Factors Influencing the Usage of Mobile Money Services in Rural Tanzania- A Case of Magu District

BY

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Abstract:
This study aimed to examine the factors influencing the usage of mobile money services in rural Tanzania, with Magu district used as the case study. The study employed a quantitative research design with a 363 sample size from the target unit of analysis of mobile phone users in Magu district. The respondents were selected randomly from different trade centers in Magu, and given questionnaires to fill out. The data was analyzed with the help of IBM SPSS version 26 software, and results were presented in descriptive and inferential statistics. The study found that perceived usefulness positively influences the usage of mobile money services in the rural community. Also,, the perceived ease of use and perceived risks positively influenced the attitude towards using mobile money services, which led to the actual use of the services. Transaction cost was found to be the hindering factor as it was observed to have a negative influence on the attitude of the rural community towards the usage of mobile money services. The study recommends that policy makers and service providers re-assess existing policies and marketing strategies to make mobile money services affordable, secure, user-friendly, and localized.

Keywords: *Mobile money services, Perceived Usefulness, Perceived ease of use, Perceived Risk and Transaction cost.*

Background of the study

The introduction of mobile money has changed the financial inclusion landscape in developing countries, providing access to crucial financial services for the poor and helpless who comprise a large population segment. For example, in Africa, a region where financial exclusion is a serious barrier to development, mobile money technology has 58 times the reach of bank branches (Ahmad et al. 2020). This is because unlike straight banking and financial services, mobile network operators have networks that reach further and deeper into rural areas that are historically marginalized. It is, therefore, not surprising that the scale of mobile money in Africa continues to grow, with more than 481 million registered mobile money accounts in 2019 (Andersson-Manjang et al. 2020).

Like other African countries, mobile money since 2009, when it was first introduced in Tanzania, has become the key provider for the fast increase of financial inclusion among Tanzania citizens (Di Castri & Gidvan, 2014). Mobile money technology allows people with different livelihoods and deeds to send, receive, and pay different bills using mobile phones. The major companies in Tanzania which provide mobile money services are Vodacom Tanzania PLC through M-Pesa with 36 percent market share, Tigo through Tigo-Pesa (31 percent market share), Airtel through Airtel-Money (21 percent), Halotel through Halo-pesa (9 percent) and TTCL through T-Pesa (3 percent) (TCRA, 2023). The overall number of mobile money accounts was 44.4 million in April 2023, with 4.2 billion transactions in the same month, indicating its great usage among Tanzanians (URT, 2023). Furthermore, different studies show that mobile money is the most chosen method many Tanzanians use to send and receive money (Di Castri & Gidvan, 2014).

Mobile money technology has become a practical stage for financial services to be stretched to large population segments at a reasonably lower cost than traditional branch banking. This is because traditional branch banking requires large investments in infrastructure and personnel (Nandhi, 2012). The initiation of mobile money technology is described by the continued advancements in mobile phone technology that has resulted in easy access to financial services even by people in rural areas. The mobile network's notable progression has made an exclusive opportunity to provide financial and social services through a mobile network (Kabir, 2013).

Although many studies argue that the internet and other technology-based transactions are not safe, not useful, and would lead to fraud, many people think it is safer, flexible in time, and can be done anywhere and anytime (Chowdhury and Ahmmad 2011).

Studies show that when mobile money technology is used and applied as a payment channel, it helps to increase financial inclusion among the unbanked population and creates opportunities for financial organizations to provide a wide range of services, mostly to people living in rural areas (Diniz et al., 2011). Mobile money is very useful in the provision of financial services to the under-served population (GSMA, 2022). Mobile money has made alternative financial services accessible, allowing people the freedom and agency to achieve well-being goals.

Through the Minister of Information, Communication, and ICT, the Tanzanian government demonstrates the authority's active commitment to the growth of mobile money services by highlighting the accessibility of mobile networks all over the country. For example, the government of Tanzania has a joint fund with mobile network operators (Vodacom, Tigo, and Airtel) to facilitate the installation of new telecommunications towers in rural areas where commercial companies can't afford to invest due to poor business conditions. The fund is the Universal Communications Service Access Fund (UCSAF). This government strategy has resulted in a positive outcome where 98 percent of Tanzanians live in areas where a 2G network is accessible, enabling them to have access to normal calls and texts as well as the USSD mobile money access system. Sixty percent of all Tanzanians are connected through 3G network coverage, while 45 percent are connected through 4G network coverage (TCRA, 2023). Mobile network service providers have also invested a lot in building modern infrastructures (recently introduced 5G technology in Tanzania) and promoting their services so that every mobile phone owner is aware of the existing services. Some MNOs, such as Tigo and Vodacom Tanzania, have developed mobile applications whereby all smartphone users can install and access the mobile money account from any side of the world. All such efforts are done to give all mobile phone users access to mobile money services.

The mobile network's high penetration (98 percent), investment, and promotions are done by MNO towards mobile money, and the mobile money usage growth rate in Tanzania brings interest for the researcher to choose mobile money as the study area. As per Tanzania Communications Regulatory Authority [TCRA] (2023) report, mobile money accounts increased from 35 million in April 2022 to 44.4 million in April 2023. The report also revealed that mobile money accounts are increasing at an average of 13 percent growth rate per year from 2020 to 2023.

The usage of mobile money services in Tanzania's rural community

There is no common definition of the rural community around the globe. Each country has its indicators to use in defining it. In Tanzania, indicators such as politico-administrative, population density, and economic activities define the rural or urban community (Wineman et al., 2020). In general, a rural area or a country side is a geographic area located outside towns and cities. Typical rural areas have a low population density and small settlements. Agricultural areas and areas with forestry typically are described as rural (Wineman et al., 2020).

Considering the infrastructural developments described in the forgoing text, it is evident that we are in times of mobile technology ubiquity. The concern to scholars and researchers is, therefore, no longer the adoption of technology, but rather the adoption and usage for what as a means or realizing the economic advantage of technology in the country community. Among the many applications for which technology has been adopted is facilitating monetary transactions for different purposes worldwide. In broad terms, monetary transactions can be categorized as business-oriented, such as payments for purchases and other remittances, and non-business or social transactions involving transfers to relatives, friends, contributions, and others.

Koomson et al. (2022) conducted a study in East Africa to examine the relationship between mobile money usage and engagement in entrepreneurship. The study found that mobile money users living in rural areas greatly desire to engage in entrepreneurial activities.

However, the studies so far conducted do not provide enough information on the factors pro or against mobile money technology use for business among rural communities where both formal and informal ICT education is rare. The study conducted by Koloseni & Mandari (2017) suggests that attitude, behavioural control, and trust positively influence the intention to use mobile money services. Another study conducted by Mswahili (2022) in Tanzania found that perceived ease of use, price, network accessibility, security and trust, service quality, and task characteristics greatly influence the usage of mobile money services. Kelly and Palaniappan (2022) conducted a similar study in Ghana and found that perceived risk, perceived cost, social influence, perceived usefulness, and perceived ease of use in the lenses of the Technology acceptance model (TAM) have a great influence on the usage of mobile money services.

Statement of the research problem

It is now a common phenomenon in other places of the world which are highly urbanized that mobile money payments prevail. That is not the same for rural intensive places. Studies show that the majority of mobile money transactions are from urban to rural where people in town send money to their rural relatives (Engelmann et al., 2018; Pazarbasioglu et al., 2020; Sakyi-Nyarko et al., 2021; Lavelle-Hill et al., 2022). In that context, there is no evidence showing the promoting factors for adopting the technology in business, such as mobile payment, that the policymakers and developers can capitalize on to push for the technology usage and discourage hoarding cash in Tanzanian rural communities.

This study intends to investigate the influence of factors such as perceived usefulness and ease of use as provided by the Technology Acceptance Model (TAM), and the perceived risks and transaction costs as the operational factors in adopting mobile money technology for business in rural communities.

Research objectives

i) To determine the influence of the perceived usefulness of mobile money services as the factor for usage.

ii) To determine the influence of perceived ease of use of mobile money services as the factor for usage.

iii) To ascertain the influence of perceived risks of using mobile money services as the factor for usage.

iv) To determine the influence of transaction costs incurred by mobile money service users as the factor for usage.

LITERATURE REVIEW

Theoretical framework

Different theories have been developed to explain how Information Technology [IT] systems (like any other technological innovation) can be adopted in society and gain mass usage. Some of the developed theories include the Unified Technology Acceptance User Theory (UTAUT) by Venkatesh et al. (2003), Davis' (1989) Technology Acceptance Model (TAM), and Roger's (1995) Diffusion of Innovation (DoI) or Innovation Diffusion Theory (IDT). The paragraphs below explain the attributes of the two famous and mostly used theories.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), is the modification of the Theory of Reasoned Action proposed by different scholars to be used specifically for modeling user acceptance of information technology systems. This adaptation concisely explains the general determinants of computer systems acceptance, explaining user behaviour across a wide range of end-user computing technologies and user populations (Kukafka et al., 2003).

The technology Acceptance Model is a framework determining the organisation's preparedness to adopt a new technological application (Venkatesh & Davis, 2000). TAM is presented in four stages: beliefs, attitude, intention, and use. At a belief stage, two primary variables are perceived usefulness and perceived ease of use. Attitude is driven by beliefs, which influence the intention to use a service and finally provide results for the actual use of the technology (Burton-Jones, & Hubona, 2005, p.61). Figure 1 shows the framework with its fundamental constructs as described by Davis (1989).

Similarly, TAM is an information systems theory that explains how users accept and use technology. The model suggests that when users are presented with a new technology, several factors influence their decision about how and when

they will use it. The important components of TAM are the perceived ease of use and perceived usefulness, affecting behavioural intentions to use.

Figure 1: Technological Acceptance Model
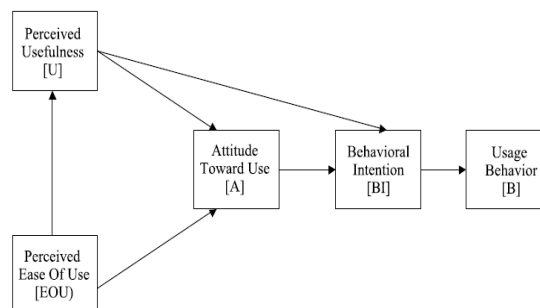
Source: Kukafka et al., (2003).

The customer's intention to use largely depends on the perceived usefulness of the new technology. One study found that expectations of accuracy, security, network speed, user-friendliness, user involvement, and convenience were the most important quality attributes underlying perceived usefulness (Banu et al., 2019).

Astaria et al. (2022) expanded the TAM theory by adding perceived risk attribute to be one of the factors influencing the adoption and usage of mobile money technology, which is relevant to this research objective number three. This is because online transactions are uncertain (Ahorsu et al., 2020).

Also, the study conducted by Lema (2017) on mobile money usage among the unbanked rural population extended the original TAM by adding perceived risk and transaction costs as part of the factors influencing the usage of mobile money services. The finding revealed that perceived risk and transaction cost negatively influenced the usage of the mobile money service technology.

Unified Technology Acceptance User Theory

The Unified Technology Acceptance User Theory (UTAUT), developed by Venkatesh et al. (2003) through reviews and consolidation of eight IT adaptation theories. Theories such as Technology Acceptance Model, Motivational Model, Theory of Planned Behaviour, Theory of Reasoned Action, Model of PC Utilisation, Innovation Diffusion Theory, and Social Cognitive Theory was the eight building blocks of UTAUT. The goal of the UTAUT is to explain user intentions to use an information system and subsequent usage behaviour. According to the theory, four key constructs exist performance expectancy (the extent to which an individual believes that using a system will help them achieve better results on the task), effort expectancy (the extent to which an individual perceives the ease of using the system); social influence (the extent to which an individual perceives that important others believe they should use the new system); and

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facilitating conditions (the extent to which an individual believes that an organizational and technical infrastructure exist to support the use of the system as direct determinants of usage intention and behaviour) (Venkatesh et al., 2003). The impact of the four key constructs is mediated by gender, age, experience, and voluntariness of use (Venkatesh et al., 2003). Modification and revision are required to use UTAUT in certain IT applications, such as mobile money because the theory is not 100 percent perfect (Venkatesh et al., 2003). For example,, the UTAUT doesn't explain anything on perceived risk and transaction cost as the factor that may influence a mobile phone user to adopt and use mobile money services, making it inappropriate to use in this study.

The selected theory for this study
The presented theories (TRA, TPB, TAM, DoI, and UTAUT) serve as a foundation for a more in-depth understanding of the technology acceptance and usage as the subject matter. The literature review suggests that technology use varies depending on the group of people and the society in which they live. According to the theories, technology is more likely to be adopted if it benefits the individual or organization. Furthermore, the theories demonstrate that different people adopt technology at varying levels. Different scholars have proposed these theories in the context of study or situations of the time.

This study fits into the guidance of TAM theory as it captures the first two variables: perceived usefulness and perceived ease of use. These two variables (perceived usefulness and perceived ease of use) are equivalent to performance expectancy and effort expectancy, respectively, in UTAUT, but both UTAUT and TAM have no explanations on current security and cost issues. As an extension of TAM theory, this study added transaction cost and perceived risk, which are the key issues mobile money users in Tanzania appear to be concerned with (Koloseni & Mandari, 2017; Mswahili, 2022; Jariyapan et al., 2022).

Empirical literature review
Studies have been conducted around the globe regarding the factors influencing mobile phone users to use mobile money services. Others came up with reasons why people don't like to use mobile money, and others came up with factors that influenced customers to start and continue using mobile money systems.

There are several factors that, in one way or another, do influence mobile phone users also to adopt and use mobile money services. These include but are not limited to perceived ease of use, perceived usefulness, perceived risks, perceived cost, trust, attitudes, social influence, facilitating conditions, personal desires, and feasibility of the services (Rogers, 1995; Davis, 1989; Kukafka et al., 2003; Venkatesh & Davis, 2000; Venkatesh et al., 2003; Astaria et al., 2022; Chitungo & Munongo, 2013).

In the lenses of TAM, factors that influence the uptake of mobile money technology, specifically in the scope of this study (the rural communities), were categorically outlined as; how easy or difficult it is to use the technology for desired ends (perceived ease of use) and what benefits does that technology bring to the users (perceived usefulness). Additional factors used in this study are estimates of possible losses that a user may suffer while using the technology (perceived risks) and sacrifices or charges that user needs to pay to accomplish the mobile money transaction (Transaction cost). The factors are further described in preceding paragraphs with guidance of the applied theory underpinning this study.

Perceived usefulness (PU) of mobile money services
One of the reasons that may influence the usage of mobile money technology is the clear communication of its benefits to the potential users. According to Rogers' (1995) diffusion theory, users are willing to accept innovations if they provide a distinct advantage over existing solutions. The construct of perceived usefulness in TAM theory reflects this.

Davis (1989) defines perceived usefulness (PU) as the degree to which a person believes using a mobile money system will improve their job performance. Several existing studies have examined the impact of perceived usefulness on the intention to use mobile money services.

To understand the variables influencing the intention to continue using the mobile money application in Indonesia, Sasongko et al. (2021) carried out the research using a quantitative methodology with a sample size of 426 people. The outcome demonstrated that perceived usefulness significantly impacts users' intentions to continue using electronic money services.

Tun (2020) conducted a similar study in Thailand to analyze the factors affecting users' intentions to use mobile money from Myanmar's financial service providers. The study used 234 respondents with a quantitative research design, and the results revealed that trust and perceived usefulness greatly influence behaviour intentions to use mobile money technology.

Ly et al. (2022) provided evidence from Vietnam on factors that affect mobile money's continuous use during the Covid-19 pandemic, where a quantitative research design was adopted with a 181 sample size. According to their study, adopters' behavioural intentions to use mobile money technology rely on perceived usefulness, social influence, enabling circumstances, hedonic motivation, habit, trust, and price-saving orientation.

Zambian researchers Njere and Phiri (2021) examined the variables influencing the use of mobile money technology and their effects on financial inclusion. Zambia's capital, the metropolis of Lusaka served as their case study. The study used 240 individuals as its sample size under a quantitative research design. The results showed that perceived usefulness, cost, network quality, and usability all impact whether mobile money technology is used.

This study used two indicators of perceived usefulness of mobile money services: transactions can be done more quickly and Convenience (localization and time), as indicators to measure the influence of perceived usefulness on the usage

of mobile money technology. This leads to the first hypothesis.

H1: Perceived usefulness (PU) positively influences the usage of mobile money services.

Perceived ease of use (PEoU) of mobile money service
Even though a person may think the system is helpful, Davis (1989) claims that a person may find it challenging to use. Because mobile devices have some technical restrictions, ease of use is seen as a crucial factor in adopting mobile money applications. The degree to which a person thinks utilizing the system would be effortless on both a mental and physical level is known as perceived ease of use (PEoU) (Mun et al., 2017). For instance, a person may find utilizing mobile money systems to be complicated and time-consuming due to the limitations of the features of mobile devices, such as their small display screens or the challenges associated with entering information using mobile devices. As a result, mobile money technology needs to be simple to use or implement (Mun et al., 2017). This encouraged this study to research the link between perceived ease of use and consumer interest in mobile money services. It is crucial to understand that the features of the actual system are not stressed in this construct; rather, the notion of ease of use is.

Using a Technology Acceptable Model and Diffusion Theory, Kelly and Palaniappan (2022) conducted a study in Ghana to determine the factors affecting the adoption of mobile money transaction services. With a sample size of 2,298 participants, the study used a quantitative research design. The research discovered that users' final decisions to use mobile money services were influenced by their perceptions of perceived risk, perceived cost, social influence, perceived usefulness, and perceived ease of use, which resulted in the exponential development of these services in Ghana.

Another study was conducted in Indonesia by Kurniawan et al (2021) regarding the influence of social influence, perceived usefulness, and ease of use, mediated by trust, on intention to use mobile money services. The study used a quantitative research design with a 104 sample size. The findings show that perceived utility, perceived ease of use, social impact, and trust directly influence whether users intend to utilize the mobile money application.

Mswahili (2022) conducted a study in three regions of Tanzania (Arusha, Tanga, and Dar es Salaam) to examine what influences people's willingness to use and embrace mobile money interoperability services. About 447 mobile money users from those regions participated in the survey, which employed a quantitative research design. Regression analysis revealed that perceived ease of use, price, network accessibility, security and trust, service quality, and task characteristics firmly and effectively explained 81.5 percent of the interoperability of mobile money services.

This study adopted two indicators (Ease of operation and Flexible in operation) to measure the influence of perceived ease of use on the usage of mobile money technology which led the study to a second hypothesis.

H2: Perceived ease of use has a positive influence on the attitude towards the usage of mobile money services.

Perceived risks (PR) associated with the usage of mobile money services

Perceived risks,, according to Pavlou (2001), are defined as a subjective estimate of a consumer's loss in receiving the desired outcomes. If the risk is increased from just information to the decision to perform the transaction, then the risk is associated with trust. Fahmi & Wiratama (2018) define three indicators associated with mobile money transaction risks: risk of use, security, and meeting the needs of potential benefit.

The study conducted by Jariyapan et al. (2022) stressed the need to consider both perceived risk and perceived trust as a major concern that the risk of financial loss affects whether or not mobile money systems are accepted. Concerns about security and privacy were important determinants of perceived risk.

As per Jariyapan et al. (2022), elements such as viability, security risk, user error risk, risk of privacy loss, counter-party fraud risk, and danger of illegal affiliation can be used to test the influence of perceived risks on the usage of mobile money services.

Several studies incorporated perceived risks as one factors influencing mobile money technology usage. To mention a few, Shaikh et al. (2018) concluded their study with a statement that perceived risk has a weak influence on behavioural intention to use mobile money services, but it has a significant benefit on the pre-adoption process. It has influenced other elements that would eventually directly affect a person's intention to adopt or use the mobile money service.

Another study conducted by Farah et al. (2018) revealed that Pakistan's mobile money service users are not influenced by perceived risk. Also, Moon and Hwang (2018), in their study about crowdfunding as a means of fundraising, found that perceived risk had no negative effect on the usage of mobile money services.

The study conducted by Mendoza-Tello et al. (2018) on drivers enhancing trust and intention to use cryptocurrencies for mobile money payments revealed that perceived risk has no importance in illuminating the intention to adopt and use mobile money technology to make electronic payments. As per Widyanto et al. 2021, the perceived risk and behavioural intention to use mobile money services were not shown to have a strong and direct relationship.

This study used two indicators (security or privacy risk and financial risk) to test the influence of the perceived risks on the usage of mobile money services by rural communities

Transaction cost (TC) associated with mobile money transactions

Mobile money services are helpful, but they also come with fees that the sender and recipient of the service must pay. The fees associated with mobile money vary depending on the

service supplier. In Tanzania, the sender and recipient are charged for the same services, which is how the service providers describe the transaction cost associated with mobile money technology (Kelly & Palaniappan, 2022).

In the 2021/2022 financial year, the United Republic of Tanzania's government revised the National Payment System Act, Cap. 437 and introduced the mobile money transaction levy (URT, 2022). This levy was meant to be a new source of revenue for the government to provide quality services in the education sector, rural road infrastructures, healthy sector, and water supplies to its citizens (URT, 2022). Contrary to the government's expectation, mobile money transactions dropped dramatically while the traditional banking system saw increased transactions. This led to the government establishing the same levy in banking transactions to balance the costs in all financial transactions. In response to the citizen's complaints about the newly introduced levies, the government removed the transaction levies on the transfer of money from a bank account to a mobile money account, the transfer of money from one bank account to another account of the same or different banks and withdrawal of at most Tanzanian Shillings 30,000 from bank agents or ATM. But also, the government reduced the transaction levy by 10 percent to 50 percent depending on the amount being withdrawn or transferred (URT, 2022). In the 2023/2024 financial year budget, the government of Tanzania removed all levies associated with mobile money transfers of funds (URT, 2023). The only part of mobile money service transactions still has government levy charges is the withdrawal side. Still, mobile money service users pay the government levy in additional to normal costs charged by Mobile network operators when they withdraw their money from mobile money agents. Several studies conducted to analyze the effect of government levies or taxes on mobile money transactions reveals both negative and positive impact on the consumers of the services.

A review paper by Mpofu (2022) claims that the introduction of taxes on mobile money transactions provides negative impacts such as reduced financial inclusion, difficulties with affordability, a decline in the use of mobile payment platforms, and a rise in poverty and inequality.

Researchers claim that in addition to the benefit that customers are expected to receive from mobile money services, the anticipated transaction cost associated with those services could guarantee a hesitancy to use them (Kelly & Palaniappan, 2022; Akinyemi &Mushunje, 2020; Obiero, 2016).

According to the study conducted by Kelly & Palaniappan (2022) on factors influencing the usage of mobile money services in Ghana, transaction cost was found to have a significant negative influence towards the use of mobile money services.

The study conducted by Akinyemi & Mushunje (2020) on determinants of African rural regions' adoption of mobile money technology found that mobile money is more cost-effective than other means of payment. However, Obiero

(2016) found that people in rural areas might have to pay mobile network operators a little bit more (transaction cost to amount withdrawn ratio) because, their transactions are not in large volumes of money. This contradicts Akinyemi & Mushunje (2020), whose findings revealed that mobile money technology saves cost.

The study conducted by Njere & Phiri (2021) revealed that perceived cost of financial services negatively impacts adoption and usage of mobile money services.

This study used three indicators, namely transfer charges, withdrawal charges, and government levies, to measure the influence of transaction cost on the usage of mobile money services. The review above led this study into the development of the fourth hypothesis.

H4: Transaction cost has a negative influence on the attitude toward the usage of mobile money services.

Attitude of users towards mobile money services usage

According to Kelly & Palaniappan (2022), the concepts of acquiring and adopting technology differ; the latter is somewhat influenced by the user's attitude toward technology, while the former depends on the user's beliefs. Therefore, these two views may alter throughout time and for specific reasons while considering the person's interests. One of the most critical elements in the exogenous construct in TAM has been demonstrated to be consumers' attitudes around their acceptance of technology. The actual use of a service or piece of technology depends on the user's views toward it. Other outside factors can affect a user's attitude toward embracing new technologies. Users' views have been favourably impacted by their opinions of the usefulness of technology for their businesses and how simple it is to use (perceived ease of use). Perceived risks and transaction costs also play a great role in influencing the user's attitude toward the usage of mobile money services. When a user has a positive attitude about a certain service, there is a great possibility that they will use it if it is affordable to them. For this case, the fifth hypothesis was developed, which states that;

H5: Attitude about mobile money services influences their usage.

2.3. Conceptual framework

This study tested the stipulated hypotheses that the perceived usefulness of the mobile money system can positively influence a customer's use. The study tested the influence of perceived ease of use of mobile money services on the attitude towards its usage. Also, the study attempted to test and confirm if perceived risks and transaction costs of using mobile money systems can negatively influence customer's attitudes towards using mobile money services. The conceptual framework is presented in Figure 2.2, showing both independent and dependent variables. In the dependent variable side,, the intensity of usage of mobile money technology for business purposes in rural communities has been introduced to measure the influence of dependent variables on the frequency of use of the services. Apart from those two indicators, the conceptual frameworks also show

the relation between dependent variables and the type of transactions; for this case, it is the usage for shopping and bill

payment. User's attitude mediates this relation.

Figure 2: Conceptual framework
INDEPENDENT VARIABLES   DEPENDANT VARIABLE
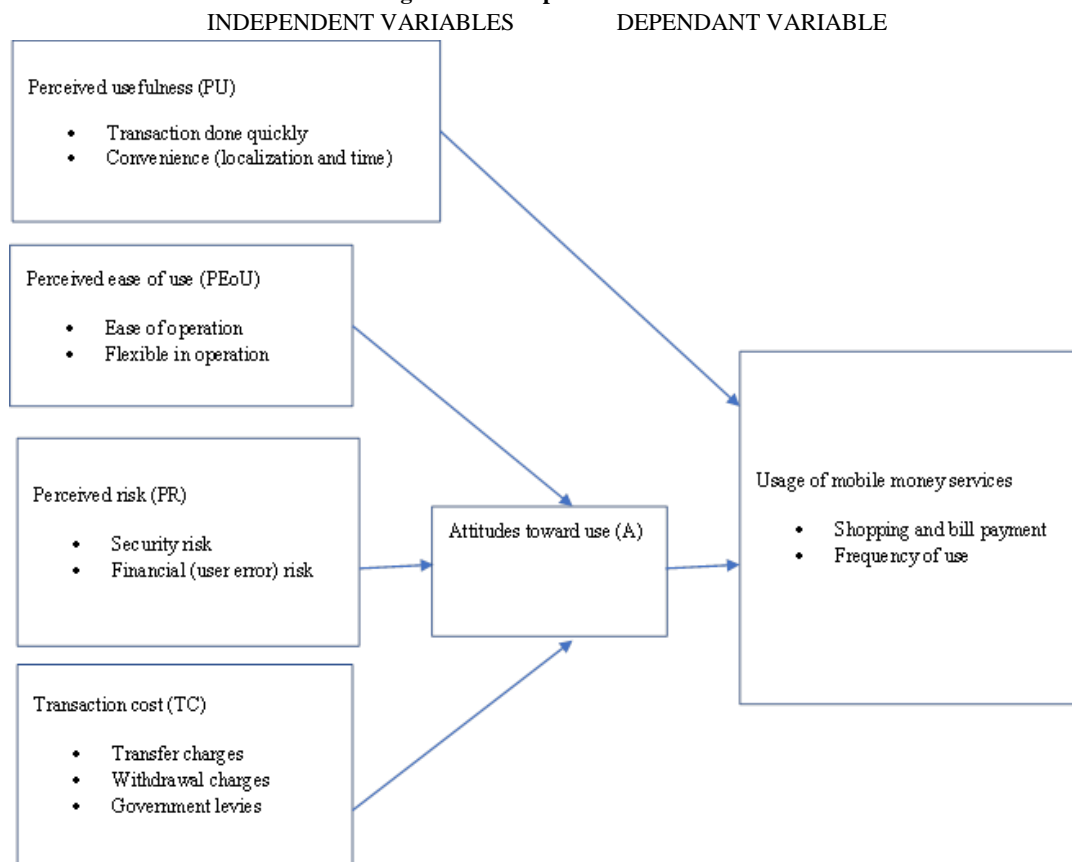
Source: Researcher (2023).

RESEARCH METHODOLOGY

Research approach/design
The research approach for this study was positivism, which emphasises making choices about how to proceed based on "what will work best" to answer the research questions (Creswell, 2014). Since there was uniformity and objectivity in generalizing the study's results, the positivist research theory was considered appropriate for this investigation (Saunders et al., 2012). To infer the relationship between variables, this study aimed to use a quantitative research design. The researcher was able to gather a larger sample of respondents using a quantitative method, which improved the ability to generalize the results compared to the situation when a small sample size would have been used.

Target population
The target population for this study was the mobile phone users in Magu district. The actual figure was not known but using the available data from the National Bureau of Statistics [NBS] (2022) and TCRA (2023) reports, the approximate figure was estimated to be 421,119.

Sample size
This study used the formula proposed by Green (1991), which was also used by other scholars (Leiknes et al., 2015; Chu et al., 2019; Mswahili, 2022) to determine the minimum sample

size in accordance with the number of independent variables. This formula is referred to as the general rule of thumb, which proposes a sample size to be not less than 50 respondents for correlation or regression analysis. The sample size keeps on increasing depending on the number of independent variables. Below is the formula proposed:

$N_{min} \geq 50+8xM$ where

N_{min} is the minimum allowed sample size
M is the number of independent variables.

For this study, there are four independent variables (M): perceived usefulness, perceived ease of use, perceived risk, and transaction cost, which are expected to be the predictors of the dependent variable (usage of mobile money service). Then, the minimum sample required was determined as follows:

$N_{min} \geq 50+8x4$, therefore $N_{min} \geq 82$ respondents.
Since the formula above gives only the minimum allowed sample size of 82 respondents, Green (1991) suggests that the sample is not limited to that minimum value, there is room to increase it to get as many samples as possible. Therefore, 363 respondents were used as the sample size for this study.

Sampling technique
Using a simple random sampling technique, the researcher selected customers from four mobile network operators (Tigo, Vodacom, Airtel, and Halotel). Those four mobile network operators was chosen purposively because, as per TCRA

(2022), they are the leading mobile money service providers with large market share in Tanzania. In this study, it was difficult to identify customers who own a mobile phone. Therefore, the convenient method was used to select mobile money agents, shops, markets, and ginneries in Magu district, which was used as the starting point to reach the target population.

Data collection instrument
The study obtained and used primary data by administering structured questionnaires to respondents. The respondents were asked to answer the questions based on a 5-point Likert scale, ranging from '1 = strongly disagree' to '5 = strongly agree'.

Data analysis
Data collected from respondents through questionnaires was checked for consistency to eliminate misleading data that could arise from misrepresenting questions in questionnaires. The data was analyzed using the statistical package for social sciences (SPSS) version 26, and results were presented in descriptive and inferential statistics.

The outcome of the data analysis was an equation in the form of $Y = \beta_o + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$ where Y stands for the dependent variable (usage of mobile money service), X_1 is the Perceive usefulness (PU), X_2 is the Perceived ease of use (PEoU), X_3 is the Perceived Risk (PR), X_4 is the Transaction Cost (TC), and ε is standard error of the estimate. B_1 to β_4 are regression coefficients, while β_o is the constant. Table 3.1 gives the data analysis plan/summary for this research.

RESEARCH FINDINGS, PRESENTATION AND DISCUSSION

Response rate
The researcher aimed to attain a minimum of 82 respondents presented in chapter three, as proposed by Green (1991), due to the lack of statistical data on the target population. However, the researcher managed to distribute 400 questionnaires, but only 363 respondents (90%) filled and returned the questionnaires.

Demographic characteristics of the respondent
The results obtained regarding demographic aspects were summarized and presented in table 1

Table 1: Demographic information of respondents

Character	Category	Frequency	Percentage
Gender of respondent	Male	273	75.2
	Female	90	24.8
	Total	**363**	**100**
Age of respondent	18-30	152	41.9
	31-40	146	40.2
	Above 40	65	17.9
	Total	**363**	**100**

Source: Field data, (2023)

It was observed that 75.2 percent of all respondents were male, while 24.8 percent were female. This was done to include all genders to avoid bias as this is a scientific study. Due to African culture, especially in rural areas, females are somehow left at home to take care of children while males go out to work or do business for the family (Kim, 2022). This led the researcher to reach more males than females as the visited areas were only trade centres and ginneries, of which very few women were found.

To get valid data, the researcher grouped the respondents into different age categories. Category one comprised youths aged 18 to 30 years whose participation was 41.9 percent, category two was respondents aged 31 to 41 with 40.2 percent, and category three was respondents aged more than 40 years who contributed 17.9 percent of the total response. This was done in accordance with Kim, (2022) who suggested that possession and usage of mobile money account is significantly related to respondent's age. This statement was proved to be right by this research, as seen in table 2, which shows the usage frequency of mobile money about age group.

Table 2: Mobile money usage frequency distribution according to age group

		Frequency Of Usage				
		3	8	16	26	Total
Age of a respondent	18-30	85	39	18	10	152
	31-40	34	43	34	35	146
	Above 40	20	24	16	5	65
Total		139	106	68	50	363

Source: Field Data, (2023)

The results showed a very low usage of mobile money services for respondents aged more than 40 years because the mobile money services found them into their traditional ways of doing business with cash or bank transactions. They adopted the mobile money technology but still not much attached to it as compared to other age groups.

Reliability test
It is usually best practice to check each construct item for reliability and validity to ensure the integrity and quality of a measurement instrument before testing the study hypothesis for meaningful interpretation (Mswahili, 2022). The reliability test was conducted for every variable used in this study. The Cronbach Alpha scale is the preferred measure used to test data reliability. The variable with a Cronbach Alpha of more than 0.7 is considered acceptable, 0.8 is good, and 0.9 is excellent (Cronbach & Shavelson, 2004). The results presented in table 3 implies that the reliability of data collected was good for the first three variables: perceived usefulness, perceived ease of use, and perceived risk. The reliability of the fourth variable, namely transaction cost, was found to be excellent as its Cronbach's Alpha value was above 0.9. The overall reliability of data was found to be okay

and suffices the data collection process because the employed Cronbach's Alpha reliability scale provided the statistical results above 0.7, which is the cut-off value.

Table 3: Reliability Statistics

| Variable name	Cronbach's Alpha	N of Items
Perceived Usefulness	.811	4
Perceived Ease of Use	.808	4
Perceived Risk	.806	4
Transaction cost	.923	6

Source: Field data (2023)
Parametric Assumptions test
Before conducting the correlation and multiple-regression analysis, the researcher performed a parametric assumptions check and confirmed if the data falls within the acceptable threshold. Normality and linearity of data are the two assumptions checked in this study to ensure all variables pass the test before conducting other analysis.
Normality assumption

The normality test is an act of testing the assumption that all data are normally distributed to allow easy prediction of values. When the normality test is violated, it leads to uneven validity and reliability of data. The Shapiro-Wilk and Kolmogorov-Smirnov tests are two of the most well-known normality tests. The other two are numerical methods using Skewness-Kurtosis indicators and graphical methods using histograms and normal distribution curves. These three approaches are the most frequently used for determining the error normality of a random sample with a certain sample size (Souza et al., 2023). The study employed histograms with normality curve to check the normality of data for each variable, as presented in Figure 4. The test concluded that the data in this study satisfies the normality test requirements.

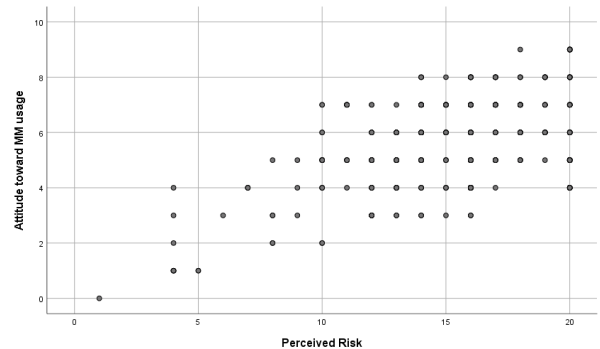**Figure 3. Histogram with the normal distribution curve**
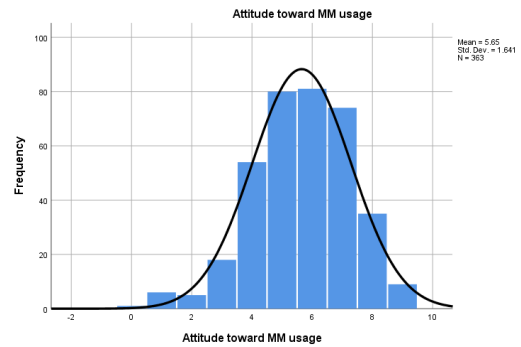
Source: Field data, (2023)

Figure 4: Simple scatter plot of TC against ATU
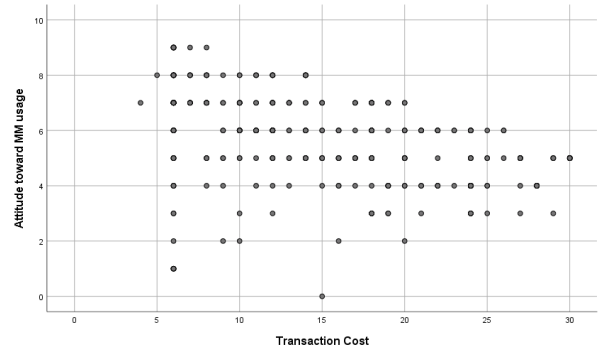
Source: Field data, (2023)
Figure 5: Simple scatter plot of PR against ATU

Source: Field data, (2023).

Correlation results
This study employed Pearson Product-Moment Correlation (PPM) to measure the strength of the relationship between the independent variables and dependent variables. The PPMC results were recorded and presented, as seen from table 4.

Table 4: Correlation results

Correlations								
Variable name	**Metric**	**PU**	**PEoU**	**PR**	**TC**	**ATU**	**MMU**
Perceived Usefulness	Pearson Correlation	1	.770**	.572**	.172**	.574**	.830**
	Sig. (2-tailed)		0.000	0.00	0.001	0.000	0.00
	N	363	362	363	363	363	363

Perceived Ease of Use	Pearson Correlation	.770**	1	.598**	.236**	.650**	.671**
	Sig. (2-tailed)	0.00		0.00	0.000	0.000	0.00
	N	362	362	362	362	362	362
Perceived Risk	Pearson Correlation	.572**	.598**	1	.421**	.527**	.504**
	Sig. (2-tailed)	0.00	0.000		0.000	0.000	0.00
	N	363	362	363	363	363	363
Transaction Cost	Pearson Correlation	.172**	.236**	.421**	1	-.419**	-.136**
	Sig. (2-tailed)	0.001	0.000	0.00		0.000	0.01
	N	363	362	363	363	363	363
Attitude toward MM usage	Pearson Correlation	.574**	.650**	.527**	-.419**	1	.733**
	Sig. (2-tailed)	0.00	0.000	0.00	0.000		0.00
	N	363	362	363	363	363	363
Mobile_Money_Usage	Pearson Correlation	.830**	.671**	.504**	-.136**	.733**	1
	Sig. (2-tailed)	0.00	0.000	0.00	0.010	0.000	
	N	363	362	363	363	363	363
**. Correlation is significant at the 0.01 level (2-tailed).							

Source: Research findings, (2023).

The correlation table 4 shows that the dependent variable (Usage of mobile money services) is highly correlated with two variables. The first variable is perceived usefulness with the Pearson-Product Moment Correlation value of 0.83, and the second variable with high correlation was the mediator variable (attitude toward use) with a PPMC of 0.733. The dependent variable was found to have a very weak negative association with transaction cost; the PPMC was found to be -0.136.

Attitude toward use showed a very high association with perceived ease of use (r=0.650). Also, there was a significant relationship between attitude and perceived risk with r=0.527, while the transaction cost showed a negative association (inverse relationship) with attitude toward use.

The PPMC results also showed a weak correlation (relationship) between transaction cost and other independent variables. The PPMC values for the transaction cost ranged from -0.419 to 0.421,; the weakest part was the the dependent variable with r=-0.136. This provides a reason why a mediator variable was needed to link the cost and the usage of mobile money services.

On the other hand, perceived risk had a strong correlation when tested against perceived usefulness, perceived ease of use, and attitude towards usage (r=0.572, r=0.598, and r=0.527, respectively). The weaker correlation was observed when tested against the dependent variable (r=0.50), suggesting a mediator variable to be used for stronger association.

Perceived ease of use produced a strong relationship with the perceived ease of use (r=0.77) and observed a weak association against transaction cost. A stronger correlation was observed when tested against the mediator variable, which had a higher PPMC than when tested against the dependent variable. This also signified the need to have a mediator variable in between for more strong relationship.

The perceived usefulness was the most powerful variable that affected the dependent variable (mobile money services usage). This is because it is the only variable that produced a PPMC of 0.88, which signifies its strength and shows no need to pass through the mediator to create a strong association.

Multiple Linear Regression analysis results
Since all the linear regression assumptions were met, the researcher conducted a multiple linear regression analysis to examine the influence of each independent variable on the

usage of mobile money services. The analysis involved three stages. Stage one is the regression analysis of all independent variables against the mobile money services usage. The second step involved the analysis of three independent variables (perceived ease of use, perceived risk, and transaction cost) against the mediator variable (attitude toward use). The last stage was the regression analysis of perceived usefulness and attitude toward use against the dependent variable (usage of mobile money services). The results were tabulated in tabular form for interpretation.

Regression analysis without the mediator variable

This multiple regression stage one was conducted on all four independent variables, namely perceived ease of use, perceived usefulness, perceived risk, and transaction cost, to see how they account for the usage of mobile money services. The results were recorded and tabulated into the model summary table 5 and ANOVA table 6.

Table 5 presents the model summary of the regression analysis's findings. The multiple correlation coefficients' value, R, was .894, indicating that the variables could be predicted with sufficient accuracy.

Table 5: Model Summary 1

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.894[a]	.799	.797	3.25905	1.881
a. Predictors: (Constant), Transaction Cost, Perceived Usefulness, Perceived Risk, Perceived Ease of Use					
b. Dependent Variable: Mobile_Money_Usage					

Source: Research Findings, (2023)

Table 6: ANOVA

ANOVA[a]						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15100.481	4	3775.120	355.425	.000[b]
	Residual	3791.854	357	10.621		
	Total	18892.334	361			
a. Dependent Variable: Mobile_Money_Usage						
b. Predictors: (Constant), Transaction Cost, Perceived Usefulness, Perceived Risk, Perceived Ease of Use						

Source: Research findings, (2023)

In a regression study, R Square measures how much variation in the dependent variable can be attributed to the predictor variables. It has been suggested that you check the significance of an F test of an ANOVA to see whether the R-squared is significant (Mswahili, 2022). The ANOVA analysis presented in Table 6 reveals that $F_{(4, 357)} = 355.425$, p =0.000 (p<0.05), indicating that the regression is both statistically significant and a good match for the data. It is because R-square has a high value, which typically denotes a stronger model.

From the results in Table 7, the achieved R-square was .799 showing that all four factors can by 79.9% predict the usage of mobile money services.

Regression analysis of independent variable with the mediator
At this stage, the research conducted another multiple regression to check whether the independent variable can predict the attitude toward the usage of mobile money services. The conceptual framework presented in Chapter Two showed the three variables (perceived ease of use, perceived risk, and transaction cost) to be mediated by attitude toward the use of mobile money service for them to have a total effect.

Table 7: Model Summary 2

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.969[a]	.939	.938	.402	1.952
a. Predictors: (Constant), Transaction Cost, Perceived Ease of Use, Perceived Risk					
b. Dependent Variable: Attitude toward MM usage					

Source: Research findings, (2023)

The regression analysis results were tabulated in summary, as seen in table 7 and 8. Model summary number two presents the relationship between the elaborated three independent variables and the mediator variable. The result reveals the multiple correlation coefficient (R) value to be .969. This shows that attitude towards using mobile money services can be predicted with a very high accuracy using the perceived ease of use, perceived risk, and transaction cost. The value of R-square was also found to be .939, signifying that the independent variables could explain 93.9% of total changes in attitude towards the use of mobile money services. This was supported by the significance value recorded in the ANOVA table 8, whose significance value was observed to be $F_{(3, 358)} = 1824.827$, p =0.000 (p<0.05).

Table 8: ANOVA Results

ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	884.701	3	294.900	1824.827	.000b
	Residual	57.854	358	.162		
	Total	942.555	361			
a. Dependent Variable: Attitude toward MM usage						
b. Predictors: (Constant), Transaction Cost, Perceived Ease of Use, Perceived Risk						

Source: Research finding, (2023)

At this stage, the coefficient table was also recorded to be used in calculating the total effect of the three independent variables, which requires a mediator to affect the dependent variable. The results are presented in Table 9.

Table 9: Regression Coefficients Summary

Coefficientsa								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.346	.115		3.014	.003	.120	.572
	Perceived Ease of Use	.254	.008	.512	31.369	.000	.238	.270
	Perceived Risk	.237	.008	.538	30.588	.000	.222	.252
	Transaction Cost	-.170	.003	-.778	-53.626	.000	-.176	-.163
a. Dependent Variable: Attitude toward MM usage								

Source: Research findings, (2023)

Table 9 shows the multiple correlation coefficients for each of the three variables towards the attitude toward using mobile money services. The test was conducted under a 95 percent confidence interval, and all variable regression coefficients were found to be statistically significant. This implied a partial mediation between the independent and dependent variables. The coefficient results were reserved to be used to calculate the total indirect effect of such variables on the usage of mobile money services.

Regression analysis of perceived usefulness and mediator against MM usage

This is the fourth and last multiple regression analysis, which was run to check the contribution of mediator variable on the regression coefficient values to combine them for a total indirect effect. The results were presented in table 10, 11, and 12 showing the model summary and regression coefficients, respectively.

Table 10: Model Summary 3

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.934a	.873	.872	.297
a. Predictors: (Constant), Attitude toward MM usage, Perceived Usefulness				

Source: Research findings, (2023)

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From the results recorded in Table 10, the value of the multiple correlation coefficient was improved from 0.894 to 0.934, and the value of the R-square improved from 0.799 to 0.873, providing evidence that the mediator variable contributed. From the ANOVA table, the F-test also proved the R-square value to be statistically significant with F (2,360) = 1234.830 at p-value equal to 0.000, which is less than the cut-off sig. Value of 0.05. Since the value of the R-square was found to be very high (0.873), it was confirmed that this model provides a perfect match. This is because 87.3 percent of all changes in mobile money usage can be explained well by the changes in perceived usefulness, perceived ease of use, perceived risk, and transaction cost mediated by attitudes towards use.

Table 11: ANOVA Results

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	217.579	2	108.789	1234.830	.000[b]
	Residual	31.716	360	.088		
	Total	249.295	362			
a. Dependent Variable: Mobile_Money_Usage						
b. Predictors: (Constant), Attitude toward MM usage, Perceived Usefulness						

Source: Research findings, (2023)

The regression coefficient tables (table 4.15 and 4.18) provide evidence of how each independent variable affects the usage of mobile money services. Perceived usefulness was found to provide a statistically significant direct effect on the usage of mobile money services. The p-value recorded on this direct effect was less than 0.05, and the regression coefficient (beta) of 0.678 at a 95 percent confidence interval. Perceived ease of use showed an indirect positive effect on the usage of mobile money services with a beta value of 0.512 and p-value of 0.000 which implies that the effect is statistical significance. Perceived risks also provided the same results with a positive indirect effect on the usage of mobile money services. Perceived risk recorded a regression coefficient of 0.538 and a p-value of 0.000 which is less than 0.05, to signify that the effect is statically significant. Transaction cost is the only variable that negatively affected the usage of mobile money services. The recorded beta value was -0.778 with a p-value less than 0.05, which implied the effect was statistically significant.

Table 12: Regression Coefficients Summary

Coefficients[a]								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	.187	.078		2.383	.018	.033	.341
	Perceived Usefulness	.165	.006	.678	29.525	.000	.154	.176
	Attitude toward MM usage	.184	.012	.363	15.812	.000	.161	.206
a. Dependent Variable: Mobile_Money_Usage								

Source: Research findings (2023).

From the multiple regression analysis coefficient tables, the conceptual framework was modified to match the actual field responses. Figure 4.8 shows the resulting conceptual framework with the regression coefficients for each direct and indirect link.

The conceptual framework in Figure 4.8 led the researcher to the mathematical calculations to determine the total effect of perceived ease of use, perceived risk, and transaction cost on the usage of mobile money services. This total effect was achieved by combining variable regression coefficients and mediator variable coefficients using the Sobel product coefficient approach. This approach suggests that to get a total indirect effect, two regression coefficients have to be multiplied together (Sobel, 1982). That is;

$$\beta_{indirect} = (\beta_{iv}) \times (\beta_m)$$

Where β_{iv} represents the independent variable regression coefficient, and β_m represents a mediator variable coefficient towards the dependent variable. Newsom, (2023) also recommended this approach to be one of the better ways to be used in calculating the indirect effect of the variable, which has no or little direct relationship with the dependent variable. Another approach recommended by Newsom (2023) is the

difference approach. For this study, only the product approach was used to calculate the indirect effect of the three variables, which required partial mediation to indirectly predict the dependent variable.

For perceived ease of use, the overall regression coefficient for indirect effect was calculated as;
$\beta_2 = 0.512 \times 0.363$,
$\beta_2 = 0.186$
For perceived risk;
$\beta_3 = 0.538 \times 0.363$
$\beta_3 = 0.195$

For transaction costs;

$\beta_4 = -0.778 \times 0.363$
$\beta_4 = -0.282$

The overall multiple regression equation now becomes
$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$, where X_1 stands for PU, X_2 stands for PEoU, X_3 stands for PR and X_4 stands for TC.

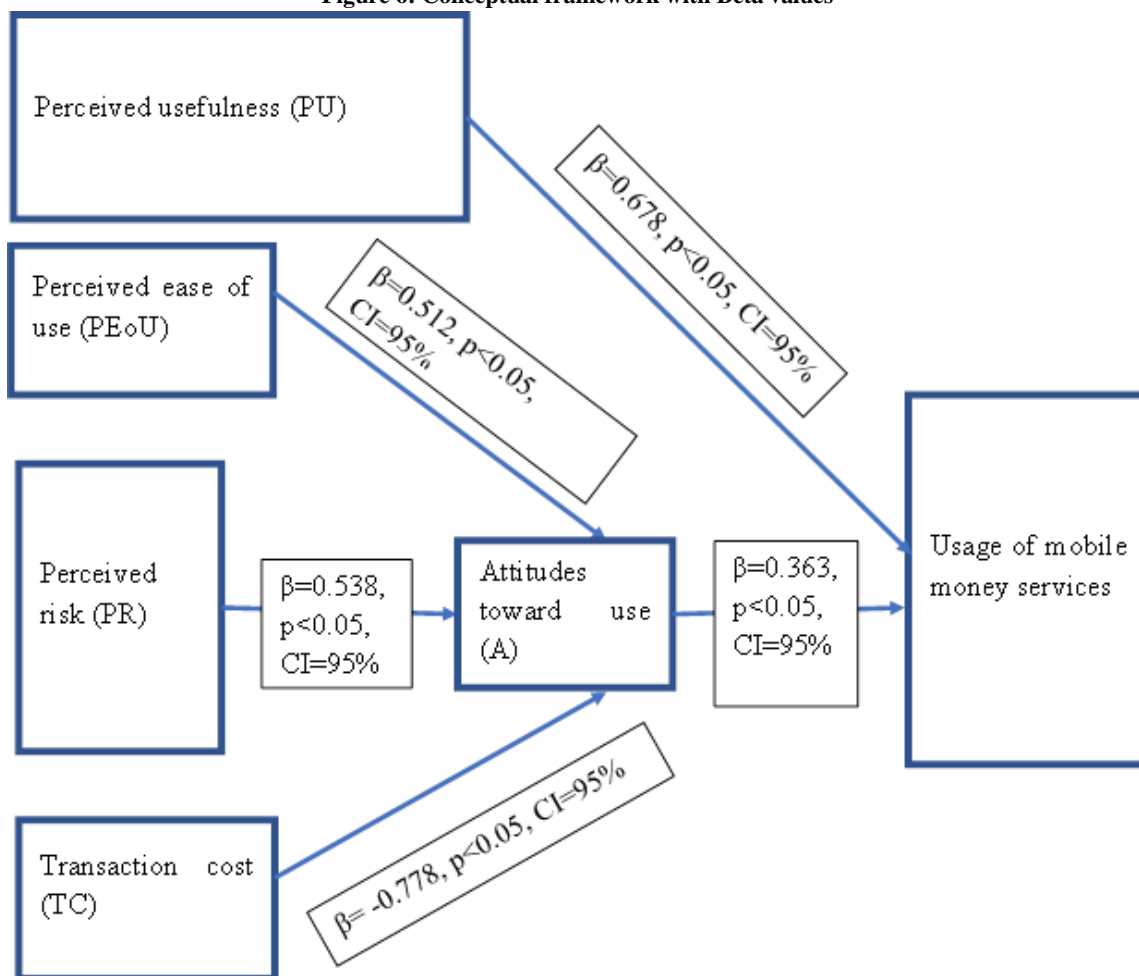The multiple regression equation was developed as;
$Y = 0.187 + 0.678PU + 0.186PEoU + 0.195PR - 0.282TC + 0.78$
Therefore,
$Y = 0.967 + 0.678PU + 0.186PEoU + 0.195PR - 0.282TC$

Figure 6: Conceptual framework with Beta values

Source: Research finding, (2023)

The research findings showed that perceived usefulness influences mobile money services usage. According to Davis (1989), a person's perception affects how valuable they consider technology to be. It alludes to people's conviction that a specific system can enhance performance. This study illustrates the different advantages that mobile money services provide to satisfy the advantages of using mobile money for bills and goods or services payment. It suggests that having access to mobile money services has the advantage of making it simpler for customers to pay for purchases and government bills promptly and correctly. As a result, the perceived usefulness was found to positively influence the usage of mobile money services. This research finding was found to be in line with the findings of studies conducted by other scholars (Wong & Hiew, 2005; Sasongko et al., 2021; Tun, 2020; Ly et al., 2022; Njere and Phiri, 2021) who all confirmed that the perceived usefulness has a positive influence on the usage of mobile money services. One's perception of technology that it is useful to them immediately improves in proportion to how closely the technology is adapted to the demands of people in the workplace (Kurniawan et al., 2021). This finding led the research to accept the null hypothesis one that perceived usefulness positively influences the usage of mobile money services.

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According to the research finding report, people are willing to use mobile money services because they are easy to use. The rural community in Tanzania prefers using mobile money systems because their steps are easy to follow. They consider it easy to use and no assistance is needed to complete the transaction. From the correlation and multiple regression analysis, this variable was found to positively influence the rural community's attitudes towards the use of mobile money services. This outcome is consistent with research by Mswahili (2022) and Richard & Mandari (2017), who discovered that users choose technology that is simple to use and offers actual solutions. As a result, more people are drawn to utilize mobile money services.

Consumers can choose to use the digital payment technology offered by multiple vendors (MNO) if it is thought to impact their attitude. Then, users of mobile money services can do so with ease. Additionally, rural communitiesies consider mobile money services to be simple electronic transactions. The study by Kurniawan et al. (2021), which significantly demonstrated a positive association between perceived ease of use and usage of mobile money services, is supported by the research finding presented here. According to Akbari et al. (2020), perceived ease of use has a favourable impact on the attitude towards using mobile money services. This research finding led the researcher to accept the null hypothesis two that perceived ease of use positively influences the attitude towards the usage of mobile money services.

The data from the study's findings showed that the use of mobile money services was significantly influenced favourably by perceived risks. Unlike the researcher's hypothesis, the rural community seems not to be worried about risk concerns in mobile money services. They trust mobile money technology more than how they trust cash handling as they believe that even if money is lost can be recovered if was on a mobile money system. The outcome confirms the findings of other studies that revealed acceptance and usage of mobile money services were positively influenced by perceived risks (Shaikh et al., 2018; Farah et al., 2018; Moon and Hwang, 2018; Mendoza-Tello et al., 2018; Widyanto et al., 2021). Additionally, the study's findings are consistent with those made by the Global System for Mobile Communications (2018), which discovered that customers' primary concerns when deciding whether to use mobile money are data privacy and security. Extreme caution must be used while sharing sensitive data, particularly financial information (Mswahili, 2022). Other studies found that agent-driven fraud, sharing personal identification numbers (PINs), phishing attacks, and identity theft are the most important security concerns (Guma, Mussa, & Anael, 2020).

The rural community in Tanzania sees mobile money services as more secure, easy to recover the lost money, and easy to reverse transactions sent to the the wrong destination. They also trust the mobile network operators (MNO) regarding security concerns, as they provide assistance and have developed measures to reduce the risk of losing money. Some of the features developed by MNO is the self-reverse of wrong transactions. Also, rural community appreciates the

initiative done by both MNOs and the government of Tanzania through the Tanzania Communications Regulatory Authority (TCRA) which provides education to be alerted on online theft issues and provides a way forward to report cyber security cases.

This research finding led the researcher to reject the null hypothesis three that perceived risks negatively influence attitudes towards the usage of mobile money services.

The transaction cost of using mobile money services was also discovered to be a significant factor affecting the attitudes towards the usage of mobile money services. The results of studies on the factors influencing the adoption of mobile financial services by Lema (2017) and Richard & Mandari (2017) are consistent with this conclusion. According to the studies mentioned above, Tanzania's rural community which are mostly an unbanked population, finds it difficult to utilize mobile financial services due to their high costs. Affordable services, however, may spur quicker uptake (Mswahili, 2022). The lowering of transaction costs for mobile financial services should be considered for efficient integration of mobile money services. The government levy was among the indicators used by this study to test for influence of transaction cost on the usage of mobile money services. The response from rural dwellers was that this levy is too high and, if possible, should be removed to make the mobile money services affordable. Very few supported its existence.

The research finding revealed a negative attitude toward accepting mobile money services transaction costs. This finding was found to be consistent with other studies conducted around the globe, which found that transaction costs hurts the usage of mobile money services (Mpofu, 2022; Kelly & Palaniappan, 2022; Akinyemi &Mushunje, 2020; Obiero, 2016; Njere & Phiri, 2021). Contrary to the study conducted by Akinyemi & Mushunje (2020) and Akinyemi & Mushunje (2020), who found the transaction cost to be more cost-effective and hence provides stimulus to consumers to use mobile money services.

This research finding led the researcher to accept the null hypothesis that transaction cost negatively influences the attitude towards the use of mobile money services

Conclusion

This study examines what makes mobile money services so popular and effective in Tanzanian rural communities. According to the study's findings, users' top concerns regarding using mobile money services include perceived usefulness and perceived ease of use. Other variables included perceived risk and transaction costs. Because the majority of the data were only collected in a few Tanzanian villages, the study's findings cannot be generalized. Therefore, additional research should be carried out in numerous villages, if not all East African countries.

Theoretical implication

The research's conclusions make several important additions to the theoretical frameworks. First, this study combined pertinent elements from recognized TAM theory to analyze

the factors influencing the usage of mobile money services. The study's findings led to the identification of four crucial factors from the corpus of prior research without duplicating one another. The variables in question are perceived usefulness, perceived ease of use, perceived risks, and transaction costs. The three variables (PEoU, PR, and TC) were found to be mediated by attitude on their influence towards the usage. As a result, the proposed model offers a more thorough explanation of factors that influence people to choose Mobile money services than any earlier research. Since the TAM theory has only two constructs (PU and PEoU), this study added the two variables (PR and TC), which were found to be the important factors that influence rural communities from using mobile money services. Therefore, the findings offered theoretical and empirical support for the recently created integrated model.

Practical implication

The findings will also serve as the foundation for decision-makers as they further hone technology acceptability and success models in the developing field of mobile money services. The study's findings also help mobile money service providers, the government, and other stakeholders develop successful strategies for promoting financial inclusion and growing their already established client base (Mswahili, 2022).

This study initially quantified the variables influencing the usage of mobile money services before discussing its practical ramifications. As a result, this would help Mobile Network Operators and policymakers understand how these issues affect the development of the Cash-less economy through mobile money services. By encouraging them to consider these factors when creating such service platforms, the provided findings would also broaden the understanding of the service providers.

Recommendations

To maintain the beneficial intention of using mobile money systems, service providers should pay particular attention to creating mobile money system interfaces which are easy to use, secured with minimal risks, affordable, and improve payment transaction performance. Mobile Network Operator decision-makers and the communication regulatory authority (TCRA) should increase awareness campaigns to inform mobile money service users of the risks associated with incorrect mobile money system usage. Furthermore, Mobile Network operators as service providers should ensure that financial transactions are carried out securely and effectively through their mobile money channels regardless of place or hour.

Mobile Network Operators should increase their marketing strategies through intensive promotion and registrations of new merchants in rural areas. The common payment method found in rural by this study was cash payment. The businesses in rural by which mobile money was found to be in use are payment of electricity and water bills, airtime, bundled payment, TV subscriptions, and very few paying for goods. This is because the Mobile Network Operators have not

reached there to promote and start or register enough merchants to promote a cash-less economy as directed by the URT (2023).

In collaboration with the policymakers, Mobile Network Operators should review the pricing strategy used in the mobile money industry. Although the government of the URT (2023) has withdrawn the government levies in some transactions, the withdrawal charges which are having government levies, remain a challenge to rural communities. This is because, as per this study's finding, the usage of digital payment is still very low in rural communities of Tanzania. This implies that the money they receive or deposit into their mobile money account has to be withdrawn into cash before spending them. Maintaining government levies in the withdrawal charges becomes a burden in rural communities and relief in urban areas where digital payment prevails.

As a result, if stakeholders will work on the mentioned recommendations, this research would result in the development of affordable, safe, and user-friendly mobile money systems that satisfy user preferences.

Areas for further studies

This study targeted only mobile phone and mobile money users in rural communities. However, it would have been wise to consider the viewpoints of a wider range of stakeholders when conducting this research, including non-users, merchants, retailers, and business owners. Therefore, the researcher suggests further studies to focus on that group of mobile money service users and non-users to have common factors for all parties. The researcher also recommends further studies using a different theory (apart from TAM theory) such as UTAUT or UTAUT2 to check the contribution of other factors, such as social influence and facilitating conditions.

Finally, even though the current study had a sufficient number of participants, it's possible that the conclusions can't be applied to all Tanzanian customers living in rural areas.

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