# Save My Money: Digitizing Informal Savings in Pakistan

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## Abstract

Around the world, Rotating Savings and Credit Associations (ROSCAs) are a prevalent saving mechanism in markets with low financial inclusion ratios. ROSCAs, which rely on social networks, facilitate credit and financing needs for individuals and small businesses. Despite their benefits, informality in ROSCAs leads to problems driven by disagreements and frauds. This further necessitates ROSCA participants' dependency on social capital. To overcome these problems, to build on ROSCA participants' financial proclivities, and to enhance access and efficiency of ROSCAs, we explore opportunities to digitize ROSCAs in Pakistan by building a digital platform for collection and distribution of ROSCA funds. Digital ROSCAs have the potential to mitigate issues with safety and privacy of ROSCA money, frauds and defaults in ROSCAs, and record keeping, including payment history. In this context, we illustrate features of a digital ROSCA and examine aspects of gender, social capital, literacy, and religion as they relate to digital ROSCAs.

## Author Keywords

ROSCAs; Mobile Money; Mobile Wallet, Gender, Pakistan

**A ROSCA Participant**
Razia, a forty-year old woman is the organizer of a ROSCA. She and ten of her neighbors meet on the first of every month, when they each contribute Rs. 5000. The cumulative amount (Rs. 50,000) is taken by one woman each month, and with the cycle completing in ten months, after each member receives her turn. Razia, the organizer keeps the first pot, which she needs to pay for her daughter's medical treatment. The other members receive their turn in the upcoming months through a lucky draw.

**ACM Classification Keywords**
H.5.2. Information interfaces and presentation (e.g., HCI); K.4.4. Electronic Commerce

## Introduction

World Bank states that around two billion people in the world and 100 million in Pakistan do not have access to formal financial services. Financially excluded individuals and businesses often rely on informal channels to meet their financial needs for savings, credit, and insurance [1]. According to the Financial Inclusion Insights (FII) data, in Pakistan 36% of people save money and only 4% of those save money with a formal financial institution. A majority (63%) saves cash in a hiding place and 33% save money through Rotating Savings and Credit Associations (ROSCAs) [2]. ROSCAs are a popular form of savings found throughout the world in regions of Latin America, Africa, and Asia.

In Pakistan, ROSCAs, also referred to as interest free loans or committees [3], are formed through social networks. ROSCA members contribute a fixed sum of money to a collective fund from which every member receives the full sum at least once during the lifetime of the ROSCA [4] [5]. The extent of social interconnectivity varies from ROSCA to ROSCA. In some groups all members know each other while in others they rely on the organizer's social network. These social connections act as a guarantee for a member's ROSCA contributions. The most common ways in which ROSCA funds are distributed are through lottery and nomination (bidding) [6]. Bidding requires interest payments, so participation often depends on religious norms. ROSCAs exist both in markets that lack formal financial services as well as in well-developed financial markets [7].

ROSCAs have both savings and credit aspects. The credit aspect is advantageous for members who require funds at an earlier date than if they had saved by themselves. Members achieve the savings aspect as a commitment device, forced financial discipline, and/or a tool to cope with the social pressure of lending within their social circle. Savings may have a defined purpose, where members save money to purchase durable goods, or they can provide insurance to meet expected or unexpected future financial needs [8].

However, ROSCAs exhibit some problems. The Wave 3 FII survey reveals frauds committed by organizers or members, record keeping issues, delays in payments, privacy and safety concerns, and member disagreements [2]. We argue that digital financial services could minimize many of these issues and scale ROSCA benefits to larger groups connected through information and communication technology. We propose a digital ROSCA solution in this paper and aim to investigate the potential benefits of digital ROSCAs, which include solving record keeping issues, privacy and safety of ROSCA money, handling frauds and defaults, providing a platform to make purchases, and building payment histories and credit ratings of individuals. These benefits are explained later in the paper. Along with these possible benefits this research also aims to look at some open research questions, which are as follows.

- How can the social aspects of ROCASs be integrated into a digital ROSCA?

- How do gendered issues affect the digitization of ROSCAs?
- What design features do digital ROSCAs require within the context of an Islamic society?

Currently, the Information and Technology (ITU) Fintech Center, in collaboration with the Digital Financial Services Research Group at the University of Washington (UW), is pursuing the digitization of ROSCAs. This project is funded by the Bill and Melinda Gates Foundation and Karandaaz Pakistan. We plan to share the results of this eight-month research project at the upcoming CHI conference.

## Proposed Design of a Digital ROSCA:

According to the FII survey, more than half of ROSCA users in Pakistan own a mobile phone and 31% of ROSCA users can send and receive a text message [2]. During our project, we will explore an approach for digital ROSCAs by understanding technology use of ROSCA organizers and members. Mobile money platforms can work through USSD, SMS, and smartphone applications. A digital ROSCA could either be a stand-alone application or embedded into an existing mobile wallet.

***Digital ROSCA Features:***

We envision a digital ROSCA to have features translated from traditional ROSCAs as well as novel features, which will address issues that we discover during our field research. We expect that some of these features can be developed in the short run while others might require longer implementation.

A major contribution of our work will focus on interface design for digital ROSCAs. ROSCA participants have varying levels of literacy and income. We plan to design an interface that will be equally usable for literate, low-literate, and illiterate users. Different techniques have been recommended to make interfaces more usable for low-literate or illiterate users, which include a preference for text-free designs over text-based designs [9], audio and graphical guidance [10], and voice-based interfaces [11].

***Expected Outcomes:***

Here we outline the expected outcomes, some of which can be achieved in the short term, whereas some will require long-term implementation. These outcomes are based on previous research and discussions, and will be refined through our qualitative research.

*Solving Record Keeping Issues:*

It is the ROSCA organizer's responsibility to keep track of all the transactions. The complexity of record keeping can increase with group size or with literacy challenges of the organizer. Other aspects that complicate record keeping include when members' trade turns or when there are delays between payment collection and distribution. A digital ROSCA application could streamline these record-keeping issues.

*Privacy and Safety of ROSCA Money:*

Currently, ROSCAs do not ensure safety and privacy of the money that has been collected. This can result in loss or theft where either the organizer or all of the ROSCA members have to bear the loss. Digital ROSCAs will overcome the issues of carrying and handling cash in physical form as the physical cash will be replaced with digital money.

*Handling Defaults and Delayed Payments:*
Delay in payments is a common issue for ROSCA members. The organizer must call and request member payments by the due date and recover the money in the case of a delay. We want to explore why defaults occur and how organizers and other group members deal with such defaults. When groups are created, the participants and the organizer make a decision based on previous social interactions about an individual's ability to make payments. Inevitably some members will default, and the extent of the default will vary (i.e., a few delayed payments, no payments, etc.). Considering these groups are built on social capital, we want to see how crucial social relationships are in managing defaults and the empathy of other members towards underlying reasons for default. A digital ROSCA could make use of social capital to handle the default and delay issues. For example, a member could receive a negative rating if they do not make timely payments.

*Handling Frauds:*
Organizers or members can perpetrate frauds. Organizers could abscond with the collected money, whereas members might delay their payments or stop making payments altogether once they receive a collection. According to FII, 12% of ROSCA users reported losing money either through organizer or member fraud. We will determine if common elements exist between frauds, and ask about how members who were affected by fraud perceive ROSCAs. One goal of a digital ROSCA is to overcome such frauds by keeping track of payments and distributions. With a formal record, defaulters may be exposed or face legal action.

*Using a Digital ROSCA to Purchase Goods:*
As discussed above, one of the major reasons to join ROSCAs includes purchasing durable goods. The FII data indicates that 19% of ROSCA participants use ROSCA money for one-time purchases (e.g., televisions or air conditioners). Digital ROSCA participants could be linked directly with manufacturers or vendors, who could potentially offer flexible plans for purchase.

*Building Payment History and Credit Ratings:*
People who successfully participate in ROSCAs exhibit a certain payment capacity and financial discipline. However, without a formal record they cannot capitalize on their financial behavior. We aim to build credit history and ratings of ROSCA users based on their performance in ROSCA groups. These credit ratings may increase access to formal borrowing for individuals. Alternatively, those who default would risk receiving a poor credit rating, which may restrict them from future ROSCA participation.

## Methodology

This qualitative study will include 80 semi-structured interviews with ROSCA organizers, ROSCA members, and individuals who choose not to participate in ROSCAs. We will indicate gender, age, income level, locality, and literacy. To complement these interviews, we will also seek perspectives from the digital financial services (DFS) industry. Interviews with product managers will yield feedback and expectations on our work. Findings and recommendations from the collected data will be used for design and development of the digital ROSCA system. After development we will test the digital ROSCA platform with selected users.

Prototype development will be facilitated through the UW Demo Lab with its simulated mobile money environment and support to carry out basic mobile money operations. We aim to conduct initial testing with fake money, whereas real money could be used in future testing with access to industry APIs and agreements with industry partners. The following themes will be discussed with ROSCA participants, ROSCA organizers, and industry experts.

*Legal Issues and Institutional Design Considerations:*

Before embarking on development, we must understand the legal nuisances related to digitizing a ROSCA. All financial products are subject to regulations, which can impact their design and testing. When digitizing ROSCAs, questions arise on the governance of ROSCAs. We imagine four possible variations of the digital ROSCA, which progress from informal to formal. We define informal as completely based on social connections to enforce rules, whereas formal means involvement of a licensed entity to enforce rules. The first model is connecting ROSCA groups through an app where the organizer uses the app for record keeping to generate a payment history. In this case the legitimacy of the payments can be questioned and subject to fraud, limiting usefulness for credit rating. The second model would include ROSCA groups formed through social networks, with payments conducted through mobile wallets. This would create a payment history that could be used for assessing credit ratings. In this model the risk of defaults falls on the group members. The third model would use a rating system to digitally connect members who were not part of the same social network, thus increasing the size and reach of ROSCA groups considerably. This could also mean flexibility in size of individual contributions such that members who can contribute a fraction of the single contribution can participate in a group when paired with other such members to form one complete contribution. This could be enabled through algorithms. A fourth model would establish institutional ROSCAs, which would allow individuals to connect with a bank to make periodic ROSCA payments. Here the risk of default will be borne by the bank.

We have two design ideas for digital ROSCAs. The first would be a standalone application for ROSCA and the second would be a ROSCA module embedded within a wallet application. In the case of the embedded application, the constraints of usability for existing apps might not be suitable to our target audience. The advantage would be the ability to reach the existing user base of a mobile wallet. Creating a standalone application may have legal complexities because it must be offered by a licensed entity. Holding money deposits is not allowed without a license, and therefore the money flowing in and out of the ROSCA app could be directed to an individual's mobile wallet with the ROSCA app serving as a conduit.

*Functioning of and Issues for Existing ROSCA Users:*

We will inquire about people's perceptions regarding ROSCAs, what factors are considered when forming a ROSCA, what motivates individuals to join a ROSCA, whether or not people have faced issues with ROSCAs, and how people feel about a digital version of a ROSCA.

*Informal Savings: An Alternate to ROSCAs?*

FII data indicates that hiding cash at home is the most prevalent informal saving mechanism. We will ask non-participants of ROSCAs how they save, if they save at

home, if they considered joining a ROSCA, their perceptions about ROSCAs, aspects that restrict them from participating in ROSCAs, if they would be open to a digital ROSCA, and design considerations which might facilitate their participation in a digital ROSCA.

*Modality of ROSCA Users:*

As we are proposing a technological intervention we also need to determine the modality of potential digital ROSCA users. Modality refers to the type of mobile phones and ownership models, internet access and usage, and technical literacy of the participants.

## Context Specific Design of Digital ROSCAs

*Gendered Aspects of ROSCAs:*

Pakistani society has a high level of gender segregation. Gender is an important variable in ROSCA group formation as per the FII data. Women are twice as inclined to participate in ROSCA savings as compared to men. Where women take the lead on participating in ROSCAs, they lag behind in mobile usage in developing countries. Many households in developing countries share a mobile phone between two or more family members. This aspect of mobile usage raises privacy concerns in the case of using digital ROSCA applications and needs to be addressed in our interviews. By creating a digital ROSCA, we will provide the group a platform to communicate with each other. Joining the platform for discussion will be entirely on the user. We will need to ascertain the prospects of a potential user accepting or declining such platforms. We will consider recommendations on all these factors when designing our intervention.

*Social Aspects in ROSCAs:*

Social capital is defined as the trust, information, or benefits that people gain from their social networks [12]. It is evident from previous research that social capital and trust have strong roots in overall ROSCA group formation and functioning. We aim to explore the extent to which social capital is critical to ROSCAs today in comparison to the earlier development of ROSCAs. We will need to determine the social benefits of ROSCA participation and anticipate how these valued social aspects can be integrated into the digital ROSCA.

*Religious Aspects of ROSCAs:*

The lack of interest free saving options in formal financial instruments results in people to saving informally in order to maintain religious norms. Within Islamic societies the collection of interest is problematic. The nomination (bidding) ROSCA models, generate concerns because of interest. Further exploration about how to design within the context of an Islamic society will be critical to successful adoption and use.

## Conclusion

In this paper, we propose a digital ROSCA, which will digitize the current system of Rotating Savings and Credit Associations (ROSCAs). We discuss issues of the current ROSCA models and present the expected outcomes of our proposed solution, which may mitigate some of these issues. We propose an extensive qualitative study followed by design and implementation phases. Ultimately, if successful, our model could have applications in a wide range of geographies where people utilize ROSCAs.

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