

NAME: UFODIAMA MIRACLE NMESOMA

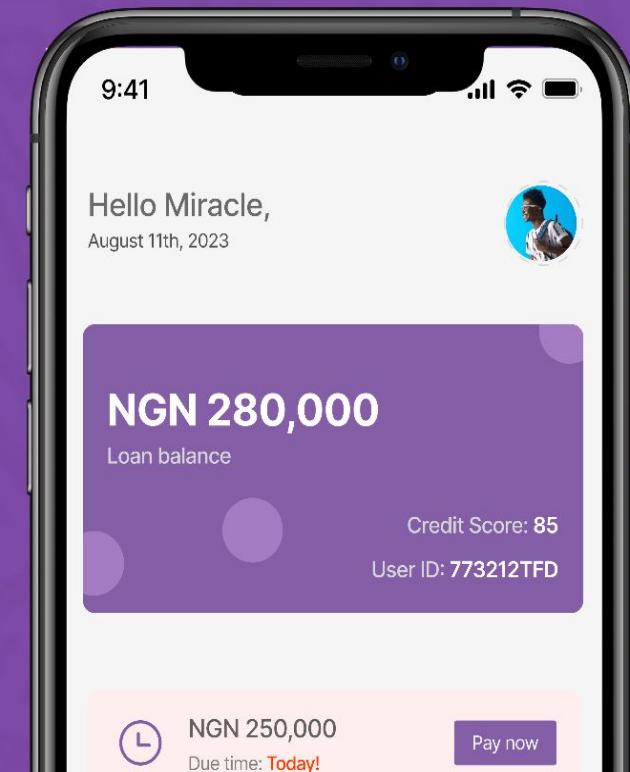
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DEPARTMENT: COMPUTER SCIENCE

PROJECT PRESENTATION SLIDES FOR THE BSC. PROJECT TOPIC:
**DEVELOPING AN AUTOMATED LOAN PROCESSING SYSTEM FOR
COMMERCIAL BANKS**

BOROWISE.

DEVELOPING AN AUTOMATED **LOAN** PROCESSING SYSTEM FOR **COMMERCIAL BANKS.**



Ufodiamma Miracle's Project.

Abstract

A specialized automated loan processing system designed for commercial banks to enhance efficiency. It aims to reduce wait times and minimize Non-performing Loans (NPLs) by employing modern technologies and Object-oriented Analysis and Design Methodology (OOADM).

The user-friendly front-end interface is built using React-Native for seamless interaction for both bank employees and customers. Postgres is utilized for its reliability and scalability in handling large loan data volumes.

This system is adaptable for implementation in Nigerian commercial banks offering loans to borrowers.



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Introduction

Background to the Study

The loan processing system has undergone significant changes in recent times, with the advent of more cutting-edge technology in the financial sector.

Platforms such as Palmpay, Fairmoney, KudaBank, and Opay have tackled the problem of reducing the stress of availing loans. However, these platforms have a significant challenge in loan recovery.

This project aims to develop an Automated Loan Processing System for commercial banks in the form of a mobile application that will increase the loan recovery rate for the banks and improve the satisfaction of their customers.

The system proposes to leverage Optical Character Recognition (OCR) to process identification documents and asset declarations, personalize loans based on the customer's financial goals, risk tolerance, and repayment capacity, and smooth loan recovery processes via reminders and offering affordable repayment plans.



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Statement of the Problem

The existing lending system in Nigerian commercial banks comes with severe limitations and shortcomings.

These are some of those shortcomings:

- Tedious paperwork that is time-consuming and prone to errors.
- Accessibility problems that make it inconvenient for individuals residing in remote areas or with limited physical mobility to access financial services.
- Lack of personalization of loan plans that provide limited flexibility and personalization in loan offers.
- Ineffective loan recovery process that often lacks proactive strategies and relies heavily on manual follow-ups, leading to low recovery rates and challenges in tracking and managing delinquent accounts.



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Objectives and Aim of the Study

Objectives

The specific objectives of this project are as follows:

- Users can register and create credit profiles on login.
- Users can fill out forms to receive personalized loan offers.
- The application promotes loan repayment through affordable payment plans and reminders.
- Only users with sufficient assets can access certain loans.

Aim

This project aims to design and develop a fast, user-friendly runnable on mobile smartphones (both Android and iOS devices,) enabling individuals to conveniently access loans from a bank, and banks to adopt intelligent repayment enforcement methods. The application will provide a seamless and efficient borrowing experience, empowering users and banks to manage their loans more efficiently.



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Significance of the Problem & Scope of study

This project has the following significance:

This project aims to develop an Automated Loan Processing Application for Nigerian Commercial Banks. The application will streamline loan processing, personalize loan offers, and promote loan repayment.

It will benefit banks, customers, and the government by increasing lending capacity, fostering entrepreneurship, and promoting financial inclusion.

Scope of Study

The project aims to develop an innovative loan processing application for Nigerian Commercial Banks, providing a convenient and efficient digital platform for customers to initiate loan applications, receive personalized loan recommendations, and facilitate loan recovery, streamlining the overall lending process.



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Theoretical Background

The needs and perspectives of the user which includes everyone who owns and uses a bank account and who may need a loan now or in the future are left out of the research, when in fact they and their needs are the primary targets of a loan processing automation system in the first place.

The other research papers that do not dwell on the details of neural networks, and the ethics and demerits of using AI in the finance sector versus the merits of using AI in making financial decisions

The system design is developed using CSS for frontend styling, and JavaScript React Native for User Interface. JavaScript Node is used for the backend/server side, and PostgreSQL ensures data validation and safety on the Database side. Records are updated when user takes loans or repays loan, or increases credit score by updating employment or asset information.



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Review of Related Literature

The existing literature on automated loan processing systems primarily focuses on the perspectives of lenders and the technical aspects of the systems. However, there is a lack of emphasis on the needs and perspectives of borrowers.

This project aims to address this gap by developing a loan automation system that prioritizes the borrowers' needs, such as fitting loans to their credit profiles and providing affordable repayment plans. The research also highlights the importance of financial inclusion, economic growth, and ethical considerations in loan automation. Various technologies, including React Native, Tailwind CSS, StyledComponents, SQL, Postgres, NodeJS, and Azure Cognitive Services, are proposed for the implementation of the loan automation system.

Additionally, the project draws insights from related studies on lending efficiency, loan performance, digital channels in banking, and credit analysis. By streamlining loan processing, improving decision-making, and enhancing customer experience, the loan automation system aims to benefit both lenders and borrowers, contributing to overall banking stability and economic development.



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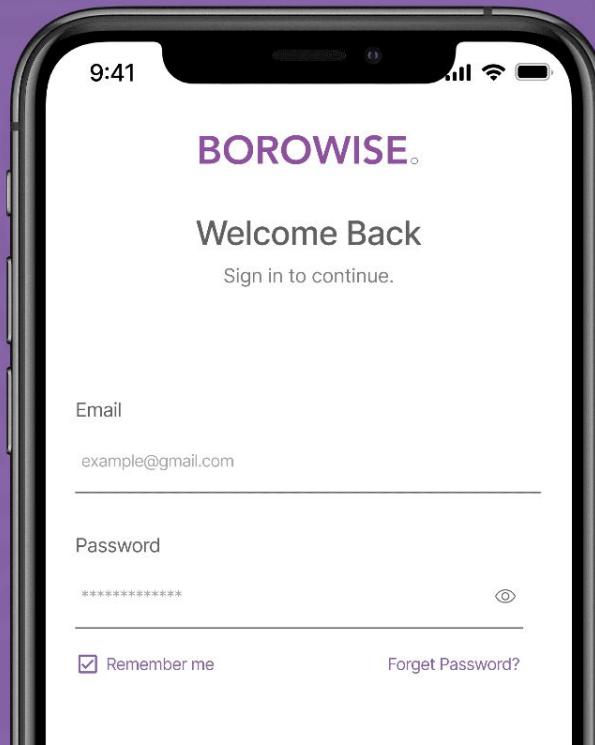
System Analysis and Design

Introduction

System analysis involves data collection, problem identification, and breaking down a system into its constituent elements.

The intricacies of loan processing pose distinct challenges to the seamless flow of operations in commercial banking. To address this, the researcher plans to meticulously dissect the proposed Automated Loan Processing System using the Object-Oriented Analysis And Design Methodology (OOADM).

The study underscores the difficulties faced by commercial banks in streamlining their loan processing systems using the chosen approach, including issues like loan approval timelines, alterations in administrative procedures, occasional oversights, loan repayments, and more. The use of digital technologies and automation, such as artificial intelligence and machine learning, can address these deficiencies and improve the efficiency, accuracy, and accessibility of the loan processing system.



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Description of Existing System

The current loan processing system used by commercial banks is manual and paper-based, lacking a centralized point of access, which results in labor-intensive activities that are prone to errors and delays in loan approvals.

The loan officer is burdened with physically visiting different departments involved in the loan approval process, which is time-consuming and resource-intensive.

Additionally, loan plans are not personalized and suited to the borrower's risk appetite and capacity, and loan repayments are difficult to navigate due to the manual process and red tape, leading to Non-Performing Loans (NPLs).

The use of digital technologies and automation, such as artificial intelligence and machine learning, can address these deficiencies and improve the efficiency, accuracy, and accessibility of the loan processing system.



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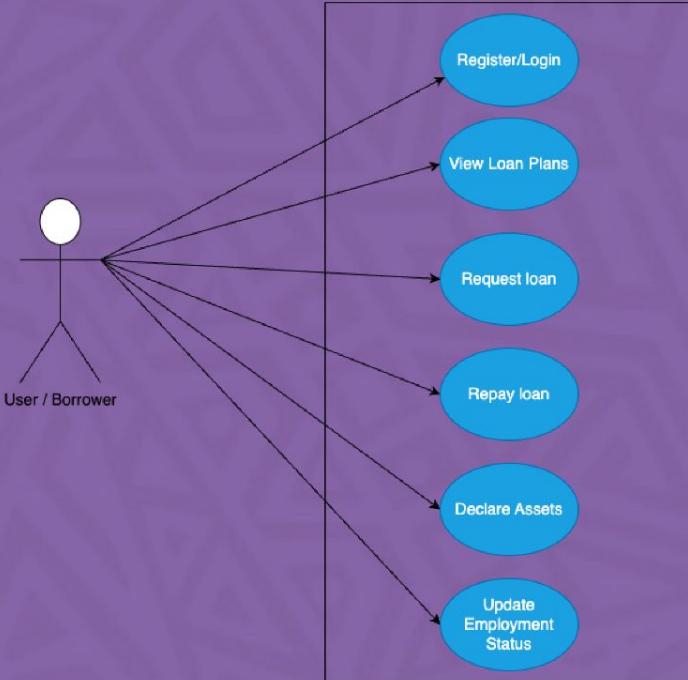
Analysis of the Proposed System

The proposed system is a smartphone mobile application that allows borrowers to obtain loans suited to their credit profiles and risk capacity. It offers easy accessibility from any location without the need to visit a physical bank. The system fits borrowers to loan plans using algorithms, eliminating the bias of loan officers. It provides a streamlined user experience and user interface, guiding users through the application and offering alerts for loan repayments.

The system utilizes the Object-Oriented Analysis And Design Methodology (OOADM) and employs tools like UML diagrams for system design and modeling. Automation and analytics improve efficiency and decision-making in the loan origination process

Use Case Diagram

A use case diagram is a UML diagram that specifies the behavior expected from software from the perspective of end-users and provides a brief overview of different components concerning interaction between use-case, actors, and systems.



USE CASE DIAGRAM

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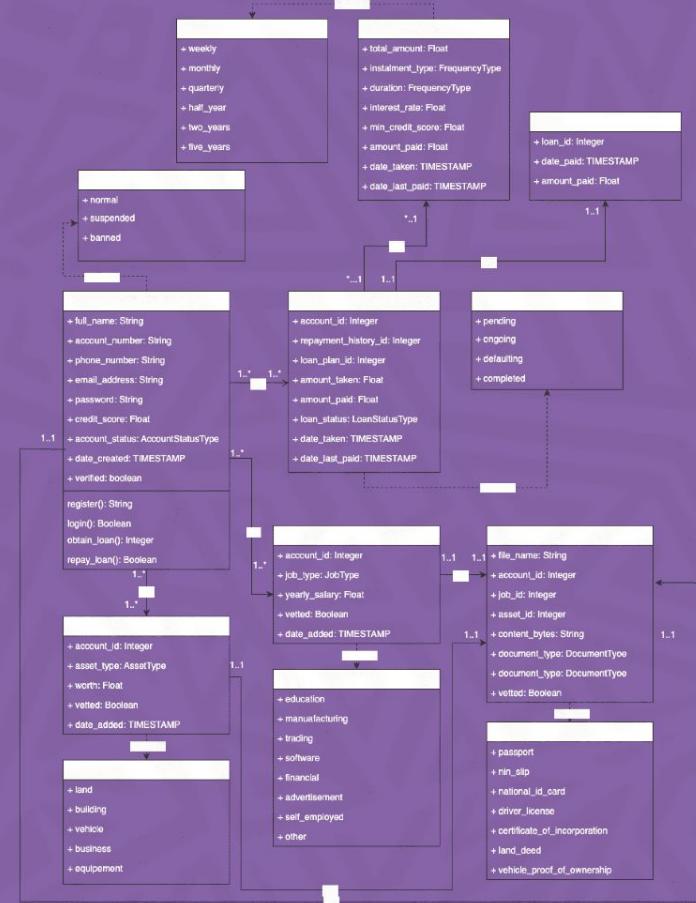
Analysis of the Proposed System

Class Diagram

A class diagram is a UML tool that shows all the major parts of a system and their connections. It depicts a group of classes, interfaces, affiliations, and limitations.

The classes in the diagram include Account, LoanPlan, Loan, FrequencyType, RepaymentHistory, Asset, AssetType, Job, JobType, Document, and DocumentType.

It is used to describe the logical structure of a database system and to visualize a banking system. Class diagrams are widely used in the modeling of object-oriented systems because they are the only UML diagrams that can be mapped directly with object-oriented languages.



CLASS DIAGRAM

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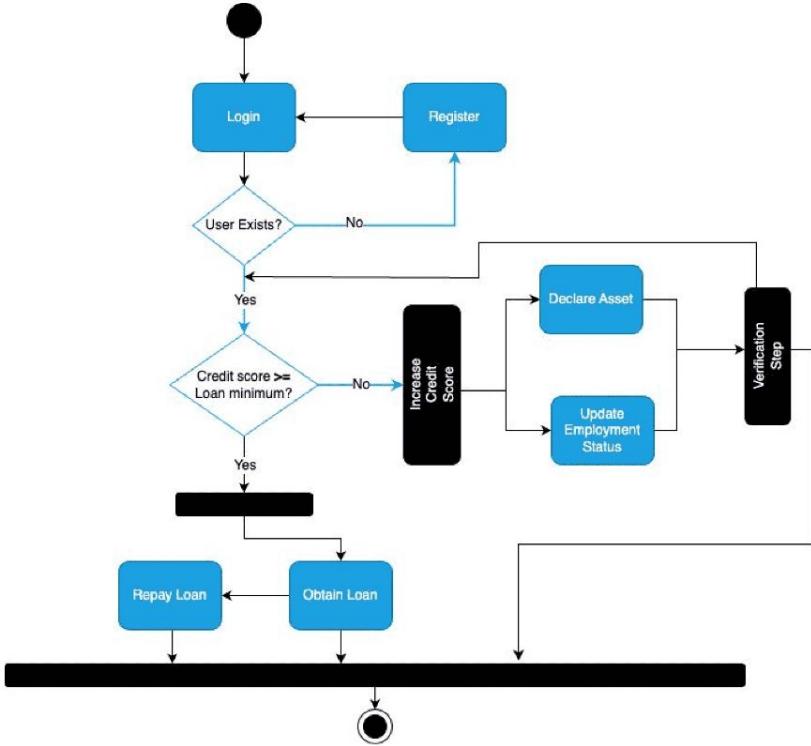
Analysis of the Proposed System

Activity Diagram

The activity diagram is yet another crucial UML diagram for outlining the dynamic properties of the system. In essence, it is a flowchart that shows how information moves from one activity to the next.

A system operation might be used to describe the action. Each actor in the system has its own activity diagram since each actor can do actions.

The main actor in this system is the User, who represents the borrower.



Flow Chart

Design of the Proposed System

Database Design

System design is the process of developing a system's architecture, modules, and components as well as the numerous interfaces that connect them to the data that flows through them [15].

In order for the implementation to be compatible with the architectural entities listed in the system architecture models and views, the system design process must provide sufficient particular data and knowledge about the system and its components.

The following issues will be covered in this part, which describes how the system will operate:

- Database Design
- Input Design
- Output Design
- System Architecture



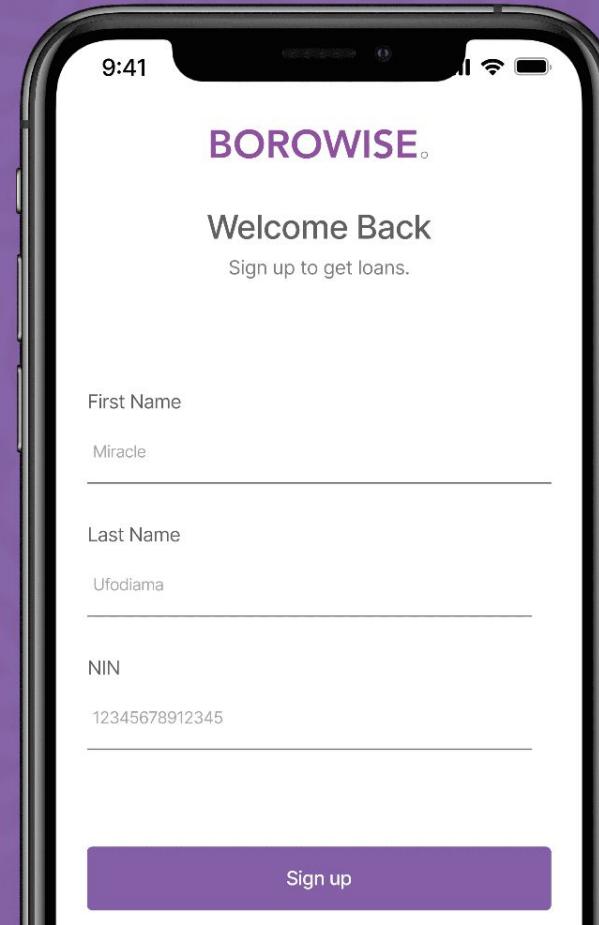
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Design of the Proposed System

Input Design

The application's input architecture is shown in the input design, where the input is the data or information that the system is given for processing.

This is accomplished by utilizing the React Native Text User Interface Library. Two of the inputs to the proposed system are registration and asset upload forms. These forms are depicted below.



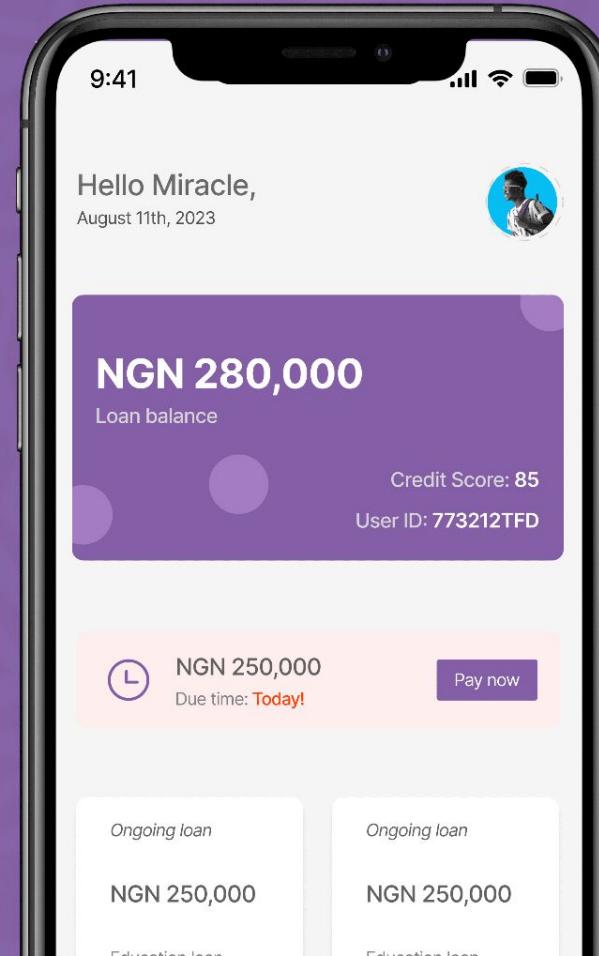
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Design of the Proposed System

Output Design

The application's output display, which displays the loan plans and account information like credit score, is shown in the output design.

The Text, Views, and Buttons used are from React Native's User Interface Library. The system's output, which includes the outcome of input processing, is what the system creates.



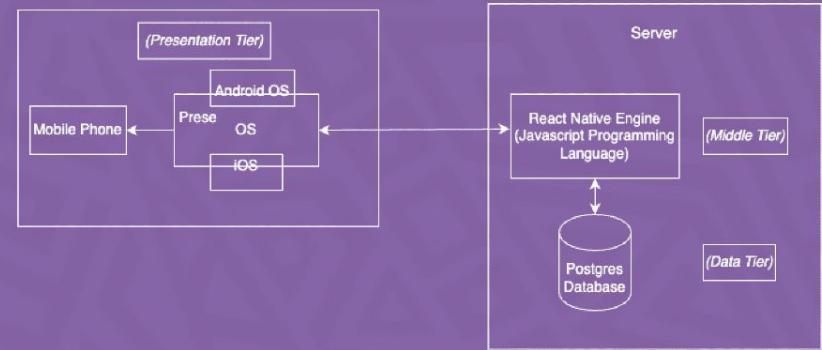
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Design of the Proposed System

System Architecture

The suggested method employs a three-tiered structure. the middle or business-logic tier, which is driven by the JavaScript programming language and runs the React Native Engine, the data or database server tier, and the presentation tier, which is made up of the mobile phone and its operating system.

The operating system of the user's mobile phone powers the user interface. The data tier is responsible for keeping the necessary data, while the presentation tier is linked to the middle tier's business logic.



SYSTEM ARCHITECTURE DIAGRAM

System Implementation

Introduction

System implementation is the process of making a new system available to a specific group of users (also known as deployment.) It is a process that includes the development of the system, ongoing system support, and continuous maintenance [20].

Support and maintenance are important in order to guarantee that the information system is operational and meets the quality requirements (commonly referred to as quality assurance.)

This chapter discusses how the proposed system will be implemented and the prerequisites that must be satisfied to implement it.

Additionally, it includes information about the architecture that was used to implement it, the software testing that was conducted, and the development environment that was chosen.



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System Implementation

Choice of Development Environment

A development environment, also known as an integrated development environment (IDE), is a software development environment that combines various tasks involved in software development into a single program.

The proposed Automated Loan Processing System will be developed using React Native, a highly preferred choice for cross-platform mobile development.

The system will utilize JavaScript for the application's logic and the React Native framework for the implementation of the user interface. React Native enables cross-platform app development, and its ecosystem offers loads of handy tools and IDEs that make app development a breeze.

The Visual Studio IDE was used for linting and debugging capabilities during the development phase.



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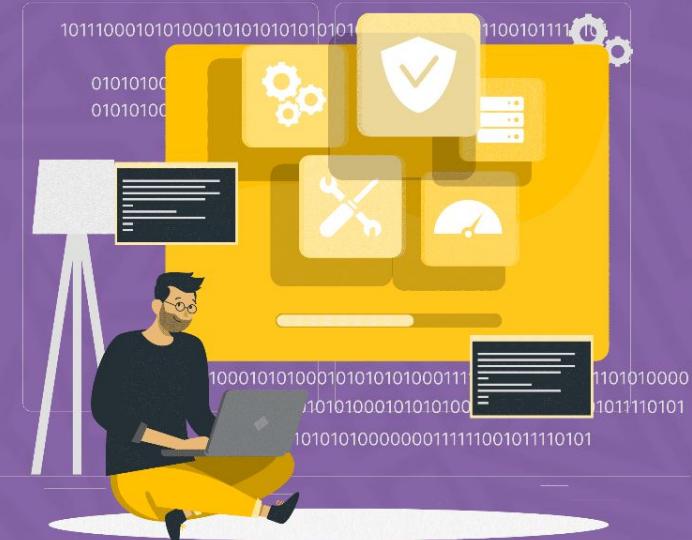
System Implementation

Implementation Architecture

The proposed system's implementation architecture describes the system's physical design as well as how it should be developed. The Automated Loan Processing program is in charge of a number of duties, which it completes with the aid of its essential parts. The accompanying diagram demonstrates how the system interacts with a variety of various components, each of which serves a specific purpose and plays a unique role.

The application offers aid in successfully exploring its View when the user is welcomed to the system. When the user is welcomed, they are guided on the next steps by alerts and intuition since the flow of the application is designed to be very intuitive.

The system's ViewModel, which is always connected to the Application Logic, automatically redirects data that a user enters into the User Interface (UI). The persistent logic then interacts with this application logic, which causes it to write the user sign-in token as well as other non-sensitive data to the device disk. As a result, the View is refreshed to reflect updated information.



System Implementation

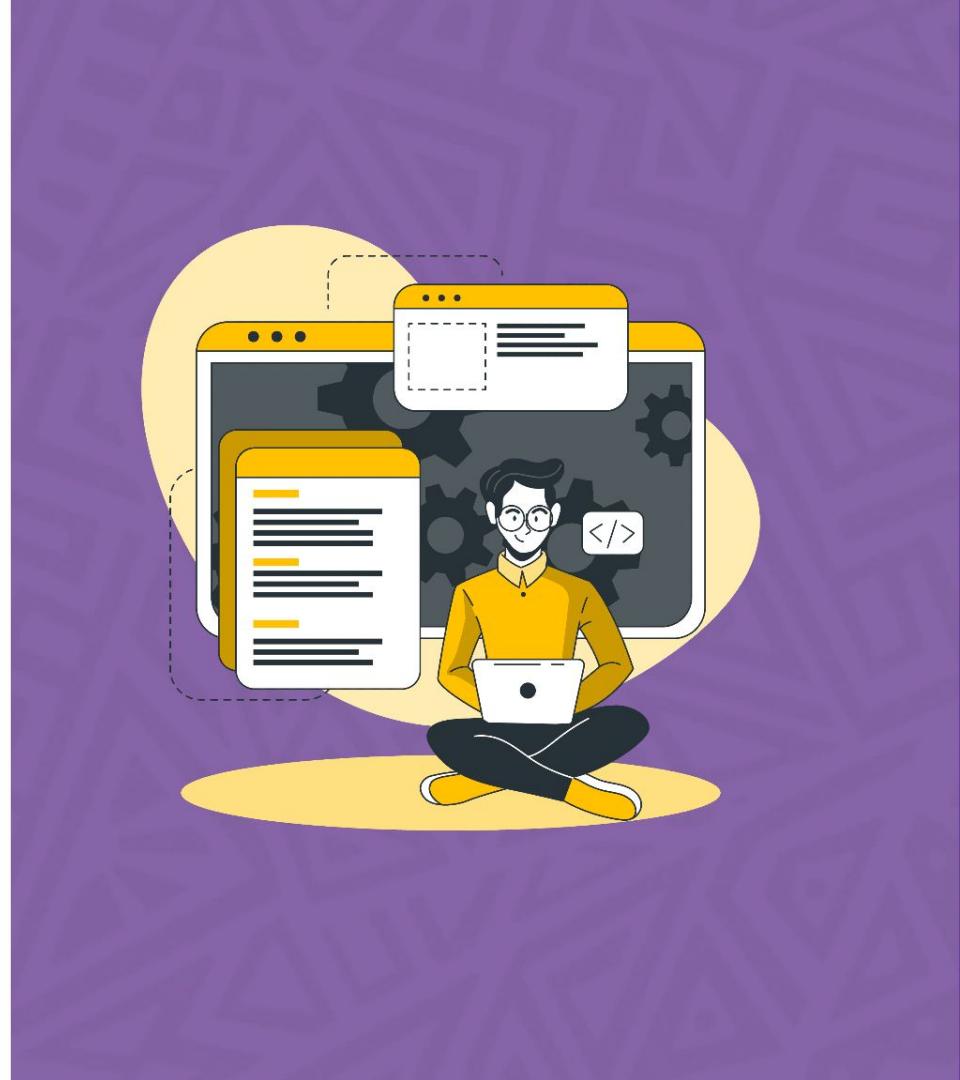
Software Testing

Software testing is the process of evaluating and verifying a software program's functionality to ensure it meets the specified requirements.

It aims to identify errors, bugs, and performance issues in the software. Testing can be done using various methodologies, such as black box testing, unit testing, and non-functional testing.

The proposed Automated Loan Processing System underwent testing at each level of development to identify and correct any faults. The first level of testing focused on eliminating logical and semantic errors, while the second level validated the accuracy, user interface, and user flow on different Android devices.

Testing methodologies are crucial in ensuring the quality and stability of software products, and they help predict the timeline of software development.



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Documentation

Software documentation is a written text or image that accompanies or is present in the source code of computer software. It explains how the software works or how it should be used to achieve its intended goal.

User Manual

Based on the search results, it seems that the loan processing system in question involves the use of external documentation, such as a user manual, to guide users in using the application.

The goal of the program is to make it easier for students to track and manage school activities. The user guide provides step-by-step instructions on how to engage with the application's capabilities.

The application includes features such as credit score display, loan options, loan requests, loan repayments, and profile updates. The use of comments in the source code improves the code base's maintainability, readability, and comprehension.



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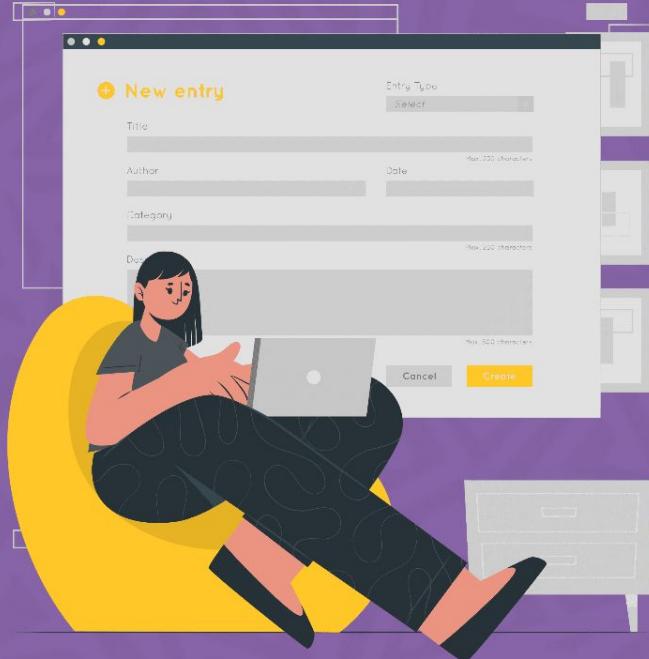
Summary and Conclusion

Introduction

The Automated Loan Processing App is a user-friendly and efficient solution that simplifies the loan application process. By integrating automation and instant communication, the app eliminates the need for paperwork and manual submissions, making loans more accessible. The app's onboarding process is smooth, and users can upload non-sensitive financial information to receive a credit score reflective of their risk capacity. The app provides informative screens and guides to keep users informed throughout the loan application journey. The essential components of the app have been successfully integrated, and React Native's Text Input component and AsyncStorage were employed for data persistence.

Conclusion

An automated loan processing app simplifies and accelerates the loan application process, providing a user-friendly interface and real-time updates. Automation technologies streamline loan processing, reducing errors and saving time. The app improves accuracy in loan decisions and enhances transparency. It offers a transformative solution for lenders and borrowers, making loans more accessible and efficient.



Summary and Conclusion

Recommendation

Throughout the course of this project, this mobile application has been able to solve a small portion of the challenges that confront lenders and borrowers in today's rapidly evolving financial and technological landscape.

It would be beneficial to conduct additional research on the subject of adding more features, such as making it possible for administrators to regulate user behaviour on the application in a seamless manner.

Additionally, additional work needs to be done to investigate better options that would enable these people to have a smooth and secure procedure of logging in with relation to the input of their passwords.

Borrowers would be able to use the majority of these functions on their Android devices without the need for additional assistance if they followed the steps outlined in the User Manual section in System Implementation.

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Thank you

For your attention