# **DEDICATION**

THIS WORK IS DEDICATED TO MY FAMILY

# ACKNOWLEDGEMENT

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# GLOSARY

* AICS: African Institute of Computer Sciences
* APK: Android Package Kit
* ERD: Entity Relational Diagram
* 2TUP: Two Track Unified Process
* IPA: iOS App Store Package
* IOT: Internet of Things
* MVC: Model View Controller
* UML: Unified Modelling Language
* AI: Artificial intelligence

# ABSTRACT

Technology has revolutionized various aspects of life, playing a crucial role in communication, marketing, and beyond. Web applications and technology, including smartphones, tablets, and laptops, has become an essential part of people's lives. This project, named **"CONCEPTION AND REALIZATION OF A TONTINE MANAGEMENT PLATFORM"** The project aims to revolutionize the traditional tontine financial arrangement by integrating modern technology for enhanced accessibility and efficiency. This application leverages mobile or web technology and a robust backend system to offer users a seamless, real-time interface for managing their tontine contributions and distributions. Through a user-friendly app, participants can easily track their investments, view their standing, and interact with the tontine pool from anywhere. By employing advanced features like real-time notifications, automated calculations, and secure transactions. This project adopts a combination of UML (Unified Modelling Language) and 2TUP methodology to produce a robust and efficient solution for managing and optimizing tontines remotely. By combining UML and the 2TUP methodology, the project aims to deliver a well-designed, user-friendly, and efficient solution for tontine management and optimization. The iterative and collaborative nature of 2TUP, along with the visual modelling capabilities of UML, ensures a structured development process, timely delivery of increments, and a focus on user needs and satisfaction.

**Key-words**

* Tontine Management
* Financial Arrangement
* Contributions
* Distributions
* Automated Calculations
* Secure Transactions
* User Engagement

# 

# RESUME

La technologie a révolutionné divers aspects de la vie, jouant un rôle crucial dans la communication, le marketing, et au-delà. Les applications web et les technologies, y compris les smartphones, les tablettes et les ordinateurs portables, sont devenues une partie essentielle de la vie quotidienne. Ce projet, intitulé "**CONCEPTION ET RÉALISATION D'UNE PLATEFORME DE GESTION DE TONTINE**", vise à révolutionner l'arrangement financier traditionnel de la tontine en intégrant des technologies modernes pour une meilleure accessibilité et efficacité. Cette application utilise la technologie mobile ou web et un système backend robuste pour offrir aux utilisateurs une interface fluide et en temps réel pour gérer leurs contributions et distributions de tontine. Grâce à une application conviviale, les participants peuvent facilement suivre leurs investissements, consulter leur statut et interagir avec le fonds de tontine depuis n'importe où. En utilisant des fonctionnalités avancées telles que des notifications en temps réel, des calculs automatisés et des transactions sécurisées, ce projet adopte une combinaison de UML (Unified Modelling Language) et de la méthodologie 2TUP pour produire une solution robuste et efficace pour la gestion et l'optimisation des tontines à distance. En combinant UML et la méthodologie 2TUP, le projet vise à fournir une solution bien conçue, conviviale et efficace pour la gestion et l'optimisation des tontines. La nature itérative et collaborative de 2TUP, associée aux capacités de modélisation visuelle de UML, garantit un processus de développement structuré, une livraison ponctuelle des incréments et un accent sur les besoins et la satisfaction des utilisateurs.

**Mots clés:**

* Gestion de Tontine
* Arrangement Financier
* Calculs Automatisés
* Contributions
* Distributions

# ABBREVIATION

* 2TUP: Two Track Unified Process
* Admin: Administration
* AICS: African Institute of Computer Sciences

Alphabetic other

* UI: User Interface
* ERD: Entity Relational Diagram
* UC: Usecase
* DBMS: Database Management System
* MVC: Model View Controller
* UML: Unified Modelling Language
* ICT: Information and Communication Technology

**GENERAL INTRODUCTION**

The idea of machines that take-in random facts, process them and send out meaningful information stems from the 11th century, however, computers only saw the light of day in the 20th century. Since then, computers have gone from being the size of an entire room to being able to fit in the human palm and now we even find some as small as a sheet of paper. The tontine is a financial arrangement that originated in 17th-century France and is named after Lorenzo Tonti, the Italian banker who proposed it. During the 18th century, the tontine gained popularity in France and other European countries as a method to finance public projects and government debts, offering a unique way to raise capital while providing income to participants. The African Institute of Computer Sciences (AICS) in fulfilment of its mission to train African engineers in Africa and for Africa puts in place a three-month internship period for level two students. This period gives students the opportunity to put into practice skills acquired in school in a professional milieu and to further develop their problem-solving skills through assistance in companies. We did our internship at “Etech for self-worth”, which is a growing company in the field of computer engineering whose mission is to Bridge the gap between Africa and Technology and form mostly in IOT section. At Etech, we worked on the theme “**"CONCEPTION AND REALIZATION OF A TONTINE MANAGEMENT PLATFORM**”, with the aim of providing a user interface with dynamic management of their funds. The achievement of this theme was carried out under 8 main sections which are;

1. **Insertion Document:** In this book, we shall present the company in which we spent our internship period and the way we were welcomed in the company. At the end of this section, we will elaborate on our theme.
2. **Existing System:** Here, we shall present the already present system in place, that is the one used for consultation and follow-up purposes.
3. **Specification Book:** In this book, we specify the needs of the user taking into considerations the time and cost of the project.
4. **Analysis Document:** Here, we shall present the analysis method chosen together with the presentation of all the diagrams used for the analysis of this project.
5. **Conception phase:** This presents the generic and detailed conception of the project to bring out real world constituents.
6. **The Realization phase:** This phase will permit us to visualize the implementation process of the solution.
7. **Test of functionalities:** In this phase, we shall present to you the different functionalities or modules of our application and how they work.
8. **The User Guide:** This elaborates on all conditions necessary to use the application and how to use it**.**

**PART ONE: INSERTION PHASE**

Preamble

This phase presents the details of how we were integrated in the host company, the company presentation and organization, and a brief introduction to our project.

Overview

INTRODUCTION

1. WELCOME AND INTEGRATION
2. GENERAL PRESENTATION OF REALIZE CENTER
3. ORGANISATION OF THE COMPANY
4. HARDWARE AND SOFTWARE RESOURCES OF THE COMPANY
5. BRIEF PRESENTATION OF THE PROJECT THEME

CONCLUSION

## INTRODUCTION

The insertion phase is a period (generally of 02 weeks) reserve for the different interns to discover and to familiarize with the working environment. Here, we got to know about the staffs, the different hardware and software resources used, the different departments which constitute the enterprise, how the company function both internally and externally and we were introduced to our work space. During this period, we were also attributed an internship master often called professional supervisor and a theme. We also had a time to discuss amongst us interns on topics like what we love doing most, what we dislike, our believes and experiences. We shared about different realizations and failures in life.

## WELCOME AND INTEGRATRION

### **Welcome**

We arrived at REALIZE on Monday July 2023 at 8:00am. We were welcomed, by **Mr. TANUE MONETTE BUKWATI** the enterprise frontend developer, who introduced us to our work space and his collaborators. Later run, he gave us the task to do some findings on the possible internship themes that we can work on.

### **Insertion**

A working day at REALIZE start from 07:30am to 04:30pm. Our tasks in the company generally follow a predefine routine. Every day we were to write five pages of our internship report, to complete the assigned task for the day. It was also an opportunity to present our difficulties and challenges to everyone and receive directives.

## GENERAL PRESENTATION OF THE COMPANY

### **History**

Realize is a Cameroon based non-governmental tech start-up institute founded by Mr. **NDELOGAKEH Daniel** in 2022 which proposes IT solutions and empowers the use on new technologies in Cameroon

### **What is REALIZE all about**

### **Missions**

The mission of Realize mainly relates to the empowerment and the perpetuation of Technology use. These missions include:

* + Design and realize mobile-oriented software for companies and individuals;
  + Assist newborn companies for quick growth using computer sciences;
  + Provide training and certifications to improve qualified human resources in many fields of study;
  + Take an active part in the sustainable development of the world through innovative solutions and virtual reality.

### **Vision**

At Realize, we believe that the true potential of every organization and individual can be unlocked through the harmonious fusion of analysis, development, realization, and data analytics. Our vision propels us forward, guiding us to make a lasting impact on the digital landscape and shape a future where innovation knows no bounds."

### **Activities**

The activities of Realize range from computer sciences, engineering, and training.

We can outline the following:

* + Conception realization, and hosting of websites;
  + Software development and maintenance;
  + Training in Software related fields;
  + Conception and realization of multimedia;
  + IT consulting, IT support and innovation

### **Geographical location**



## ORGANISATION OF THE ENTERPRISE

### **Administrative Organization of REALIZE**

REALIZE is administratively organized as follows;

#### **The General Management**

**REALIZE** is a company made up of a team of engineers in the field of computer science. The main mission of the company is to solve the computer problems that companies face on a daily basis in the following areas:

* Mobile development
* Web development
* Artificial Intelligence
* Data analysis
* Big data

• Machine Learning

### **Human resource department**

This department is in charge of the following:

* + Recruitment and Hiring
  + Acts as a liaison between employees and management;
  + Manages employee compensation and benefits programs;
  + Develops and implements company policies and procedures, ensuring compliance with employment laws and regulations.
  + Manages administrative tasks related to employee records, data management, and

HR systems

### **Communication Department**

This department is in charge of the following:

* + - Handles public relations activities, which involve managing the company’s reputation and image;
    - Responsible for crafting and delivering messages to external stakeholders such as customers etc.;
    - It fosters effective communication within the company;
    - They create and manages content across different platforms and channels;

### **Department of Financial Affairs**

This department is in charge of the following:

* + - Responsible for developing and managing the company’s financial plans and budgets;
    - Prepare and presents accurate and timely financial reports to management, stakeholders, and regulatory authorities;
    - Responsible for managing cost and expenses within the organization; ➢ Ensures compliance with tax laws and regulations. Etc.

### T**echnical department**

This department is in charge of the following:

* + - Responsible for managing the company’s technological infrastructure, including networks, hardware;
    - Play a role in managing and maintaining the company’s data;
    - Responsible for implementing and maintaining cybersecurity measures to protect the company’s digital assets from potential threats;
    - Interacts with technology vendors and manages relationships with external service providers. Etc.

### **Software Engineering Department**

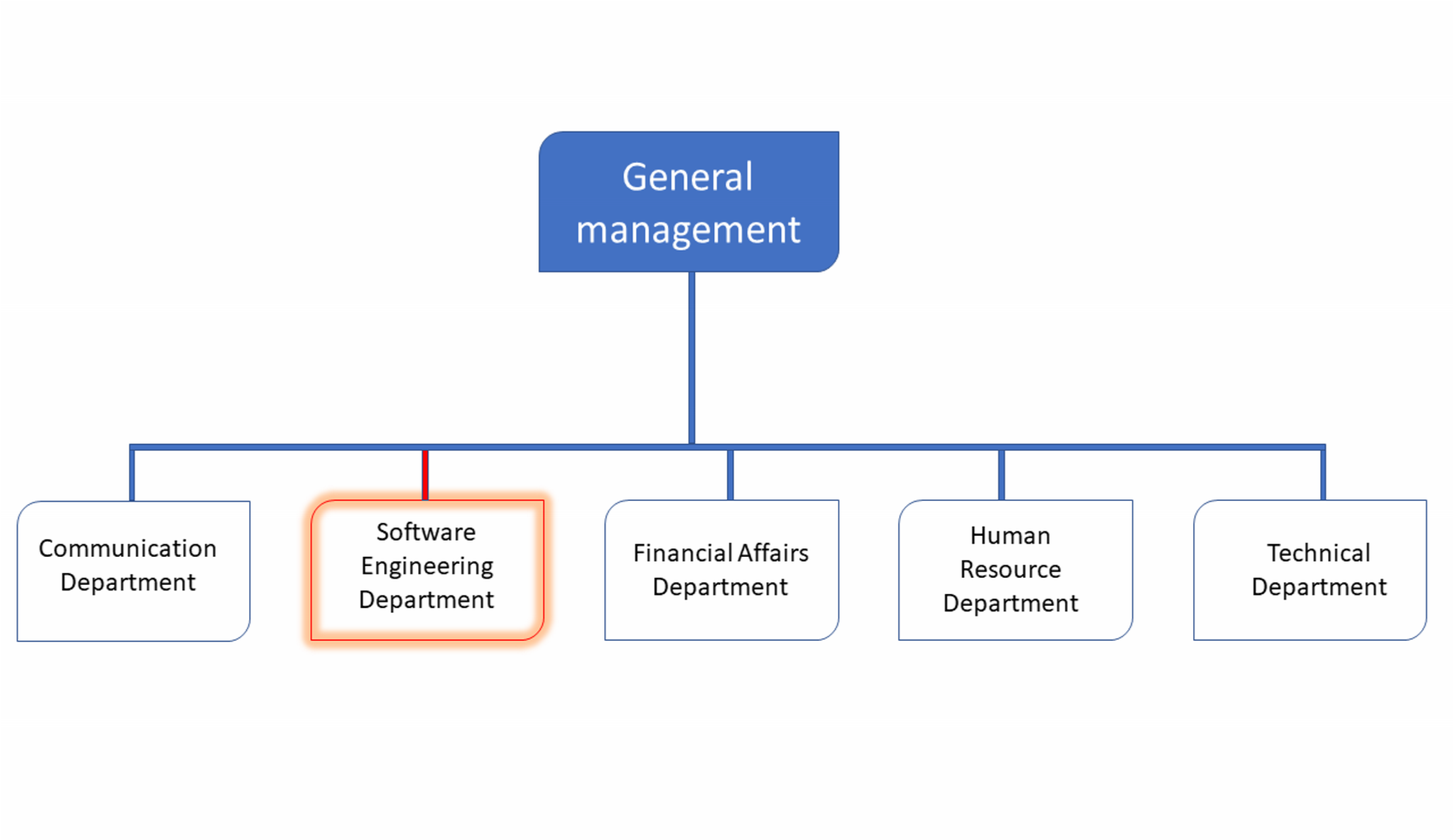
This department is in charge of the following:

* + - Primarily responsible for developing software applications and systems;
    - Responsible for maintaining and supporting software application throughout their lifecycle;
    - Evaluation and realization of projects etc.

### **Functional organization of REALIZE**

The functional branch of REALIZE is organized as follows; The organizational chart is first and foremost a communication tool designed to facilitate understanding of the relationships and connections within the company. It allows for a global view of the company in terms of services, divisions, and much more.

**REALIZE** has four divisions within it, and we have been assigned to all divisions except the secretariat.



*Figure*

*2*

*:*

*Company functional organization (source: Realize*

*)*

### **Attributions**

### **Web Programming Division:**

In this division, all web development projects of the company, partners and clients are routed for realization. Its role is to:

* Design and produce the technical specifications;
* Respect and enforce the application of company standards;
* Write the content of web programming training and provide training in the context of training.
  + 1. **Mobile Programming Division:**

In this division, all mobile development projects of the company, partners and clients are routed for realization. Its role is to:

* Design and produce the technical specifications;
* Respect and enforce the application of company standards;
* Write the content of mobile programming training and provide training in the context of training.

### **Secretary:**

For billing, photocopies, and customer registration.

## HARDWARE AND SOFTWARE RESOURCES OF THE COMPANY

### **Hardware Resources**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Designation | Quantity | Characteristics | Observation |
| 1 | MacBook Pro | 1 | APPLE | Good |
| 2 | Modem | 1 | CAMTEL | Good |
| 3 | LCD Screen | 1 | HP | Excellent |
| 4 | Training equipment and office furniture | / | / | / |

**Table 1**: Hardware resources of REALIZE (source: MERCURIAL 2023)

### **Software Resources**

As an enterprise specialized in IT, REALIZE also comprises of software resources such as;

**Table 2**: Software resources of REALIZE (source: MERCURIAL 2022)

|  |  |
| --- | --- |
| Designation | Software |
| Operation system | Windows 10, Mac OS, parrot Linux |
| Design tools | Photoshop |
| Integrated development environment (IDE) | Visual studio code, |
| Text editor | Sublime text, notepad++ |
| Database management system (DBMS) | MongoDB, PostgreSQL, MySQL |
| Web browser | Google chrome, Microsoft edge |
| Document editor | Microsoft office word |
| Presentation | Microsoft office PowerPoint |

## BRIEF PRESENTATION OF THE PROJECT THEME

During our insertion phase in REALIZE, we were asked to look for themes which solves a specific problem and something innovative. Professional supervisor took some time to look into what we proposed as themes and he also proposed some themes ideas. Finally, we had to go for **“CONCEPTION AND REALIZATION OF A TONTINE MANAGEMENT PLATFORM”**. This system is a software that is made up of a web application for users. With this application, users will have the possibility to contribute their money easily and more efficiently where records are been kept and also reduce manual paper work.

**Conclusion**

The insertion phase was a very educative one, we got to know more about the history of the company, how it all started till the level it is right now, we got to know the staff and other interns, in fact we felt at home. Finally, we decided to work on the theme **“CONCEPTION AND REALIZATION OF A TONTINE MANAGEMENT PLATFORM”.** Now that we have chosen the theme we will work on; we can move on to the specification book of our report where we will identify the objectives and requirements for our project.

**PART TWO: EXIXTING SYSTEM**

### Preamble

The existing system is a part of the internship report where we shall give a detailed explanation of our theme. That is, what the theme is all about and also to give more precision concerning the application we are to produce. Also, it provides a deep understanding of the system currently in placed associated to the various limitations, the problems that result from these and the solution we propose.

### Overview

INTRODUCTION

1. PRESENTATION OF THE THEME
2. DESCRIPTION OF THE EXISTING SYSTEM
3. CRITICISMS OF THE EXISTING SYSTEM
4. PROBLEMATIC
5. PROPOSED SOLUTIONS

CONCLUSION

# INTRODUCTION

In order to successfully achieve a project, we need to have clear information of what the project will consist of, this is where the existing system part of our report comes into play.

The existing system refers to the system put in place to carry out the work done in the field on which our theme is based. Understanding this system is a great step in solving the problems that we might identify. It’s of great importance that we take into consideration this system before proposing a suitable solution that will ameliorate the current one. After studying the existing system, we shall present our different critics concerning it. We shall also give the problematic as well as the propose solution to these problems.

## PRESENTATION OF THE THEME

During our first days at Realize, we were encouraged by our professional supervisor to take a day or two to come up with a suggestion of a theme for our internship period. Taking into consideration the desire of the company to work on innovative projects as expressed by the companies objectives

Chief Executive Officer during his welcome address to us, and our desire to contribute in our humble way to solving day-to-day problems, we proposed the theme “**CONCEPTION AND REALIZATION OF A TONTINE MANAGEMENT PLATFORM**”. A tontine management app system plays a crucial role in automating and streamlining the administration of tontine investments—a financial arrangement where participants pool funds and receive payouts based on their longevity or other agreed-upon terms. The app helps manage contributions, track participant records, and administer payouts efficiently, ensuring transparency and accuracy. It often includes features like automated calculations of payouts, notifications, and detailed reports, reducing manual errors and administrative burden, and enhancing the overall experience for participants and administrators alike.

## STUDY OF THE EXISTING

Many tontines today face a range of significant challenges that impact their effectiveness and appeal. One major issue is the regulatory landscape; tontines often operate in a gray area with outdated or inconsistent regulations that can lead to legal ambiguities and difficulties in compliance. In some jurisdictions, tontines may not fit neatly into existing financial or insurance frameworks, creating uncertainty for both administrators and participants. Transparency is another critical concern. Traditional tontines, which rely on manual processes and informal record-keeping, can suffer from a lack of clear communication about terms and conditions, leading to misunderstandings and disputes among participants. The administrative burden associated with tontines is also considerable. Managing contributions, tracking individual participant data, calculating payouts based on longevity or other criteria, and ensuring accurate and timely disbursements require complex and meticulous record-keeping. Without modern, automated systems, these tasks are prone to errors and inefficiencies. Additionally, tontines can be vulnerable to issues of trust and security; participants must rely on the integrity of the managing entity, and any perceived or actual mismanagement can lead to dissatisfaction and disputes. The combination of these challenges makes tontines less attractive compared to other financial products that benefit from clearer regulations, more robust administrative systems, and greater transparency.

## LIMITATIONS OF THE EXISTING SYSTEM

At the end of our collection of information concerning the daily collection process in a microfinance, we find that the system has weakness that should not be overlooked despite their efforts.

# *Table 3: Criticism, consequences and proposed solution*

|  |  |  |
| --- | --- | --- |
| **Problems** | **Consequences** | **Proposed Solutions** |
| 1. Lack of Transparency | - Disputes among members - Erosion of trust - Potential for fraud | - Implement clear and detailed documentation - Use digital platforms for real-time tracking - Regularly audit and review transactions |
| 2. Poor Management and Supervision | - Mismanagement of funds - Potential for loss of capital - Discontent among members | - Appoint experienced managers or supervisory boards - Provide training and establish clear guidelines - Regular performance reviews |
| 3. Inadequate Record Keeping | - Difficulty in tracking contributions and distributions - Increased risk of errors - Disputes over records | - Use digital tools for record-keeping - Maintain accurate and up-to-date records - Implement backup and recovery systems |
| 4. Regulatory Compliance Issues | - Legal penalties and fines - Risk of shutdown - Damage to reputation | - Stay informed about relevant regulations and laws - Consult with legal experts - Ensure compliance with local and national financial regulations |
| 5. Security Concern | - Risk of fraud or theft - Unauthorized access to sensitive information - Loss of funds | - Implement strong security measures (e.g., encryption, multi-factor authentication) - Regular security audits - Educate members about security best practices |

## PROBLEMATIC

**Given that security is paramount in financial transactions, ensuring a simple and explicit process is crucial, especially when the financial well-being of individuals is at stake. Our tontine system must address various challenges such as transparency, management, and record-keeping. With these critical observations in mind, we must ask: How can we streamline the transaction process between contributors and collectors while maintaining robust security and efficiency? Our application aims to provide a solution by integrating advanced security measures and user-friendly features to facilitate secure and efficient financial interactions within the tontine.**

### **PROPOSED SOLUTION**

After our study and criticism of the existing situation, we propose to design a Web application to solve the problems stated aboveby allowing: The application to;

* **Implement Real-Time Reporting:** Provide a digital platform where participants can view real-time updates on contributions, withdrawals, and other transactions.
* **Detailed Records:** Maintain detailed and accessible records of all transactions and decisions made within the tontine.
* **Qualified Management Team:** Appoint experienced and trustworthy individuals to oversee the tontine operations and ensure proper management.
* **Digital Record System:** Utilize a digital record-keeping system to accurately track all transactions, contributions, and withdrawals.
* **Backup and Security:** Regularly back up records and ensure they are securely stored to prevent data loss. Deposit contribution
* **Implement Strong Security Measures:** Use encryption and secure authentication methods to protect digital transactions and sensitive data.

**PART THREE: SPECIFICATION BOOK**

Preamble

The primary goal of the specification book is to outline with great precision the requirements or need of the users and the description of the resources necessary to realize the project. It is considered as a communication and description tool which permits us to avoid inadequate results.

Overview

INTRODUCTION

1. CONTEXT AND JUSTIFICATION
2. OBJECTIVES OF THE PROJECT
3. EXPRESSION OF NEEDS
4. PLANNING OF THE PROJECT
5. ESTIMATION OF COST
6. CONSTRAINTS
7. DELIVERABLES

CONCLUSION

# INTRODUCTION

In order to successfully achieve a project, we need to have clear instructions so as to avoid failure. Hence, realizing the document phase called the specification book will help avoid the failure of our project. The specification book permits to specify the expectations of the customer as well as the standards that will govern the project for a good, smooth, precise and concrete project. It establishes a certain agreement between the client of the project and the person who is supposed to realize the project. It presents the objectives and needs of the system to be developed. The present specification book relates to the context and justification, the needs of the project, the plan and the deliverables.

## I. CONTEXT AND JUSTIFICATION

### **1. Context**

Cameroon is a home to closely 28,697,813 million inhabitants and an estimated **37.5 percent** of the country's population lives below the poverty line; microfinance would seemingly be an ideal solution to the economic problems of the country poorest citizens. Even though microfinances try to solve a peculiar problem we have noticed that they are still some lacunae in their way of doing that is mainly in their way of recording daily collections where everything is done on papers, lack of security which leads to mothers in the market being duped, and no traceability of their collectors.

### Justification