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Smartphone Use in Financial Management among Women's Informal Saving Groups in Dodoma, Tanzania

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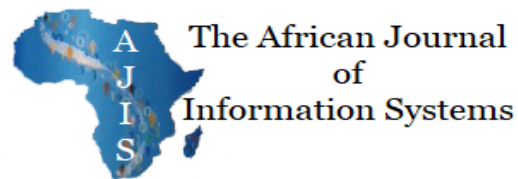
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Cover Page Footnote

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ABSTRACT

Diffusion of smartphone technology has created multiple opportunities for economic development. This research investigated the use of smartphones in financial management among women's informal saving groups in Dodoma, Tanzania. Qualitative data were collected from 10 groups, derived from 15 interviews and 3 focus group discussions (FGDs) with 22 participants and thematic analysis was done. The findings revealed that research participants were using smartphones to access WhatsApp, the camera, mobile money applications and the calculator for coordination, recording, calculation, and payment. It was also found that untrustworthy communications, high charges and mobile fraud were challenges experienced by the groups. Familiarity, ease of use and nature of the group were identified as important reasons for the smartphone use in financial management. The research contributes knowledge regarding digitizing informal saving groups although smartphone use was not strongly linked to financial management success. This suggests a need for improved skills and technological empowerment to achieve sustainable growth.

Keywords

Women's informal saving group, smartphone application, mobile applications, financial management.

INTRODUCTION

While reports show the rapid growth of financial institutions in Tanzania, formal financial services access has remained relatively low (National Financial Inclusion Framework [NFIF], 2017). Data indicate that 10.6 million out of 27 million (54%) of the population aged 16 years and above use informal financial institutions such as informal saving groups to access financial services (Finscope

Tanzania, 2017). These statistics suggest a need for recognition of the role that informal saving groups play in financial inclusion and economic development. Informal saving groups are unregulated social organizations aimed at providing financial services to their members for different economic purposes (Gugerty, 2007). These groups are increasingly active in both urban and rural areas and address existing barriers including the absence of suitable financial services (Mhando, 2018). They are available everywhere (in the neighbourhood and market areas), are offered by numerous agents (co-workers, farmers, co-worshippers) and membership is voluntary and open to those who comply with the group requirements (Mataku & Kaseke, 2014). The mode of contribution is determined by the nature of the group and the agreement, for example members may be required to contribute daily, weekly, or monthly (Mataku & Kaseke, 2014; Oranu et al., 2020). Globally, there are many forms of ISG (see Table 1).

Table 1*Forms of Informal Savings Groups (ISGs)*

Form of ISG	Distinctive characteristics	Sources
Rotating savings and credit associations (ROSCA)	Operate on a reciprocity principle; payments are made mostly in cash or in-kind; cyclical model which rotates daily/weekly/monthly; contributions are taken immediately by one member; no interest charged; flexible (members can switch turns); members carry the risk of losing money compared with those taking money first	(Ardener, 2014; Prina, 2015; Oranu, Onah, & Nkhonjera, 2020)
Village community banks	Dominant in rural areas; stress on solidarity; offer loans and insurance; charge interest; skill empowerment	(Kinisa, 2019; BOT and FSDT, 2016)
Village savings and loan associations	Dominant in village; fund is kept in lockbox; passbook for recording savings; weekly meetings; members may borrow up to three times the value of their savings; charge interest; distribute dividends	(Ardener, 2014; Ksoll et al., 2016; Oranu et al., 2020)
Accumulated savings and credit associations (ASCA)	Act as collective bank: contributions are set aside to grow as loan opportunities for members; charge loan interest; interest is earned either as dividends or are set aside to deal with emergency/insurance; keep records; highly flexible	(Sadr, 2017; Oranu et al., 2020)

This study focuses on rotating savings and credit associations (ROSCA) and accumulated savings and credit associations (ASCA) as they are dominant in low- and middle-income countries like Tanzania (Lukwa et al., 2022). There is substantial evidence that shows ROSCA and ASCA play an important role in financial inclusion by providing small amounts of credit and assisting saving by low-income earners, and thus promoting community development (Lukwa et al., 2022; Oranu et al., 2020). They play an essential role in improving the livelihood and sustenance of women, especially poor women, who are the heads of families (Anord, 2020). Most importantly, they offer the most basic and fundamental form of financial mediation and are highly flexible in terms of the amount saved and loan provided (Johnson, Malkamäki, & Niño-Zarazua, 2010; Sadr, 2017). Given that most women have poor financial literacy, the ease of financial procedures and flexibility draw a large number of participants and facilitate multiple social and economic roles (Klapper, Lusardi, & Van Oudheusden, 2015). The current study focuses on financial management for urban women, and this is an additional reason why village

community banks and village savings and loan associations were excluded from the study - they are dominant in rural areas and also offer life skills empowerment which is out of study target.

Women are reported to dominate in ISGs, they account for up to 80% of participants worldwide (Rickard & Johnsson, 2018). This highlights the existing financial exclusion of women compared to men and that it is due to numerous barriers that prevent women from accessing formal financial services. Social-cultural aspects and a patriarchal ideology undermine women's financial self-determination and ability to excel in economic development which results in increasing dependency on their partners (Arnold, 2020). ISGs remedy financial exclusion by providing services and microfinance to people unable to access formal financial institutions due to poor financial literacy, high-interest rates, irregular income, and lack of collateral (Mhando, 2018). Members of ISGs acquire opportunities to save and borrow and hence not only to sustain household consumption but to climb out of vulnerability to poverty. Besides, ISGs support the development of financial management skills and encourage continuing teamwork and moral support (Mataku & Kaseke, 2014).

Despite the potential of ISGs for economic and social development, groups are constantly confronted by challenges that jeopardise their existence. Research findings indicate that ISGs suffer from inadequate loan management, lack of financial skills and improper record-keeping which may result in theft, delayed repayment, and loan default (Biyela, Tsibolane, & Belle, 2019; Mwangi & Kimani, 2015; Mori, Olomi, & Nyantori, 2016). These challenges are serious and have multiplier effects that depress growth, sustainability, profitability, and the peace of mind of ISGs members. Poor financial management that condones irregular repayment by debtors often results in delayed repayment to others, loan defaults and even fraud to try to hide the true state of affairs, and this can eventually lead to the collapse of the enterprise (Mwangi & Kimani, 2015). Financial illiteracy and social relations appear to be the root causes of many problems in ISGs and threaten their survival (Biyela, Tsibolane, & Belle, 2019; Klapper, Lusardi, & Van Oudheusden, 2015; Mori, Olomi, & Nyantori, 2016). Financial management skills equip an individual to make sound choices regarding financial use and management (Gomera, 2020). Hence financial management skill empowerment is needed to achieve effective inclusion and sustainable growth.

Technology creates opportunities in business, education, employment, civic involvement and leisure (Lwoga & Chigona, 2019). Examples include automating the business supply chain, mobile banking, and connecting employees and customers. Smartphones, mobile money and associated applications can facilitate financial operations and help marginalised groups overcome many of the challenges that they face with those operations (Karlan et al., 2016). In ISGs, smartphone applications exist that handle financial management operations, such as sending monthly contributions, applying for loans and loan repayment (Wambua & Wamuyu, 2020). The effective use of smartphone platforms in ISGs has been reported to increase trust, address record-keeping problems and reduce the need for proximity (Biyela, Tsibolane & Belle, 2019). This implies that proper application of this technology in women's ISGs is both feasible and can improve financial management performance, increasing profitability and sustainability. Despite the viable opportunity presented by smartphone technology in improving financial management in Sub-Saharan Africa, informal economies such as women's ISGs have still not profited sufficiently from the technology – possibly they still regard it as a communication tool only useful for maintaining social relations rather than extending economic opportunities (Mramba, 2018). Women have been found to demonstrate a lack of confidence in the use of information communication technology (ICT) devices; this may be due to established power relations in the community where women are disadvantaged in terms of access to and use of these technologies (Kapondera & Hart, 2016; Lwoga & Chigona, 2019). The use of smartphone in financial management among women in ISGs has

received little research attention. The reported research has largely concentrated on the general use of ICT in Stokvel (Biyela, Tsibolane, & Belle, 2019) and the role of mobile applications in mitigating challenges facing ISGs (Wambua & Wamuyu, 2020).

In Tanzania, the realm of technology for development in the informal economy includes the use of smartphone applications in market research, the interaction between micro business and microfinance, and agriculture (Gomera et al., 2017; Kapinga et al., 2018; Rumanyika et al., 2021). However, these solutions do not directly address the financial management needs of women in ISGs. We need innovative technology applications to improve the performance of women's ISGs in the financial management chain. This research on improving the efficacy of women's ISGs positioned itself in the initial stage of design science research (DSR). DSR focuses on addressing problems through systematic study to develop practical solutions to problems in the real world (Hevner, 2007; Johannesson & Perjons, 2014). As such, this research explored smartphone adoption and its use to address the requirements and challenges in financial management for this user group; it then supported the design and implementation of a smartphone solution to cater for those needs and issues. In addition, the research used domestication theory as the lens to understand the means of use of a smartphone by women within an ISGs in for financial management. Smartphone technology was chosen due to the computing and personalized environment offered which allows the user to seamlessly and conveniently carry out multiple functions (Egbe & Mutanga, 2016), its accessibility (Tanzania Communications Regulatory Authority [TCRA], 2020) and its affordability (Global System for Mobile Association [GSMA], 2020). Considering these multiple advantages, a smartphone can be adopted and used to perform a variety of financial management operations. Thus, the research answered the following questions:

1. In what ways do women's informal saving groups use smartphones for managing their finances?
2. What are the challenges experienced by women's informal saving groups in using smartphones for financial management?

This research contributes knowledge to the existing literature regarding how digital resources such as a smartphone improve the operations of an informal economy like women's ISGs to achieve profitability, effective financial inclusion, and suitable growth. Moreover, the domestication framework aids in developing a comprehensive understanding of the underlying motives, drivers, and challenges towards adopting and using smartphones by ISGs for financial management. The research also contributes knowledge to the domain of technology for development and DSR by presenting the complex case of women's ISGs in Tanzania regarding the use of smartphone technology. This aids in developing technological solutions relevant to their ecosystem.

In the following section we provide a literature review on informal saving groups, financial management, smartphone use in ISGs, the theoretical framework and a conceptual framework. This is followed by a description of the methodology used in the research. The third part presents the findings followed by discussion on the use of smartphone. Finally, the research reaches conclusions and makes recommendations based on the research findings.

LITERATURE REVIEW

Informal Saving Groups in Social and Economic Development

Despite the exponential increase in the number of financial institutions, access to financial services has remained relatively low in Tanzania (National Financial Inclusion Framework, 2017). The low degree of financial inclusion is exacerbated by a lack of financial literacy, irregular income, a high-interest rate, and service delivery inefficiencies. Informal saving groups (ISGs) have, however, succeeded in filling

the financial gap in urban and rural areas as community-based organizations (Mhando, 2018). As indigenous, informal, financial intermediaries, ROSCA have different names in common use: *polla* in Mexico *chit funds* in India, *susu* in Ghana, *upatu or mchezo* in Tanzania (Sadr, 2017). ASCA require members of the group to constantly make contributions to the fund and then lend money to the members charging a small interest rate based on agreed terms. The interest thus realised is used to strengthen the fund and is added as a dividend to the members at the end of the cycle. Members in ISGs get supported in various economic activities and social emergencies (Mwangi & Kimani, 2015). In India, self-help groups (SHGs) empower women in rural areas by lending money to members as well as loans to non-members in need at a small interest rate resulting in investment in different production activities (Somanathan, Vandewalle, & Baland, 2008). In this way a women's ISG acts as a source of microfinance providing financial help to the local people in need and should not be taken for granted. In Nigeria, informal groups are hubs for acquiring life skills, such as reproductive health care service, and adult literacy (Hugh & David, 2010). In Tanzania, ISGs are effective tools for poverty reduction; they help individuals meet consumption needs, pay school fees, run businesses, and increase and diversify income (Mohamed, 2014). ISGs link women with other institutions for different services, for example with home agencies, development agencies and banks (Pathak, & Pant, 2018). However, they are constrained by several financial management challenges that negatively affect their growth, profitability, and sustainability.

Financial Management in Women's Informal Saving Groups

Financial management helps businesses to use resources effectively, fulfil stakeholders' commitments, gain competitive advantage, and to prepare for long-term financial stability (Subramanian & Paramasivan, 2009). In ISGs, financial management practices include fund management and control, financial recording, collection of contributions, saving, and loan disbursement. Nevertheless, studies have revealed that ISGs experience poor financial management practices resulting in loss of membership, conflict, theft, and bankruptcy (Mwangi & Kimani, 2015). The assessment done by Klapper et al. (2015) on fundamental concepts of financial literacy revealed that one-third of the adult population is financially illiterate, and women in particular suffer from poor financial literacy. Such a skills gap contributes to bad financial decisions, putting groups at risk of collapsing due to default on repayment of loans. Weak financial management practices result in ISGs members taking loans without having clearly explained loan repayment arrangements thus resulting in loan default (Mori et al., 2016). Financial management equips an individual with the ability to make informed decisions about financial products and services.

It has been found that fund management and financial decisions in many ISGs are influenced by the social relationship norms operating in that environment (Kear, 2016) or Ubuntu (Biyela et al., 2019), and that these appear to deviate from more widely accepted rules (Mwangi & Kimani, 2015). In addition, poor financial recording is found to cause much conflict in women's ISGs (Anord, 2020). The records were reported to be untidy, incorrect, and missing important information required to support financial decisions (Biyela et al., 2019; Wambua & Wamuyu, 2020). The evidence suggests that fund management irregularities and poor financial decisions cause many ISGs to die prematurely as members fail to repay or group leaders disappear with money while some members do not contribute regularly for fear of losing their money. It follows that there is a need for sound and effective mechanisms that would eliminate such irregularities in financial management for effective financial decision-making and fund management. Such mechanisms would empower ISGs providing them with the basic skills of financial management and procedures promoting proper functioning and sustainable growth.

Smartphone Usage in Informal Saving Groups

Global statistics indicate that in 2020 around 3 billion people owned smartphones, with about 474 million smartphone users in the Middle East and Africa (Statista, 2020). The increase in smartphone use in Africa is attributed to the computing features found on the smartphone and falling prices of such devices attributable to due to the introduction of Chinese smartphone brands, such as TECNO and Infix (Global System for Mobile Association, 2020). The TCRA (2020) data indicate that about 27.9 million of the Tanzanian population are Internet users. The reported increase in the number of Internet users in Tanzania has also been triggered by the availability of relatively cheap smartphones and decreasing prices of the services offered by telecommunication companies such as Vodacom, Tigo, Halotel, and Airtel (TCRA, 2020). Smartphone technology assists in the creation of new or enhanced and inclusive social and economic activities. It can effectively narrow the digital divide, increase financial inclusion, lower both production and transaction costs, and dramatically increase rapid, cheap, and ubiquitous communication (Mramba, 2018). At the community level, mobile devices, particularly smartphones, are extremely effective and powerful tools as they have different functionalities for users embedded in them (Egbe & Mutanga, 2016). They are particularly adept at multitasking activities such as are frequent in social interaction and a working environment (Ko, Kim, & Kim, 2021). Smartphones facilitate several operations, including automating the business supply chain, mobile banking, and connecting employees and customers within and outside the business.

In ISGs, the smartphone can be used for common group operations, such as sending monthly contributions, applying for loans, and loan repayment. Smartphone application use in women's ISGs reduce the incidence of record-keeping problems, the need for physical proximity and can be used by members to improve their financial knowledge (Wambua & Wamuyu, 2020). Nonetheless, studies indicate that in Africa informal economies such as ISGs have not yet widely benefited from ICT devices. They appear to be regarded as tools with limited use, for communication purposes only, rather than as a mechanism to deepen and broaden development (Mramba, 2018). Compared to men, women have been reported to view smartphones largely only as a way to maintain social ties (Lwoga & Chigona, 2019). This same research also indicates that the female research subjects demonstrated a lack of confidence in the use of ICT devices. This is attributed to prevailing power relations in the community, where women are disadvantaged in terms of access to and use of ICT technologies (Kapondera & Hart, 2016). Furthermore, a lack of digital skills, poor access to infrastructure and a shortage of appropriate local content are reasons identified for the slow adoption and use of ICT (Heeks, 2019). It is proposed that designing a contextualized smartphone application that considers local preferences would accelerate adoption of high-impact smartphone technology. Furthermore, it is the understanding that such a smartphone application would inspire potential users and enable them to become more competitive as they gain access to business tools and learn new ways of doing business, thus improving performance and livelihood in general. Current technology solutions that set out to address challenges that hinder sustainable development for the informal sectors in Tanzania (for example, Kapinga et al, 2018; Rumanyika et al, 2021), do not directly address the financial management challenges facing women's ISGs. This research is positioned within the initial stage of DSR; we explore the needs, requirements, and challenges for this clearly defined user group as a basis for the subsequent design and implementation of a smartphone solution to address those needs and issues.

Theoretical Literature

Domestication theory was used as a lens to understand how women's ISGs use smartphones for financial management. Domestication theory describes the processes by which a technology is accepted, used, or rejected by users and the driving force behind their choices (Silverstone, Hirsch, & Morley, 1992). The

theory addresses questions like what technological products and services mean to the user, how the user interacts with technology, and what role these technologies can play in human life (Haddon, 2003). Domestication theory looks beyond the adoption and use of ICT rather focussing on the interaction between value, needs, and interests and the technology (Silverstone et al., 1992; Biyela et al., 2019). Such interactions can lead a user to accept and use the technology or to decline it.

The adoption and use of technology involves processes of commodification, appropriation, objectification, incorporation, and conversion (Silverstone et al., 1992). The *commodification* phase involves assessing potential benefits and domestic needs and relates the technology to its use within a context. Such knowledge explains the user's choice to accept or reject the technology (Egbe & Mutanga, 2016). *Appropriation* it is when users possess and control a physical or material device to access technology products and services. Simple possession of a device, however, does not imply acceptance of technology; rather, it should be present in the user's environment space (Biyela et al., 2019).

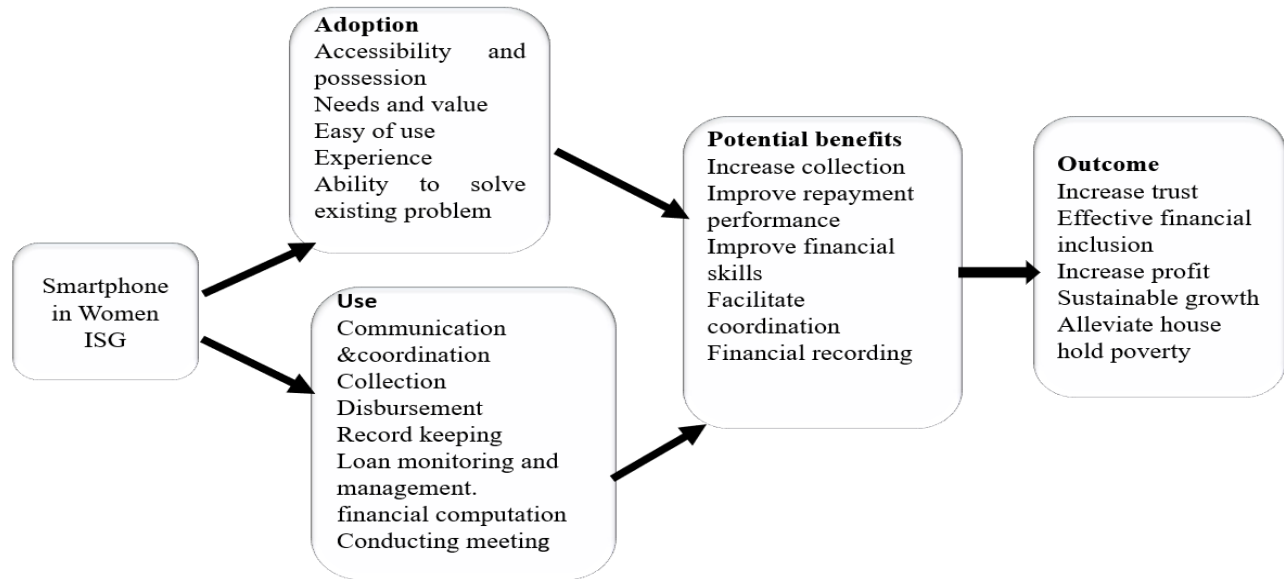
Objectification, therefore, focuses on the way users physically include technology in their environment. That is, how users give space to technology in everyday life (Biyela et al., 2019). *Incorporation* refers to the process by which technology is integrated into daily routines and is deployed by an individual user in the environmental sphere (Letsie, Kabanda, & Chigona, 2015). Such technology must actively aid in the performance of a specific task. Hence, when smartphones are adopted and used in women's ISGs, they must be used to easily and effectively complete functions like coordination, collections, financial monitoring and control, and record keeping (Balagobei, 2019; Biyela et al., 2019; Wambua & Wamuyu, 2020). Lastly, at the *conversion* stage the technology is an taken-for-granted feature in a user's environment and is part and parcel of their daily life; the user demonstrates ownership of such technology, and it becomes part of their identity (Letsie, Kabanda, & Chigona, 2015). Research shows that the domestication of smartphones among individuals and groups involves similar processes; however, this domestication depends on the potential benefit and value attached to it (Biyela et al., 2019; de Reuver et al., 2016; Osazee-Odia, 2016; Tojib et al., 2015). Smartphone use must mediate between life experience and value in order for the user to accept or reject its applications. In other words, appropriation is a key aspect of using a smartphone by an individual or group (De Reuver et al., 2016).

In the current research domestication theory was found to be appropriate as it fits well with research related to ICT for development and hence with smartphone use in financial management by women's ISGs. Most importantly the theory was found to convincingly describe the ways by which women in ISGs incorporated and used the potential opportunity offered by a smartphone in financial management. The research sheds light on understanding the way women in ISGs integrate smartphones into financial management operations. Further, the theory provided understanding of perception, perspective, motive, behaviour and the challenges of adopting and using smartphones by women's ISGs in financial management. Indeed, the use of smartphones for financial management in women's ISGs is based on the good potential gains brought by smartphones to a group's development by reflecting their needs, experience and values. As such, smartphone was deemed to address financial management challenges that contribute to loan default, delayed repayment, corruption, poor meeting attendance, lack of financial discipline, conflict, theft or poor governance (Gomera et al., 2017; Mori et al., 2016; Mwangi & Kimani, 2015). These problems have been attributed to a variety of factors, including the need for physical meetings for collection and disbursement, entrusting money to individuals, manual recording, and other irregularities that allow for illicit financial arrangements. Smartphone use can help regulate financial management and hence subsequently improve profitability, stability and sustainable growth. This is a

precursor of the fourth industrial revolution for facilitating effective financial inclusion and alleviating household poverty. This is as depicted in Figure 1 of the conceptual framework.

Figure 1

Conceptual Framework



Note. Adapted from Biyela et al., 2019; Davis, 1989; Ko et al., 2021; Silverstone et al., 1992; Wambua & Wamuyu, 2020.

METHODOLOGY

Research Design

This was exploratory qualitative research. Exploratory research is recommended in defining, justifying as well as providing underlying causes of the problem (Johannesson & Perjons, 2014). Rumanyika et al. (2019) argued that an exploratory study is typically conducted when the researcher seeks to define and understand the problem before conducting further research. Since the current study is at the initial stage of DSR, that is, problem explication, exploratory research was an appropriate way to define and provide a comprehensive understanding of (including knowledge about, experience of, motivation and ways of identifying behaviour patterns related to) the incorporation and use of smartphones in financial management among women in ISGs.

Study Population and Sampling Strategy

The study consisted of women's ISGs from different parts of the city of Dodoma. We used non-probability sampling techniques such as purposive, snowball and convenience sampling. The sample included 10 groups of women belonging to ISGs with participants residing in urban Dodoma, including a group with at least five participants making use of smartphones for group functioning and with at least six months of group operational experience. Non-probability sampling was used due to the informal nature of the groups. Initially, the purposive method was used to identify a few groups where we interviewed their representatives. After the interview, snowball sampling was applied where interviewees were asked to recommend other participants who would understand the research topic.

Moreover, some participants who were willing to provide information were identified during the data search and these were considered to be a convenient sample. Direct contact and phone calls were used to make appointments for interviews and FGDs. The study planned to collect many data sets; when we reached 10 groups, the research reached its saturation point. Data saturation is a point in the research where no new themes emerge from the data (Corbin & Strauss, 2015) and hence determines the number of samples to be included (Mason, 2010). A total of 42 representatives from 10 groups, with 15 interviews and 22 FGDs between people from three different groups provided data included in this study (see the summary in Table 2). Groups were anonymized and are identified as G1, G2, G3, G4, G5, G6, G7, G8, G9, and G10, as well as FG1, FG2, and FG3 for FGD. Each FGDs was comprised of 5 to 12 members.

Data Collection Methods

The research employed interviews and FGDs to collect qualitative data from the participants. The interview was an appropriate method used to obtain the perspectives, knowledge, experience, and perspectives regarding challenges from different participants. Due to its flexibility, the interview facilitates interactive discussion as well as allowing follow up question basing on research participants' responses (Johannesson & Perjons, 2014). The average time for one interview was 45 minutes.

An FGD is an efficient method for addressing constraints associated with a face-to-face interview while it allows collection of many data from different women participating in ISGs. Furthermore, FGDs brought together people from different backgrounds (as recommended by Johannesson & Perjons, 2014) to jointly define and identify how women's ISGs incorporate and use smartphones in financial management, as well as the challenges they face. The research conducted three FGDs (FG1, FG2, and FG3) on different days. The ISGs participating in FG1 typically operate as a ROSCA, while FG2 and FG3 are more like an ASCA. However, the participants in FG3 belong to the same workplace with a relatively high level of education, while FG2 largely consisted of unemployed people from the neighbourhood. The combined contributions from discussion with these groups of participants offered the researchers a deep understanding and a clear and complete picture of smartphones use in this context. On average, FGDs lasted for 60 minutes.

The researcher obtained research approval from the Director of the College of Education's Dodoma campus as well as the administrative secretary of Dodoma City Council. We also obtained the participants' consent prior to conducting the interviews and FGDs. In addition, the purpose and benefits of the research, individual and data protection as well as participant right were clearly communicated.

Table 2

Data Collection Methods, Number of Group Members and Representatives (Interviewee and Focus Group Discussion)

Group label	No. of members	No. of interviews	No. of FGD's
G1	12	1	
G2	6	1	
G3	5	2	
G4	13	2	
G5	40	3	
G6	23	2	

Group label	No. of members	No. of interviews	No. of FGD's
G7	10	1	
G8	15	1	
G9	14	1	
G10	25	1	
FG1	15	5	1
FG2	23	12	1
FG3	19	10	1
Total		42	3

Note. FGD = focus group discussion.

Data Analysis

The research used thematic analysis to analyse data from the interviews and focus groups. Thematic analysis enables researchers to identify, analyse and report important themes and patterns in qualitative data sets (Clarke & Braun, 2006; Maguire & Delahunt, 2017), and can use participants' opinions and verbalised thoughts to create themes and generate a theory (Rumanyika et al., 2019). In this research, thematic analysis was considered appropriate for identifying interesting themes and patterns and consequently, provided a good understanding of the experiences, perspectives, opinions, reported the use and challenges faced. There are several ways to approach thematic analysis (Alholjailan, 2012; Clarke & Braun, 2006). This research adopted the six steps of thematic analysis described by Clarke and Braun (2006). These steps not only provide a clear and understandable framework for analysing data (Maguire & Delahund, 2017), but also ensure the trustworthiness of research data (Nowell et al., 2017). The research data was in the form of audio and text and were translated from Swahili to English and transcribed. The analysis was conducted as follows:

1. *Become familiar with the data*: During this step the researchers went through the audio, text and images taken during data interviews and FGDs several times to familiarize themselves with data.
2. *Generate initial codes*: At this stage the researchers addressed the research questions in a systematic and meaningful manner. This activity was conducted by highlighting, using different colours, pieces of data that were considered to be relevant, important and interesting to the research questions. For example, one of the codes was interview extracts that showed a smartphone was used to remind group members of the meeting date. The researcher continued with coding on a similar basis for each research question until all transcripts were done. Then the codes were evaluated and modified to fit with the research questions.
3. *Search for theme*: This step was completed by examining the codes and grouping them into patterns or themes that appeared to be related. The research developed many different codes in relation to financial management practices, smartphone adoption and use in financial management, and the challenges the groups experienced in using smartphones in financial management. As such, we were able to identify different themes from these codes; from the above example code (remind group members of the meeting date), we were able to group this a code with others into a broader theme of communication.
4. *Review themes*: During this step the researcher assessed, reviewed, modified and improved the themes identified in step three to determine their relevance, coherence, and identify discrepancies within the themes and in terms of the research questions as well. As a result, some themes were removed, some were adjusted, and others were combined into a single broader theme.

5. *Define themes*: This step involved final refining and deciding which themes to include in the analysis. We focused on the essence of the themes, what the theme represented and the relationship between themes by developing a narrative on financial management practices in women's ISGs. This entailed focusing on the technologies and associated processes that groups adopted and used in financial management as well as the challenges experienced by the groups regarding smartphone use. We identified several themes for each research question. For example, in research question one, coordination, recording, calculation and mobile payment were themes. This step also involved tallying to obtain the frequency, or the number of occurrences of codes relative to themes and subthemes. These narratives highlighted the experiences, opinions, challenges, and perspectives of women in ISGs regarding smartphone use.
6. *Write-up*: This was the final step and involved writing a research report in which the final themes were presented. All the identified themes from the data set, based on relationships between them, were given and were supported by direct quotations from the participants to provide a convincing explanation of that theme.

Research Context

This study was conducted in different locations of Dodoma city. Despite Dodoma being the capital city of Tanzania, Finscope Tanzania (2017), reported that it was a region with a high percentage of people who were only *informally* included. The exclusion rate was reported to have gradually *increased* from 12% in 2013 to 16% in 2017 even though the government offices had relocated from Dar es Salaam in 2016. This attracted the researchers' attention and was the basis of the decision to conduct the study in this area. The study concentrated on urban areas because of the predominance of the selected types of ISGs there. This decision was reinforced by the availability of network coverage (the availability of networks and ICT infrastructure in urban areas is relatively good compared to rural areas). Moreover, the selection of urban areas was made in order to obtain many participants who already owned and were using smartphones in group operations.

FINDINGS

Demographic Profile of the Respondents

The study visited groups with between 5 and 40 members (see Table 2). The analysis of the findings given in Table 3 indicates that the majority of the participants in these ISGs were between 18-37 years old. This implies that the participants in these ISGs were active and energetic and had the desire to be financially independent to cover household consumption. Regarding education, the findings showed that most of the participants had secondary to tertiary education. This implies that financial flexibility and social relations were the determinant factors for using ISGs. Further, the results show that the majority of the women were the small business owners, implying the same as above, i.e., being financially independent. ASCA was the more frequently found form of ISGs over ROSCA. This preference is attributed to the multifunctional services offered by ASCA.

Table 3

Demographic Profile of Women's ISGs Participants

Category	Sub-category	Frequency
Age	18-27	19
	28-37	13
	38-47	09
	48+	01

Category	Sub-category	Frequency
Education level	Primary	07
	Secondary	16
	Tertiary/university	18
Occupation	Housewife	3
	Small business owner	16
	Public servant	13
Form of ISGs	ASCA	32
	ROSCA	10
Economic function of the group	Saving, lending and social support	37
	Purchasing household item	5

Note. ISGs= Informal saving groups; ASCA= Accumulated savings and credit associations; ROSCA= Rotating saving and credit associations.

With respect to the economic function of the group, the results indicate saving, lending and social support were the main functions of the groups visited. This suggests that quick, simple, and flexible financial services that are self-managed fulfil the needs of and attract many members. In addition, personal, independent saving may become difficult since the money may get used unpredictably for daily consumption or be stolen. On the other hand, women's ISGs act as a form of insurance during emergencies like illness or death, as members are confident, they will receive moral and financial support. The attraction of ISGs insurance is because the majority of Tanzanians do not have access to other insurance services or accurate information on life insurance.

Financial Management Challenges Experienced in Women's ISGs

The research findings revealed several financial management challenges caused by poor practice in financial planning, recording and loan management. As a result, groups were facing delayed repayment, loan default, corruption, loss of money and theft problems regardless the education level (Table 3).

Many participants stated that irregularities in loan management, poor loan decisions, low levels of financial skill, payment irregularities, and placing excessive trust were often behind delayed repayment, default and theft. The finding included evidence of the lack of financial skill members as some were borrowing without having any plan regarding repayment resulting in default. Interviewee K, G5 said that "we lack knowledge on the importance of loan as the result we misusing it like buying dresses". Moreover, the finding revealed that many groups' loan management strategies could not effectively expose risks of poor repayment. The researcher observed loans being agreed to verbally and disbursed, borrowers taking loans without any prior plan for repayment and that the groups' funds were kept by individuals. During interviews, the group representatives claimed, "one may build trust by contributing and even buying additional shares after taking the loan, they disappear", "we grant loan without assessing the borrower's repayment capacity", and "defaulter makes us trapped in debt, because when one member failed to repay, other members would be required to cover the loss". To minimize repayment risks to the groups and thus increasing profitability and stability, skills are necessary for assessing whether a borrower is viable.

Poor and improper financial record keeping was noted to be a pressing challenge to all of the women's ISGs covered in this research. Financial documents, such as informal passbooks, exercise books, and credit forms were inconsistent, difficult to compare, irrelevant, inaccurate, untrustworthy, and not

understandable even by the ones who had prepared them. Most representatives reported that poor record keeping was a reason for misunderstandings and enabled fraud in many women's ISGs in Dodoma. They stated that, "Actual treasurers have no recording skill such that many of the records do not match and contain errors and sometime forget to record", "Financial report is not open; where one can be granted or oppressed". Some groups reported not having any paper-based records; they were using WhatsApp accounts to store financial information. Participants said no one could delete information posted in the WhatsApp group. Therefore, they were making decisions and financial references based on what was available in the WhatsApp account. Researchers urge women's ISGs to be empowered by introducing the basics of financial recording as a way to create a proper record for planning, making decisions, managing credit, as well as assessing the business' performance.

Use of Smartphones for Financial Management in Women's ISGs

Types of Smartphone Applications Used in Women's ISGs

The analysis of the results found that women's ISGs were using a variety of smartphone applications. These included online and offline applications. The online applications used primarily by women ISGs were social media applications (WhatsApp, Facebook, Instagram, and YouTube).

It was revealed that none of the research participants had used email, online games, online calendars, or visited other websites. Regarding offline applications, women ISGs were using voice calls, calculators, short message services, cameras, and offline games. The results showed that women's ISGs members were unaware of other mobile functions like e-learning, online financial services, zoom, Excel, online auctions, online training, and government services available online. Hence, they sought assistance when requiring online services like filling in government forms or applying for birth certificates. It was noted that WhatsApp was the most used online application, while short message service and voice calls were considered to be offline applications. It was further found that ISGs preferred WhatsApp to other social media because it was easy to use, while short message services and voice calls were opted for because of their low cost and popularity among group members. This is indicated in the following statements: "Simple to use", "Trusted and ensures delivery of information", "Facilitate real-time charting" and "One megabyte is enough to access the shared information".

Women's ISGs Perception on the Use of Smartphones

ISGs demonstrated a positive perception of smartphone use. Group representatives stated that smartphones had simplified many aspects of their lives. For example, they could communicate and hence, participate in different family, social, and office matters and various functionalities could assist in this by allowing them to share files, make voice and video calls, and send text messages. They added that they had many responsibilities and smartphones enabled performance of tasks like sending money and chatting while at the same time taking care of household activities. Women in ISGs saw the smartphone as a secure and trustworthy tool for information storage, immediate delivery of information, and convenience in carrying out group functions. During the interviews, the participants described different uses of smartphones; it could send reminder messages, be used to discuss group matters, make repayments, keep records, and promote active participation.

"Instead of travelling from one location to another for meetings, we can do everything on WhatsApp while the chat message helps members to follow even those when not online at the time."

This implies that the smartphone has many advantages for participants in ISGs.

Smartphone Uses in Financial Management by Women's ISGs

Communication and Sharing Information

Women participants in ISGs reported using voice calling, group messaging, short message service, and WhatsApp groups to share information. It was noted that when group leaders wanted to inform members about something, they would send them a short message service or messages via WhatsApp group rather than waiting to make an announcement at a face-to-face meeting or when visiting members. When the issue was very urgent, they would use voice calls. The participants pointed out that WhatsApp was easy to use because a message sent once could reach several people, even though they said it was not good to use WhatsApp when the information sought was urgent. Information shared via WhatsApp included calls for meetings, reminding participants about their dues and contacting participants who had not shown up for meetings. Representatives noted that members used their smartphones to offer apologies for not attending the meeting and for sharing social news and greetings. It was said that some groups were using WhatsApp as a medium for storing information and financial records. The researchers observed some WhatsApp group messages as a means of recording a list of debtors, subscription fees due, and photos taken from the meetings. Some of the messages sent via WhatsApp were also shared through SMS. The results mean that the smartphone facilitated the implementation of plans, overcame constraints related to physical meetings, and reduced information asymmetry (predominantly top-down, one-way communication) and hence improve collaboration and performance.

Coordination

The research participants informed us that they did not always need to physically meet with each other to performing group activities. They were using WhatsApp groups to follow up loan repayment, create and share financial records, coordinate group social events, and have other social discussions. It was found that leaders sent loan reports via WhatsApp to remind borrowers of the amount they owed the group (outstanding balance) and repayment period as well as to indicate which of the recipients were responsible for the fund in the next rotation. Based on the findings, eight groups used a mixture of face-to-face and WhatsApp for coordination while the three groups coordinated almost all activities via WhatsApp. "This is a digital group, no physical meeting or hard cash; we work only via WhatsApp. The organizer works by guiding us on WhatsApp, like notifying us the pot receiver and share the payment lists"; "We normally receive a notice reminding us of the contributions needed on the meeting day". This implies that smartphone use significantly improves access to information and repayment performance and consequently overcomes delayed repayment, theft, as well as trust issues.

Mobile Payment

The research findings show that the research participants were using smartphones to carry out various money transactions. They reported that mobile money applications enabled them to deposit loan repayments, pay penalties, buy shares, and to effect loan disbursements for members of the ISG who could not collect them physically. They stated that these applications involved relatively few procedures related to depositing and withdrawing and one could access them from mobile agents found everywhere in the country. On this, they said, "I received the loan I had requested in my mobile account while I was away" and "Mobile money enables us to operate digitally, no hard cash". The results also revealed that some groups were using mobile money as a "bank" and a safe means of transferring and keeping money since no one could steal it "keeping money on mobile account ensures the safety of money". However, the findings reveal that none of the groups were using mobile banking and Internet banking as it was felt not suitable for their operation. "This cannot work in our groups maybe for Savings and Credit Co-Operative Society". It was found that the three groups were mainly using mobile money, while some

were collecting it physically to strengthen solidarity and have an opportunity to discuss how to improve their association. This implies that mobile payment facilitates fund management, saves time, and improves repayment performance.

Financial Calculation

The results showed that women ISGs were also using smartphones for data processing. Women's ISGs reported that they were using calculation software to perform simple financial calculations to determine the current number of shares, fees, fines collected, loan repayments made, interest rate per loan, and gross profit obtained over a period of time. The smartphone calculator has features to perform these mathematics operations thus ensuring the accuracy of financial calculations. "This task involves a lot of calculations. For example, in each end of the session we need to know the total amount of money collected to decide on loans to be provided", "Interest rate calculation requires an advanced tool to compute". These remarks show that accurate financial calculations were recognised as being essential in financial planning and decisions.

Keeping Records

The results show that groups were using WhatsApp accounts and smartphone cameras to store their financial information. Groups were found photographing records of loans and shares recorded in exercise books and then shared them on the WhatsApp groups. The finding revealed that some groups have no paper-based records; they were using WhatsApp accounts to store financial information as no one could delete information posted in the WhatsApp group. Therefore, they made decisions and financial references based on what was available in the WhatsApp account. On this they had this to say, "A scanned copy of collection information is available on WhatsApp.", "We have no worry when we miss the meeting since the summary and collection report are shared on WhatsApp group by the secretary.". Some representatives said that they were taking pictures and videos of members who had attended the meeting then shared them for reference purposes, and some photos were used as WhatsApp profile pictures. "Videos and photos taken in a part last cycle had a lot of memory", "The group profile picture was taken when we visited our college after discharged from hospital". This implies that smartphone cameras facilitate record-keeping and tracking of the group progress, which is an essential ingredient in planning, deciding, and managing group finances.

Challenges Experienced by Women ISGs in Using Smartphones on Financial Management

The related question sought to reveal the perceived challenges of using smartphones in financial management by women's ISGs and these were lack of trust, cost implications, mobile fraud, and network failure.

Lack of Trust

The research participants questioned smartphones' trustworthiness. They mentioned cases which had made them not trust transactions and information supplied via smartphones. One of the dissatisfactions revealed was the fictitious information about loan repayments that was sometimes spread via mobile money and also fake reasons for not attending meetings. The findings show that some dishonest members were using excuses like poor Internet coverage, sickness, and travel for not attending meetings or not making loan repayment. During the interview, group representatives claimed that because it was difficult to authenticate the information some members were using smartphones to cheat the group, "Some members take advantage of the smartphone to deceive us into thinking they are sick or travelling to avoid penalty, but all these have been lies.", "We banned some use of the smartphone to enforce

responsibility among members”. It should be noted that mistrust within the groups jeopardizes stability, confidence, and safety and results in poor repayment, conflict and decreasing membership.

Cost Implications

The research participants complained about the cost of mobile services, including mobile money tariffs and government taxes. Groups incurred expenses when using mobile money services to deposit contributions and withdraw loans and social support to affect collection. They claimed that processing fees charged by mobile money providers on the transactions was affecting collections and repayment. This challenge was found largely to affect the online based groups as they were only transacting by mobile money. During the interviews, group representatives said they were struggling harder than before to get instalments paid; adding extra money for charges was too much for them, and as a result, became factors for delayed payment. One explained: “Imagine for a loan amounting to 500,000 Tanzanian shillings (Tzs), they deduct 8,000 Tzs for transaction”; “We prefer physical money, on mobile money we keep losing money when we deposit and withdraw”; “The charges have caused many of us not use the services. As result, when we miss meetings, it is better to stay with money till the next meeting to avoid incurring such costs”. Based on these findings, it can be said that higher cost negatively affects repayment, encourages dishonesty and increases over-reliance on physical meetings for payment.

Mobile Phone Fraud

The study found that women belonging to ISGs had lost confidence in using smartphones, particularly for mobile repayment and data bundles due to fraud. Some ISG representatives reported losing money following messages instructing them to send a repayment to certain mobile numbers. “It was really painful when I lost repayment money over scammer's message”. They added that some scammers had been calling asking for information about a mobile money balance while the others were tricking them by resending the money that had been sent incorrectly to their account. It was also claimed that the megabytes of data bought did not match with actual use hence affecting their access to critical information, discussion, and providing timely feedback on WhatsApp. “A weekly bundle gets finished in hours, shortly after subscription, you receive a notification asking to subscribe again.”

Network Failure

Network failure was reported to hinder smartphone use in ISGs operations, increasing reliance on physical gathering. This challenge included poor Internet access, weak signal, occasional unavailability, and delayed SMS delivery, particularly in an emergency. The online groups were the most affected as they relied totally on the smartphone Internet for group operations. During the interview, participants claimed that access to stable Internet was a disaster; the Internet was weak as it kept fluctuating from 4G to 2G, thus leading to irregular WhatsApp access.

DISCUSSION

Commodification of Smartphone in Financial Management by Women's ISGs

The commodification process involves analysing potential benefits and opportunities presented by smartphones to assist with financial management. The nature of the group, affordability, ease of use and occupation of members all influence the use of smartphones in carrying out the financial management functions of ISGs. The findings revealed that women's ISGs assessed the value of both online and offline smartphone applications for various financial management domains. Regarding offline applications, women's ISGs used voice calls, calculation software, short message services, and cameras. Women's ISGs chose these applications because they were affordable and easy to use. For instance, a camera and a calculator never require a data bundle for use thus allowing scanning of documents, taking

photos and making videos as well as performing financial calculations all at no cost. On the other hand, short message service and voice calls were opted for because of their low cost and popularity among group members. With respect to online applications, WhatsApp was adopted and used because it was perceived as a trusted, affordable, and easy platform with which to streamline financial operations through the instant delivery of information. It permitted group members to collaborate and to get access to information at a later time in case they did not have data. However, the results show some women in ISGs were unaware of the existence or usefulness of advanced mobile applications. This could be due lack of digital skills and because they only support content that is irrelevant within the context in which these women work and live (Heeks, 2019). Ease of use was found to be an essential factor in the adoption and use of particular smartphone applications. The preferred applications enable women to navigate, locate and use different financial management functions seamlessly with little knowledge and effort. This finding is supported by Davis (1989) who proposed the technological acceptance model and who argued that users' decisions to use or decline a certain technology depend on ease of use.

Appropriation of Smartphone by Women's ISGs in Financial Management

Appropriation is the stage where technology meets the needs and requirements of users in different ways (Ko, Kim, & Kim, 2021). Appropriation is divided into objectification and incorporation.

Objectification looks at the possession of a smartphone and the way the women in ISGs would give the smartphone space in their financial management operations. However, this research focuses on *incorporation* as we assumed that objectification was handled in the sampling process by including only participants who possess smartphones. Incorporation entails how women ISGs adopt, incorporate, and use smartphones to actively facilitate the financial management of the groups including activities such as coordination, collections, management, and recording and as well as the challenges experienced in using smartphones in financial management.

The research findings showed women active in ISGs incorporated and used smartphone applications to remotely support groups activities. WhatsApp was found to be the dominant application and was used by most of the groups. This suggest that WhatsApp is trusted, affordable, and easy to use to streamline group operations due to its ability to instantly deliver financial and social information to groups of people and to get immediate responses. Collaboration between group members enables them to share responsibilities for a group outcome (Appel et al., 2020). The WhatsApp environment enables ISG members to work together to plan, make decisions and monitor financial and social matters and in this way promotes trust, responsible lending, good fund management and active engagement. This finding is in line with Biyela et al. (2019), who found that WhatsApp enabled discussions and maintenance of relationships in Stokvels, and the finding that notifications received by members reduce delayed repayment (Wambua & Wamuyu, 2020). Among the groups studied in the research at Dodoma, three were principally operating on WhatsApp and had no physical collection or meetings while the blended groups include face-to-face meetings to strengthen solidarity. This means that women participating in ISGs could leverage smartphones to some extent overcome the lack of proximity and delayed repayment. Given that traditional groups demand constant movement of members and organizers from one place to another to attend meetings and given the nature of the responsibilities that women have, physical distances continued to hinder meeting attendance and cause make collection difficult. This finding is supported by Biyela et al. (2019) and Mwangi & Kimani (2015). Digital groups are flexible and convenient for participants to engage in wherever they are. Nevertheless, due to the absence of an appropriate smartphone platform, some groups faced a problem of untrustworthy online communications.

The findings revealed that smartphone use contributes to untrustworthy behaviour and fraud by group members and organisers. Some ISGs members were reported to have taken advantage of smartphone communication to report fictitious reasons for not contributing, not repaying dues and not attending the meetings. Dishonest members used poor Internet connectivity, lack of airtime or Internet data as excuses for not attending meetings or making loan repayment. Another challenge use was mobile phone fraud and some participants reported being scammed and losing their repayment. Given the widespread occurrence of cyber-crime, we suggest a sensitization campaign to enable women ISGs to identify indicators of mobile fraud. The findings further indicated dissatisfaction with the validity of data bundle sales and management of use by network providers as the data bundle size appeared not to reflect actual use. The bundle was finished very quickly, and the purchaser was notified to buy more to continue to access online information in order to affect participation and access the shared information. A similar complaint was reported by Edward (2021), in the Citizen Newspaper when the Tanzania Communications and Information Technology Minister directed the regulatory authority to address citizens' complaints regarding data bundles whose size did not match with the money they had recharged with. Given the importance of the Internet for accessing digital information (Lwoga & Chigona, 2019), data use needs to be transparent and easy to understand to allow Internet access and customer satisfaction. Hence, mobile network providers should educate customers on the effective use of data bundles to eliminate complaints.

Another important finding was that WhatsApp was serving as a medium for storing information and financial records. Collections of financial reports, photographs and videos that could be shared and stored on WhatsApp page where everyone can see it were useful. This feature was felt to increase trust by enhancing the visibility and access to information as no one could manipulate or delete the shared data. This agrees with other research where the WhatsApp platform was found to promote transparency and access to information by Stokvel members where a payee would share evidence of repayment via WhatsApp with the rest of the members (Biyela et al., 2019). It was found that the women in ISGs were exploiting a new form of financial recording by taking photographs and making videos of different events to show which members attended the meeting as well as scanning (photographing) reports and other information on paper and then sharing them for reference. This suggests that new smartphone applications created for the financial management can be incorporated by women's ISGs in an interesting way as the potential benefits of applications in financial management influenced smartphone acceptance and use. This is consistent with Davis (1989) which shows that perceived usefulness influences behavioural intention as well as actual behaviour when accepting technology such as this. This can be explained based on the financial recording systems in many women's ISGs that were paper-based, inconsistent, had many errors and were only accessible by leaders to cause misunderstanding (Bank of Tanzania & Financial Sector Deepening Trust, 2016) and affect financial audit, loan follow-up and future reference (Mwangi & Kimani, 2015). The type of group determined the financial record system used; ASCAs based groups were found to have more paper-based records than ROSCA groups. This was attributed to their multifunctional model (offering both loans and social insurance). However, it was also found that the groups were unaware of the standard requirements of financial recording. Such weaknesses in financial records attract fraud. In light of this, we recommend providing training covering the basics of financial recording as a way to facilitate planning and decision management relating to providing credit, assessing financial progress, maintaining financial history, and expanding opportunities (Mramba, 2018). Moreover, we believe that it is imperative that a relevant digital recording system that would automate financial recording be designed and that it should be shared with participants. Automated electronic recordkeeping systems offer opportunities to generate and maintain accurate and up to date financial reports and to share these with all members within a short time (Balagobei, 2019).

The finding further shows that women's ISGs were using smartphones to access mobile money services applications and hence to make remote repayments and deposit savings. The mobile money system was believed to simplify the payment of shares, loan instalments, and fees and at the same time, to be a simple and convenient way to receive the approved loan or social insurance payment when the ISG member could not transact physically. This suggests that the mobile money system has the advantages of accessibility, timesaving, being able to complete the transaction at a convenient time and at one's own pace and a smaller number of procedures needed to complete the transactions (GSMA, 2020). In addition to accessing the mobile money application remotely via a smartphone, it can also be accessed in person from the nearest mobile money agents when cash is deposited or collected. The nature of the groups and the occupation of members influenced the use of mobile payment; as such, online groups and groups made up of civil service workers use mobile payment extensively. This indicates that not only can mobile money overcome problems associated with physical collection of payments and delayed payments, but it also improves financial inclusion for women. Digital financial inclusion is reported to be a critical enabler for attaining other sustainable development goals, especially in the emergent economy (Klapper, El-Zoghbi, & Hess, 2016). Electronic payment creates a robust mechanism to overcome financial barriers and offers cost-effective access to financial services (NFIF, 2017). Another important finding was that women's ISGs use mobile money as a bank and a safe means of protecting group funds from being stolen. Instead of individuals keeping group money, the money was kept in mobile money accounts thus reducing the likelihood of theft and other forms of fraud (Ksoll et al., 2016). Moreover, mobile money made repayment easier and more convenient and, as a result, reduced delays in repaying instalments for outstanding loans. This, therefore, increased trust and information symmetry among group participants and encouraged inclusive and sustainable growth. This finding is in line with those of Biyela et al. (2019) and Ksoll et al. (2016) that mobile payment reduces the risk involved when entrusting individuals with holding group money while expanding financial opportunity by creating history (Nazir, 2019).

However, the majority of the groups visited were *not* using mobile or Internet banking services as they felt these were not meant to them. This is contrary to the findings regarding Stokvels in South Africa whose members use mobile banking (Biyela et al., 2019). The ISG finding may be due to lack of exposure to a wide variety of digital services, time constraints, or because procedures are unfamiliar. Furthermore, the research found the high charges for mobile money transactions to discourage use of mobile money for repayment and therefore to increase reliance on physical cash. The charges per transaction were noticed to indeed be high and research respondents stated that they incur many additional charges when depositing or withdrawing money. This cost was found to cause delayed repayment, associated reduced fund collection, dissatisfaction, excessive reliance on physical cash and increased theft. When an ISG member did not complete a transaction at a meeting they would keep the money until the next meeting to avoid incurring costs. On the other hand, the online-based groups were the most affected one. The finding confirms that of Biyela et al. (2019) who show that Stokvels used cash because mobile money and banking services were considered to be detrimental because of transaction charges. Stillman (2017) also reported that high mobile money charges hinder informal savings groups choosing to be linked to formal financial institutions. Mobile money is a valuable mechanism for expanding financial inclusion, particularly in emerging economies, thus the transaction charges need to be reasonable for effective inclusion specially to low-income earners.

The use of calculation software was also found to be beneficial to women's ISGs as it helped them to calculate the number of shares, fines collected, loans repaid, loan interest rate and gross profit obtained in a session. It was noted that financial calculations were important for group decision-making related to the loan disbursed, gross profits earned by individual members, and when making dividend decisions.

However, this would also work well using an application that automatically performs financial computations thus producing accurate information. Women ISGs need a more sophisticated smartphone application that includes advanced features for advanced use (Ko et al., 2021), for record keeping (Balagobei, 2019), as well as for loan management (Wambua & Wamuyu, 2020), rather than being limited to WhatsApp and calculators and cameras.

This study had various limitations; although the research was meant for women ISGs who possessed smartphones, some groups were found to have strict rules on smartphone application use as a way to carry out the group functions. This limited the study from capturing detailed data on smartphone use. Moreover, the ROSCA and ASCA ISG types differ regarding operating procedures. This research combined data from the two, thus bringing in complications in data analysis and interpretation as the researchers faced difficulty in separating the information collected. Tanzania is a big country with several women ISGs found throughout both rural and urban areas. The study reported on here was confined to Dodoma which is urban. Given the variations in social and economic development the findings cannot be generalized hence call for extension of the research to the other parts of the country.

Recommendations Based on the Study Findings

Given the functions of the women's ISGs, their characteristics, and the challenges confronting them, the following are recommended as possibilities that can improve their associations:

1. In the long run, designing and applying a smartphone application to address financial management challenges facing women's ISGs is essential. The study clearly shows that the use and application of smartphone technology will potentially improve the performance of ISGs by increasing collection, reducing the need for physical proximity, eliminating corruption, enhancing self-management of funds, overcoming financial recording problems, and increasing the financial skills to members.
2. Financial Technologies (FinTech) should be used to digitise the financial activities to create accurate, reliable, and real-time information about the ISG's financial status. Digitising functions like savings, loan disbursements, revenues, and expenditures will enable and support robust loan management strategies, reduce conflicts, increase transparency and trust among group members rather than relying solely on trust and social relations.
3. Learning technologies - ISGs members are characterized by financial illiteracy. They need training as to how to reach proper financial and investment decisions for individuals and groups to invest the loan/fund in a profitable business that retains the value of money for smooth repayment. Digital learning facilities like video tutorials, e-textbooks, online games, multimedia, and mobile applications can allow ISGs members to get skills and knowledge at their own pace and time.
4. Formalization of women ISGs is foremost important to prevent abuse behaviours brought by defaults, corruption, and theft, then expanding opportunity to formal financial and insurance institutions. This can be achieved through linking information between national identification and Sim information. Such information will facilitate access to credit and insurance and reduce tracking offences committed by participants as well as linking them to formal financial and insurance institutions.
5. Digital resources play a critical role in improving work and human life. This study provided insight into the important role played by smartphones in improving financial management of women ISGs and the overall group functioning. It is recommended for regulators and authorities to create a conducive environment to enable many people, particularly the low-income earners, to benefit from these opportunities by reducing costs of data bundles and mobile money transaction charges.

CONCLUSION AND FUTURE WORK

This research offered insights on the smartphone's use in financial management among women in ISGs in Dodoma. The finding shows women ISGs use both online and offline smartphone applications for different group functions. The online application, i.e., WhatsApp, was used for communication, coordination, and storing of information as it was deemed to increase trust, reduce physical proximity, and promote collaboration among group participants. On the other hand, offline applications such as cameras, calculators, mobile payments, short messages, and voice calls were also used in communication, keeping records, financial calculations, and performing transactions. Popularity, easiness of the application, nature of the group and occupation were important aspect on the use of smartphone in financial management.

Camera and calculation smartphone application was revealed as a new promising application in record keeping by women ISGs that were not captured in the previous literature. For example, camera was being used as a means for storing information by capturing events as well as scanning financial reports written on papers then shared on WhatsApp page for references. Although the smartphone has showed remarkable opportunity in financial management, but at a small extent linked to the financial management of the groups to resulted in mistrust and irresponsibility among some members. Such inefficiency was attributed by the lack of skills in basics of financial management (financial skills, financial recording and loan management) as well as the absence of smartphone applications relevant to the financial management of the groups. Further women ISGs consider advanced smartphone applications were not relevant to them and their financial management functioning. This suggests training on the basics of financial management for proper functioning and sustainability as well as designing relevant smartphone applications to accommodate financial management needs and requirements.

There are some studies on the application of mobile technology solutions in ISGs (Arnold, 2020; Biyela, Tsibolane, & Belle, 2019; Mukenya, 2019; Wambua & Wamuyu, 2020). However, these researchers did not focus on smartphone technology, financial management and women to make this research unique in this context. Additionally in Tanzania, research on the realm of technology for development particularly in informal sectors has less been studied. A few research examples include mobile training in micro business by (Gomera et al, 2017), mobile marketing application for entrepreneurship development (Kapinga, Montero, & Mbise, 2018) as well as Mobile technology for street trading in Tanzania (Rumanyika et al., 2021). Yet, the application cannot address the financial management practice and challenges. This work will facilitate future studies since researchers intend to design a contextualized smartphone application solution to facilitate acquiring of the basics of financial management skills.

Previous research by Mramba (2018), recommended for the designing and developing technology-based solutions for informal workers. However, to have a successful technology solution for informal workers, high level of participation and contextualization are needed (Rumanyika et al., 2021). The research will adopt DSR to define user requirements and then design smartphone application with aids of Johannesson and Perjons (2014) framework. The smartphone is relevant in ISGs because it provides a personalized environment for members to engage in group financial management matters seamlessly and conveniently, considering that majority of them have smartphones. Women ISGs can leverage the power of smartphones to improve group performance, overcome constraints connected to physical collections, reduce conflicts, increase security, improve financial skills hence ensuring sustainable group growth and making a positive contributable impact to household development.

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