exploratory factor analysis was used to determine if students' attitudes, social pressure, and facilitating conditions have a significant influence on the students' intentions to use mobile money banking services. [28] report that students' attitudes, social pressure, and facilitating conditions do influence students' intentions to adopt mobile money. The following observations are made:

1. Concerning students' attitudes, easy access to mobile money services and convenience

or ease of use were responsible for pushing students' attitudes.

2. With regard to social pressures, peers and colleagues had the most influence on students' adoption of mobile money services.
3. Finally, in terms of facilitating conditions, lower costs of mobile devices were more positively related to students' intentions to adopt mobile money.

### **The Ghana Perspective**

In Ghana, according to [14], the adoption of mobile money transfer services is not as widespread as the acceptance and use of mobile device handsets. The authors, on a framework of key constructs from the Technology Acceptance Model (TAM) and Diffusion of Innovation (DoI) theory, used Structural Equation Modeling (SEM) to analyze data collected in order to ascertain the key factors that influence the adoption and use of mobile money transfer services.

The results indicated that the adoption of mobile money transfer services was low among Ghanaians. However, ease of use and relevance or usefulness, together with perceived trust and perceived risk in mobile money services and the ability to run trials of the services, were shown to have a significant impact on the intention to adopt mobile money transfer services by consumers [14].

A cross-administration case synthesis and hierarchical regression analyses revealed that perceived usefulness, perceived trust, social influence, and competitive intensity are the major factors that significantly influence the Ghanaian consumer's adoption of mobile money banking services. Furthermore, age and income level were also revealed to have a positive relationship with the intention to adopt mobile money [5].

[29], also in a bid to look at how technology changes people's behaviours through the simplicity and convenience it affords, by administering a questionnaire to a randomly

selected sample of 506 students from the University of Ghana on how the use of mobile money banking services affects their spending behaviours.

The survey results indicate that adopters of mobile money banking services spend more than those students who are non-adopters of these services, with the authors recommending that students be cautious in how they use mobile money banking and other technologies so as to minimize negative behaviours (such as indiscriminate spending) caused by using the technology and maximize the positive behaviours (such as increases in productivity).

Asravor, Boakye, and Essuman [20] aimed to fill the research gap regarding the factors that influence the adoption of mobile money services among small-scale farmers in Ghana by investigating the determinants of the decision to own a mobile phone, register with a mobile money service and actually use the mobile money service using a 3-stage or triple hurdle model. The first and second hurdles were analyzed with the logit regression model, while the third hurdle was analyzed using the quasi-Poisson regression model. Asravor, Boakye, and Essuman [20] concluded that the decision to own a mobile phone, to register with a mobile money service, and to use the service were all influenced by age, educational status, marital status, household size, farm size, access to electricity, and the type of occupation engaged in by the head of household, as well as the distance between the household and the nearest mobile money agent. According to the authors, these findings implied that focus should be put on providing access to electricity and occupation in the formal sector or farming and trading in rural areas.

### **The Zimbabwe Perspective**

Despite the introduction of mobile money transfer services (MMTs) in Zimbabwe due to technological advancements, there is concern over the actual adoption rates of these services by ordinary person. [17], basing their framework

on the Technology Acceptance Model (TAM) and the Diffusion of Innovation Theory (DIT), investigate what factors influence the adoption of these mobile money transfer services in Zimbabwe. After analysis of the results obtained, Marumbwa and Mutsikiwa [17] came to the conclusion that consumers' perceived usefulness of the MMT services, their perceived ease of use, the perceived trust in how secure the systems are, and the perceived relative advantage of MMTs over traditional banking services are the major factors that determine or influence consumers' adoption of mobile money transfer services.

### **The Uganda Perspective**

In this survey conducted in Uganda, [9] hypothesize that mobile money banking services are influenced by cognitive skills, namely, mobile computing literacy (mobile phone skills) and English literacy skills. Mobile phone skills were measured using the Actual Digital Skills questionnaire developed by the European Computer Driving License (ECDL) in their 2009 report on digital literacy [30], and English literacy skills were measured using a 4-point Likert scale. These are put through models of logistic regression analysis to compare them to the adoption and actual use of mobile money services. The results corroborated the authors' hypothesis that basic mobile phone skills increased the chances of adoption of mobile money banking services but showed that this was not the case for the actual use of these services since basic mobile phone skills were enough after adoption for consumers to learn to use various mobile money banking services. On the other hand, English literacy skills were shown not to have any significant impact on the adoption of mobile money services.

### **The Somaliland Perspective**

Oyefolahan, Ahmed, and Abubakar [31] investigate the factors that drive consumers' adoption of mobile money transfer services in Somaliland by testing the following constructs



of the Technology Acceptance Model: perceived ease of use, perceived usefulness, and perceived trust (all moderated by gender) against the intent to adopt mobile money transfer services. The results of the study showed that perceived ease of use and usefulness were major considerations that consumers go through to ascertain that new technology is user-friendly and will be convenient before adopting to use said technology.

Similarly, perceived trust was also seen as a factor that is considered by consumers to convince themselves that the service in question is secure enough before adopting its use. However, according to the authors, gender did not play a significant role in the adoption of mobile money transfer services among consumers in Somaliland.

### **The Kenya Perspective**

According to [32], mobile money banking services, though intended to narrow the gap between the mostly poor unbanked and the banking sector, is still highly skewed against the unbanked due to numerous challenges that slowed the rate of adoption of these mobile money banking services in Kenya. Using a qualitative research design, comprising semi-structured interviews, observations and focus group discussions, the study revealed some factors that were responsible for hindering the adoption of mobile money services. According to the results, the lack of national identification cards was the most significant factor that prevented unbanked consumers in rural areas from registering and using mobile money services. Few mobile money agents, inadequate cash (paper and electronic) on the part of agents, lack of awareness as well as a language barrier were the other factors influencing mobile money service adoption.

[3], through a critical review of existing literature and secondary data and a survey of mobile phone users in urban places, deliberate on the major factors that influenced the early

adoption of mobile money banking services (using M-PESA as a case study) in Kenya.

The review of the literature and secondary data revealed that the homogeneity and ubiquity of mobile phones and mobile networks due to the large market share of Safaricom in Kenya was a major factor in the early adoption of mobile money services. This was in addition to the use of early adopters to connect to the poor and unbanked in communities and a sense of community ownership of the technology due to M-PESA being a homegrown solution.

Furthermore, the survey administered to consumers revealed that system failure and slow service at peak times, PIN security to protect transaction details, wrong recipients of transfers, and inadequate 'float' money among agents of the mobile money service were crucial indicators of the intention to adopt mobile money banking services in Kenya.

[12] select transaction cost and facilitating conditions and investigate their impact on the adoption of mobile money banking services in Kenya, one of the leading countries in mobile money banking/financial ecosystems since the introduction of mobile money in 2007 [12], using a survey whose data was analyzed with Confirmatory Factor Analysis and Structural Equation Modeling. The results showed that, while transaction costs do not influence the adoption of mobile money banking services, facilitating conditions such as reliable technology and adequate agent network coverage do influence consumers' adoption of mobile money banking services.

### **The Nigeria Perspective**

[33] sought to find out what influence's Nigerian consumers' adoption of mobile money payment services by adapting the Technology Acquisition Model in a survey design study. The results indicated that the relative advantage of mobile money services over traditional banking services was revealed as the most significant factor that influences the adoption of mobile money services. This was followed by the

compatibility and trust, and security of these services.

## Conclusions

From the 20 articles reviewed, analysed, and discussed, the number of external factors that influence mobile money adoption positively or negatively is twenty (20), and the number of internal factors that influence mobile money adoption positively or negatively are eight (8).

The external factors outnumber the internal factors, but the internal factors are grievous; they have a significant impact on the mobile money service as a whole. In fact, the author is of the view that when the internal factors are fixed, there is a high possibility of the external factors reducing considerably.

This is because the availability of service is key for people to patronize the service. Most of the external factors are user related, which can be tackled using education and sensitization. From table 1, the top five external factors researchers seem to encounter are:

1. Relevance or usefulness of mobile money, together with perceived trust and perceived risk in mobile money services
2. Age of users
3. Educational qualification of users
4. Social and peer pressures
5. Ease of use

## Conflict of Interest

I, Joyce Koi-Akrofi, the researcher, hereby declare that there is no conflict-of-interest issue related to this research work.

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