AUTOMATED LOAN RECORD MANAGEMENT SYSTEM

BY

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FACULTY OF COMPUTING

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BENIN CITY.

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A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF COMPUTER PSC SCIENCE, FACULTY OF COMPUTING, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A BACHELOR OF SCIENCE (B.Sc.) DEGREE IN COMPUTER SCIENCE

JANUARY 2026

DEDICATION

This project is dedicated to God Almighty.

CERTIFICATION

This is to certify that this project work was carried out by **OSAKPOLOR JEFFREY OSAKUE** with Matriculation Number **PSC1814512** under my supervision. It is adequate and satisfactory, both in scope and content, for the award of Bachelor of Science (B.sc) Degree in Computer Science of the University of Benin.

DR. (MRS) G.O. AZIKEN	**DATE**
(Project Supervisior)	
DR. (MRS.) USIOBAIFO A.R	**DATE**
(Project Coordinator)	
PROF. (MRS.) V.V.N. AKWUKWMA	**DATE**
(Dean, Faculty of Computing)	

APPROVAL

This project work is hereby approved in partial fulfilment of the requirements for the award of Bachelor of Science (B.Sc.) Degree in Computer Science from the University of Benin.

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ABSTRACT

In many developing regions, loan management processes remain a significant challenge due to poor record keeping, limited accountability between lenders, borrowers, and guarantors, and the absence of structured digital administration tools. This project focuses on the design and implementation of an Automated Loan Record Management System delivered through a web-based platform, the LRMS Platform. The system was developed using Object-Oriented Analysis and Design (OOAD) and a prototyping approach to ensure simplicity, usability, and scalability.

The platform comprises nine modules: Administrator Login, Borrower Registration with fingerprint capture and photograph upload, Borrower and Guarantor Details with SMS reminder management, Loan Issuance, Bank Details, Repayment tracking, a Database Dashboard for visual analytics, a Saved Records interface for searchable borrower and guarantor retrieval, and an Offline Support page. Testing confirmed that the system accurately handles borrower registration, loan record management, repayment tracking, and administrator-initiated SMS reminders to borrowers and guarantors. The system is reliable, structured, and practical for lending organizations and cooperative societies seeking to improve loan administration, reduce defaults, and strengthen accountability among all stakeholders.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

In today's digital age, financial institutions and lender organizations are increasingly adopting technology to improve service delivery, enhance transparency, and ensure accountability. However, many borrowers in Africa — especially market traders, artisans, and rural entrepreneurs — still face challenges accessing and managing loans due to low literacy levels and limited exposure to digital tools. Traditional loan processes often exclude individuals who cannot read or write, leaving them vulnerable to misinformation, missed payment deadlines, and exploitation. Guarantors, too, are frequently unaware of their responsibilities or the status of loans they have backed. Lenders struggle to keep accurate records, track repayments, and communicate effectively with borrowers and guarantors.

Several researchers and developers have attempted to introduce automated loan management systems to address these challenges. For example, Mbam and Igboji (2023) developed a tech-based loan system for cooperative societies in Ebonyi State, which improved accuracy and reduced errors. Similarly, Nwankwo and Ogbodo (2021) created a PHP/MySQL-based web system that provided real-time loan tracking. While these systems contributed to the digital transformation of cooperatives, they largely catered to literate users with access to internet-enabled devices and often required reading and form-filling to operate.

This poses a major challenge in many developing regions, where a significant percentage of cooperative society members are non-literate and have limited digital literacy. Solutions like those from Eze and Okon (2019) and Uche and Bello (2018), while technically sound, lack accessibility features that accommodate users with little or no education. Although voice-based

systems such as the one developed by Ibrahim and Lawal (2023) for market women introduced voice commands to aid usage, they rely heavily on internet access, which is often unreliable or unavailable in rural communities.

Biometric authentication, particularly thumbprint technology, has emerged as a promising alternative for identity verification. Systems like those developed by Okeke and Edobor (2022) and Chinedu and Adebayo (2022) utilized biometric and SMS technologies to enhance user authentication, reduce fraud, and improve loan tracking. However, these systems were often either too costly, lacked multilingual or offline support, or were not fully designed with non-literate users in mind.

Given the above, this study proposes the design and implementation of an Automated Loan Record Management System delivered through a web-based platform. The system will:

1. Register borrowers digitally, capturing their full name, phone number, address, business type, guarantor details, fingerprint, and passport photograph through a structured web-based registration form
2. Provide dedicated modules for Loan Issuance, Bank Details capture, and Repayment tracking
3. Allow administrators to view borrower and guarantor profiles, monitor SMS reminder status, and manually send reminders from the Borrower Details page
4. Store all loan records digitally in a structured database accessible through the Dashboard and Saved Records modules
5. Provide an Offline Support page to ensure continued access to system information when internet connectivity is temporarily unavailable

By leveraging these technologies, this system will reduce loan defaults, improve record-keeping accuracy, and promote accountability between lenders, borrowers, and guarantors. The system aims to make modern loan administration more accessible, transparent, and practical for diverse organizational settings.

1.2 Statement of the Problem

Despite the technological advancements in automating financial systems, existing lender organizations still struggle to engage borrowers who are not literate or digitally savvy. Many lending organizations:

- Require text input and reading comprehension
- Rely on internet connectivity
- Are built on outdated or rigid technology stacks
- Have limited language support or usability customization
- Leave guarantors uninformed

For instance, Mbam and Igboji's (2023) system lacked mobile integration, while AZ Research Consult (2022) relied on outdated Visual Basic 6.0. Nwankwo and Ogbodo's (2021) web system excluded illiterate users due to the absence of audio or icon-based navigation. Even more innovative systems like the voice-based model by Ibrahim and Lawal (2023) require internet access, making them unreliable in low-bandwidth environments.

Furthermore, while biometric solutions have been introduced in some models, they are often costly or do not adequately account for the needs of low-income, rural cooperative members. The lack of systems that blend web accessibility, fingerprint capture, manual SMS reminders, and offline support means that a large section of the target population is excluded from the benefits of automation.

This project addresses this problem by developing an automated loan record management system that:

- Registers borrowers via a structured web form capturing personal details, fingerprint, and photograph
- Manages loan issuance, bank details, and repayment tracking through dedicated modules
- Enables administrators to manually send SMS reminders to borrowers and guarantors from the Borrower Details page
- Stores and manages all loan records digitally through a Dashboard and Saved Records interface
- Provides an Offline Support page for continued access during network disruptions

1.3 Aim and Objectives of the Study

Aim: To design and implement an Automated Loan Record Management System that uses a web-based platform with fingerprint capture, structured loan administration modules, and SMS reminder functionality to reduce loan defaults and streamline loan record management.

Objectives:

1. To develop a web-based borrower registration module that captures personal details, fingerprint, and passport photograph for secure member identification.
2. To implement dedicated modules for Loan Issuance, Bank Details, and Repayment tracking to support complete loan lifecycle management.
3. To enable administrators to view borrower and guarantor profiles and manually send SMS reminders from a dedicated Borrower Details page.
4. To store and manage loan records digitally, accessible through a Database Dashboard and Saved Records interface for easy retrieval and auditing.

5. To provide an Offline Support page ensuring continued access to system information during periods of network unavailability.

1.4 Significance of the Study

This study offers both practical and academic value. On a practical level:

1. It contributes to financial inclusion by providing a structured, web-based platform accessible to lending organizations of varying sizes.
2. It enhances security and accuracy in loan processing through fingerprint capture during borrower registration, reducing identity impersonation.
3. It improves communication between lenders, borrowers, and guarantors through a dedicated SMS reminder interface on the Borrower Details page.
4. It reduces fraud and disputes by maintaining transparent, digitally stored loan records accessible through the Dashboard and Saved Records modules.

Academically, this project:

- Builds on the findings and limitations identified in previous studies on digital loan management.
- Offers a practical model of web-based loan administration that integrates fingerprint capture, SMS reminders, and offline support.
- Serves as a reference for future researchers developing accessible financial management systems for lending organizations.

By combining structured web design, fingerprint-enhanced registration, and SMS reminder functionality, the system sets a precedent for how future financial technologies can be inclusive, transparent, and scalable across different organizational contexts.

1.5 Scope of the Study

The scope of this study is focused on the development of a web-based Automated Loan Record Management System delivered through the LRMS Platform. It includes the following modules:

- Administrator login and authentication
- Borrower Registration with fingerprint capture and photograph upload
- Borrower and Guarantor Details with SMS reminder management
- Loan Issuance recording and management
- Bank Details capture linked to borrower profiles
- Repayment tracking and balance updates
- Database Dashboard for visual analytics and record monitoring
- Saved Records for searchable borrower and guarantor database
- Overview page as the system homepage
- Offline Support page for access during network disruptions

The system will be tested within a sample lending organization, with the aim of eventual expansion to multiple similar organizations.

1.6 Limitations of the Study

1. The system depends on internet connectivity for full operation; areas with poor or no internet access may experience service interruptions, though the Offline Support page provides partial mitigation.
2. SMS reminders are manually initiated by the administrator from the Borrower Details page and are not automatically scheduled by the system based on due dates.
3. The prototype is implemented as a web application; a dedicated mobile application version is not included in the current scope.

4. The user interface may only support basic language features due to time and technical constraints.
5. Cost of SMS delivery and resistance to technology adoption among older users may pose practical challenges during deployment.

CHAPTER TWO

2.1 LITERATURE REVIEW

This chapter reviews existing studies, systems, and technological approaches that relate to automated loan record management. It examines how previous works attempted to solve problems in loan administration, the motivations behind their technological choices, and the limitations that still prevented them from meeting the needs of lending organizations that require structured digital record keeping, fingerprint-enhanced registration, and accessible administrator-facing interfaces. The overviews also highlight the gaps in existing systems and the need for an inclusive solution that integrates these functionalities into a unified web-based platform.

2.2 ENHANCING COOPERATIVE LOAN SCHEME THROUGH AUTOMATED LOAN MANAGEMENT SYSTEM

Mbam and Igoji in 2023 developed a system for cooperative loan schemes through automated loan management for cooperative societies in Ebonyi State.

Why This Idea Emerged:

The solution was motivated by the need to eliminate manual processes, which often result in inconsistencies and record loss. The system improved accuracy and reduced delays in loan processing.

Digital Transformation:

The system represents a significant step in digital transformation but does not solve the accessibility problem, where guarantors are often excluded from reminder communications, leading to poor accountability and increased default rates.

Limitations:

Despite its strengths, the system lacked a structured web-based interface and did not provide dedicated modules for loan issuance, bank details capture, or repayment tracking. It required form-filling and text-based navigation, which excluded users who could not read or write. It also offered no fingerprint capture during registration, no photograph upload, and no mechanism for administrators to view and manage SMS reminder status per borrower.

2.3 DESIGN AND IMPLEMENTATION OF LOAN MANAGEMENT SYSTEM USING PHP AND MYSQL

A different approach was introduced by Nwankwo and Ogbodo in 2021, who developed a PHP/MySQL loan tracking system with real-time monitoring. Their goal was to allow lending organizations to access loan histories, update repayment details, and communicate with borrowers efficiently through a web interface.

Why This Idea Emerged:

The study attempted to reduce the communication gap between lenders and borrowers by providing online loan visibility.

Limitation:

The major issue with this solution was its dependence on internet availability, which is unreliable in developing regions. Also, the system lacked borrower registration features that incorporate fingerprint capture or photograph upload, and it provided no dedicated Borrower Details page where administrators could view SMS reminder history and manually dispatch reminders to both borrowers and their guarantors. There was equally no Offline Support provision for periods of network disruption.

2.4 VOICE-ENABLED LOAN MANAGEMENT SYSTEM FOR MARKET WOMEN

Ibrahim and Lawal in 2023 introduced a voice-based loan management system targeted at market women. Their work recognized the literacy problem and attempted to address it by incorporating voice commands and audio prompts into the loan management process.

Why This Idea Emerged:

This innovation was intended to help non-literate borrowers navigate digital systems without reading or typing.

Limitation:

While the system improved accessibility, it relied heavily on stable internet for voice processing, making it impractical for rural or low-bandwidth areas. Additionally, it did not integrate fingerprint capture during registration, photograph upload, or a structured web-based module system covering loan issuance, bank details, repayment tracking, and a searchable saved records interface. The system also lacked a dedicated administrator-facing dashboard for visual analytics and record monitoring.

2.5 AUTOMATED LOAN DISBURSEMENT MANAGEMENT SYSTEM FOR COOPERATIVE SOCIETIES

Okeke and Edobor as well as Chinedu and Adebayo in 2022 designed systems that incorporated thumbprint verification alongside SMS notifications.

Why This Idea Emerged:

The systems sought to improve security, reduce fraud, eliminate identity impersonation, and provide quick access to borrower information.

Limitations:

While these systems introduced biometric elements, they lacked a unified web-based platform with a structured sidebar navigation covering all loan administration modules. There was no dedicated Borrower Details page that consolidated the borrower's profile, loan balance, guarantor information, and SMS reminder log in one view. The systems also did not provide a Database Dashboard for visual analytics showing aggregate counts of borrowers, guarantors, active loans, and offline queue status, nor a Saved Records module with searchable borrower and guarantor listings showing ID, bank, and loan status.

2.6 LOAN RECORD AUTOMATION USING BIOMETRIC AND SMS ALERTS

The use of SMS alerts in loan monitoring has been explored in several works. Chinedu and Adebayo and Okeke and Edobor in 2022 demonstrated that SMS reminders reduce loan default rates by notifying borrowers before repayment deadlines.

Why This Idea Emerged:

SMS was introduced as an affordable communication channel that works on basic phones, reachable by both borrowers and guarantors regardless of literacy level.

Limitation:

The systems reviewed in literature did not provide a dedicated interface where administrators could view the SMS reminder log per borrower, see the reminder status (Sent or Queued), and manually trigger reminders for both the borrower and guarantor from a single profile page. They also failed to integrate SMS management within a broader modular web platform that simultaneously handles registration, loan issuance, bank details, repayment, and record retrieval.

2.7 CONTRIBUTION OF EXISTING SYSTEMS AND GAP ADDRESSED BY THE PROPOSED SYSTEM

The review shows that while several researchers have contributed meaningfully to digital loan management, existing systems fall short in critical areas. Previous systems introduced innovations such as web processing, voice assistance, SMS alerts, and biometric elements, yet none adequately combined all of the following into a single, unified web-based platform:

- A structured borrower registration form that captures full personal details, fingerprint, and passport photograph together
- Dedicated, independently navigable modules for Loan Issuance, Bank Details, and Repayment tracking
- A Borrower Details page that consolidates the borrower's profile, guarantor information, loan balance, loan status, and SMS reminder log — with the ability to manually send reminders to both borrower and guarantor from the same page
- A Database Dashboard providing visual analytics showing aggregate totals for borrowers, guarantors, active loans, and offline queue
- A Saved Records interface enabling searchable retrieval of all registered borrowers and guarantors with their ID, bank, guarantor, and loan status
- An Offline Support page ensuring continued access to system information during network disruptions

It is precisely these gaps that the proposed Automated Loan Record Management System addresses through its web-based LRMS Platform.

CHAPTER THREE

3.1 METHODOLOGY AND SYSTEMS ANALYSIS

This chapter presents the methods and analytical techniques used in developing the Automated Loan Record Management System. The methodology adopted ensures that the resulting system is simple, secure, user-friendly, and efficient for loan administrators.

To achieve this, a detailed systems analysis was conducted to understand the requirements of an automated loan management system. The analysis focused on the challenges in current loan management practices, especially poor record keeping, lack of structured borrower registration, absence of guarantor tracking, and limited communication between lenders and borrowers. These findings guided the system design that follows.

The system requires clear and traceable processes such as:

- Actors (Borrower, Guarantor, Admin, System)
- Objects (Loan record, User profile, Fingerprint scanner, SMS module, Registration form, etc.)
- Interactions (Registration, Loan Issuance, Repayment, Reminder dispatch, Record retrieval)

This system contains reusable components, modular features, and clear relationships between users and functions. It also supports scalability and future upgrades.

3.1.1 Prototyping

Since the system serves organizations handling non-literate and semi-literate borrowers, a prototype model was adopted. The prototype included:

- Structured web forms with clear field labels
- Simple, consistent navigation through a sidebar menu

- A secure administrator login page
- Fingerprint capture button integrated into the registration form
- Photograph upload functionality
- Sample SMS reminder dispatch from the Borrower Details page

Feedback from potential users helped refine the UI design and workflow.

3.2 PURPOSE AND PROCEDURES OF THE AUTOMATED LOAN MANAGEMENT SYSTEM

3.2.1 Purpose of the System

The purpose of the Automated Loan Record Management System is to create a platform that:

- Enables fast and structured borrower registration using a web form that captures personal details, fingerprint, and passport photograph
- Provides dedicated modules for Loan Issuance, Bank Details, and Repayment to support the full loan lifecycle
- Allows administrators to view borrower and guarantor profiles and send SMS reminders from the Borrower Details page
- Stores all loan records digitally in a structured database for easy retrieval and monitoring
- Provides an Offline Support page for continued access during periods of network disruption

3.2.2 Procedure

The system performs the following operations:

1. **User Registration Procedure**
    - Administrator navigates to the Registration page

- Enters borrower's Full Name, Phone Number, Address, Business Type, Guarantor Name, and Guarantor Phone
- Captures the borrower's fingerprint using the Capture Fingerprint button
- Uploads the borrower's passport photograph using the Upload Photo button
- Saves the record to the database

2. **Loan Issuance Procedure**
    - Administrator logs in and navigates to the Loan Issuance module
    - Selects the borrower from the saved records
    - Enters loan amount and relevant issuance details
    - System stores the loan record to the database
3. **Bank Details Procedure**
    - Administrator navigates to the Bank Details module
    - Enters the borrower's bank account number, bank name, and linked phone number
    - System saves and links the bank details to the borrower's profile
4. **Repayment Tracking Procedure**
    - Administrator navigates to the Repayment module
    - Selects the borrower and enters the amount paid
    - System updates the remaining loan balance and records the transaction
5. **SMS Reminder Procedure**
    - Administrator navigates to the Borrower Details page
    - Reviews the borrower's profile, loan balance, and SMS reminder log
    - Clicks the Send Reminder button to dispatch an SMS to the borrower and guarantor

- The system logs the reminder with its status (Sent or Queued)

6. **Record Retrieval Procedure**
    - Administrator uses the Dashboard for visual analytics and aggregate monitoring
    - Uses the Saved Records module to search and retrieve individual borrower and guarantor profiles

3.3 OPERATIONS OF THE AUTOMATED LOAN RECORD MANAGEMENT SYSTEM

The system shall:

1. Allow administrators to register borrowers using the web-based registration form, capturing personal details, fingerprint, and photograph.
2. Store borrower passport photographs and basic demographic details linked to their profile.
3. Provide a dedicated Loan Issuance module for recording and managing loans issued to borrowers.
4. Capture and store borrower bank details through the Bank Details module.
5. Track loan repayments and update outstanding balances through the Repayment module.
6. Allow administrators to view borrower and guarantor profiles and send SMS reminders from the Borrower Details page.
7. Maintain loan repayment history and outstanding balances accessible through the Dashboard.
8. Provide secure access using administrator login credentials from the Login page.
9. Retrieve borrower and guarantor information through the Saved Records search interface.
10. Provide an Offline Support page for continued access to system information during network disruptions.

3.4 USE CASE DIAGRAM

Actors:

- Administrator
- Borrower
- Guarantor
- System (SMS Service, Web Server, Fingerprint Scanner)

Use Cases:

- Login as Administrator
- Register borrower (with fingerprint capture and photo upload)
- Create loan record
- Capture bank details
- Update repayment
- View borrower and guarantor details
- Send SMS reminder
- View Dashboard analytics
- Retrieve saved records
- Access offline support page

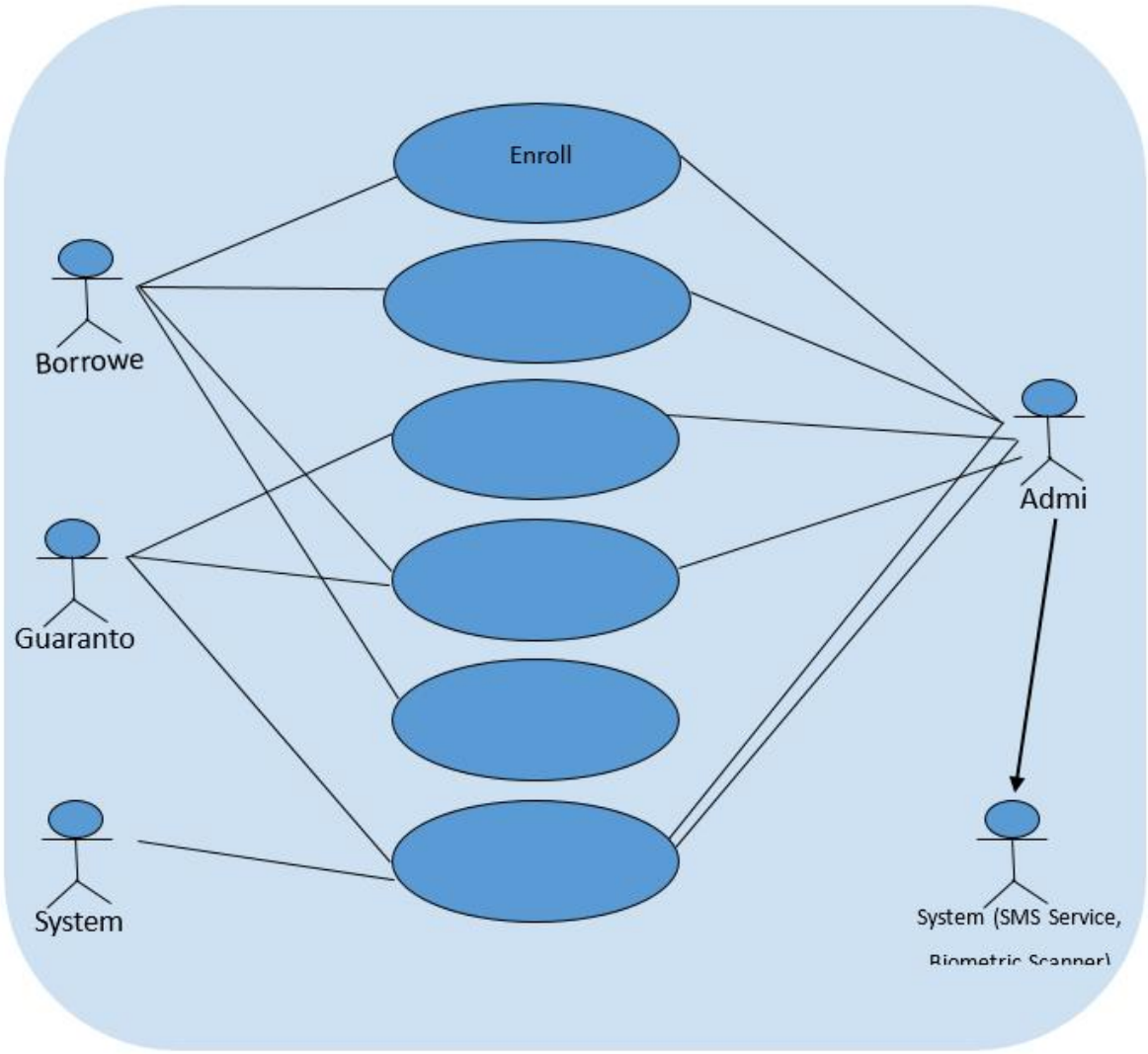


Figure 3.1: Use Case Diagram for

Automated Loan record management system

3.5 USE CASE DESCRIPTION

Use Case: Administrator Login

- **Actor:** Administrator
- **Precondition:** Administrator must have valid login credentials
- **Main Flow:**
    1. Administrator navigates to the Login page and enters email and password
    2. System validates credentials against the database

3. Administrator is redirected to the Overview (Homepage) upon successful login

- **Post Condition:** System grants access to all navigation modules
- **Exception:** Invalid credentials — system displays error and prompts re-entry

Use Case: Register Borrower

- **Actor:** Admin
- **Main Flow:**
    1. Admin navigates to the Registration page
    2. Enters borrower's Full Name, Phone Number, Address, Business Type, Guarantor Name, and Guarantor Phone
    3. Captures borrower fingerprint via the Capture Fingerprint button
    4. Uploads passport photograph via the Upload Photo button
    5. Clicks Save — system stores the record to the database
- **Post Condition:** Borrower record saved and accessible in Saved Records

Use Case: Send SMS Reminder

- **Actor:** Admin
- **Trigger:** Administrator identifies a borrower with an upcoming or overdue repayment
- **Main Flow:**
    1. Admin navigates to Borrower Details page
    2. Reviews borrower profile, loan balance, guarantor, and existing SMS log
    3. Clicks Send Reminder button
    4. System dispatches SMS to borrower and guarantor and logs the status as Sent or Queued

3.6 CHARACTERISTICS OF THE AUTOMATED LOAN RECORD MANAGEMENT SYSTEM

The system has the following characteristics:

1. **Web-Based:** Accessible through any standard web browser via the LRMS Platform without additional software installation.
2. **Secure Login:** Protects system access through administrator email and password authentication.
3. **Fingerprint-Enhanced Registration:** Integrates fingerprint capture within the borrower registration form to strengthen identity verification.
4. **SMS Reminder Management:** Enables administrators to manually send SMS reminders to borrowers and guarantors from the Borrower Details page, with status tracking (Sent/Queued).
5. **Intuitive Interface:** Features a consistent sidebar navigation, structured forms, and clear page layouts for ease of use.
6. **Secure and Transparent:** Reduces fraud and improves accountability through digitally stored, searchable loan records.
7. **Modular Architecture:** Each function — Registration, Loan Issuance, Bank Details, Repayment, Dashboard, Saved Records — operates as an independent, navigable module.
8. **Offline Support:** Provides an Offline Support page ensuring continued access to essential system information during network disruptions.
9. **Efficient Storage:** Maintains all borrower, guarantor, loan, and repayment records in a structured database for easy retrieval.

3.7 ARCHITECTURE DESIGN

This system architecture consists of:

1. **User Layer**
    - Borrowers (registered via web-based registration form with fingerprint capture)
    - Guarantors (linked to borrowers during registration; notified via SMS reminders)
    - Loan officers / Administrators (operate all system modules through secure login)
2. **Application Layer**
    - Login authentication module
    - Borrower registration module (with fingerprint capture and photo upload)
    - Loan issuance module
    - Bank details module
    - Repayment tracking module
    - Borrower details and SMS reminder module
    - Dashboard analytics module
    - Saved records module
    - Offline support module
3. **Data Layer**
    - Borrower database (personal details, fingerprint data, photographs)
    - Guarantor records
    - Loan records database (issuance, balance, repayment history)
    - Bank details store
    - SMS reminder logs
    - User credentials and session data

4. **Hardware Components**
    - Computer or laptop with a web browser for system access
    - Fingerprint scanner device for borrower fingerprint capture during registration
    - Web server or hosting environment
    - SMS gateway for reminder dispatch

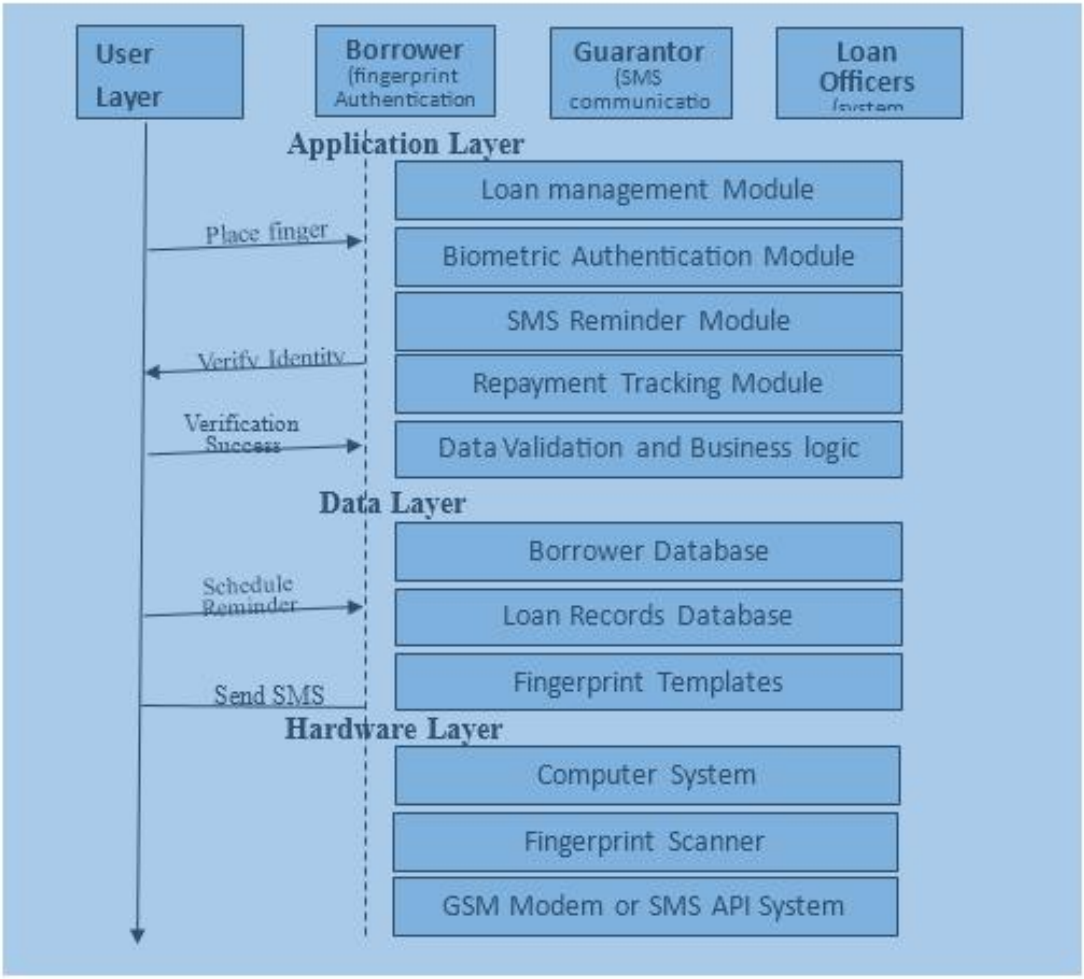


Figure 3.2: Architecture Design

3.8 SEQUENCE DIAGRAM

Basic Sequence: Borrower Registration and Loan Issuance

1. Admin; Login Page: Enter email and password
2. Login Page; System: Submit credentials for validation

3. System; Database: Verify admin credentials
4. Database; System: Return authentication result
5. System; Admin: Load Overview homepage and display navigation modules
6. Admin; Registration Page: Enter borrower details, capture fingerprint, upload photo
7. Registration Page; Database: Save borrower record
8. Admin; Loan Issuance Module: Select borrower and enter loan details
9. System; Database: Save loan record
10. Admin; Borrower Details Page: Review profile and click Send Reminder
11. System; SMS Service: Dispatch SMS to borrower and guarantor and log status

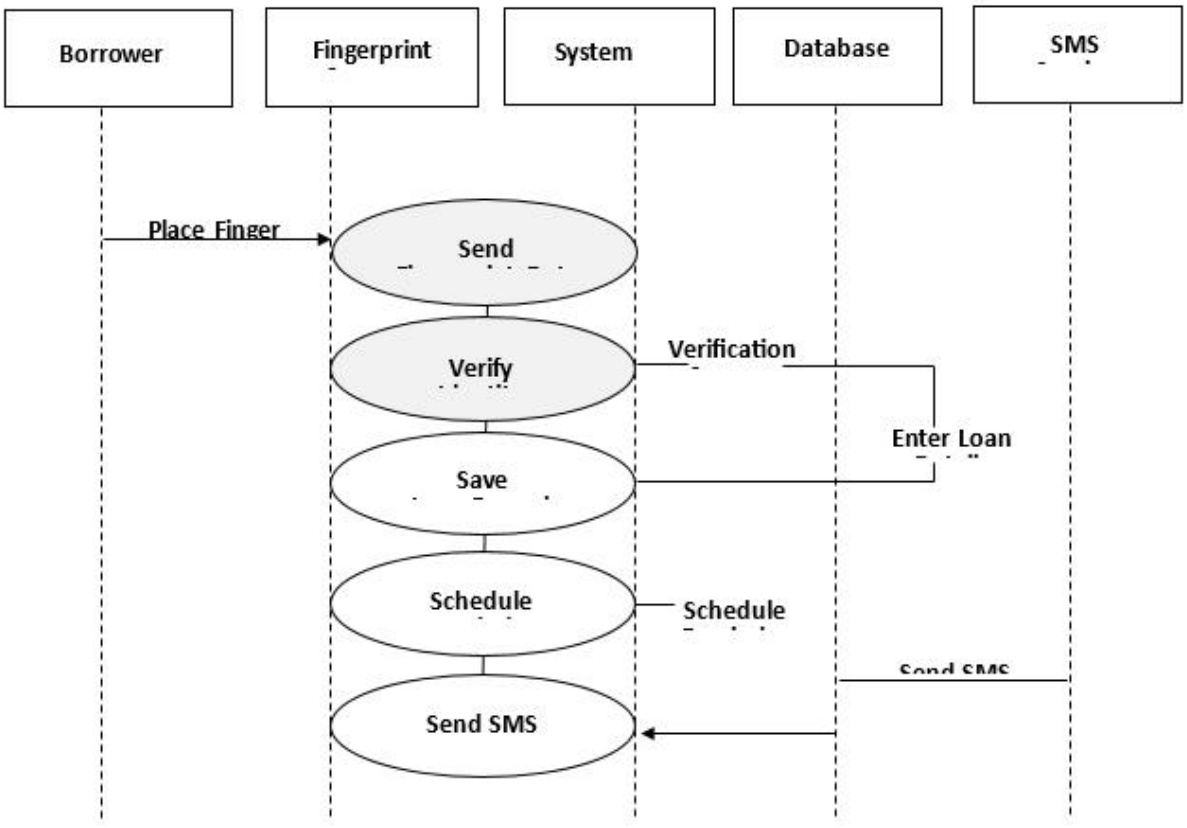


Figure 3.3: Sequence Diagram

3.9 ACTIVITY DIAGRAM

Administrator Login and Registration Activity

1. Start
2. Administrator navigates to the Login page
3. Admin enters email and password
4. System validates credentials against the database
    - If valid: Redirect to Overview homepage and load navigation modules
    - If invalid: Display error message and prompt re-entry
5. Admin navigates to the Registration page via the sidebar
6. Admin completes the registration form — Full Name, Phone Number, Address, Business Type, Guarantor Name, Guarantor Phone
7. Admin captures borrower fingerprint using the Capture Fingerprint button
8. Admin uploads borrower photograph using the Upload Photo button
9. Admin clicks Save — system stores record to database
10. Admin continues to required module (Loan Issuance, Bank Details, Repayment, Borrower Details, Dashboard, or Saved Records)
11. End

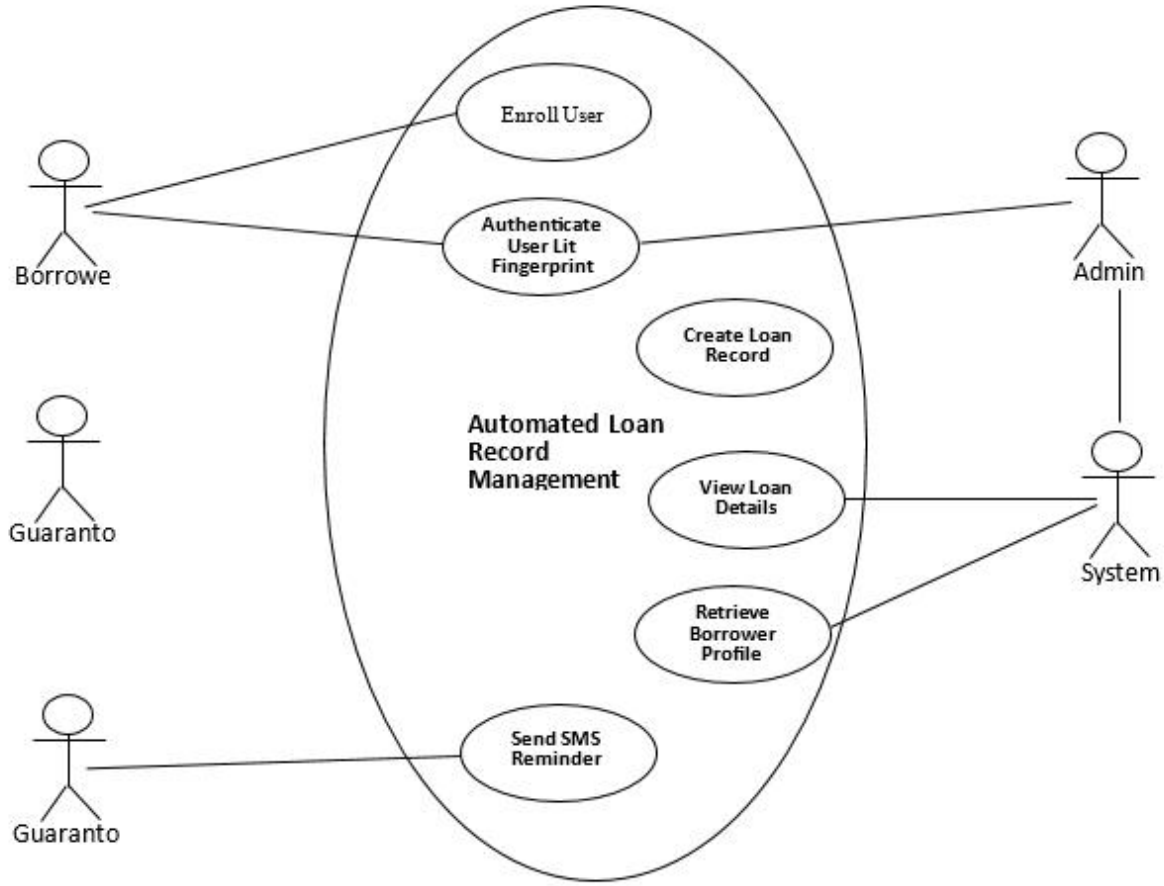


Figure 3.4: Activity Diagram

3.10 SYSTEM EFFICIENCY MEASURES

To ensure efficiency, the system adopts:

1. **Web-Based Registration:** Ensures fast and accurate borrower enrolment through a structured online form with fingerprint capture and photo upload.
2. **SMS Reminder Management:** Enables administrators to send and track reminders to borrowers and guarantors, reducing loan default risks.
3. **Structured Database:** Stores all borrower, guarantor, loan, and repayment records in a well-organised database for reliable retrieval.

4. **Structured Web UI:** Designed with a consistent sidebar, clear page layouts, and logical navigation for efficient system operation.
5. **Modular Architecture:** Facilitates easy maintenance, independent module updates, and future system expansion.
6. **Secure Storage:** Protects sensitive borrower and guarantor information through credential-based access control.
7. **Fast Retrieval Mechanism:** The Saved Records interface and Dashboard enable instant retrieval and monitoring of borrower profiles and loan statistics.
8. **Offline Support:** The dedicated Offline Support page ensures continued access to essential system information during network disruptions.

CHAPTER FOUR

4.1 SYSTEM DESIGN AND IMPLEMENTATION

This chapter explains the practical development of the automated loan record management system. It describes the major technologies applied, the system architecture, the development environments used, and the various tools that enabled the implementation of biometric authentication, offline operations, SMS notifications, and digital loan record management. The system was developed with a strong emphasis on simplicity, accessibility, and reliability, especially for organizations serving non-literate members.

4.2 TECHNOLOGY APPLICATION

The system integrates several technologies that work together to ensure fast authentication, secure data storage, and smooth loan management operations. The key technologies applied include:

1. **Web Application Interface Technology:** Used to deliver the system through a browser-accessible interface, enabling administrators to register borrowers, manage loan records, and access the dashboard from any internet-enabled device.
2. **SQLite Local Database Technology:** Selected for its lightweight nature and full offline functionality, allowing the system to run efficiently without internet connectivity.
3. **SMS Gateway Technology (API-Based):** Used to send automated reminders to borrowers and guarantors regarding upcoming or overdue payments. Message are queued and automatically sent once network is available.

4. **Desktop Application Interface Technology:** Implemented using a graphical interface framework that supports icons, buttons, and simple navigation suitable for non-literate users.
5. **Modular Back-End Architecture:** Ensures that each component-authentication, SMS module, loan module, and profile management-operates independently for easy updating and maintenance.

4.3 FRONT-END CLIENT APPLICATION

The front-end client application is the user interface through which administrators interact with the system. It was designed with the following goals:

1. Simple navigation using large buttons and meaningful icons.
2. Minimal text, allowing non-literate users to understand operations easily.
3. Clear navigation prompts and structured form fields guiding users through each process
4. Colour-coded indicators for loan status, reminders, and payments.
5. Responsive design ensuring the interface renders correctly across different screen sizes and devices.

The front-end includes screens for:

- Borrower registration
- Login page
- Homepage
- Registration page
- Administrator dashboard

- Borrower details page
- Saved records interface
- Administrative dashboard

The interface was created to be visually intuitive and highly responsive.

4.4 BACK-END SYSTEM

The back-end controls the systems main logical operations, manages data processing, and coordinates communication between modules. It consists of:

1. **Login Authentication Engine:** Validates administrator credentials against the database and manages secure session access to the system.
2. **Loan Processing Module:** Handles loan issuance, balance calculations, repayment tracking, and overdue status updates.
3. **SMS Notification Engine:** Automatically schedules reminders to borrowers and guarantors based on due dates.
4. **Database Manager:** Ensures secure storing and retrieval of all profiles, guarantors, loan records, and repayment history.
5. **Offline Synchronization Logic:** Allows the system to record transactions offline and queue SMS messages until network service becomes available.

This modular back-end ensures accuracy, stability, and security of all transactions.

4.5 PROGRAMMING LANGUAGES USED

The system was developed using a combination of languages that provide stability, security, and smooth interfacing with biometric devices:

1. **Python:** Primary language for system logic, biometric integration, and database processing.
2. **SQL (SQLite Query Language):** Used for creating and managing tables, views, and data relationships.
3. **HTML/CSS (For Optional Web-Export Modules):** Applied in generating printable loan summaries and borrower statements.

   Python was chosen especially because of its strong support for biometrics, SMS APIs, and rapid prototyping.

4.6 SOFTWARE TOOLS USED

Several software applications were used in building the system

1. **Python IDLE/VS Code:** Main development environment
2. **SQLite Studio:** Database creation and management
3. **Web Framework (Flask/Django):** Used for building the web application, routing pages, and handling form submissions
4. **Postman:** SMS API endpoint testing
5. **Figma/UI Mockup Tools:** For designing interface screens
6. **GitHub:** Version control during system development

These tools helped ensure systematic development and efficient debugging.

4.7 HARDWARE TOOLS USED

The system requires specific hardware component for full operation

1. A computer or laptop with a web browser for accessing and operating the system
2. Laptop or desktop computer for running the application

3. Mobile phone (for SMS gateway testing)
4. USB cables and external storage for data backup and device connectivity
5. Power backup (optional) to ensure uninterrupted loan processing

The combination of hardware tools ensures smooth and secure system operations.

4.8 DEVELOPMENT TOOLS

The development tools employed include:

1. **Python Libraries:**

- Tkinter (GUI)
- Request (SMSAPI)
- SQLite3 (Database Integration)
- Pillow (Image Processing)

2. **Interface Mockup Tools:** Used to design intuitive icon-based user pages.
3. **System Testing Tools:** For debugging logic, testing biometric devices, and validating database operations.

The tools collectively supported the full implementation of the automated loan record management system.

4.9 TESTING

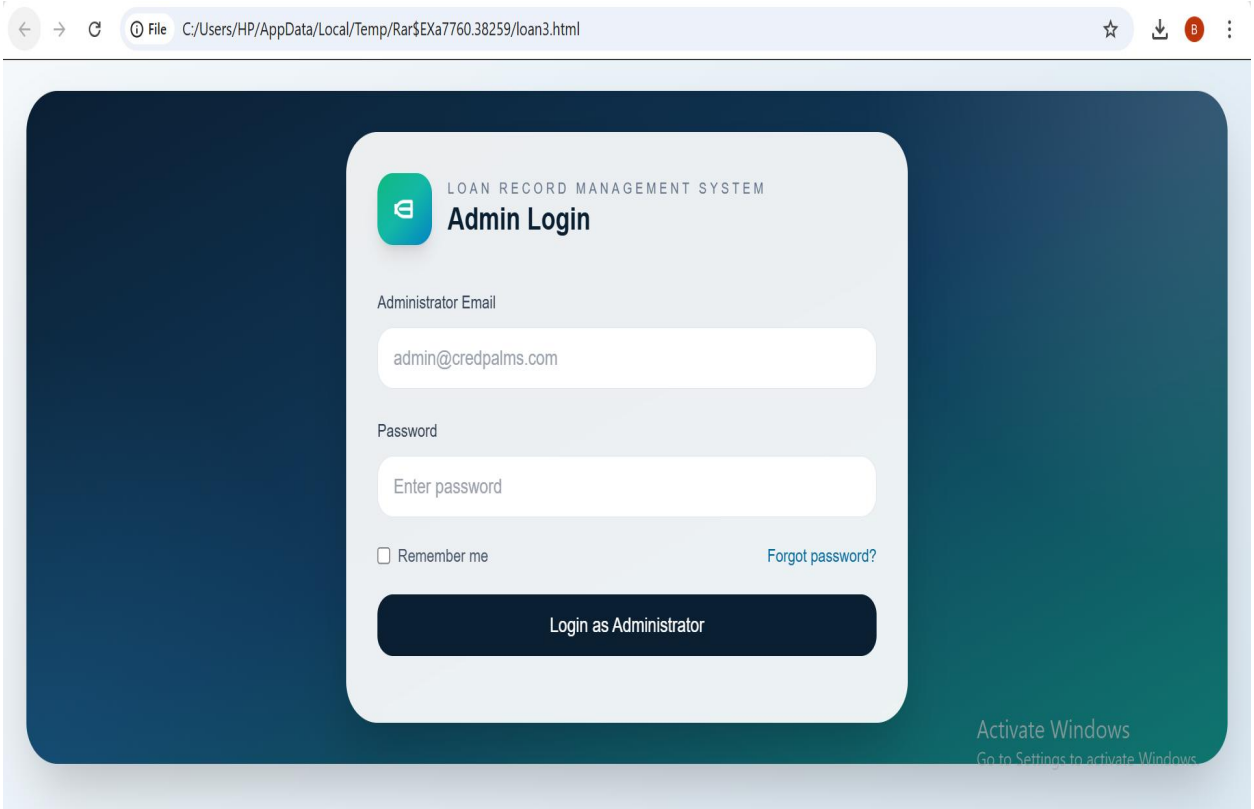
Testing was conducted to verify that all modules of the web-based loan management system functioned as expected. This included functional testing of the login page, homepage navigation, borrower registration, borrower details management, the administrative dashboard, and the saved

records interface. Each feature was tested separately and later verified collectively in an integrated environment.

4.9.1 Login Page

This test verified that the login page loads correctly and that users can authenticate securely before accessing the system. Testing activities included:

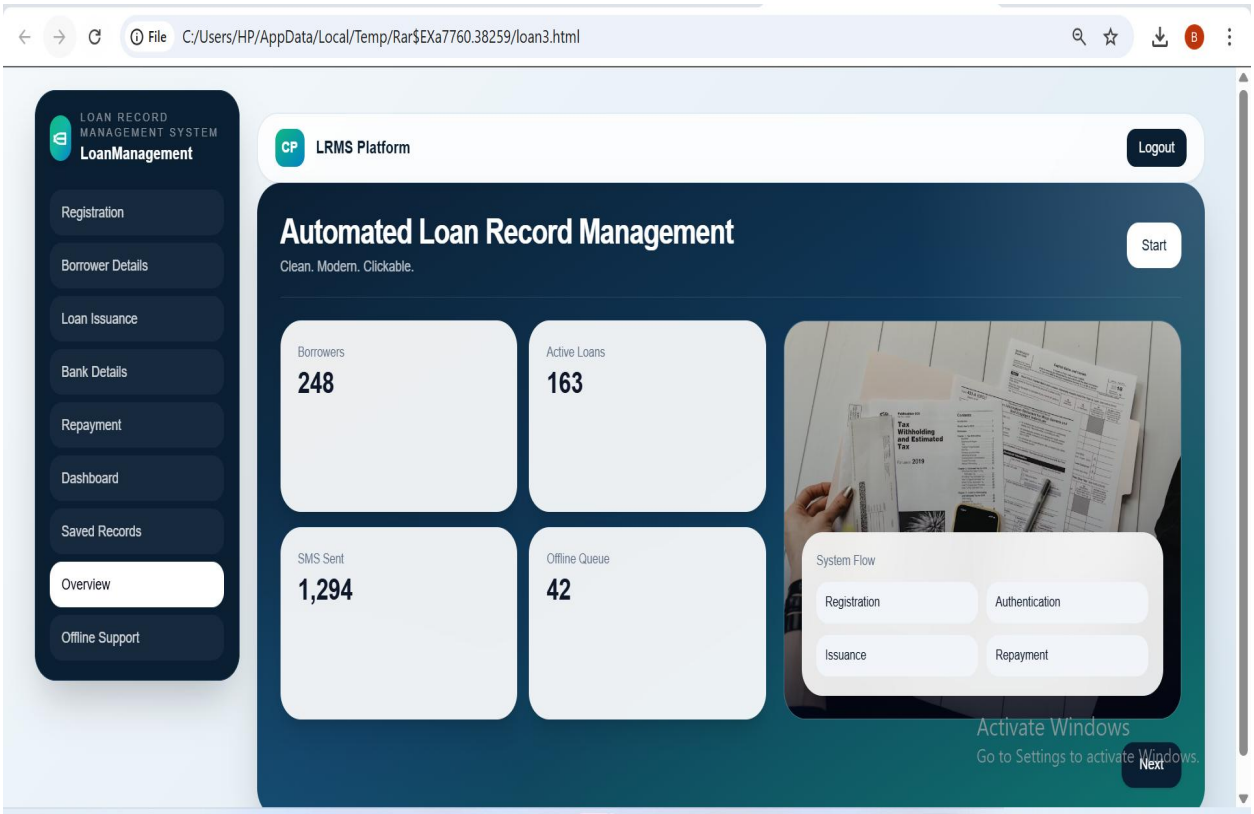
1. Entering valid administrator credentials and confirming successful access
2. Attempting login with invalid credentials and confirming rejection
3. Verifying that the login form fields and submit button render correctly
4. Confirming that the system redirects to the homepage upon successful login



4.9.2 Homepage

This test confirmed that the homepage displays correctly after login and provides clear navigation to all major system modules. The system was tested to confirm:

- All navigation menus and quick-access buttons are visible and functional
- The homepage loads without errors in both online and offline scenarios
- Module links correctly redirect to their respective pages
- The interface layout is clean and accessible to administrative users

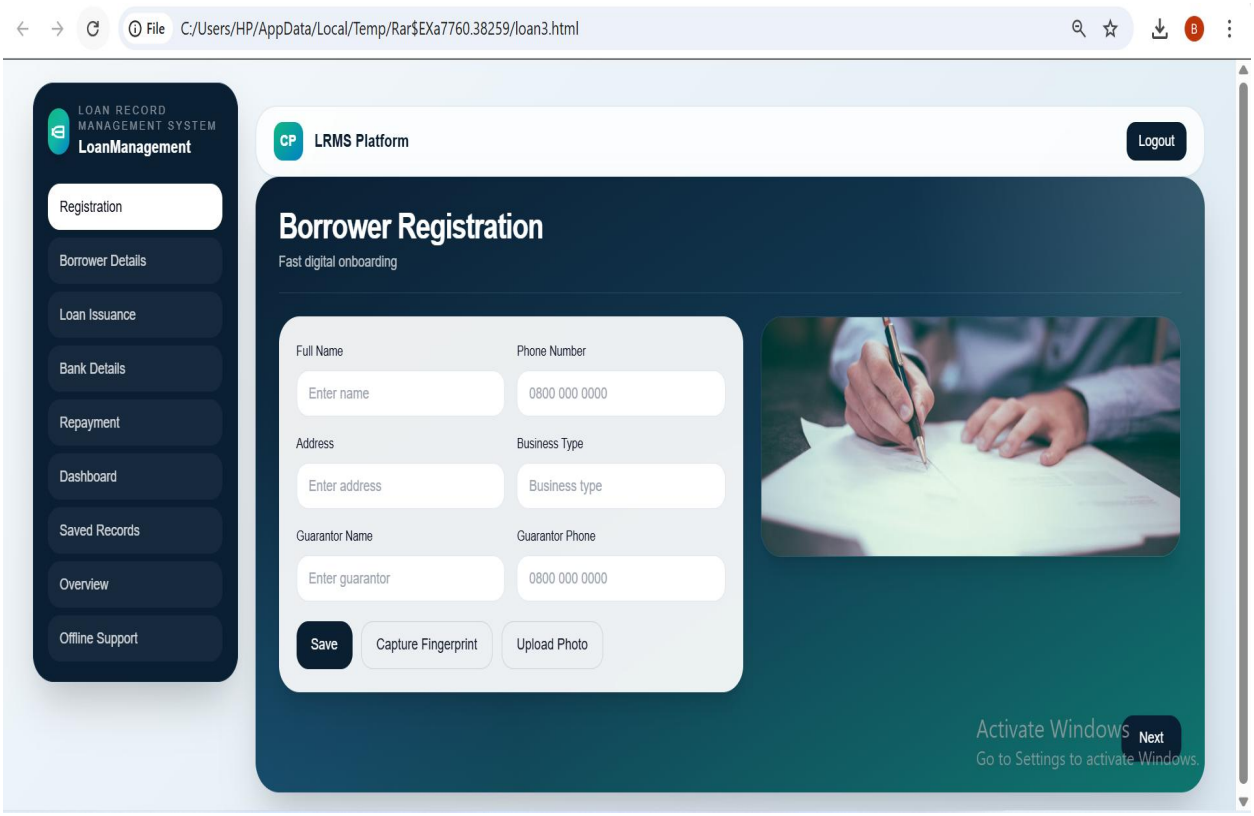


p

4.9.3 Registration Page

This test verified that new borrowers can be registered successfully through the web-based registration interface. Testing activities included:

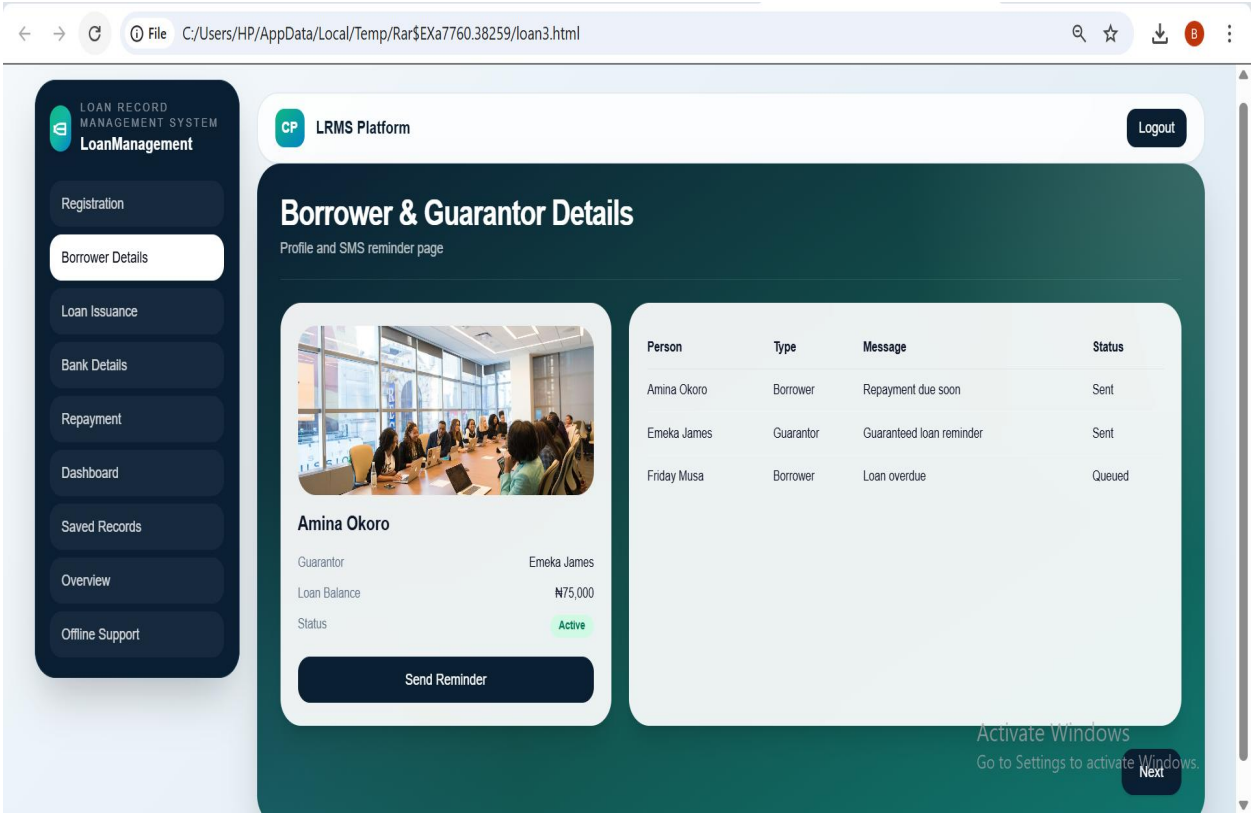
1. Entering borrower personal details including name, contact, and guarantor information
2. Uploading a passport photograph through the registration form
3. Saving borrower details to the database and confirming a success message
4. Verifying that incomplete or invalid entries trigger appropriate validation errors
5. Confirming that newly registered borrowers appear in the saved records interface



4.9.4 Borrower Details Page

This test confirmed that individual borrower profiles are displayed accurately along with loan and guarantor information. This test confirmed that:

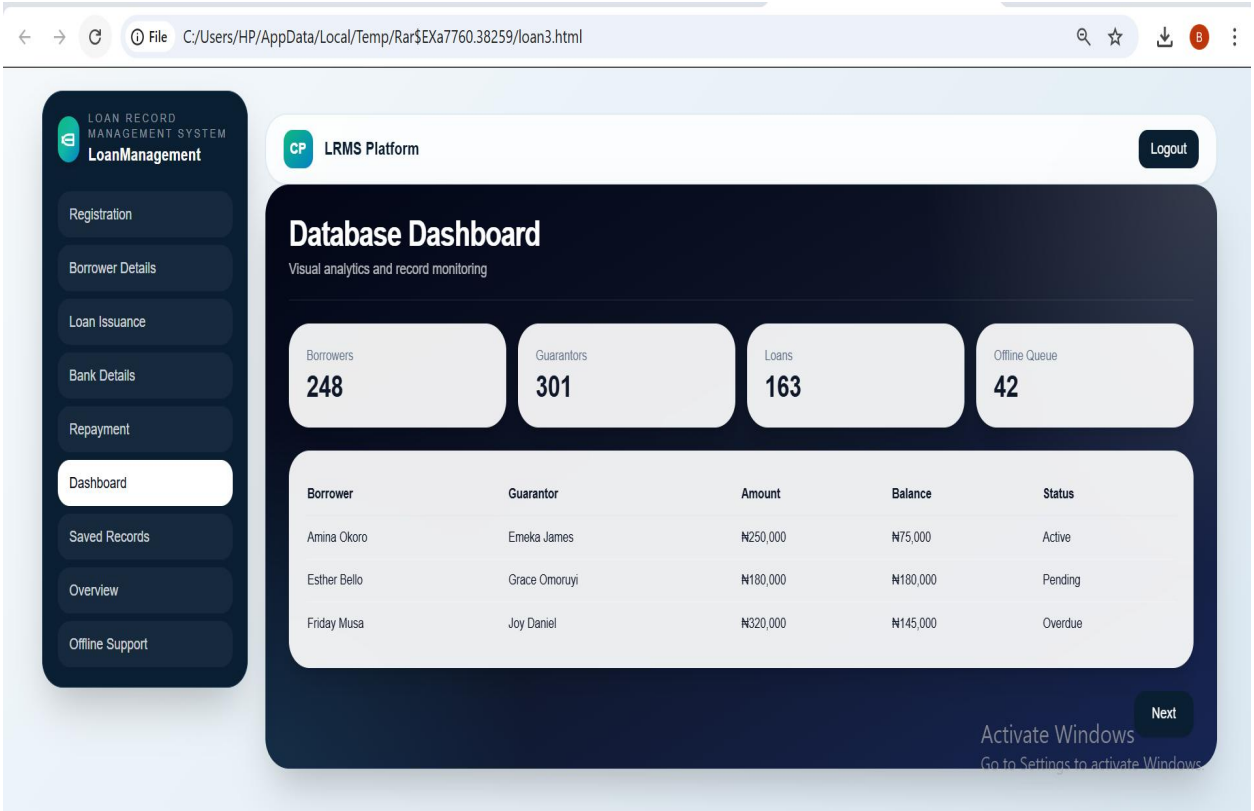
1. Borrower personal and contact details load correctly
2. Guarantor details are displayed alongside the borrower profile
3. Loan history, outstanding balances, and repayment records are correctly shown
4. Administrators can update or edit borrower details without data loss
5. SMS reminder status for the borrower is visible on the profile page



4.9.5 Dashboard

The administrative dashboard was tested for its ability to provide a summary overview of all system activities and records. This page was tested for:

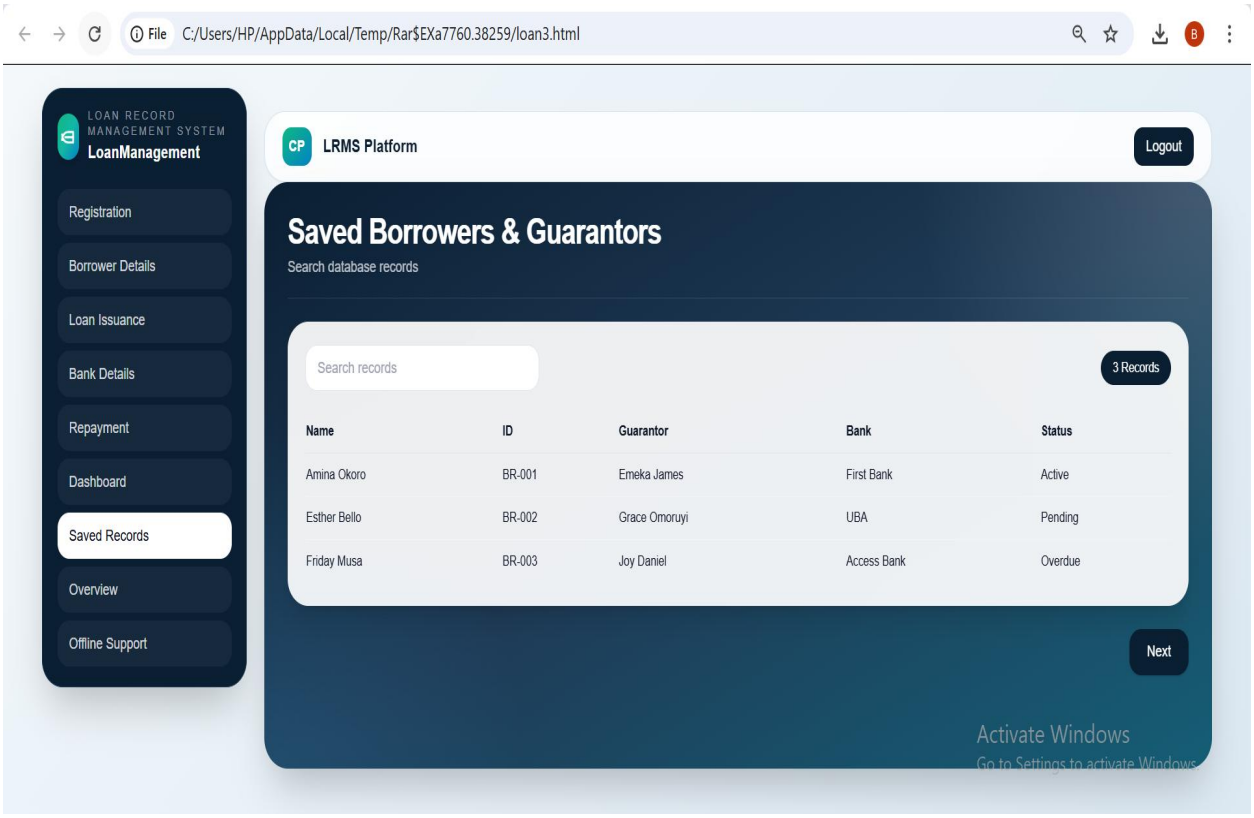
1. Displaying total number of registered borrowers and guarantors
2. Showing aggregate loan statistics including total issued, repaid, and outstanding amounts
3. Providing access links to individual borrower records and loan details
4. Displaying SMS reminder logs and scheduled notifications
5. Confirming that real-time data updates reflect correctly on the dashboard



4.9.6 Saved Records Page

This test verified that all registered borrowers and their associated loan records are correctly stored and retrievable. The interface was tested for:

1. Displaying a complete list of all registered borrowers
2. Showing linked guarantor profiles alongside each borrower
3. Providing search and filter options to locate specific borrower records
4. Verifying that loan history and repayment logs are accurately displayed
5. Confirming that record entries can be edited, updated, or removed by administrators
6. Ensuring data integrity is maintained across all saved records



CHAPTER FIVE

5.1 SUMMARY

This project focused on the design and implementation of an Automated Loan Record Management System tailored for organizations, cooperative societies, and market individuals who are non-literate or semi-literate. The motivation for this study arose from the challenges faced by traditional loan management systems, which often rely heavily on reading, writing, and constant internet access — factors that exclude a large portion of borrowers in developing regions.

The system was designed to address these challenges through a web-based platform that integrates biometric fingerprint capture, automated SMS reminders, and offline support alongside structured digital record management. The project adopted Object-Oriented Analysis and Design (OOAD) and a prototyping model to ensure clarity, usability, and scalability.

During implementation, a user-friendly web-based interface was developed under the LRMS Platform, featuring a clean sidebar navigation and structured page layouts accessible through any standard web browser. The system was tested across all nine modules: the Login Page, Homepage (Overview), Borrower Registration, Borrower & Guarantor Details, Loan Issuance, Bank Details, Repayment, Database Dashboard, Saved Records, and the Offline Support page. Test results showed that the system performed efficiently, securely, and accurately across all tested modules, successfully handling borrower registration with fingerprint capture, SMS reminder dispatch, loan issuance and repayment tracking, and record retrieval.

5.2 CONCLUSION

The Automated Loan Record Management System successfully meets the objectives set out at the beginning of this project. By combining a web-based interface with biometric fingerprint

capture, automated SMS notifications, offline support, and structured loan administration modules, the system provides a practical and inclusive solution for managing loan records in underserved communities.

The integration of fingerprint capture during borrower registration strengthens identity verification and reduces impersonation, while automated SMS reminders sent to both borrowers and guarantors enhance accountability and reduce loan default rates. The Offline Support page ensures that critical system functions remain accessible even when internet connectivity is temporarily unavailable, making the system reliable and adaptable to real-world deployment conditions.

The Database Dashboard provides administrators with real-time visibility into borrower counts, guarantor records, active loans, and offline queue status, while the Saved Records interface enables quick search and retrieval of borrower and guarantor profiles. Together, these features demonstrate that a well-designed, technology-driven loan management solution can promote financial inclusion, improve transparency, and strengthen trust between lending institutions and borrowers across diverse organizational settings.

5.3 RECOMMENDATIONS

Based on the findings and successful implementation of this system, the following recommendations are made:

Adoption by Cooperative Societies and Microfinance Institutions: Cooperative societies, microfinance banks, and lending organizations should adopt this system to improve loan tracking, transparency, and borrower engagement.

Multilingual and voice support integration: future versions of the system should include local language and voice-guided interfaces to further enhance accessibility for completely non-literate xusers

Mobile Application Version: A mobile (android) version of the system can be developed to support field officers and loan administrators working outside office environments.

Cloud Synchronization Enhancement: while the system supports offline operation, optional cloud synchronization can be introduced to enable data backup and multi-branch access.

Enhanced Reporting and analytics: future improvements can include advanced reporting tools, graphical analytics, and predictive analysis for loan default risk assessment.

Stronger Data Security Measures: Additional security features such as data encryption, role-based access control, and audit logs should be implemented to further protect sensitive borrower information.

5.4 CONTRIBUTION TO KNOWLEDGE

This project contributes to knowledge by demonstrating a biometric-driven, offline-capable loan management system designed specifically for non-literate users. It bridges the gap between advanced financial technology and marginalized populations, providing a model that can be adapted to similar socio-economic environments

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APPENDIX

CODES

```
<!DOCTYPE html>
<html lang="en">
<head>
 <meta charset="UTF-8" />
 <meta name="viewport" content="width=device-width, initial-scale=1.0" />
 <title>CredPalms Finance UI</title>
 <script src="https://cdn.tailwindcss.com"></script>
 <style>
  body {
   font-family: Inter, Arial, sans-serif;
   background: linear-gradient(135deg, #f4f8fb, #e8f1f7, #dce8f2);
  }

  .glass {
   background: rgba(255, 255, 255, 0.92);
   backdrop-filter: blur(16px);
   -webkit-backdrop-filter: blur(16px);
  }

  .screen-bg::before {
   content: "";
   position: absolute;
   inset: 0;
   background:
    radial-gradient(circle at top right, rgba(255, 255, 255, 0.16), transparent 28%),
    radial-gradient(circle at bottom left, rgba(56, 189, 248, 0.14), transparent 25%);
```

```
    pointer-events: none;
   }

   .active-nav {
    background: white;
    color: #020617;
   }

   .screen {
    display: none;
   }

   .screen.active {
    display: block;
   }
  </style>
</head>
<body class="min-h-screen p-4 lg:p-6 text-slate-900">
  <div class="max-w-[1600px] mx-auto flex flex-col lg:flex-row gap-6">
   <aside id="sidebarNav" class="w-full lg:w-[280px] shrink-0" style="display:none;">
    <div class="rounded-[28px] bg-[#0b1f33] text-white p-5 shadow-2xl border border-[#15324e] sticky top-4">
      <div class="flex items-center gap-3 mb-6">
       <div class="h-12 w-12 rounded-2xl bg-gradient-to-br from-emerald-500 via-teal-500 to-sky-600 flex items-center justify-center shadow-lg">
        <svg width="26" height="26" viewBox="0 0 24 24" fill="none" xmlns="http://www.w3.org/2000/svg">
          <path d="M4 14.5C4 10.3579 7.35786 7 11.5 7H18V17H11.5C7.35786 17 4 13.6421 4 9.5" stroke="white" stroke-width="2.2" stroke-linecap="round" stroke-linejoin="round"/>
          <path d="M8 12H18" stroke="white" stroke-width="2.2" stroke-linecap="round"/>
```

```
      </svg>
    </div>
    <div>
      <p class="text-xs uppercase tracking-[0.25em] text-white/50">LOAN RECORD MANAGEMENT SYSTEM</p>
      <h1 class="text-lg font-semibold">LoanManagement</h1>
    </div>
  </div>

  <div class="space-y-2" id="navButtons">
    <button onclick="showScreen('signup', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Registration</button>
    <button onclick="showScreen('details', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Borrower Details</button>
    <button onclick="showScreen('issuance', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Loan Issuance</button>
    <button onclick="showScreen('bank', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Bank Details</button>
    <button onclick="showScreen('repayment', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Repayment</button>
    <button onclick="showScreen('dashboard', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Dashboard</button>
    <button onclick="showScreen('saved', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Saved Records</button>
    <button onclick="showScreen('home', this)" class="nav-btn active-nav w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition">Overview</button>
```

```
        <button onclick="showScreen('offline', this)" class="nav-btn w-full flex items-center gap-3 px-4 py-3 rounded-2xl transition bg-white/5 text-white/80 hover:bg-white/10">Offline Support</button>

      </div>

    </div>

  </aside>


  <main class="flex-1 space-y-6">

    <section id="admin-login" class="screen active relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#103a5c] to-[#0f766e] min-h-[78vh] shadow-2xl screen-bg">

      <div class="relative z-10 p-6 lg:p-8 flex items-center min-h-[78vh]">

        <div class="w-full flex items-center justify-center">

          <div class="glass rounded-[32px] shadow-2xl p-6 lg:p-8 max-w-xl w-full mx-auto">

            <div class="flex items-center gap-4 mb-8">

              <div class="h-14 w-14 rounded-2xl bg-gradient-to-br from-emerald-500 via-teal-500 to-sky-600 flex items-center justify-center shadow-lg">

                <svg width="28" height="28" viewBox="0 0 24 24" fill="none" xmlns="http://www.w3.org/2000/svg">

                  <path d="M4 14.5C4 10.3579 7.35786 7 11.5 7H18V17H11.5C7.35786 17 4 13.6421 4 9.5" stroke="white" stroke-width="2.2" stroke-linecap="round" stroke-linejoin="round"/>

                  <path d="M8 12H18" stroke="white" stroke-width="2.2" stroke-linecap="round"/>

                </svg>

              </div>

              <div>

                <p class="text-xs uppercase tracking-[0.28em] text-slate-500">LOAN RECORD MANAGEMENT SYSTEM</p>

                <h1 class="text-2xl font-semibold text-[#0b1f33]">Admin Login</h1>

              </div>

            </div>


            <div class="grid gap-5">
```

```
          <div>
            <label class="text-sm font-medium text-slate-700">Administrator Email</label>
            <input id="adminEmail" type="email" class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200 focus:outline-none focus:ring-2 focus:ring-sky-200" placeholder="admin@credpalms.com" />
          </div>
          <div>
            <label class="text-sm font-medium text-slate-700">Password</label>
            <input id="adminPassword" type="password" class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200 focus:outline-none focus:ring-2 focus:ring-sky-200" placeholder="Enter password" />
          </div>
          <div class="flex items-center justify-between text-sm">
            <label class="flex items-center gap-2 text-slate-600">
              <input type="checkbox" class="rounded" />
              Remember me
            </label>
            <a href="#" class="text-sky-700 font-medium">Forgot password?</a>
          </div>
          <button onclick="adminLogin()" class="rounded-2xl bg-[#0b1f33] text-white px-5 py-3 font-medium hover:opacity-95">
            Login as Administrator
          </button>
          <p id="adminLoginMessage" class="text-sm text-slate-500"></p>
        </div>
      </div>
    </div>
  </section>
```

```
<div id="platformContent" style="display:none;">

 <div class="rounded-[28px] border border-[#d7e6f0] bg-white/85 backdrop-blur-xl shadow-sm px-6 py-4 flex flex-col md:flex-row md:items-center md:justify-between gap-3">

  <div class="flex items-center gap-4">

   <div class="h-10 w-10 rounded-xl bg-gradient-to-br from-emerald-500 to-sky-600 flex items-center justify-center text-white font-bold">CP</div>

   <div>

    <h2 class="text-lg font-semibold text-[#0b1f33]">LRMS Platform</h2>

   </div>

  </div>

  <div class="flex items-center gap-3">

   <button onclick="logoutAdmin()" class="px-4 py-2 rounded-xl bg-[#0b1f33] text-white">Logout</button>

  </div>

 </div>


 <section id="home" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#103a5c] to-[#0f766e] min-h-[78vh] shadow-2xl screen-bg">

  <div class="relative z-10 p-6 lg:p-8">

   <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">

    <div>

     <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Automated Loan Record Management</h2>

     <p class="text-white/70 mt-1 text-sm lg:text-base">Clean. Modern. Clickable.</p>

    </div>

    <button onclick="activateById('signup')" class="rounded-2xl bg-white text-[#0b1f33] hover:bg-white/90 px-5 py-3 font-medium">Start</button>

   </div>


   <div class="mt-6 grid lg:grid-cols-[1.1fr_0.9fr] gap-6 items-stretch">

    <div class="grid sm:grid-cols-2 gap-4">
```

```
          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Borrowers</p><h3 class="text-3xl font-semibold mt-1">248</h3></div>

          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Active Loans</p><h3 class="text-3xl font-semibold mt-1">163</h3></div>

          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">SMS Sent</p><h3 class="text-3xl font-semibold mt-1">1,294</h3></div>

          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Offline Queue</p><h3 class="text-3xl font-semibold mt-1">42</h3></div>

        </div>


        <div class="relative h-full min-h-[420px] rounded-[30px] overflow-hidden border border-white/10 bg-white/10 backdrop-blur-md">

          <img src="https://images.unsplash.com/photo-1554224155-6726b3ff858f?auto=format&fit=crop&w=1400&q=80" alt="Loan dashboard" class="absolute inset-0 w-full h-full object-cover" />

          <div class="absolute inset-0 bg-gradient-to-t from-slate-950/80 via-slate-900/20 to-transparent"></div>

          <div class="absolute left-6 right-6 bottom-6">

            <div class="rounded-[28px] bg-white/90 backdrop-blur-xl p-5 shadow-xl">

              <p class="text-sm text-slate-500">System Flow</p>

              <div class="mt-3 grid grid-cols-2 gap-3 text-sm">

                <div class="rounded-2xl bg-slate-100 p-3">Registration</div>

                <div class="rounded-2xl bg-slate-100 p-3">Authentication</div>

                <div class="rounded-2xl bg-slate-100 p-3">Issuance</div>

                <div class="rounded-2xl bg-slate-100 p-3">Repayment</div>

              </div>

            </div>

          </div>

        </div>
```

<button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>

</section>

<section id="signup" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#123b54] to-[#0f766e] min-h-[78vh] shadow-2xl screen-bg">

<h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Borrower Registration</h2>

Fast digital onboarding

<label class="text-sm font-medium">Full Name</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="Enter name">

<label class="text-sm font-medium">Phone Number</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="0800 000 0000">

<label class="text-sm font-medium">Address</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="Enter address">

<label class="text-sm font-medium">Business Type</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="Business type">

<label class="text-sm font-medium">Guarantor Name</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="Enter guarantor">

```
            <div><label class="text-sm font-medium">Guarantor Phone</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="0800 000 0000"></div>

          </div>

          <div class="mt-5 flex flex-wrap gap-3">

            <button class="rounded-2xl bg-[#0b1f33] text-white px-5 py-3">Save</button>

            <button onclick="activateById('login')" class="rounded-2xl border border-slate-300 px-5 py-3">Capture Fingerprint</button>

            <button class="rounded-2xl border border-slate-300 px-5 py-3">Upload Photo</button>

          </div>

        </div>


        <div class="grid gap-6">

          <div class="rounded-[28px] overflow-hidden h-[250px] border border-white/10 shadow-xl">

            <img src="https://images.unsplash.com/photo-1450101499163-c8848c66ca85?auto=format&fit=crop&w=1200&q=80" alt="Registration" class="w-full h-full object-cover">

          </div>

        </div>

      </div>


      <div class="mt-6 flex justify-end">

        <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>

      </div>

    </div>

  </section>


  <section id="login" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#11324b] to-[#0ea5a4] min-h-[78vh] shadow-2xl screen-bg">
```

```
<div class="relative z-10 p-6 lg:p-8">
  <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
    <div>
      <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Borrower Authentication</h2>
      <p class="text-white/70 mt-1 text-sm lg:text-base">Biometric login screen</p>
    </div>
  </div>

  <div class="mt-6 grid lg:grid-cols-2 gap-6 items-center">
    <div class="glass rounded-[28px] shadow-xl p-6 flex items-center justify-center min-h-[420px]">
      <div class="text-center py-10">
        <div class="mx-auto h-28 w-28 rounded-[30px] bg-gradient-to-br from-violet-500 to-fuchsia-500 flex items-center justify-center shadow-xl text-white text-5xl">◎</div>
        <h3 class="text-2xl font-semibold mt-6">Scan Fingerprint</h3>
        <button class="mt-6 rounded-2xl bg-[#0b1f33] text-white px-5 py-3">Authenticate</button>
      </div>
    </div>

    <div class="rounded-[28px] overflow-hidden h-[420px] border border-white/10 shadow-xl">
      <img src="https://images.unsplash.com/photo-1516321318423-f06f85e504b3?auto=format&fit=crop&w=1400&q=80" alt="Authentication" class="w-full h-full object-cover">
    </div>
  </div>

  <div class="mt-6 flex justify-end">
```

```
          <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>
        </div>
      </div>
    </section>

    <section id="details" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#134e4a] to-[#0f766e] min-h-[78vh] shadow-2xl screen-bg">
      <div class="relative z-10 p-6 lg:p-8">
        <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
          <div>
            <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Borrower & Guarantor Details</h2>
            <p class="text-white/70 mt-1 text-sm lg:text-base">Profile and SMS reminder page</p>
          </div>
        </div>

        <div class="mt-6 grid xl:grid-cols-[0.75fr_1.25fr] gap-6">
          <div class="glass rounded-[28px] shadow-xl p-6">
            <div class="rounded-[24px] overflow-hidden h-44 mb-4">
              <img src="https://images.unsplash.com/photo-1573164574572-cb89e39749b4?auto=format&fit=crop&w=1200&q=80" alt="Borrower profile" class="w-full h-full object-cover">
            </div>
            <h3 class="text-xl font-semibold">Amina Okoro</h3>
            <div class="mt-4 space-y-3 text-sm">
              <div class="flex justify-between"><span class="text-slate-500">Guarantor</span><span>Emeka James</span></div>
              <div class="flex justify-between"><span class="text-slate-500">Loan Balance</span><span>₦75,000</span></div>
```

```
            <div class="flex justify-between"><span class="text-slate-500">Status</span><span
class="bg-emerald-100 text-emerald-700 px-3 py-1 rounded-full text-xs font-
semibold">Active</span></div>

          </div>

          <button class="mt-5 rounded-2xl bg-[#0b1f33] text-white px-5 py-3 w-full">Send
Reminder</button>

        </div>


        <div class="glass rounded-[28px] shadow-xl p-6 overflow-auto">

          <table class="w-full text-sm">

            <thead>

              <tr class="border-b border-slate-200 text-left">

                <th class="py-3">Person</th>

                <th class="py-3">Type</th>

                <th class="py-3">Message</th>

                <th class="py-3">Status</th>

              </tr>

            </thead>

            <tbody>

              <tr class="border-b border-slate-100"><td class="py-3">Amina
Okoro</td><td>Borrower</td><td>Repayment due soon</td><td>Sent</td></tr>

              <tr class="border-b border-slate-100"><td class="py-3">Emeka
James</td><td>Guarantor</td><td>Guaranteed loan reminder</td><td>Sent</td></tr>

              <tr><td class="py-3">Friday Musa</td><td>Borrower</td><td>Loan
overdue</td><td>Queued</td></tr>

            </tbody>

          </table>

        </div>

      </div>


      <div class="mt-6 flex justify-end">
```

```
          <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>

        </div>

       </div>

      </section>


     <section id="issuance" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#103a5c] to-[#0284c7] min-h-[78vh] shadow-2xl screen-bg">

       <div class="relative z-10 p-6 lg:p-8">

        <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">

         <div>

          <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Loan Issuance</h2>

          <p class="text-white/70 mt-1 text-sm lg:text-base">Issue and confirm new loans</p>

         </div>

        </div>


        <div class="mt-6 grid xl:grid-cols-[1.1fr_0.9fr] gap-6">

         <div class="glass rounded-[28px] shadow-xl p-6">

          <div class="grid md:grid-cols-2 gap-4">

           <div><label class="text-sm font-medium">Borrower ID</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="BR-001"></div>

           <div><label class="text-sm font-medium">Loan Amount</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="₦250,000"></div>

           <div><label class="text-sm font-medium">Issue Date</label><input type="date" class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200"></div>

           <div><label class="text-sm font-medium">Repayment Date</label><input type="date" class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200"></div>

          </div>

          <button class="mt-5 rounded-2xl bg-[#0b1f33] text-white px-5 py-3">Issue Loan</button>
```

```
          </div>


          <div class="rounded-[28px] overflow-hidden h-[340px] border border-white/10 shadow-
xl">
            <img src="https://images.unsplash.com/photo-1554224154-
22dec7ec8818?auto=format&fit=crop&w=1200&q=80" alt="Loan issuance" class="w-full h-full
object-cover">
          </div>
        </div>


        <div class="mt-6 flex justify-end">
          <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-
6 py-3 font-medium shadow">Next</button>
        </div>
      </div>
    </section>


    <section id="bank" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-
br from-[#0b1f33] via-[#155e75] to-[#1e3a5f] min-h-[78vh] shadow-2xl screen-bg">
      <div class="relative z-10 p-6 lg:p-8">
        <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
          <div>
            <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Bank Account
Details</h2>
            <p class="text-white/70 mt-1 text-sm lg:text-base">Store borrower account
details</p>
          </div>
        </div>


        <div class="mt-6 grid xl:grid-cols-[1fr_1fr] gap-6">
          <div class="glass rounded-[28px] shadow-xl p-6">
```

```
          <div class="grid md:grid-cols-2 gap-4">

            <div><label class="text-sm font-medium">Account Name</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="Amina Okoro"></div>

            <div><label class="text-sm font-medium">Bank Name</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="First Bank"></div>

            <div><label class="text-sm font-medium">Account Number</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="2014567789"></div>

            <div><label class="text-sm font-medium">Phone Number</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="0800 000 0000"></div>

          </div>

          <button class="mt-5 rounded-2xl bg-[#0b1f33] text-white px-5 py-3">Save Details</button>

        </div>


        <div class="glass rounded-[28px] shadow-xl p-6 min-h-[320px] flex items-center justify-center bg-gradient-to-br from-cyan-50 to-blue-100">

          <div class="text-center">

            <div class="mx-auto h-20 w-20 rounded-[28px] bg-gradient-to-br from-cyan-500 to-blue-600 flex items-center justify-center shadow-xl text-white text-4xl">⌁</div>

            <h3 class="text-2xl font-semibold mt-5">Secure Banking Info</h3>

          </div>

        </div>

      </div>


      <div class="mt-6 flex justify-end">

        <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>

      </div>

    </div>

  </section>
```

```
<section id="repayment" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#164e63] to-[#0f766e] min-h-[78vh] shadow-2xl screen-bg">
  <div class="relative z-10 p-6 lg:p-8">
   <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
    <div>
     <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Generate Repayment</h2>
     <p class="text-white/70 mt-1 text-sm lg:text-base">Record loan repayments</p>
    </div>
   </div>

   <div class="mt-6 grid xl:grid-cols-[0.95fr_1.05fr] gap-6">
    <div class="glass rounded-[28px] shadow-xl p-6">
     <div class="space-y-4">
      <div><label class="text-sm font-medium">Borrower</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="Amina Okoro"></div>
      <div><label class="text-sm font-medium">Payment Amount</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" placeholder="₦50,000"></div>
      <div><label class="text-sm font-medium">Current Balance</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="₦75,000"></div>
      <div><label class="text-sm font-medium">New Balance</label><input class="mt-2 h-12 rounded-2xl w-full px-4 border border-slate-200" value="₦25,000"></div>
     </div>
     <button class="mt-5 rounded-2xl bg-[#0b1f33] text-white px-5 py-3">Save Repayment</button>
    </div>

    <div class="rounded-[28px] overflow-hidden h-[360px] border border-white/10 shadow-xl">
     <img src="https://images.unsplash.com/photo-1601597111158-2fceff292cdc?auto=format&fit=crop&w=1200&q=80" alt="Repayment" class="w-full h-full object-cover">
```

```
          </div>
        </div>

        <div class="mt-6 flex justify-end">
          <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>
        </div>
      </div>
    </section>

    <section id="dashboard" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-slate-950 via-slate-900 to-blue-950 min-h-[78vh] shadow-2xl screen-bg">
      <div class="relative z-10 p-6 lg:p-8">
        <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
          <div>
            <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Database Dashboard</h2>
            <p class="text-white/70 mt-1 text-sm lg:text-base">Visual analytics and record monitoring</p>
          </div>
        </div>

        <div class="mt-6 grid sm:grid-cols-2 xl:grid-cols-4 gap-4 mb-6">
          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Borrowers</p><h3 class="text-3xl font-semibold mt-1">248</h3></div>
          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Guarantors</p><h3 class="text-3xl font-semibold mt-1">301</h3></div>
          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Loans</p><h3 class="text-3xl font-semibold mt-1">163</h3></div>
          <div class="glass rounded-[28px] shadow-xl p-6"><p class="text-sm text-slate-500">Offline Queue</p><h3 class="text-3xl font-semibold mt-1">42</h3></div>
```

```
        </div>

        <div class="glass rounded-[28px] shadow-xl p-6 overflow-auto">
          <table class="w-full text-sm">
            <thead>
              <tr class="border-b border-slate-200 text-left">
                <th class="py-3">Borrower</th>
                <th class="py-3">Guarantor</th>
                <th class="py-3">Amount</th>
                <th class="py-3">Balance</th>
                <th class="py-3">Status</th>
              </tr>
            </thead>
            <tbody>
              <tr class="border-b border-slate-100"><td class="py-3">Amina Okoro</td><td>Emeka James</td><td>₦250,000</td><td>₦75,000</td><td>Active</td></tr>
              <tr class="border-b border-slate-100"><td class="py-3">Esther Bello</td><td>Grace Omoruyi</td><td>₦180,000</td><td>₦180,000</td><td>Pending</td></tr>
              <tr><td class="py-3">Friday Musa</td><td>Joy Daniel</td><td>₦320,000</td><td>₦145,000</td><td>Overdue</td></tr>
            </tbody>
          </table>
        </div>

        <div class="mt-6 flex justify-end">
          <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>
        </div>
      </div>
    </section>
```

```
<section id="saved" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#1f3b57] to-[#155e75] min-h-[78vh] shadow-2xl screen-bg">
  <div class="relative z-10 p-6 lg:p-8">
    <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
      <div>
        <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Saved Borrowers & Guarantors</h2>
        <p class="text-white/70 mt-1 text-sm lg:text-base">Search database records</p>
      </div>
    </div>

    <div class="glass rounded-[28px] shadow-xl p-6 mt-6 overflow-auto">
      <div class="flex flex-col md:flex-row md:items-center md:justify-between gap-4 mb-5">
        <input id="searchInput" onkeyup="filterTable()" placeholder="Search records" class="h-12 rounded-2xl w-full md:w-80 px-4 border border-slate-200">
        <span class="bg-[#0b1f33] text-white px-4 py-2 rounded-full text-sm">3 Records</span>
      </div>

      <table class="w-full text-sm" id="recordsTable">
        <thead>
          <tr class="border-b border-slate-200 text-left">
            <th class="py-3">Name</th>
            <th class="py-3">ID</th>
            <th class="py-3">Guarantor</th>
            <th class="py-3">Bank</th>
            <th class="py-3">Status</th>
          </tr>
        </thead>
```

```
          <tbody>
            <tr class="border-b border-slate-100"><td class="py-3">Amina Okoro</td><td>BR-001</td><td>Emeka James</td><td>First Bank</td><td>Active</td></tr>
            <tr class="border-b border-slate-100"><td class="py-3">Esther Bello</td><td>BR-002</td><td>Grace Omoruyi</td><td>UBA</td><td>Pending</td></tr>
            <tr><td class="py-3">Friday Musa</td><td>BR-003</td><td>Joy Daniel</td><td>Access Bank</td><td>Overdue</td></tr>
          </tbody>
        </table>
      </div>

      <div class="mt-6 flex justify-end">
        <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>
      </div>
    </div>
  </section>

  <section id="offline" class="screen relative overflow-hidden rounded-[32px] bg-gradient-to-br from-[#0b1f33] via-[#1f5a78] to-[#0f766e] min-h-[78vh] shadow-2xl screen-bg">
    <div class="relative z-10 p-6 lg:p-8">
      <div class="flex items-center justify-between gap-4 border-b border-white/10 pb-5">
        <div>
          <h2 class="text-3xl lg:text-4xl font-semibold text-white tracking-tight">Offline Support</h2>
          <p class="text-white/70 mt-1 text-sm lg:text-base">System remains usable without internet</p>
        </div>
        <button onclick="activateById('home')" class="rounded-2xl bg-white text-[#0b1f33] px-5 py-3 font-medium">Overview</button>
      </div>
```

```
        <div class="mt-6 grid xl:grid-cols-[1fr_1fr] gap-6">
          <div class="rounded-[28px] overflow-hidden h-[380px] border border-white/10 shadow-xl">
            <img src="https://images.unsplash.com/photo-1520607162513-77705c0f0d4a?auto=format&fit=crop&w=1200&q=80" alt="Offline support" class="w-full h-full object-cover">
          </div>

          <div class="glass rounded-[28px] shadow-xl p-6 h-full flex flex-col justify-center">
            <div class="grid sm:grid-cols-2 gap-4">
              <div class="rounded-3xl bg-orange-50 p-5"><p class="text-sm text-slate-500">Stored Records</p><h3 class="text-3xl font-semibold mt-1">248</h3></div>
              <div class="rounded-3xl bg-amber-50 p-5"><p class="text-sm text-slate-500">Queued SMS</p><h3 class="text-3xl font-semibold mt-1">42</h3></div>
              <div class="rounded-3xl bg-slate-100 p-5"><p class="text-sm text-slate-500">Local Save</p><h3 class="text-xl font-semibold mt-1">Enabled</h3></div>
              <div class="rounded-3xl bg-slate-100 p-5"><p class="text-sm text-slate-500">Auto Sync</p><h3 class="text-xl font-semibold mt-1">Ready</h3></div>
            </div>
          </div>
        </div>

        <div class="mt-6 flex justify-end">
          <button onclick="goNextFromCurrent()" class="rounded-2xl bg-[#0b1f33] text-white px-6 py-3 font-medium shadow">Next</button>
        </div>
      </div>
    </section>
  </div>
</main>
```

```
</div>

<script>
  const flowOrder = ['home', 'signup', 'login', 'details', 'issuance', 'bank', 'repayment',
'dashboard', 'saved', 'offline'];

  function goNextFromCurrent() {
    const current = document.querySelector('.screen.active')?.id || 'home';
    const idx = flowOrder.indexOf(current);
    const next = flowOrder[(idx + 1) % flowOrder.length];
    activateById(next);
  }

  function showScreen(id, btn) {
    if (id !== 'admin-login') {
      document.getElementById('admin-login').classList.remove('active');
      document.getElementById('platformContent').style.display = 'block';
      document.getElementById('sidebarNav').style.display = 'block';
    }

    document.querySelectorAll('.screen').forEach(screen => screen.classList.remove('active'));
    document.getElementById(id).classList.add('active');

    document.querySelectorAll('.nav-btn').forEach(button => {
      button.classList.remove('active-nav');
      button.classList.add('bg-white/5', 'text-white/80');
    });

    if (btn) {
```

```
    btn.classList.add('active-nav');
    btn.classList.remove('bg-white/5', 'text-white/80');
  }
}

function activateById(id) {
  const buttons = document.querySelectorAll('.nav-btn');

  const map = {
    home: 'overview',
    signup: 'registration',
    login: 'borrower authentication',
    details: 'borrower details',
    issuance: 'loan issuance',
    bank: 'bank details',
    repayment: 'repayment',
    dashboard: 'dashboard',
    saved: 'saved records',
    offline: 'offline support'
  };

  const target = Array.from(buttons).find(btn =>
    btn.textContent.trim().toLowerCase().includes(map[id])
  );

  showScreen(id, target);
}
```

```
function adminLogin() {
  const email = document.getElementById('adminEmail').value.trim();
  const password = document.getElementById('adminPassword').value.trim();
  const message = document.getElementById('adminLoginMessage');

  if (!email || !password) {
    message.textContent = 'Enter administrator email and password.';
    message.className = 'text-sm text-red-600';
    return;
  }

  message.textContent = 'Login successful. Redirecting to platform...';
  message.className = 'text-sm text-emerald-600';

  document.getElementById('platformContent').style.display = 'block';
  document.getElementById('sidebarNav').style.display = 'block';

  const firstButton = Array.from(document.querySelectorAll('.nav-btn')).find(btn =>
    btn.textContent.trim().toLowerCase().includes('overview')
  );

  showScreen('home', firstButton);
}

function logoutAdmin() {
  document.getElementById('platformContent').style.display = 'none';
  document.getElementById('sidebarNav').style.display = 'none';
```

```
    document.querySelectorAll('.screen').forEach(screen => screen.classList.remove('active'));
    document.getElementById('admin-login').classList.add('active');

    document.querySelectorAll('.nav-btn').forEach(button => {
      button.classList.remove('active-nav');
      button.classList.add('bg-white/5', 'text-white/80');
    });

    const firstButton = document.querySelectorAll('.nav-btn')[0];
    if (firstButton) {
      firstButton.classList.add('active-nav');
      firstButton.classList.remove('bg-white/5', 'text-white/80');
    }
    document.getElementById('adminEmail').value = '';
    document.getElementById('adminPassword').value = '';
    document.getElementById('adminLoginMessage').textContent = '';
  }

  function filterTable() {
    const input = document.getElementById('searchInput').value.toLowerCase();
    const rows = document.querySelectorAll('#recordsTable tbody tr');

    rows.forEach(row => {
      row.style.display = row.textContent.toLowerCase().includes(input) ? '' : 'none';
    });
  }
 </script>
</body>
```

```
</html>
```