

# **BANK NKHONDE**

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**Abstract:** *Bank nkhone is an already existing way on which peers come together and give each other services same as the bank but with affordable rates that every single member is comfortable with. This system will just digitize what is done manually by the people. The goal of the system is to help the people to reduce the manual power, the redundancies that are there and financial services this includes mathematical calculation, financial alerts, data storage in a box where the users will apply for a loan which will hold as evidence that they applied for the loan and how much they asked and how much was agreed. The algorithm to be used is the banker's algorithm, banker's Algorithm is a deadlock avoidance which is used for deadlock detection it tells that if any system can go into a deadlock or not by analyzing the currently allocated resources and the resources required by it in the future. The resource-allocation state is defined by the resources and the maximum demands of the processes. The system will use a methodology where it allows the programmer to repeat certain stages that the programmer thinks it was not properly done or the owner of the system has suggested which is called the iterative methodology.*

**Keywords:** Bank nkhone

## **I. INTRODUCTION**

The system will help to reduce the work done by the treasurer who is like the chair of the bank nkhone group, the treasurer does all the calculations and makes sure that everything is delivered as wanted when the group was initially published. The system will show a 15% increment that each member that has taken a loan should pay which will help the fund of the group to increase regularly. The group operates on a specific duration of their choice and the number of members per group are of their choice and so the system allows the groups to have as many members as possible they want but should not be of a very high number. The treasurer will be the admin who will add members to the created group and will also remove or delete a member in case they are deceased or no longer a member of the group. In case the user will not be available for or a meeting or there is a new thing that has come up the user will be able to inform the admin using the inbox where only the admin will access the messages and the admin will be able to receive messages from all the members of the group.

## **II. RELATED WORKS**

- (1) Microfinance Institutions are financial institutions that offer financial services to low-income individuals who typically lack access to traditional banking services. Unlike bank nkhone proposed system, MFIs generally the interest rates on loans are higher and require collateral from borrowers.
- (2) Peer-to-Peer Lending Platforms these lending platforms connect borrowers directly with individual investors who are willing to lend money. However, P2P lending platforms typically charge interest rates that are higher than those offered by traditional banks and may require borrowers to have a good credit score.
- (3) Cooperative Societies are groups of individuals who come together to provide financial services to their members. Just like bank nkhone system, cooperative societies offer affordable financial services, but they typically require members to contribute to a common fund.
- (4) Mobile Money Platforms allow users to perform financial transactions using their mobile phones. While mobile money platforms may offer some of the services provided by bank nkhone such as data storage, they do not typically provide other financial services such as loans or savings accounts allow individuals to raise money for various projects or causes. such as low transaction fees, they do not typically provide other financial services such as loans or savings accounts.

(5) Online Banking Platforms allow users to perform financial transactions using the internet, online banking platforms are typically owned and operated by traditional banks and may charge higher fees and interest rates.

(6) Cryptocurrency Platforms is used to perform financial transactions using digital currencies. While some cryptocurrency platforms may offer affordable services, they are not yet widely adopted and may not be accessible to all individuals.

(7) Savings and Credit Cooperatives (SACCOs) savings accounts and loans. However, SACCOs typically require members to have a good credit history. Which limits the number of peers that could be allowed to participate this paper focuses on providing affordable financial services through a peer-to-peer model that digitizes manual processes. Unlike some of the other papers listed above, BK may not require collateral or a good credit score, making it more accessible to a wider range of individuals.

### III. METHODOLOGY



Fig 1- Iterative model

Iterative methodology is a software development methodology that involves breaking the project down into smaller pieces, and each piece goes through a cycle of planning, design, development, testing, and feedback. The process is repeated until the final product is delivered.

Iterative methodology differs from other methodologies in that it is more flexible and adaptive to changes during the software development process. It enables the project team to deliver a functioning product early in the development cycle, which provides a way to test and obtain feedback from the end-users to improve the product.

Iterative = (Plan + Design + Develop + Test) \* Feedback

- Plan: The project team determines the scope of the project, defines the requirements, and sets the goals.
- Design: the second part the team creates a detailed design of the software, including architecture, user interface, and database schema.
- Develop: the team writes the code for the software and integrates it with other components.
- Test: on here the software is tested to ensure that it meets the requirements and is free of defects.
- Feedback: collecting feedback from the end-users and stakeholders to improve the software.

### IV. ALGORITHM

The Banker's algorithm is highly accurate in preventing deadlocks and ensuring the system's safety. It uses a mathematical model to track resource allocation and future resource requests, making it effective in avoiding deadlocks. The FCFS algorithm is a simple and straightforward approach that allocates resources to processes based on their arrival order. While it is easy to implement, it does not consider the urgency or priority of processes. The SJN algorithm prioritizes processes based on their execution time or burst length, aiming to minimize waiting times and optimize resource utilization. It can be accurate in terms of reducing waiting times, but it may suffer from the starvation problem, where longer processes are delayed indefinitely.

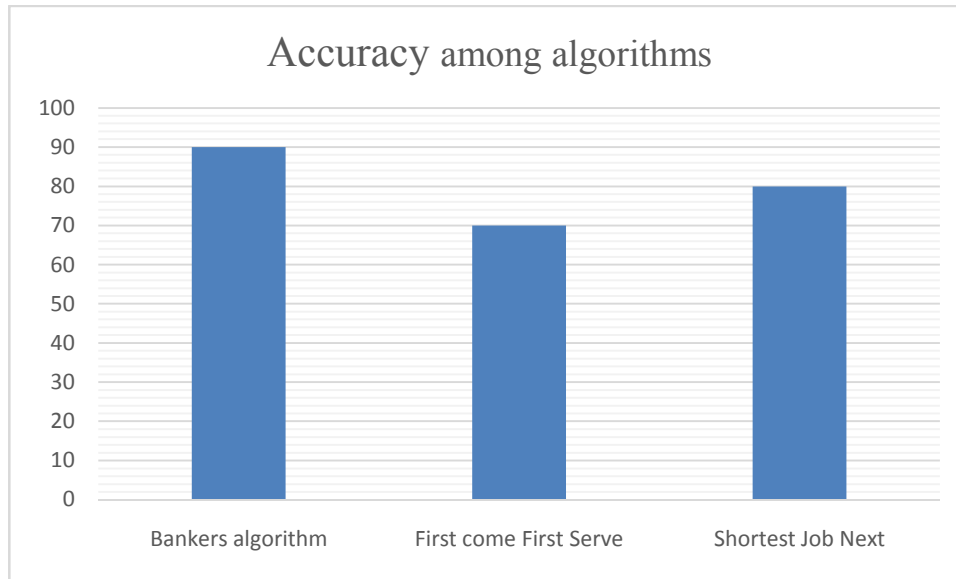


Fig 2- Accuracy among algorithms

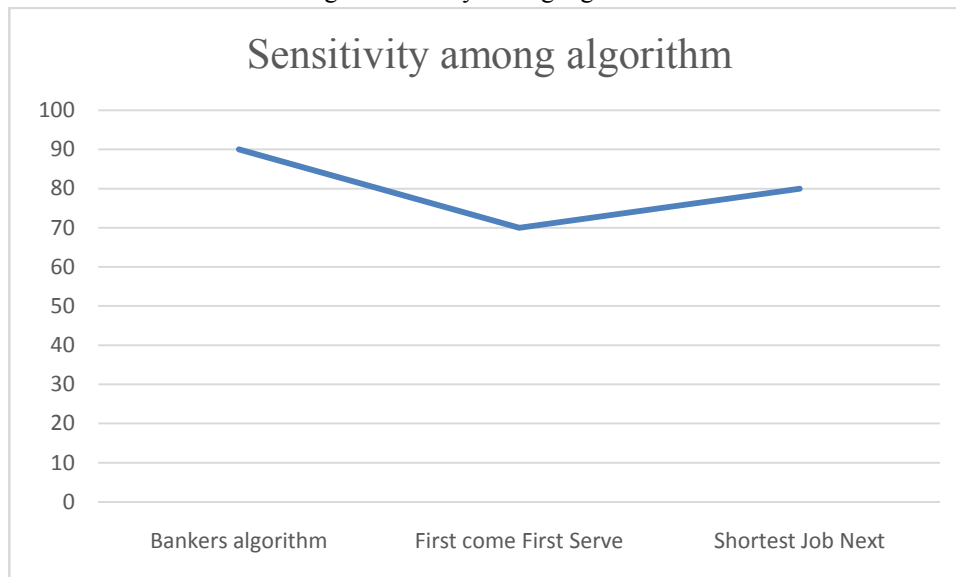


Fig 3- Sensitivity among algorithms

It can be considered how responsive they are to changes in the system's state or resource availability. The Banker's algorithm is moderately sensitive to changes in the system's state. It continuously analyzes the resource needs of processes and can adjust resource allocation based on future requests. The FCFS algorithm has low sensitivity to changes as it follows a rigid order of resource allocation based on arrival time. It does not consider the urgency or specific resource requirements of processes. The SJN algorithm is moderately sensitive to changes in the system. It prioritizes shorter jobs, allowing them to execute quickly and reduce waiting times. However, it may suffer from the "starvation" problem if long processes continuously arrive, as they will have to wait indefinitely.

on specificity, considering their ability to meet specific resource allocation requirements. The Banker's algorithm is designed to handle specific resource allocation requirements and prevent deadlocks effectively. It considers the maximum resource needs of processes and ensures that the system remains in a safe state. The SJN algorithm is specifically geared towards optimizing resource allocation by prioritizing shorter jobs. It aims to minimize waiting times and improve resource utilization. The FCFS algorithm, while simple to implement, does not prioritize specific resource allocation requirements. It follows a strict order of arrival, allocating resources to processes as they enter the system.

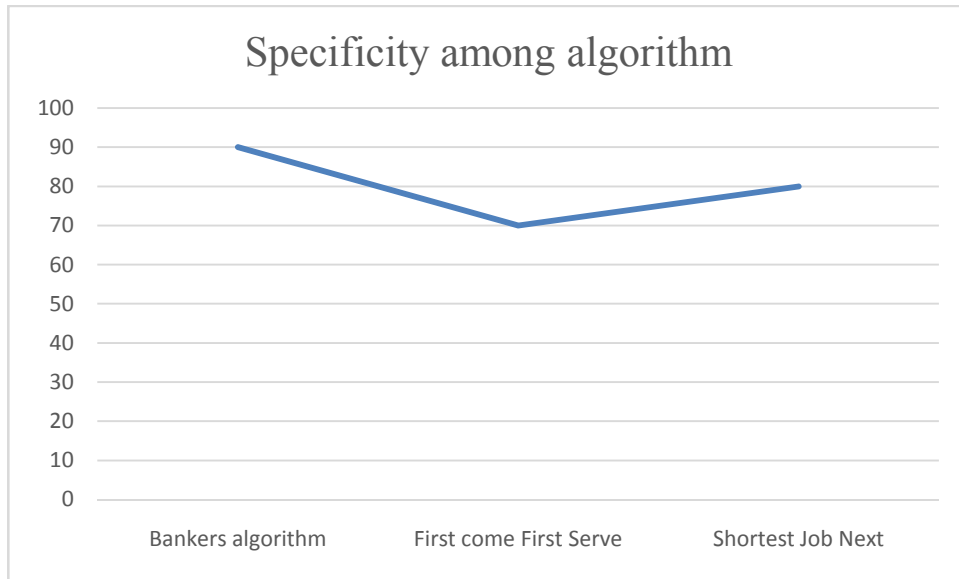


Fig4- Specificity among algorithms

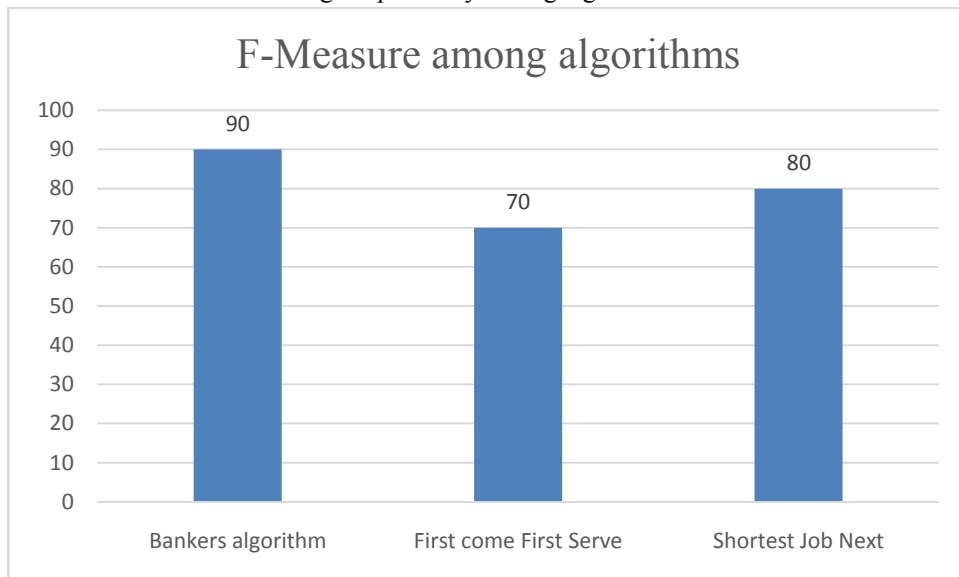


Fig 5- F-Measure among algorithms

The F-measure is a metric commonly used in information retrieval and binary classification tasks that combines precision and recall into a single value. The Banker's algorithm is highly effective in preventing deadlocks and ensuring the safe allocation of resources. It takes into account the future resource requests of processes and maintains system stability. FCFS is a simple and straightforward algorithm, but it may not be accurate in terms of optimizing resource allocation or meeting specific requirements. It can lead to longer waiting times and lower efficiency due to its inability to prioritize processes based on urgency or importance. The SJN algorithm focuses on minimizing waiting times by prioritizing shorter processes. It can be accurate in terms of optimizing resource allocation for short tasks, but it may suffer from the "starvation" problem for longer processes, affecting fairness.

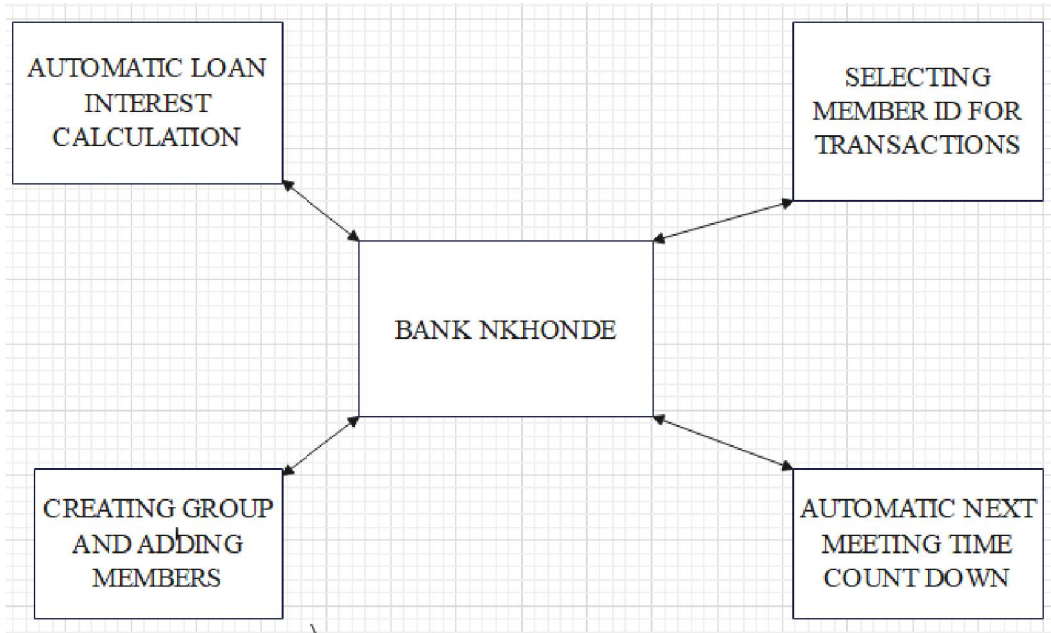


Fig 6: - module description figure

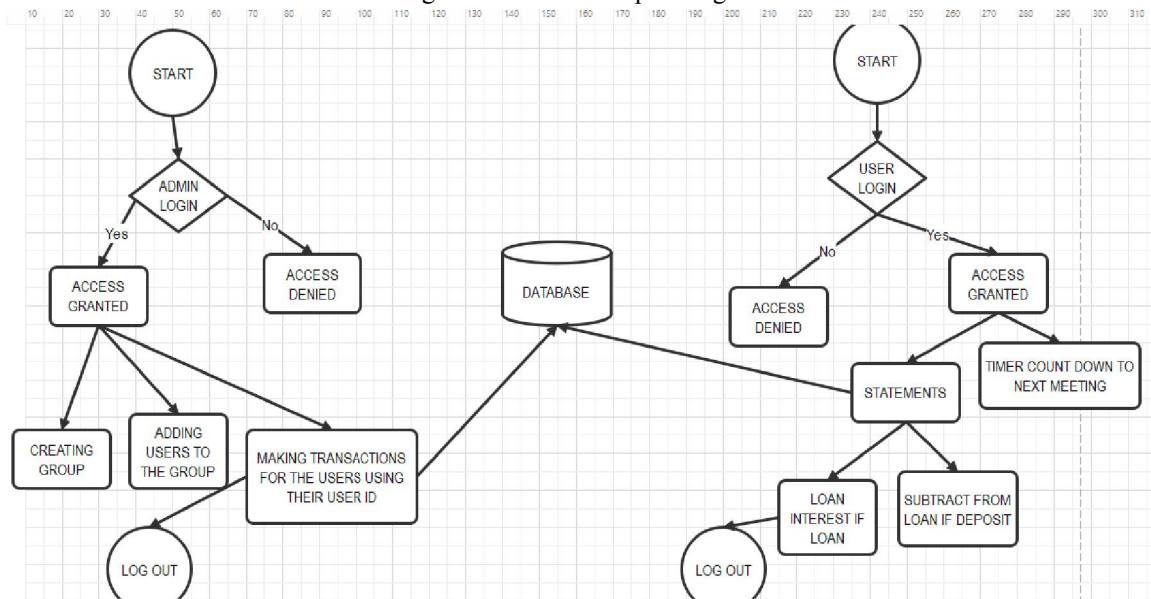


Fig 7: Bank nkhone flow diagram

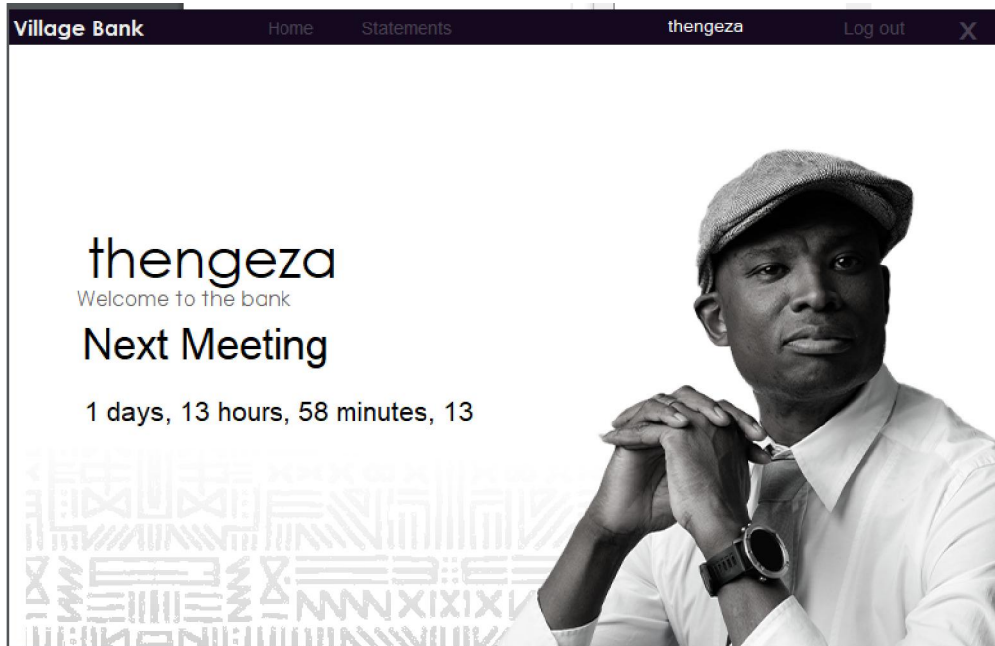


Fig 8-User homepage

The home page of the user which will show the username of the user and the amount of the days and time left to the next meeting which is a time count down.

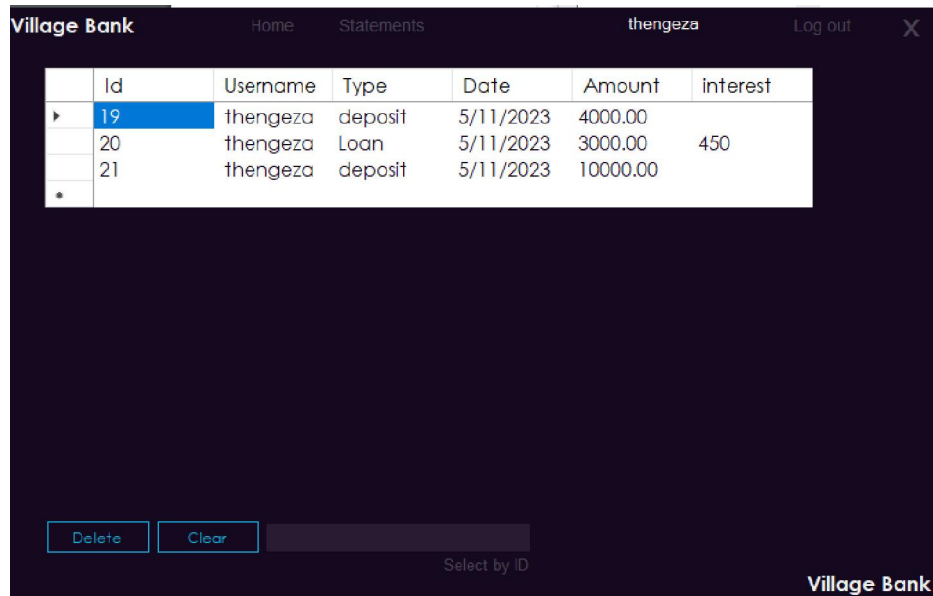


Fig 9- Statements user

These are the user statements that show the date of the transactions and the type of transaction that was made if the transaction was deposit there will be a reduction from the loan and if the transaction is a loan there will be a 15% interest in the interest column.



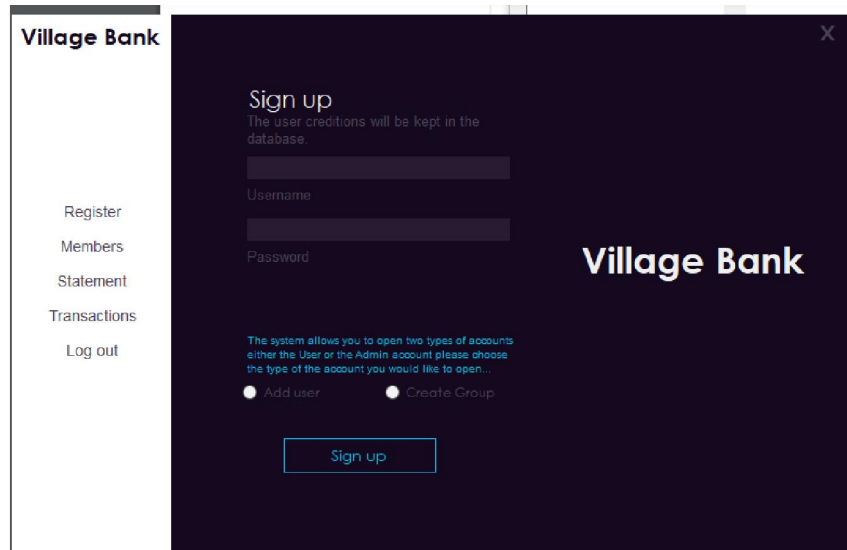


Fig-10- member registration and group creation

This is the register page where the admin will create a group and add members to the group if the member had not been added by any admin the user will not be able to log into the system.

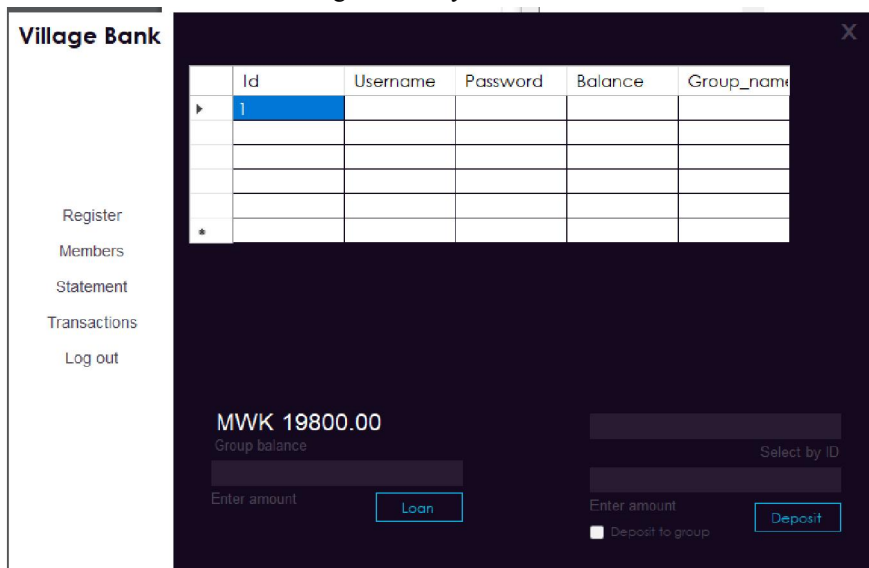


Fig 11-Transactions

This is where the admin will do every single transaction for the users by selecting their user ID so that the update query updates on the specific user's column.

#### IV. RESULTS AND DISCUSSION

Bank nkhone is a unique system in a way that the users interest rate is affordable and comfortable for all the peers of the group and the other papers the users are needed to provide collateral, which is something they hold, and it belongs to the user that has taken the loan which makes them not mostly accessible by a lot of members. They keep your valuable thing that gives them assurance that you will make sure that you pay back but in bank nkhone if the user id not being able to pay back the loan together with the interest they give the user a given a grace period where when they fail that's when they make moves to take things that belong to you and hence that is why it is done mostly amongst people that are friends and of the same community

### V. CONCLUSION

The system will help the trust of the bank nkhonde groups to increase since there will be improved ways of how their money is handled and people believe in something when there is technological help. The members will also have easier and safer ways of taking a step forward on making more money since the main point for the bank nkhonde groups is to improve the small businesses that are there in most local areas with no proper capital but they fail to get a loan from the bank due to the high rates and the fact that they have to show something that they own that can be taken by the bank in case of failing to pay back the loan that was taken but in the case of bank nkhonde they definitely had their fails which have been nullified by the existence of the bank nkhonde system and it will also make it easier for people that did not understand how it works to easily get used and start using bank nkhonde system to enjoy the services made by themselves as peers.

### REFERENCES

- [1]. Arner DW, Barberis J, Buckley RP. 2017. FinTech and RegTech in a nutshell, and the future in a
- [2]. sandbox. CFA Inst. Res. Found. 3:1–20
- [3]. Besanko D, Thakor AV. 1993. Relationship banking, deposit insurance, and bank portfolio choice. In *Capital Markets and Financial Intermediation*, ed. C Mayer, X Vives, pp.292-319. Cambridge, UK:Cambridge Univ. Press
- [4]. Carlton D, Waldman M. 2002. The strategic use of trying to preserve and create market power in evolving industries. *RAND J. Econ.* 33:194–220
- [5]. Carstens A. 2018. Big tech in finance and new challenges for public policy. Keynote address presented at FT Bank. Summit, London, Dec. 4
- [6]. Casey M, Crane J, Gensler G, Johnson S, Narula N. 2018. The impact of blockchain technology on finance: a catalyst for change. *Geneva Rep. World Econ.* 21, Int. Cent. Monet. Bank. Stud., Geneva