A PROTOTYPE IMPLEMENTATION OF MICROFINANCE SOLUTION

BY

MD. NASIRUDDIN
ID: 112-25-210

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Masters of Science in Computer Science and Engineering

Supervised By

Dr. Sheak Rashed Haider Noori
Associate Professor & Associate Head
Department of CSE
Daffodil International University

DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

2018

APPROVAL

This Project Titled **"A Prototype Implementation Of Microfinance Solution"**, submitted by Md.Nasiruddin (ID:112-25-210) to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of M.Sc. in Computer Science and Engineering and approved as to its style and contents.

<u>BOARD OF EXAMINERS</u>

_____

Dr. Syed Akhter Hossain   **Chairman**
Professor and Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

_____

Dr. Md. Islamil Jabiullah   **Internal Examiner**
Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

_____

Md Tarek Habib   **Internal Examiner**
Assistant Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

_____

Dr. Mohammad Shorif Uddin   **External Examiner**
Professor
Department of Computer Science and Engineering
Jahangirnagar University

DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Dr. Sheak Rashed Haider Noori, Associate Professor & Associate Head,** Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:

_____

Dr. Sheak Rashed Haider Noori
Associate Professor and Associate Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Submitted by:

_____

MD. NASIRUDDIN
ID: 112-25-210
M.Sc. in CSE Program
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty Allah for His divine blessing makes us possible to complete this project successfully.

We fell grateful to and wish our profound our indebtedness to **Sheak Rashed Haider Noori, Associate Professor & Associate Head**, Department of Computer Science and Engineering, Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of wireless network influenced us to carry out this project .His endless patience, scholarly guidance ,continual encouragement , constant and energetic supervision, constructive criticism , valuable advice ,reading many inferior draft and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to Dr. Sayed Akhter Hossain, Professor and Head, Department of Computer Science and Engineering, for his kind help to finish our project and also to other faculty members and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

An Prototype Implementation of Microfinance Solution has been Designed and Developed that project financial inclusion workflow driven Microfinance business solution deals with Micro Finance information system. This has been developed to meet requirements of local NGO & Financial Cooperative Society who are deals with micro-credit loan program including savings scheme.

This software solution will cater those problems and requirements of MFI and help them to be productive and efficient in their field to gain competitive advantage. "An Prototype Implementation of Microfinance Solution" is a web based Microfinance loan management system, which would automate the loan processing system of MFI. It also facilitates stakeholder details management, general ledger, loan trial calculation, management information, reports, facility follow-up, closure and day-end process. The aim of this project is to providing online real time synchronized financial business automation of the Microfinance institution such as, weekly/monthly deposit collection, micro-credit loan product disbursement and weekly/monthly installment recovery information including Management Information System or MIS reports.

TABLE OF CONTENTS

LIST OF TABLES

TABLES   **PAGE NO**

LIST OF FIGURES

LIST OF ACRONYMS

MFI	–	Micro Finance Institution
NGO	–	Non Government Organization
IT	–	Information Technology
MIS	–	Management Information System
FIS	–	Financial Information System
PROTTYASHI	–	A local NGO of greater Chittagong
HTML	–	Hyper Text Markup Language
CSS	–	Cascading Style Sheets
C#	–	C Sharp Programming Language
jQuery	–	A cross-platform JavaScript library designed to Simplify the client-side scripting of HTML
MVC	–	Model View Controller
GUI	–	Graphical User Interface
PDF	–	Portable Document Format
RAM	–	Random Access Memory
DRS	–	Disaster Recovery Site
DC	–	Data Centre

CHAPTER 1

INTRODUCTION

1.1 Introduction

Dr. Mohammad yunus, the founder of grameen bank and Microfinance business model in bangladesh, as it originated at grameen bank, involved tiny loans to women with fixed terms and amounts, group liability, weekly meetings, forced payments into a group savings account, and a set of 16 social pledges chanted each week while standing at attention [1]. The grameen model spawned imitators around the world, involving a large share of microfinance clients in bangladesh, india, the philippines and east africa, among other places.

This project is on "a prototype implementation of microfinance solution", is a financial inclusion workflow driven microfinance business solution with real time online facilities deals with micro finance information system. This has been developed to meet requirements of local ngo & financial cooperative society who are deals with micro-credit including savings scheme.

1.2 Motivation

This project is presented as the solution for those requirements of the Prottyashi to improve the productivity of their business. From this project will provide a web based software solution, mainly for the loan management purposes of the Prottyashi. This system will reduce the paper work and automate the micro-credit loan processing system with more management facilities. This project would help to gather more domain knowledge about the Microfinance industry, much more about software development and project management.

1.3 **Objectives**

"Microfinance" Online Microfinance Solutions is developed on the basis of 4 main objectives:

1. Integrating all Microfinance business processes into one system
2. Advanced controlling mechanisms to minimize the risks of errors and frauds

"An Prototype Implementation of Microfinance Solution" is an innovative online solutions, required a fully-fledged flexible solution to automate the entire Microfinance lending process and operating procedures. The system had to be capable of running high-performance scoring models in real-time 24/7, as well as implementing quick, easy and cost-effective future integrations with multiple third-party systems. After a thorough business and requirement analysis, "A Prototype Implementation Of Microfinance Solution", created an end-to-end microcredit management platform with an open upgrade safe architecture and ramification features.

The main objectives of the proposed project are as follows-

1. Designing and implementing a complete, micro-credit management system.
2. Analyzing the problems of the present manual systems of the MFIs
3. Analyzing the business model of MFIs including savings scheme and microcredit.
4. Construct the whole project plan.
5. Designing the Database.

The main objectives of any MFI is

1. To create access to credit facilities
2. To meet financial and non-financial needs
3. To develop qualities like communication skills, leadership skills,
4. Cooperation and unity among members.
5. To create employment opportunities

1.4 **Expected Outcome**

The goal of the project is to design and implement a smart, useful and efficient "An Prototype Implementation of Microfinance Solution". Expected Outcome of this project are-

- ➢ Microfinance management will get all types of deposit product reports likes daily/monthly deposit reports, Total account opened, Scheme amount, Maturity time and value etc.
- ➢ Microfinance management will get all types of micro credit product reports likes daily/month microcredit account opened, disburse, weekly installment amount, present status of any microcredit product.
- ➢ Alignment of business segments into one integrated MIS (loan tracking, Small Savings Scheme, accounting and finance, internal control etc.)

CHAPTER 2

BACKGROUND

2.1 introduction

"a prototype implementation of microfinance solution" software is that, too easy any calculation of deposit and microcredit loan product in an automated system which sought to improve mfi administration. The major target was to computerize their hitherto manual and paper-based book-keeping. As other available software solutions seemed to target big-scale mfis, they decided to design their own tailor-made solution.

"A Prototype Implementation Of Microfinance Solution" developed in C# programming language with some additional JavaScript and CSS. The database uses SQL Server. As the required web server can run locally as well as remotely, the system offers a maximum of flexibility for different scenarios. On the client side, only an ordinary web browser is needed.

Online Microfinance Solutions has two major products. This are-

1.4 Scope of the Problem

For Scope of the Problem first we have to find out what are main problem exist in the Current System. Problems exist in the Current System-

➢ Prottyashi doesn't have a proper automated loan processing system. They do most of the work manually. Spread-sheets are the only electronic media has been used by the loan officers.

Online Micro Finance Solutions "Microfinance" is designed to work seamlessly with Micro-Finance Institutions to solve the problem of Current System. Microfinance intuitive user interface, guided procedures and powerful reporting functionality optimizing the workflow to meet the demanding requirements of a Microfinance institution and simplifies the sophisticated loan process including small deposit scheme.

Microfinance serves as the lending workhouse which was designed to perform high-throughput loan processing with a robust analysis. The method-based analysis protocols automate the loan life cycle and offer a time-resolved analysis capability.

1.5 Challenges

One of the biggest challenges of Microfinance solutions is to find a common business process of all MFI. Most of the MFIs has some common process and some other has different business process. But we are try to find out almost common business process used by most of the MFIs. To developed Online Microfinance Solutions, Challenges we have to face-

➢ Business process study is very difficult because data collection from stakeholders who are not enough educated to deliver clear business model.

➢ There are several loan products with multiple size of amount disbursed and its recovery system of weekly/monthly basis installment.

➢ Deposit product is also in different type of daily/weekly/monthly basis sheme collection by field officer.

CHAPTER 3

REQUIREMENT SPECIFICATION

Programs Module:

- ➤ Captures daily loan/savings/security disbursement and collection information
- ➤ Client and group management
- ➤ Produces loan officer and branch performance measure / monitoring reports
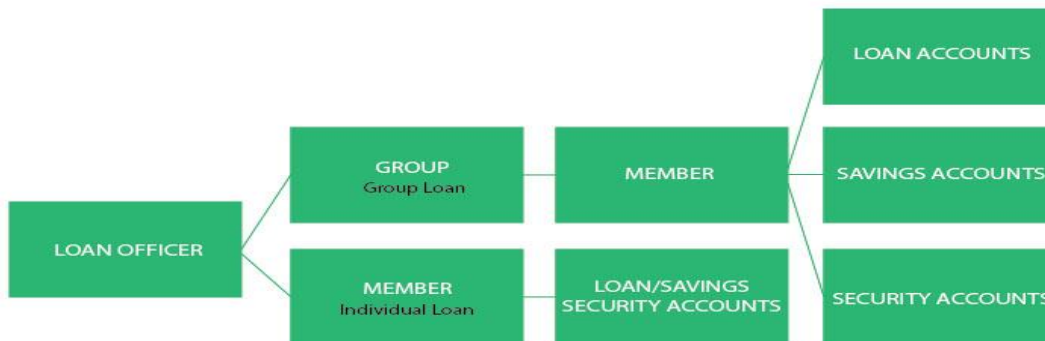

Figure 3.1 Program Module

- ➤ Specific accounting transactions (e.g. office expenses, bank receive/payment) can be managed separately
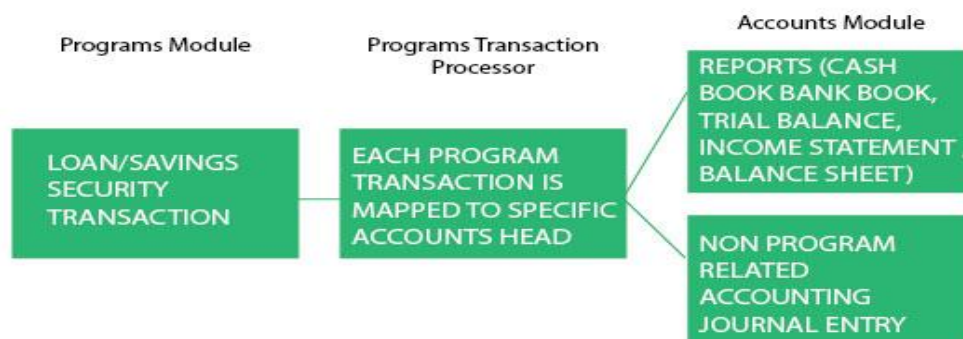- ➤ Tracks fixed assets with configurable depreciation rate Produces branch wise income expense report and balance sheet

Figure: Account Module

3.2 Requirement Collection and Analysis

This phase divided in to two main activities, Requirement gathering and Requirement analysis. Main goal of this phase is to clearly gather customer requirements, avoid ambiguities and finalize the project scope.

Requirements Gathering:

Requirement gathering is a crucial part of a software solution. If the requirements are crystal clear, chances are to be success is higher. But most commonly requirements might be ambiguous as well as not complete. To define the project scope clear and complete, customer requirements needed. Hence many requirement gathering techniques were used to complete the task.

• From organization's website

Prottyashi has their own website hosted in http://prottyashi.org/. The website supplies many details about the company such as its vision and mission, contact details, division details, case studies, enterprise services and training details.

• From documents and books published by the organization

After interviewing the stakeholders it will be better to study company documents and remove unnecessary ambiguity from the requirements.

• From Similar Solutions

Similar software [6][7][8] solutions have been studied to find other approaches to meet the requirements. Thus understanding existing solutions will be an advantage to make Microfinance a better software solution.

Requirement Collection and Analysis was carried out to study the major causes of software failure in satisfying the intended users' requirements in MFIs and proposed

solutions to this problem and test the effectiveness of the proposed solutions. The project was carried out as follows: Literature by earlier researchers on that problem was studied and compared. A study of some of the off-the-shelf Micro Finance software was done in order to determine to which extent the current software for MFIs fail to meet users' requirements. Basing on the findings from the research, proposals to solve this problem are given. There are general solutions proposed which can solve this problem in MFIs in any region and also detailed specific solutions to solve this problem of Prottyashi and any other MFIs. I believe that in order to solve this problem of software failure in meeting users' requirements in the MF sector, users' requirements could be determined per region where the social-economic indicators are similar throughout the whole region. I also believe that the low income people targeted by MFIs in Chittagong have similar social-economic indicators and therefore a solution based of Prottyashi data can as well be a solution for the any other MFIs. The proposed solution for Prottyashi is detailed as follows:

i) Statement of user's requirements broken down into five categories, namely general system requirements, data requirements, input requirements, process requirements and output requirements. If software for MFIs is going to satisfy user's needs, it must meet the requirements as specified in those categories.

ii) The software system model. This has been based on object oriented approach accessing an object database. This model has been broken into sub –systems with classes, methods and relations well defined.

Software for MFIs is based on the proposed specifications and design; it would be easy to cater for ever changing users' requirements in the MF sector. The design has been tested using prototype review, design review and inheritance-regression testing.

3.3 Use Case Modeling and Description

Use Case Modeling diagrams are graphically model the functionality of the system using actors and use cases. Use case diagrams are used to specify requirements on a subject, required usage of a system. An organization, a person or an external system can be represented as actors and their interactions with the system represented in use

cases. When drawing a use case diagram system boundaries are marked in rectangle. Use cases are drawn using ovals. Label with the ovals with verbs that represent system's functions. Actor stereotype is used to draw actors in the use case. A sample use case diagram of Microfinance system display below, which drew for the Micro Credit Loan officer, Manager, Cashier, Recovery officer as an actor. Complete use case diagrams are included in the appendix.
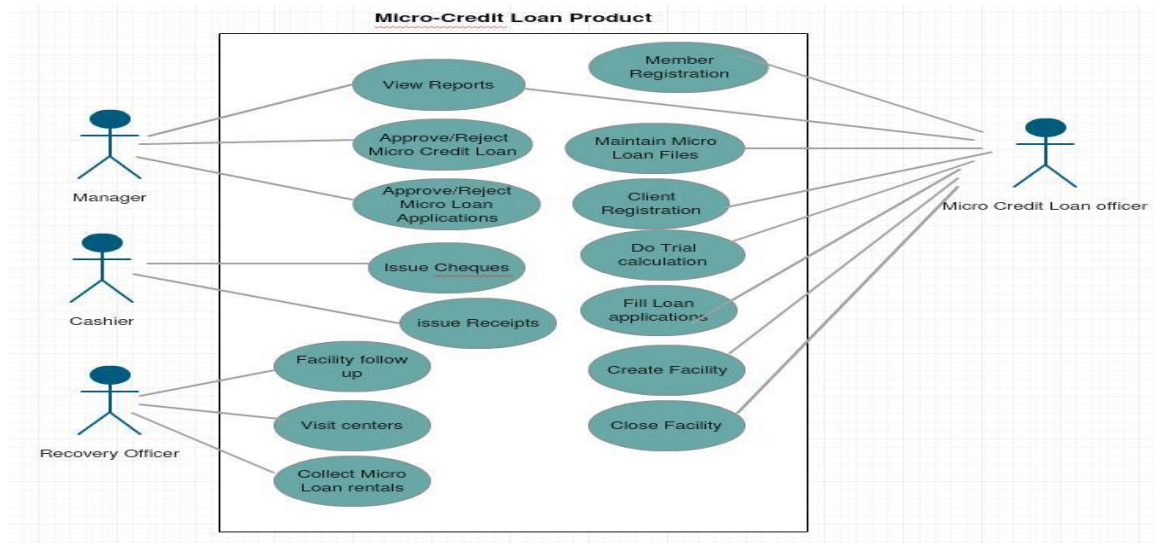

Figure : Use Case Diagram of Micro-Credit Loan Product

The following are the use case narratives of the Microfinance system.

Table 3.1: Use Case - Member Registration

Use case No :	U1
Use case :	Member Registration
Description :	Input Member/Samity details
Actors :	Micro Credit Loan Officer
Preconditions :	Create Stakeholder in the Microfinance system
Main Flow of Events :	Member ID should be exists in the system 1. Enter the Member ID and check for existing users 2.Enter Member/Samity details 3.Enter Address details of the Member/Samity 4. Fill other Member/Samity details
Alternative Flows:	1. If Member ID already exists don't allow to create Member ID

Post Conditions :	Show the generated Member ID

Table 3.2: Use Case - Maintain Microcredit Loan File

Use case No :	U2
Use case :	Maintain Microcredit Loan File
Description :	Input Member/Samity details
Actors :	Micro Credit Loan Officer
Preconditions :	Create Loan File in the Microfinance system
Main Flow of Events :	Member ID should be exists in the system 1. Enter the Member ID and check for existing users 2.Enter proposed Micro-Credit Loan details 3.Enter Total Amount, Installment size, Installment Number, Payback Period, Recovery schedule(weekly/Monthly) 4. Place for approval
Alternative Flows:	1. Complete Loan Proposal manually
Post Conditions :	Show proposed Loam Proposal.

Table 3.3: Use Case- Approved/Reject Micro-Credit Loan

Use case No :	U3
Use case :	Approved/Reject Micro-Credit Loan
Description :	Loan Proposal send from field officer for Approval
Actors :	Manager
Preconditions :	Proposed Microcredit approved or Reject in the Microfinance system
Main Flow of Events :	Manager check loan proposal according to loan product 1. Check application in details 2. Total Loan Amount 3. Number of Installment per week 4. Group Member able to paid

Alternative Flows:	Manager physically goes to inspection the project to make a decision for Approved/Reject.
Post Conditions :	If approved Crete new Loan Account or proposal return to field offier

Table 3.4: Use Case- Issue Cheque

Use case No :	U4
Use case :	Issue Cheque
Description :	Loan disbursement as per decision came from actor Manager
Actors :	Cashier
Preconditions :	Mark loan disburse in the Microfinance system
Main Flow of Events :	Loan Account should be exists in the system 1. Enter the Loan account and check it approved or not 2.Enter disburse amount 3. Issue a Cheque against the Member applied for loan 4. Mark Loan Account as disbursed
Alternative Flows:	1. Handover cash amount to the member instead of issue a cheque to the Member
Post Conditions :	Loan Account created and disbursed

Table 3.5: Use Case - Collect Micro loan Rentals

Use case No :	U5
Use case :	Collect Micro loan Rentals
Description :	Entry weekly recovery installment
Actors :	Recovery Officer
Preconditions :	Entry paid installment in the Microfinance system
Main Flow of Events :	Loan Account and Member ID should be exists in the system 1. Enter the Loan Account and check for Member details 2.Enter Installment number Member wants to paid 3.Cheque Installment amount with received amount

	4. Update Loan account as per installment recovered
Alternative Flows:	1. Check every group Member weekly installment Recovered
Post Conditions :	Show number of installment Recovered and Due

Actors of the System: There are five main actors in the system
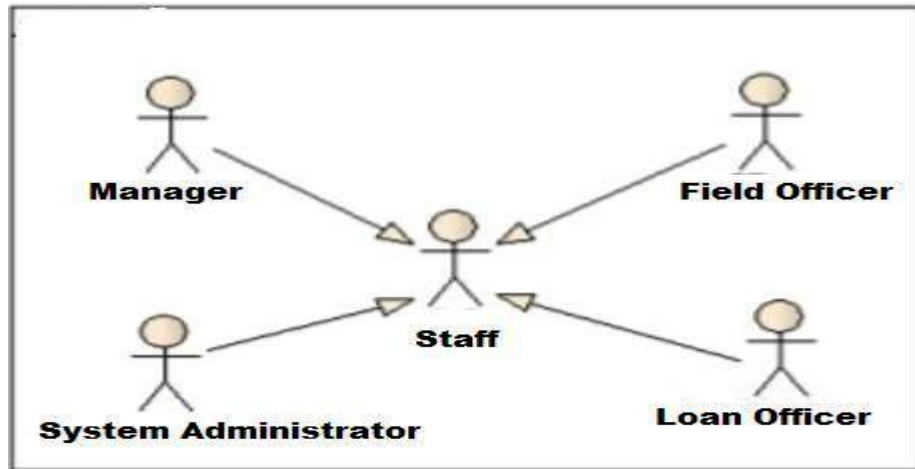
Figure 3.4: Actors of the System

3.4 Logical Data Model

Logical Data Model is an abstract model which shows specifically how the data is stored and accessed in the system. E-D diagram shows relationship between each entity of the database system.

• **Entity Relationship Diagram**

Entity Relationship diagrams is abstract and conceptual representation of data which produce a type of conceptual schema. It shows the relationships between entities in a database. The following digram is the ERD for 'M-fin' software solution which is drawn by using the Enterprise Architect tool.
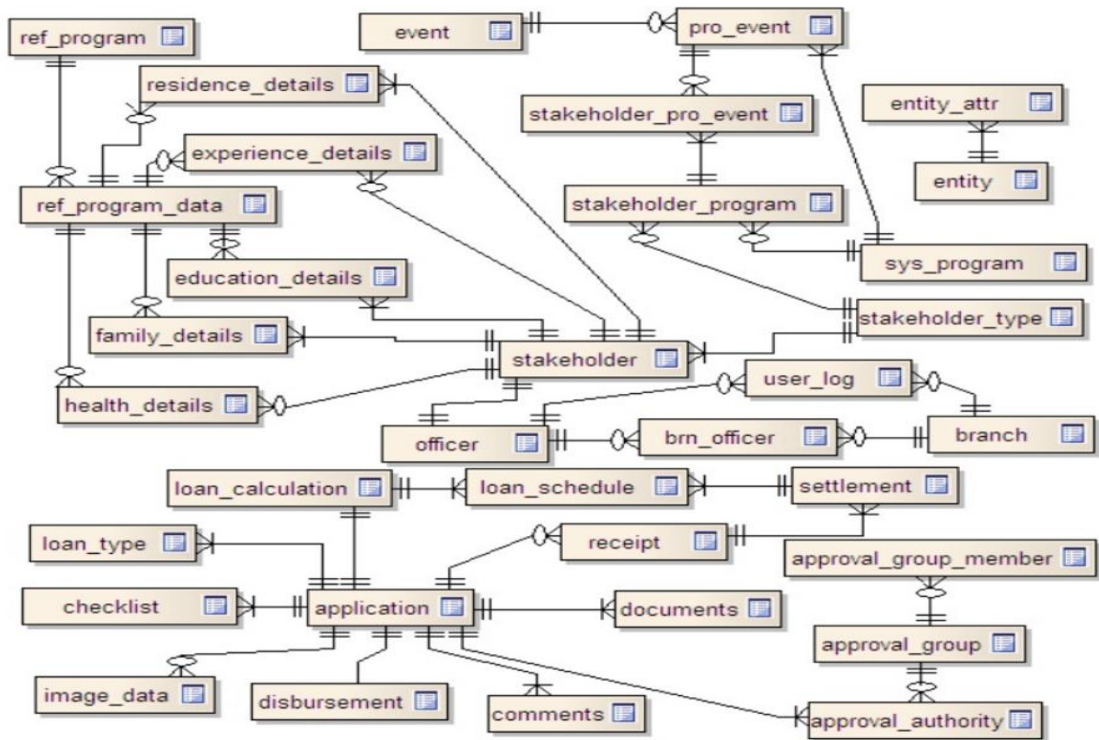
Figure 3.5: ER Diagram

• **Table Structures**

The following is sample table structures for the table Stakeholder & System Program in Microfinance system.

Entity Code: MID

Entity Name: Member ID

Table Name: Member

Table ID: tbl_01

Description: Member

Indexes:

Table 3.6: Table Structure-Member

Description	Attribute Name	Type	Length	Decimal	Key	E / D / R
Member Id	MEMBERID	Numeric	7		PK	E
MemberType Id	MEMBERTYPEID	Numeric	7		FK	R

Daffodil International University   13

Title	TITLE	Varchar	10			E
Initials	INITIALS	Varchar	20			E
First Name	FNAME	Varchar	20			E
Last Name	LNAME	Varchar	30			E
Full Name	FULLNAME	Varchar	100			E
Date Of Birth	DATEOFBIRTH	Date				E
Gender	GENDER	Varchar	1			E
Marial Status	MARITALSTATUS	Varchar	1			E
Account No	ACCOUNTNO	Varchar	20			E
Address Line 1	ADDRESSLINE1	Varchar	100			E
Address Line 2	ADDRESSLINE2	Varchar	100			E
Telephone No	TELEPHONENO	Varchar	20			E
Mobile No	MOBILENO	Varchar	20			E
System User ID	SYSUSERID	Numeric	7			E
Created Date	CREATEDDATE	Date				E

Entity Code: SYP

Entity Name: **System Program**

Table Name: system Program

Table ID: tbl_05

Description: System Program

Indexes:

Table 3.7: Table Structure – System Program

Description	Attribute Name	Type	Length	Decimal	Key	E / D / R
System Program Id	SYSTEMERPROGRAMID	Numeric	7		PK	E
System Program Code	SYSTEMPROGRAMCODE	Varchar	4			E
Description	DESCRIPTION	Varchar	20			
Parent ID	PARENTID	Numeric	7			
Reference URL	REFERENCEURL	Varchar	100			
System User ID	SYSUSERID	Numeric	7			E
Created Date	CREATEDDATE	Date				E

System Structure of the proposed solutions-

Figure 3.6: System Structure

3.5 Design Requirements

Microfinance designed to respond to these financial institution's specific needs. However, considering the multiplicity of such IT solution, it's not easy for client firms to make the right choice.

Microfinance is a booming sector, since it gives individuals and small businesses access to credit and banking services when they were excluded from conventional lending system. This activity calls for the adoption of a powerful Microfinance software because despite it is young, this fast-moving and innovative market has very precise requirements.

Key Modules:

Figure 3.7: Microfinance Management & Accounting Cycle

CHAPTER 4

DESIGN SPECIFICATION

Front-end Design

Front-end tools used to develop of the Online Microfinance Solutions "Microfinance" are that ASP.NET MVC Framework-II, jQuery and Cascading Style Sheets (CSS).

ASP.NET MVC 2 provides a new Model-View-Controller (MVC) framework on top of the existing ASP.NET 3.5 SP1 runtime. ASP.NET MVC 2 is a framework for developing highly testable and maintainable Web applications by leveraging the Model-View-Controller (MVC) pattern.

There are six main Menu of Microfinance. They are System, Manage, Reports, Accounts, and Help. Followings are brief feature list of each module.

4.1 Back-end Design

Back-end tools used to develop of the Online Microfinance Solutions "Microfinance" are that C Sharp(C#) programming language, SQL Server 2008.

 C# is based on C++ and contains features similar to those of Java.

Microfinance is designed to work with Microsoft's .Net platform to facilitate the exchange of information and services over the Web, and to enable developers to build highly portable applications.

These are the tasks for design the database in SQL Server 2008 that would need to be processed:
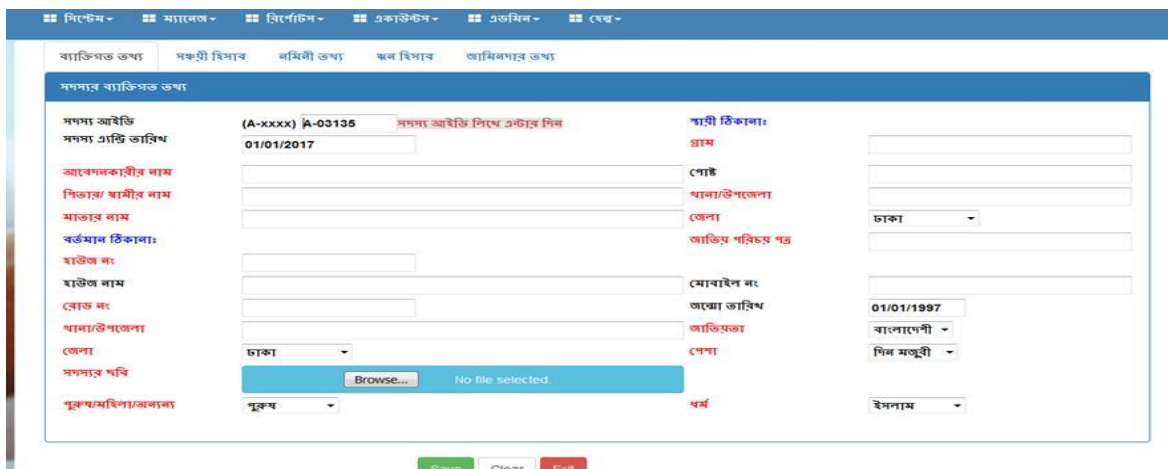
   a) Create a Samity
   b) Update Member Information of a Samity
   c) Search a particular from a Samity
   d) Installment dues of a Samity
   e) Modify a Group

4.3 Interaction Design and UX

Interaction Design and UX or User interfaces are the components of the system which users will interact with. User interface design is the part where designers focus on user interaction and experience. The goal of user interface design is to make the user's interaction as simple and efficient as possible while accomplishing business need.

• **Input Forms**

Input forms contain three sections, input fields, common toolbar and action buttons. Input fields allow data to be entered or display data selected in the grid. Display input fields will be set to read only. Date input fields have a button to trigger the date picker component and display the date selected by the date picker. Also there are reference input fields which also have a button to trigger the reference browser.

Figure 4.2: Input Forms

• **Validations**

Mandatory fields of the input forms are marked in red colour asterix. Optional fields are marked in blue colour asterix. If a user violates a validation condition, the error will display in the division filed below the element.

• **Reference Data Browsers**

Common browser windows help user to browse and select the already defined reference data. It facilitates to search data by criteria, and display data in a grid. Button toolbar will contain an OK button for input the selected record value to the parent screen and Cancel button for simply close the popup without inputting any record. Also double clicking a row will execute the function of the OK button.
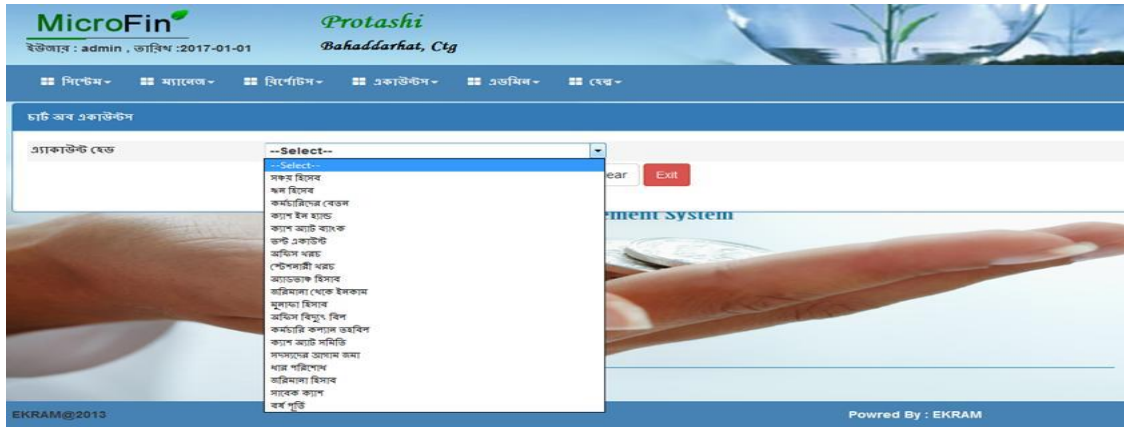
Figure 4.6: Common Browser

▪ **Development Environment**

C Sharp(C#) is used as the main programming language of this "A Prototype Implementation Of Microfinance Solution", project. The system used the ASP.NET MVC Framework-II architecture displayed as the following figure. CSS and JavaScript jQuery technologies are used as back-end tools of the system. And SQL Server 2008 is used as the database.

▪ **Hardware and Software Requirements**

Minimum hardware and software requirements for implementation of this project-

o **Server Side**

   Minimum Hardware requirements in Server Side

   • Server computer with 32/64bit architecture
   • 3.0 GHz Core2Duo Processor with 2MB Cache Memory
   • 4GB RAM

- 80GB Hard disk space

Minimum Software requirements in Server Side

- Operating system which supports 32/64bit architecture (Windows)
- ASP.NET
- Java
- Microsoft SQL Server-2008

o **Client Side**

Minimum Hardware requirements in Client Side

- Computer with 2.0 GHz processor
- 512MB RAM

CHAPTER 5

IMPLEMENTATION AND TESTING

5. Implementation of Database

Types of Records:

For Implementation of database first we have to design tables and its records of all the items discussed and decisions taken during the database table's requirements analysis. It also contains names of all general ledger and their data records.

a. Savings Ledger Format: This record contains the details of savings account of all individual member.

b. Individual Loan Ledgers Format: This record contains the details of loans taken, the interest and the fines of the individual members of the group. It also includes the amount, purpose, period and periodicity for repayment etc.

c. Group Loan Ledger Format: This record includes the information of loan and repayment of the same group members. This ledger gives the collective information for the complete group. Outside loan ledger format, income expenditure record format, individual pass book format and group format are other type of the record keeping formats.

These are the following different kinds of transactions that can be process in small saving program:

      a) Member information
      b) Samity information
      c) Loan process
      d) Savings scheme process
      e) Withdrawal system

f) Loan sanction and

g) Reports suit

Savings Accounts-

a) Open a new account

b) View / download current liquid balance

c) View / download current total balance

d) View / download transaction history

e) Record / download deposits / withdrawals

f) Record / download interest / dividend income

g) Subtract fees / charges

h) Print Statement

5.2 Implementation of Front-end Design

The Implementation of front-end design of this project looks like that-

5.2.1 System Menu:

The home page of Online Microfinance Solution project named "Microfinance" is likes that-

System menu has two sub-menu logout and home.

Figure 5.1: System Menu

5.2.2.3 Savings Account Information Change:

If you need any change of savings account information for a particular member id

Figure 5.2: Savings Account Information Change

5.2.2.4 Loan Account Information Update:

Figure 5.3: Loan Account Information Update

5.3.2.5 Member Personal Information Update:

Figure 5.4: Member Personal Information Update

Figure 5.5: Accounts Menu

5.2.4.1 Member Voucher Posting:

Figure 5.6: Member Voucher Posting

5.2.4.2 Account Voucher Entry:

Figure 5.7: Accounts Voucher Posting

5.2.5.2 Employee Information Management:

Figure 5.8: Employee Information Management

5.3 Implementation of Interactions

In this state of implementation of a project we have to input some data into the system from the MFI manual ledger of savings scheme and Microcredit loan. For that purpose we have to done data entry activities with the help of field officer working in the MFI.

Data Entry Activities:

At this step, initially, members start coming together with the initiation of forming the group. At this step, members decide specific place and time for their meeting, amount of deposit and name of their group. Each group working with some samity and member data entry.

Training:

For this solution being effective and sustainable, training is vital for both group leaders and group members.

Forming rules:

At this step, normally, the group opens its own account in the bank which is run jointly. The date of opening the account is the formal date formation of the group. Under the guidance of the facilitator, the group decides an autonomous flexible set of rules including the date of depositing the saving, frequency of meeting; amount of loan repayment of loan, interest rate on loan, penalties for non-attendance and late payments etc.

Test Cases:

the following test cases were designed and they were executed at each testing level as to identify defects. Several test rounds were carried on until the test case being passed.

Integration Testing:

The purpose of Integration testing was to expose the defects in the interface interactions between integrated components. Bottom-up Integration testing approach was used in this testing level. So the bottom level units were tested first and move into upper level units step by step. After test closure once the test meets the exit criteria, the integrated system was ready to system testing.

System Testing:

System testing is carried out using the completely integrated system. As this is the last testing level before showing the system to the users, this testing need to be thoroughly executed. So in this phase, evaluated the system's compliance with the specified requirements is verified.

Acceptance Testing:

Acceptance testing was performed by the client organization in their working environment. This was used to define acceptability of the system as they were expected and to be prepared for the delivery. A representative of each identified user groups was participated in the acceptance testing and at the end of final test round a feedback form was given to evaluate the success of the project.

5.5 Test Results and Reports

We test the software after completing a branch data entry from manual ledger. Then test the system by generating various reports and cross checking with manual ledger and found correct.

Figure 5.15: Reports Menu

Following types of reports, we can get from the solutions-

1. Member Profile Report

2. Daily Account Transaction Report

3. Ledger wise Transaction Reports

4. Member Deposit Book

5. Daily Cash Book

Form above reports few of reports screenshot are shown bellow-

Table 5.1: User List

Protashi

গনপ্রজাতন্ত্রী বাংলাদেশ সরকার অনুমোদিত
রেজিঃ নং-০০৪৮৪
Bahaddarhat, Ctg

ইউজার লিষ্ট

ক্রঃ নং	তারিখ	আইডি	ইউজার নাম	ইউজার স্ট্যাটাস
1	27/12/ 2016	nopur	Nopur	একটিভ
2	22/01/ 2017	jalal	Jalal	একটিভ
3	01/01/ 2013	admin	সিস্টেম এ্যাডমিন	একটিভ

_____   _____
অফিসার   অফিসার

Table 5.2: Member List

Protashi

গনপ্রজাতন্ত্রী বাংলাদেশ সরকার অনুমোদিত
রেজিঃ নং-০০৪৮৪
Bahaddarhat, Ctg

সকল সদস্য লিষ্ট

ক্রঃ নং	নিবঃ তারিখ	আইডি	সদস্য নাম	সদস্যের পিতার নাম	এনআইডি
176	01/01/2017	A-03023	Md. Faruk	Abdul Hanif	111111
177	01/01/2017	A-03024	Aysha Begum	Nur Nobi	11
178	01/01/2017	A-03025	Abdur Rahman	Surja Khandaker	11
179	01/01/2017	A-03026	Abdur Rahman-2	Surja Khandaker	444
180	01/01/2017	A-03027	Redoy	Abdur Rahman	1
181	01/01/2017	A-03028	Najnin Akter Roni	Abdur Rahman	111
182	01/01/2017	A-03029	Md. Ujjal	Sahabuddin Patuary	222
183	01/01/2017	A-03030	Abdur Rahim	Surja Khandaker	111
184	01/01/2017	A-03031	Mizanur Rahman	Late Milon Howlader	2692986660622
185	02/01/2017	A-03032	Lamia	Jane Alam	11111111111111111111
186	02/01/2017	A-03033	Md Giyash Uddin	Munshi Abdul Goni	1917442767168
187	02/01/2017	A-03034	Md Hasan Uddin	Md Ala Uddin	111111111
188	01/01/2017	A-03035	Md. Haroon	Md. Abu Bakkar	11111
189	01/01/2017	A-03036	Md Halim	Md Fazlu Mridha	1111111111111111111
190	02/01/2017	A-03037	Md Year Ali	Md. Alam Shardar	2617635392505
191	01/01/2017	A-03038	Md. Pannu Mia	jjj	11
192	02/01/2017	A-03039	Md Dulal	Mrito Kholilur Rahman	2612935350615
193	01/01/2017	A-03040	Md. Oliul	Moroq Mia	11

Table GL Accounts Balance Report

Chapter 6

Conclusion and Future Scope

6.1 Discussion & Conclusion

"A Prototype Implementation Of Microfinance Solution", Microfinance is developed as a web based software solution with the aims of easy maintenance. Microfinance has facility for In-depth access rights management which was not available in other competitive systems.

6. Scope for Further Developments

Scope for Further Developments:
Till now status of Microfinance Solution implementation at branch level:
- ➢ Implementation completed successfully for a single branch.
- ➢ Program officer of Prottyashi looks over the Microfinance operation from a branch.
- ➢ Loan Officers (LO's) enter their daily transactions into Microfinance and daily, weekly, monthly and yearly branch reports are prepared from Microfinance, reducing complex calculation required to prepare manual summary reports
- ➢ SMS notification system can be used in the system for every transaction

Future Developments:

This is a single branch project can be upgrade into multiple branch based solutions from a central database server with multiple Application Server according to size of the MFI. Prottyashi wants to implement central server based Microfinance solution, which will be milestone for Prottyashi's Microfinance Solution (Microfinance) project implementation.

In future everything can be done in a central database server in head office data centre with multiple applications server according to number of branches.

REFERENCES

[1] "Dr. Mohammad Yunus and Grameen Bank" from Wikipedia Website
https://en.m.wikipedia.org/wiki/Grameen_Bank

[2] "Prottyashi a local NGO has been taken the Grameen model and provided micro-credit loan
facilities to the poor people in Chittagong" from Prottyashi Website
http://www.prottyashi.org/about-us/

[3] Source: The World Bank (2005d). Targeting Resource for the Poor in Bangladesh, The World
Bank Office, Dhaka, December, 2005

[4] Source: BRAC 2004 Annual Report. Members with no loan outstanding can withdraw
savings; and with loan outstanding can withdraw in case of emergency only.

[5] Gates, Bill and Melinda Gates (2015). "Our Big Bet for the Future: 2015 Gates Annual Letter.
Bill & Melinda Gates Foundation. http://www.gatesnotes.com/2015-Annual-Letter

[6] Sensitization programmers for government officials covering 9,706 participants.