EQUB SYSTEM

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Chapter One: Introduction

1.1. Background

An Equb system, also known as a rotating savings and credit association (ROSCA), is a traditional financial arrangement where a group of people come together to save and borrow money. This system is commonly used in many parts of the world, especially in developing countries, where access to formal financial services is limited.

The Equb system is based on a group of individuals who agree to contribute a fixed amount of money to a common pool at regular intervals. This pool of money is then given to one member of the group at each interval and this cycle continues until all members have received their share of the pool.

The equb system is often used for small-scale investments, such as starting a business, purchasing a house or car, or paying for school fees. By pooling their resources, members of the equb system can access funds that they might not be able to access on their own. Additionally, the system encourages savings and financial discipline, as each member is expected to contribute to the pool regularly.

In recent years, digital financial systems have emerged, allowing users to participate in the systems online. These digital systems often provide additional features, such as automatic contributions and withdrawals, and can be used to see financial histories.

For software requirements related to equb systems, it is important to understand the traditional equb system and digital versions of financial systems, as well as the specific needs and requirements of users who participate in equb systems. This may include features such as automatic contribution tracking, online account management, and integration with local financial regulations and practices.

1.2. Statement of the problem

The traditional equb saving system has been a popular financial arrangement for many years, particularly in developing countries where access to formal financial services is limited. However, this system has several challenges that can be addressed through software solutions.

- One of the main challenges of the traditional equb saving system is the lack of transparency and accountability. Because the system relies on trust and social connections between group members, there is often no clear record of contributions and distributions. This can lead to disputes and conflicts within the group, and can discourage new members from joining.
- Another challenge is the inconvenience and potential for fraud associated with the physical exchange of money. Members of the group must meet in person to exchange cash, which can be time-consuming and risky. Additionally, there is always the possibility that one member may go off with the entire pool of money, leaving other members with no recourse.
- A further challenge is the limited scalability of the traditional equb saving system. The number of members in the group is typically limited by the amount of money that can be contributed and the logistics of coordinating meetings. This limits the potential benefits of the system and can make it difficult for groups to grow and expand.

To address these challenges, software solutions can be developed to facilitate transparency and accountability, enable secure and convenient financial transactions, and support the growth and scalability of equb systems. These solutions could include digital record-keeping and transaction tracking, secure online payments and withdrawals, and automated contribution scheduling. By developing software solutions that address the specific needs of traditional equb saving systems, we can help to make this important financial arrangement more accessible and effective for people around the world.

1.3. Objectives

1.3.1. General Objectives

The general objective of a digital equb system for software requirements is to provide a modern and efficient platform for individuals and communities to participate in rotating savings and credit associations (ROSCAs) online. This system aims to address the limitations of traditional equb systems and promote financial inclusion, security, transparency, and accountability.

1.3.2. Specific Objectives

Record-keeping: *The digital equb system should allow for accurate and comprehensive record-keeping of all financial transactions and member contributions, ensuring transparency and accountability.*

Automated contribution scheduling: The system should provide an automated platform for members to schedule their contributions, with reminders and notifications to ensure timely and regular payments.

Secure financial transactions: *The system should provide a secure platform for online payments and withdrawals, with robust security features to protect against fraud and unauthorized access.*

Scalability: The system should be designed to accommodate a large number of members, allowing groups to grow and expand beyond the limitations of traditional equb systems.

User-friendly interface: The system should have an intuitive and user-friendly interface, making it easy for members to navigate and use all the features of the system.

Integration with local financial regulations and practices: The system should be designed to comply with local financial regulations and practices, ensuring its legality and widespread use.

By meeting these specific objectives, a digital equb system can provide a reliable and effective platform for members to participate in ROSCAs, promoting financial inclusion and stability, and improving economic development in communities around the world.

1.4. Methodology

1.4.1. Requirement gathering methods

There are several methods that can be used to collect requirements for a digital equb system. A combination of the following methods can be used to gather comprehensive and accurate requirements for the system.

Interviews: *As a method for the collection of requirements about the digital equb system, we use interviewing method to understand peoples who belongs to the traditional equb system and also, we raised questions that helps us to get much information about the traditional equb system limitations and strengths so as to get more information to develop the new system.*

Introspection: *We have also used introspection method for gathering data as we have known about the fundamental rule and regulations of the traditional equb system, the limitation, advantages and the value added to the society, by considering this we try to put our thinking about traditional equb system as baseline to get a requirement about traditional equb systems .*

Literature review: *By using this method, we try to review existing literature, magazines, leaflets and research studies related to the digital equb system and similar financial systems to identify key requirements for the system.*

Brainstorming: *we have also use Brainstorming to gather requirement in addition to the above methods ,as we are teams we used this method to* generate ideas to solve clearly traditional equb system problems, each of us tried to think freely about the traditional equb system, as all of us come up with ideas and we try to link those

ideas to get more information about the problems of existing traditional system, based on those information we got the requirement for the system.

1.4.2. Analysis and design Methodology

When it comes to analysis and design methodology for software requirements of a digital equb system, there are several approaches that can be used.

In our case we use:

Structured Analysis and Design: Structured analysis and design (SAD) is a methodology that uses a top-down, hierarchical approach to break down a system into smaller component the focus is on understanding the functions and processes of the system and how they interact with each other. Requirements are gathered through interviews, introspection, brainstorming, and literature review, and other methods are documented in detail. The resulting documentation is used to guide the development of the system.

SAD is a design methodology that involves breaking down an application into reusable and independent components. Each component is responsible for a specific functionality and can be easily combined with other components to create a more complex application. This approach provides several benefits, such as:

Reusability: Components can be reused in different parts of the application or even in other applications, saving development time and effort.

Modularization: Components are self-contained and can be developed and tested independently, making the development process more manageable and efficient.

Flexibility: Components can be easily modified, added or removed as requirements change, making the application more flexible and adaptable to changing needs.

Maintainability: Components are easy to maintain and debug, as each component is responsible for a specific functionality.

Since we use React JS to implement which is a component-based library, and it provides several features to support the component-based design methodology. React components are reusable, modular, and flexible, making them a great fit for applications with complex and changing requirements.

Overall, component-based design is a preferred methodology for React JS projects due to its emphasis on reusability, modularity, flexibility, and maintainability.

Object-Oriented Analysis and Design: Object-oriented analysis and design (OOAD) is a methodology that focuses on identifying the objects or entities that make up the system and how they interact with each other. The focus is on understanding the behavior of the objects and their interactions, rather than on the functions and processes of the system as a whole.

Requirements are gathered through interviews, introspection, brainstorming, literature review and other methods are documented in detail. OOAD uses tools such as use case diagrams, class diagrams, and sequence diagrams to visualize the system and its behavior. The resulting documentation is used to guide the development of the system.

Both SAD and OOAD have their strengths and weaknesses, and the choice of methodology will depend on the specific requirements and needs of the digital equb system being developed. A hybrid approach that combines elements of both methodologies may also be used. The important thing is to choose a methodology that is appropriate for the system being developed, and to use it consistently and effectively throughout the development process.

1.4.3. Implementation Methodology

1.4.3.1. Feasibility

Feasibility analysis is an important aspect of software development, as it helps to determine whether a proposed system is worth developing or not. When it comes to the equb system, feasibility can be evaluated based on economic benefit, technical knowledge required, and time available.

Economic Feasibility: The equb system has the potential to provide economic benefits to its users. By pooling resources together, users can access funds that they may not have been able to access on their own. Additionally, by participating in an equb, users can build trust and relationships with each other, which can lead to other economic benefits such as joint ventures or partnerships. From an economic perspective, the equb system appears to be feasible.

Technical Feasibility: The technical feasibility of the equb system depends on the level of technical knowledge required to implement the system. While some technical expertise may be required to develop the software, the equb system itself is relatively simple and can be implemented using existing software tools and platforms. This means that technical feasibility is relatively high, and the system can be implemented by a team with the appropriate technical skills.

Time Feasibility: The time available to implement the equb system will depend on a number of factors, including the complexity of the system, the size of the development team, and the availability of resources. However, since the equb system is relatively simple and can be implemented using existing software tools and platforms, it is likely that the time required to develop the system will be relatively short. This means that time feasibility is also relatively high.

In conclusion, the equb system appears to be feasible in terms of economic benefit, technical knowledge required, and time available. While there may be some challenges associated with implementing the system, these challenges are likely to be manageable with the appropriate resources and expertise.

1.5. Beneficiaries or significant of the project

The equb system has the potential to benefit a wide range of individuals and groups. Here are some of the key beneficiaries or significance of the equb system:

Individuals: Individuals who participate in an equb can benefit by gaining access to funds that they may not have been able to access on their own. This can help them to achieve their financial goals, whether it's paying for

education, starting a business, or buying a home. Additionally, participating in an equb can help individuals build trust and relationships with other members, which can lead to other social and economic benefits.

Communities: The equb system can also benefit communities by promoting financial inclusion and economic empowerment. By bringing together individuals from different socio-economic backgrounds, the equb system can help to bridge economic disparities and promote social cohesion.

Small Businesses: Small businesses can benefit from the equb system by gaining access to funds that they may not be able to access from traditional lending institutions. This can help them to start or expand their businesses, which can in turn contribute to local economic growth.

Financial Institutions: Financial institutions can also benefit from the equb system by expanding their customer base and gaining insights into the financial behavior of individuals and communities. This can help them to develop more tailored financial products and services that better meet the needs of their customers.

Overall, the equb system has the potential to benefit individuals, communities, small businesses, and financial institutions by promoting financial inclusion and economic empowerment.

1.6. Limitations of the project

While the digital equb system has many potential benefits, there are also some limitations to consider:

Technical Requirements: To participate in a digital equb, users must have access to a computer or mobile device and a reliable internet connection. This may be a limitation for some individuals, particularly those who live in areas with poor internet connectivity or who cannot afford to purchase the necessary technology.

Security Risks: Any system that involves the exchange of money or personal information carries some degree of risk. The digital equb system must be designed with strong security measures to protect user data and prevent fraud.

Limited Accessibility: While the digital equb system may be accessible to individuals who are already familiar with digital technologies, it may be less accessible to those who are not comfortable using technology or who do not have access to the necessary equipment.

Potential for Default: The digital equb system relies on participants making regular payments into the pool. If one or more participants fail to make their payments, the system may be at risk of collapse.

Limited Flexibility: The digital equb system typically operates on a fixed schedule and may not be able to accommodate changes in participants' financial needs or other unexpected events.

Overall, while the digital equb system has many potential benefits, it is important to

be aware of these limitations and to design the system in a way that addresses them as much as possible.

1.7. Scope of the project

The scope of the digital equb system includes the following:
Participants: The digital equb system is designed for individuals who want to save and borrow money through a group-based savings. Participants can be individuals or groups of people who come together to form an equb.
Contributions: Participants contribute a fixed amount of money to the equb on a regular basis. The contribution amount and frequency are determined by the equb's rule and regulation.
Payouts: Participants can receive payouts from the equb when they are randomly selected by the system. The payout amount is typically determined by the equb's rule and regulation.
Administration: The digital equb system requires an administrator to manage the system and ensure that all participants are following the rules.
Technology: The digital equb system relies on technology to manage contributions, payouts, and other aspects of the system. The technology used may include web-based application.
Overall, the scope of the digital equb system is focused on providing a group-based savings that allows participants to save and borrow money in a reliable and transparent manner. The system is designed to be accessible, flexible, and secure, with the aim of promoting financial inclusion and economic empowerment.

1.8. Organization of the project

In these project documents we are discussing system details in each chapter. Before we begin to write chapter one the document includes table of contents.
The first chapter of this document includes the Introduction part of the project Which includes sub topics like background, existing system study, proposed system, general objective, and specific objective, significant of the system, scope and methodologies and tools.
The second chapter of the document includes system feature like existing system, problem of existing system, proposed system, requirement analysis like functional requirement system use case, use case documentation, business rules, nonfunctional requirement and system requirement like software requirement and hardware requirement.

Chapter Two: System features

2.1. The Existing System

The traditional equb system is a savings and credit model that has been used for centuries in various cultures and communities around the world. It is a system where a group of individuals come together to form a savings club, where each member contributes a fixed amount of money on a regular basis, and the collected funds are then distributed to members of the group in according to random selected member who is lucky. The system is typically organized and managed by the members themselves, and there is usually no external service provider or technology involved. also, In the traditional equb system, the payout amounts are determined by the members themselves. The system is typically based on a mutual trust and social capital between members, and the members are often friends, family members, or members of a particular community.

While the existing equb system has been a successful savings and credit model in many communities, it has some limitations.

- One of the main limitations is that it is often limited to a small group of people who know each other well, which can limit its reach and impact. The system also requires a high level of trust and social capital among members, which may not exist in all communities.
- Another limitation of the traditional equb system is the lack of formal record-keeping and transparency, which can lead to disputes among members and undermine the sustainability of the system.
- Finally, the system may not be able to accommodate changes in participants' financial needs or other unexpected events, which can limit its flexibility and usefulness.

Overall, while the traditional equb system has been a successful savings and credit model for many communities, it has some limitations that may be addressed through the development of a digital equb system that uses technology and formal record-keeping to enhance transparency, accessibility, and sustainability.

2.2. Proposed System

The proposed system of the digital equb system aims to address the limitations of the traditional equb system by introducing technology and formal record-keeping to enhance transparency, accessibility, and sustainability.

- The digital equb system will be based on a website that enables participants to contribute and receive payouts electronically. This will make the system more accessible to a wider range of people and enable participants to participate remotely, without the need for physical meetings.
- The digital equb system will also introduce a formal record-keeping system to ensure transparency and accountability among participants. All contributions, payouts, and other transactions will be recorded electronically and made

available to participants in real-time. This will reduce the likelihood of disputes among members and promote trust and confidence in the system.

- The digital equb system will also include an automatic administration component to manage the system and ensure that all participants are following the rule and regulation of the system and the participants can manage their own account.

Overall, the proposed system of the digital equb system aims to enhance the traditional equb system by introducing technology and formal record-keeping. This will make the system more accessible, transparent, and sustainable, and promote financial inclusion and economic empowerment among participants.

2.3. Requirement Analysis

2.3.1. Functional requirement

Functional requirements for the digital equb system are the features and capabilities that the system must have in order to meet the needs of its users. Some of the functional requirements for the digital equb system may include:

User Registration

The system should allow new users to register and create an account.

User registration should include providing personal information such as name, contact information, and ID information.

Create equb type

The system should allow users to use built in equb type.

The system should allow users to create custom equb type.

Contribution Management

The system should allow users to contribute a fixed amount of money to the equb at regular intervals.

The system should also manage contribution schedule, history of contributions and payment.

Payout Management

The system should allow users to receive payouts according to the schedule agreed upon by the members.

Notifications

The system should send notifications to users regarding upcoming contributions and payouts, changes in the contribution or payout schedule, and other relevant information.

Search

The system should allow users to view the list of members of an equb.

The system should allow users to search by types of equb like daily, weekly, monthly equb or by amount of deposit and contribute accordingly.

Security

The system should provide adequate security to protect user data and prevent unauthorized access to the system.

Integration

The system should be able to integrate with external systems such as payment gateways, accounting systems, and other relevant systems.

The system should allow users to access external systems for their contribution and payouts.

Automatic winner selection:

the system should automatically select the winner of the equb for a specific round.

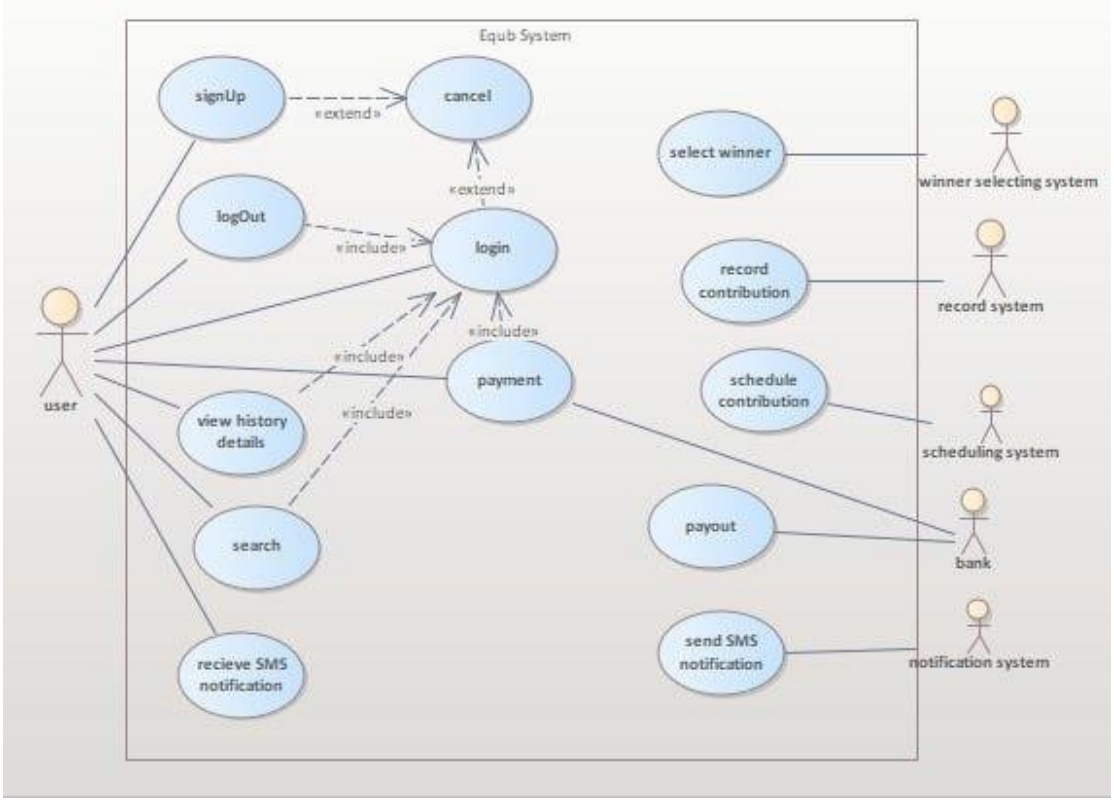
The system must exclude the previous winners of the equb for upcoming rounds.

The system should also automatically select the last user of equb as winner for last round.

Overall, the functional requirements of the digital equb system should ensure that the system is user-friendly, secure, and able to meet the needs of its users.

2.4. System Use case

2.4.1. Use case Diagram



2.4.1.1. Use Case documentation

***Use case**: 01*
***Use case name**: Login*
***Actor:** Equb user*
***Description**: Checking the intended user is authorized or not.*
***Precondition**: The user must have an account in the system and must remember his/her username and password to login to his/her account.*
***Post condition**: The users successfully login.*
Basic course of action:

user action	***system response***
The user opens the system	*The system displays the login page.*
The user enters user name and password then click login button.	*The system checks the username and password*
	The system opens the users home page.

***Alternative course of action:** If the username and password is invalid, the system displays an error message, then go back to step 3 of basic course of action.*

***Use case:** 02*
***Use case name:** payment*
***Actor:** equb user*
***Description**: checking that the member of equb have paid their fixed contribution to equb account at each phase or not.*
***Precondition:** The User must be a member of particular equb, and must have Commercial bank of Ethiopia account.*
***Post condition:** The user successfully paid their fixed contribution to equb account.*

***Use case:** 03*
***Use case name:** Payout*
***Actor:** bank*
***Description**: The System Checking that all equb members have paying his/her fixed equb contribution to the equb account or not and then automatically select the winner after that the system transfer money from equb account to the winner bank account.*
***Precondition:** For the system to pay for winner, the system must automatically select the winner of equb at each phase and the system also have bank account of*

commercial bank of Ethiopia.
***Post condition**: The system successfully payout to winner of equb member.*

***Use case**: 04*
***Use case name:** view history detail*
***Actor**: Equb user*
***Description**: the equb user can see history detail of your account in the system*
***Precondition:** The user must be a member of particular equb.*
***Post condition:** The users see the history detail of your account.*

***Use case**: 05*
***Use case name**: logout*
***Actor:** Equb user*
***Description**: Checking the intended user is wants to quit or not.*
***Precondition:** The user must have an account in the system and must Login to his/her account.*
***Post condition:** The users successfully logout from the system.*

***Use case:** 06*
***Use case name:** search*
***Actor**: Equb user*
***Description:** finding out what types of equb the user wants.*
***Precondition:** The user must have an account in the system and must login to his/her account.*
***Post condition**: The users successfully find the type of equb he/she wants.*

***Use case:** 07*
***Use case name:** schedule contribution.*
***Actor:** scheduling system*
***Description:** the system schedules the staring and end date of the payment.*
***Precondition:** the user must have an equb account with number of members and payment amount.*
***Post condition**: the system schedule the date.*

***Use case**: 08*
***Use case name**: create account.*
***Actor:** Equb user*
***Description:** Enabling the user to sign up to the system.*
***Precondition:** the user must fulfill the required information to sign up to the system.*
***Post condition:** The users successfully have account in the system.*

Use case: *09*
Use case name: *send notification.*
Actor: *notification system.*
Description: *reminding the user useful information about the equb.*
Precondition: *The user must have an account in the system and must be a member of particular equb.*
Post condition: *the system send SMS notification to the user successfully.*

Use case*: 10*
Use case name: *receive notification.*
Actor: *Equb user.*
Description: *the Equb user receive SMS notification from the system.*
Precondition: *The user must have an account in the system and must be a member of particular equb.*
Post condition: *the user receive SMS notification from the system successfully.*

Use case: *11.*
Use case name: *automatically select winner.*
Actor: *winner selecting system.*
Description: *the Equb system automatically select the winner of equb for each round.*
Precondition: *The user must have an account in the system and must be a member of particular equb and pay fixed amount.*
Post condition*: the lucky user selected by the system.*

Use case*: 12.*
Use case name: *record contribution.*
Actor*: record system.*
Description: *the Equb system record the contribution made by the user in their equb history.*
Precondition: *The user must have an account in the system and must be a member of particular equb.*
Post condition: *the record contribution of user is kept in the system.*

2.5. Business Rule Documentation

Business Rule Documentation for Digital Equb System:
Equb Cycles
The equb cycles will be monthly, weekly, daily and custom.
Each cycle will consist of a predetermined number of members.
Members will take turns for receiving the payout.
The equb will continue until all members have received their payout.

Membership

Membership is limited to adults who are at least 18 years old and can bring collateral property.

Each member must contribute a fixed amount to the equb each cycle.

Members who fail to contribute their share will be sequestrated the collateral property he/she brings.

Payouts

The payout amount will be determined at the beginning of each cycle.

The payout will be given to the member whose turn it is.

The payout will be transferred to the member's account.

The payout will be made within 24 hours .

Administration

The equb will be administered by a designated person or committee.

The administrator will manage the system.

Notification

Members will receive notification when they have to contribute and payout.

Members will receive notification when they win the equb.

Searching

the user will be able to search equb types based on amount to deposit and length of time to contribute or number of members.

Create custom equb type

The user will be able to create custom equb type based on amount to deposit and length of time to contribute or number of members.

User Interface prototype

Login/Registration: *The user interface should have a login and registration screen for new and returning users to access their account.*

Dashboard: *Upon logging in, the user should be directed to a dashboard that displays their current equb cycle, contribution history, payout history, and other relevant information.*

Equb Cycle Information*: The user interface should display information about the current equb cycle, including the cycle start and end dates and the payout amount.*

Contribution Management: *Users should be able to easily manage their contributions to the equb. This may include the ability to make contributions online, view their contribution history, and receive reminders for upcoming contributions.*

Payout Management*: Users should be able to manage their payouts from the equb. This may include the ability to request a payout, view their payout history, and select their preferred payout method.*

Notification System*: The user interface should have a notification system that alerts users of upcoming contributions, payouts, and other important events related to the equb.*

Search functionality: *the user interface should have search functionality that allows*

users to search equb types to participate.
These are features that a user interface for a digital equb system may include. The design and functionality of the UI will ultimately depend on the specific needs of the system and the preferences of its users.

2.6. Nonfunctional requirement

Non-functional requirements for the digital equb system are the characteristics that describe how the system should behave and perform, rather than the specific features it should have. Some of the non-functional requirements for the digital equb system may include:

Performance

The system should be able to handle up to 10000 number of users and transactions without significant performance degradation. Response times for user actions should be less than 10 seconds.

Usability

The system should be user friendly and navigate for users of all technical skill levels. The user interface should be intuitive and responsive.

Reliability

The system should be able to recover from any failures or disruptions within five minutes and efficiently.

Scalability

The system should be able to handle an increase in the number of users and transactions over time.

The system should be able to accommodate future growth and expansion.

Security

The system should protect user data and prevent unauthorized access.

The system should implement authentication, authorization, and encryption mechanisms to ensure data privacy and security.

Compliance

The system should comply with all relevant regulations and standards, including data protection laws and financial regulations.

Availability

The system should be work 24/7 and provide an uptime guarantee to ensure that users can access the system whenever they need it.

Maintainability

The system should be easy to update.

The system should be modular and well-documented, with clear code and a well-defined development process.

Interoperable

The system should be able to integrate with external systems and APIs seamlessly, enabling users to access and use data from other systems.

Overall, the non-functional requirements of the digital equb system should ensure

that the system is efficient, reliable, secure, and easy to use, meeting the needs of its users and stakeholders.

2.7. System Requirement

2.7.1. Hardware requirements

Hardware requirements needed for the system:

- *Processor speed=1.7 GHZ and above*
- *RAM=1 GB and above*
- *Hard disk space=16GB and above*
- *Ethernet card with an internet and internet zone*

2.7.2. Software requirements

Software requirements needed for the system:

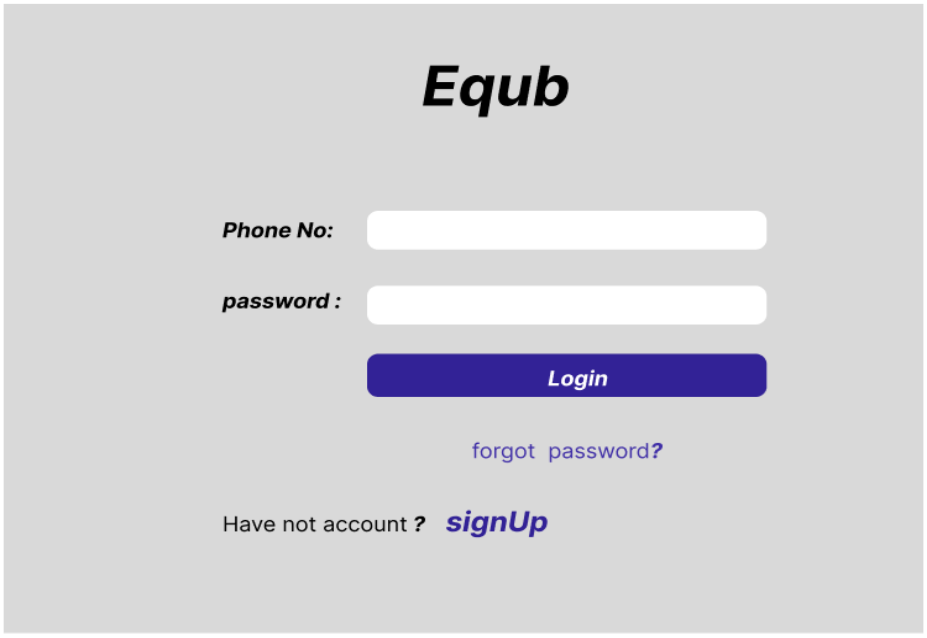
- *Database: MongoDB is a NoSQL Server*
- *Web server: Apache HTTP server*
- *TCP/IP Protocol suite*
- *Operating system: Windows (8, and above), Linux, Ubuntu*
- *Client-side application (Browser): currently available/functional browser (Google chrome, Microsoft edge, Mozilla Firefox, safari).*

Chapter Three: System Design

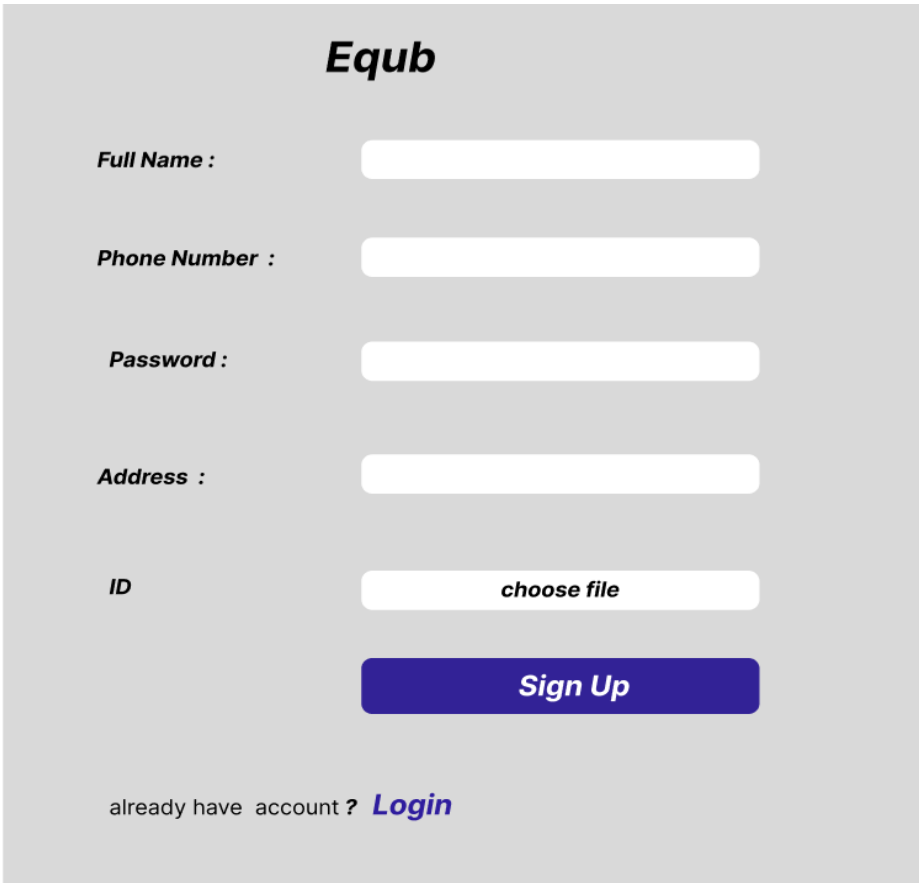
3.1. User Interface Design

Home Page:

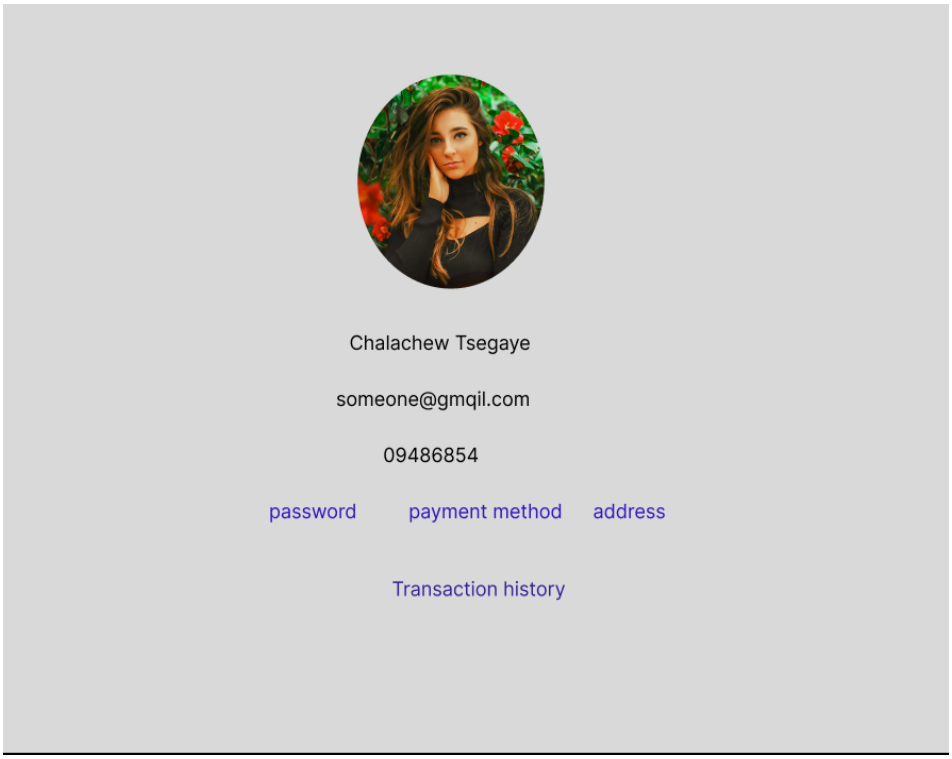
Login page:



Sign Up page:



Profile page:



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5. **Appendices**

HTTP: Hypertext Transfer Protocol.

IEEE: Institute of Electrical and Electronics Engineers.

IP: Internet Protocol.

OOAD: Object Oriented Analysis and Design.

ROSCA: Rotating Saving and Credit Association.

SAD: Software Analysis Design.

TCP: Transmission Control Protocol.