

Understanding IT Operations in the Banking Sector: Internship at Agrani Bank PLC. IT Department

by

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An Internship Report submitted to the Department of Computer Science and
Engineering
in partial fulfillment of the requirements for the degree of
B.Sc. in Computer Science and Engineering

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Declaration

It is hereby declared that

1. The Report submitted is my/our own original work while completing degree at Brac University.
2. The Report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The Report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. We have acknowledged all main sources of help.

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Abstract

An outline of my three-month internship at Agrani Bank PLC's Information Technology (IT) Department is provided in this report. The goal of the internship was to impart useful knowledge about how IT oversees and supports banking operations. I saw a variety of IT operations during this time, including data management, software support, network security, and system maintenance. Additionally, I learned about cybersecurity procedures, the core banking system (CBS), and the function of IT in guaranteeing efficient transaction processing and digital banking services, such as online banking, ATM services, and mobile banking apps.

My understanding of how IT supports data security, operational effectiveness, and better customer service in the banking industry has improved as a result of my internship. It also shed light on how IT departments maintain system uptime, oversee network infrastructure, and fix technical problems to guarantee continuous banking services. All things considered, this internship expanded my understanding of banking IT architecture and increased my desire to work in digital banking systems and banking technology.

Keywords: Information Technology (IT), Banking Operations, Core Banking

System (CBS), Digital Banking, Cybersecurity, Network Infrastructure, Data Management, System Maintenance, IT Support, Internship Experience.

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Chapter 1

Introduction

1.1 Background

One of Bangladesh's top state-owned commercial banks, Agrani Bank PLC is essential to the nation's banking and financial industry. Agrani Bank was founded in 1972 in accordance with the Bangladesh Banks (Nationalisation) Order with the intention of meeting the economic demands of the recently independent country. With a vast branch network, foreign exchange houses, and corporate banking services, it has developed into one of the biggest commercial banks over time.

Corporate banking, retail banking, SME financing, agricultural loans, remittance services, foreign trade facilitation, and a variety of digital banking solutions are just a few of the many services offered by Agrani Bank PLC. With more than a thousand branches nationwide and a robust global footprint, the bank has significantly boosted Bangladesh's economy.

The technological core of Agrani Bank is the IT and MIS Division. It guarantees the seamless operation of database administration, cybersecurity, IT infrastructure, core banking software, and the deployment of digital services like internet and mobile banking. By implementing cutting-edge technological solutions, this division consistently strives to increase productivity, transparency, and customer satisfaction.

Agrani Bank PLC has an organised organisational structure to effectively oversee its operations across the country.

Agrani Bank Head Office: Comprising 37 divisions, the Head Office oversees the bank's central administration.

Zones and Circles of Agrani Bank: Agrani Bank has set up :

11 Circle Offices, which act as regional hubs and coordinate activities within their respective territories, in order to efficiently manage its vast branch network.

53 Zonal Offices: These offices oversee and manage the activities of branches in designated zones, guaranteeing uniform service provision and policy compliance.

Branch Network: Agrani Bank has 979 branches and 36 corporate offices

43 branches of authorised dealers (AD) Real-time online banking systems connect all branches, allowing clients to transact with ease.

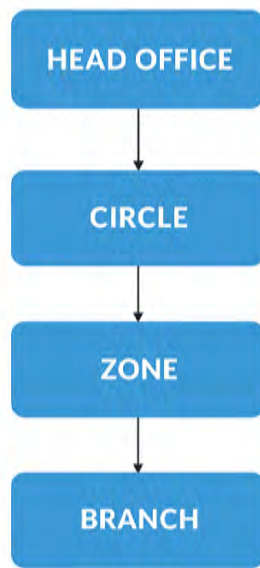


Figure 1.1: Agrani Bank Hierarchy

Islami Banking Window: The first state-owned commercial bank in Bangladesh to offer Shariah-based Islami banking is Agrani Bank PLC. This system is run by the 'Islami Banking Unit,' which started with five Islami Banking Windows on February 28, 2010. The bank has now extended this service to 60 Islami Banking Windows in different branches.

Every zone reports to Zonal office. Zonal office reports to Circle office(dhaka has 2 circles other divisions has 1 circle) and Circle office reports to Head office. Corporate branches(does foreign exchange) are out of zones . Those Branches reports to either circle office or head office. Principle office reports to Head office

1.1.1 Vision and Mission

Vision:

By upholding international standards in effectiveness, service quality, sound management practices, customer care, and financial stability, Agrani Bank PLC hopes to become the premier state-owned commercial bank in Bangladesh.

Mission:

Agrani Bank PLC's mission is to strictly follow legal requirements while conducting

all business with honesty and equity. In order to maximise the benefits for both clients and staff, the bank consistently implements international best practices to improve its policies and processes.

1.1.2 How Does Agrani Bank PLC – IT and MIS Division Work

To guarantee seamless operations and provide dependable services to its millions of clients, a sizable financial institution such as Agrani Bank PLC needs a well-organised setup. As the bank’s technological backbone, the IT and MIS Division makes automation, system integration, and digital banking services possible. The division’s operations are explained by the following structures, which are the result of the collaboration of management teams, system administrators, and knowledgeable IT specialists.

1.1.3 Program Management

Senior executives and department heads oversee the operations of the IT and MIS Division. Program management is in charge of managing IT-driven projects, system updates, and the deployment of banking software. While preserving data security, compliance, and service dependability, managers make sure that every project is in line with the bank’s strategic goals. They act as the primary liaison between management, external stakeholders, and technical teams.

1.1.4 System Ownership

Digital platforms and core banking systems at Agrani Bank are managed by structured ownership. As the “system owner,” the IT and MIS Division makes sure that database management, transaction monitoring systems, and core banking solutions (CBS) run smoothly. Assigned modules are owned by department heads and IT administrators, guaranteeing continuous banking operations and adherence to Bangladesh Bank’s policies.

1.1.5 Quality Assurance

All IT systems and digital banking platforms are subject to quality assurance in order to preserve effectiveness and security. System testing, troubleshooting, and performance monitoring are routinely carried out by the IT and MIS team. To guarantee compliance, security, and customer satisfaction, quality assurance procedures are conducted prior to the launch of new banking services (such as internet banking modules or mobile banking features). This guarantees that banking apps and software continue to be dependable, easy to use, and error-free.

1.1.6 User Experience Design

Customer experience is one of the most important factors in contemporary banking. Agrani Bank’s IT and MIS Division is always working to enhance digital interfaces, including online portals, ATM services, and mobile banking apps. System design

is greatly influenced by management input, user feedback, and legal requirements. The ultimate objective is to give clients utilising the bank's digital services a smooth and safe experience.

1.1.7 What Agrani Bank PLC. Does

One of Bangladesh's biggest state-owned commercial banks, Agrani Bank PLC offers a variety of banking and financial services to its clients. Its services are made to satisfy the requirements of people, companies, and governmental entities, guaranteeing financial inclusion and economic growth nationwide.

Among the primary services offered by Agrani Bank PLC are:

Retail banking services: Include credit card, debit, and savings accounts, current accounts, fixed deposits, and loans.

Corporate and SME banking: Includes working capital loans, trade finance, investment support, and business financing

Agricultural Loans: Special loan programs designed to support agricultural development for farmers and rural communities.

Remittance Services: Through international partnerships, expatriates can receive safe and effective money transfer services.

Foreign Trade and Exchange: LC (Letter of Credit) facilities, foreign currency transactions, and import/export financing.

Digital Banking Services: The IT and MIS Division oversees Internet, mobile, and ATM banking as well as other technology-driven solutions.

The IT and MIS Division, which guarantees smooth technological integration, supports and enhances all of these services. To give consumers safe and dependable banking services, core banking systems, online platforms, and digital channels are created, maintained, and continuously enhanced.

With its extensive branch network and robust IT infrastructure, Agrani Bank PLC is dedicated to providing contemporary, effective, and user-friendly financial solutions throughout Bangladesh.

1.2 Rational of the Study or Motivation

The main reasons for doing this internship at the IT and MIS Division of Agrani Bank PLC were to close the knowledge gap between theory and practice and to obtain practical experience in a banking technology setting. As a computer science and engineering student, I was interested in learning how big banks use technology to make sure that their hundreds of branches across the country run safely, effectively, and scalable.

Information systems, automation, and digital innovation are becoming more and more important in modern banking. I studied database management, software en-

gineering, and network security during my coursework, but I gained a deeper understanding of their practical significance after seeing how they were applied in a real-world financial infrastructure.

Furthermore, one of Bangladesh's top state-owned commercial banks, Agrani Bank PLC, uses a variety of digital platforms, such as MIS, Core Banking System (CBS), and other management software. Working here gave me the chance to learn more about data integrity, software integration, and large-scale system management—all of which are essential for a future in IT and data-driven banking solutions.

My desire to improve my technical and professional abilities, learn more about enterprise-level IT operations, and make a significant contribution to a company that is essential to Bangladesh's financial ecosystem ultimately drove me to pursue this study.

1.3 Problem Statement

Loan management is a crucial but challenging operational procedure in the contemporary banking and financial industry. For loan applications, approvals, EMI calculations, and reporting, many financial institutions still use manual or semi-automated systems. This results in inefficiencies, a greater likelihood of human error, a lack of transparency, and a delay in making decisions.

Among the main obstacles are:

- Workflows for manually applying for and approving loans
- Accurately tracking EMI payments is difficult.
- Absence of real-time analytics and reports
- Absence of a centralized system for evaluating officers' and branches' performance
- Customers' inability to see loan status and repayment information

Customer satisfaction, data accuracy, and operational efficiency are all adversely affected by these problems. A fully digital, automated, and data-driven loan management system that can optimize loan operations and offer management actionable insights is therefore desperately needed.

1.4 Objective

The purpose of this report is to provide a thorough overview of my learning outcomes and to document my internship experience.

1.4.1 Aim

This internship project's main goal is to create a web-based loan management system that streamlines operations, increases customer and bank official transparency, and automates the entire loan lifecycle.

1.4.2 Specific Goals

The project's particular goals are:

- To create a safe system for customers, loan officers, and administrators to register, log in, and log out with role-based access.
- To automate the loan application, verification, and approval procedures, as well as the creation of loan sanction letters following approval.
- To put in place an EMI tracking and calculation system that lets clients see their repayment status and EMI schedule.
- To create analytics dashboards and reports that administrators can use to track loan performance, approvals, and repayments.
- To make it possible to analyze loan distribution by branch in order to better track regional performance.
- To assess loan officer performance indicators, such as loans that have been approved and those that are still pending.
- To use Bootstrap to create a polished, responsive, and easy-to-use interface.

1.5 Methodology in Brief

The primary focus of this report is my work experience and the knowledge I acquired while interning at the IT and MIS Division of Agrani Bank PLC. While some information was gathered from official and secondary sources, the majority of the data and insights in this report are based on my own personal experience.

1.5.1 Primary Data

- Experience in the real world gained during my internship
- Advice, directives, and conversations with coworkers and superiors
- Observations from meetings, briefings, and departmental activities

1.5.2 Secondary Data

- The official website of Agrani Bank PLC
- Internet resources and pertinent documents pertaining to the IT and banking industries

1.6 Key Learnings and Insights

1.6.1 Technical Learnings

- Gained practical knowledge of the Models, Views, and Templates (MVT) architecture of the Django web framework.
- Learned how to put role-based access control and user authentication and authorization into practice.
- Created and maintained relational databases for loan, EMI, branch, and user profile data using Django ORM.
- Implemented business logic, including sanction letter generation, loan approval processes, and EMI computations.
- Bootstrap was used to create responsive dashboards that enhance user experience.
- enhanced debugging abilities through the resolution of practical problems including database migrations, template faults, and HTTP method errors.

1.6.2 Professional and Soft Skills Learnings

- Gained a thorough understanding of the procedures used in actual banking and loan processing.
- Improved analytical thinking and problem-solving skills through real-world implementation problems.
- Acquired expertise in technical reporting and project documentation.
- Enhanced self-learning and time management abilities while working autonomously on a full-stack project.

1.7 Team Overview

I got the chance to work with a very talented and collaborative technical team at Agrani Bank PLC's IT and MIS Division during my internship. The division was made up of system analysts, database administrators, network specialists, and software engineers who worked together to make sure the bank's technology infrastructure ran smoothly.

The Core Banking System (CBS), Management Information System (MIS), Advanced MIS (AMIS), and a number of web-based solutions like loan management and billing platforms were among the in-house banking applications that our team was principally in charge of maintaining and developing. Because each team member was assigned a specific task based on their technical proficiency, effective cooperation and information exchange were made possible.

Observing system design procedures, comprehending database structures, and learning about web application frameworks like PHP,.NET, and Java utilised within the

department were all part of my internship. Additionally, I helped by recording workflow procedures, examining data flow between modules, and providing supervision for small debugging or testing jobs.

Working in this cooperative setting gave me the opportunity to obtain practical experience with enterprise-level software systems and to comprehend how coordination and teamwork are essential to the smooth operation of a sizable IT infrastructure such as that of Agrani Bank.

Chapter 2

Technological Background

2.1 Overview of Technical Environment

A Windows-based operating system was used to build the project in a local development environment. Python and the Django framework were used in the development of the web-based application. To control project dependencies and guarantee library isolation, a virtual environment was set up.

Database models, front end templates, and backend logic were all created under a single Django project structure during the development process. Before the system was finalized, it was tested locally using Django's integrated development server.

2.2 Technologies and Tools Used

The following technologies and tools were used during the development of the Loan Management System:

- Programming Language: Python
- Web Framework: Django
- Database: MySQL
- Frontend Technologies: HTML, CSS, Bootstrap
- Authentication System: Django's built-in authentication framework
- Version Control: Git (for code management and tracking changes)
- Development Tools: Visual Studio Code, Command Prompt / Terminal

These tools enabled efficient development, testing, and debugging of the application.

2.3 System Architecture and Design Patterns

The Model-View-Template (MVT) architecture of Django is used by the system:

- Model: Manages business logic and database structure (Loan, EMI, User Profile, Branch, etc.)
- View: Includes request handling, data processing, and application logic
- Template: Oversees the presentation layer and user interface

This division of responsibilities guarantees the application's scalability, maintainability, and modularity. Role-based access control was also put in place to govern administrator, loan officer, and client permissions.

2.4 Development Methodology

Throughout the project, an incremental and iterative development methodology was used. Starting with user authentication and working its way up to loan management, EMI tracking, reporting, and analytics functions, the system was developed module by module.

Before going on to the next module, each feature was put into practice, tested, and improved. Early error detection and ongoing system improvement based on testing results were made possible by this method.

2.5 Technical Resources Consulted

Throughout the project's development, the following resources were consulted:

- Official Documentation for Django
- Official documentation for Python
- Stack Overflow and other online developer communities
- Django and Bootstrap-related technical blogs and tutorials
- The organization's project criteria and internship advice

These tools aided in comprehending ideas, fixing mistakes, and putting best practices into action.

Chapter 3

Project Responsibilities

The duties performed throughout the Loan Management System project's development are detailed in this section. Planning, system design, front-end and back-end development, database design, testing, and the integration of several functional modules were all included in the duties. To guarantee the creation of a safe, scalable, and user-friendly system, the work was done in an organized and methodical manner.

3.1 Requirement Analysis and System Planning

Understanding the operational and functional needs of a digital debt management system was the first duty. This involved establishing the responsibilities and system permissions of important stakeholders, including administrators, loan officers, and customers.

To identify essential features including user registration, authentication, loan application processing, loan approval workflow, EMI production, payment tracking, reporting, and analytics, system needs were examined. These specifications were used to plan the system's functional structure, which included data relationships, user flows, and module separation.

This stage made sure that the system architecture was in line with practical business requirements and actual banking operations.

3.2 Database Design and Data Modeling

The database structure was designed using Django's ORM system. Several relational models were developed, such as:

- Models of users and profiles for role-based access
- Loan application methodology for processing loans
- EMI model for monitoring installments
- Branch model for activities that are branch-wise
- Models related to reporting and analytics

3.4 Authentication, Authorization, and Role Management

Role-based authorization and user authentication were fully implemented as part of the project. Django's framework for authentication was utilized to oversee:

- Registration of users
- Logging in and out securely
- Management of sessions
- Protection using passwords

To separate permissions for officers, administrators, and customers, a unique role-based access control system was put in place. To ensure system security and operational control, each user position was given a dedicated dashboard and access to only permitted system functionalities.

3.5 Frontend Development and User Interface Design

HTML, CSS, and Bootstrap were used in the development of front-end interfaces. Among the responsibilities were:

- Creating dashboards for customers
- Creating dashboards for officers
- Creating administrative dashboards
- Making views of the EMI timetable
- Creating loan application forms
- Developing analytics and reporting views
- Creating interfaces for document downloads and receipts

Usability, accessibility, and clarity were taken into consideration when designing user interfaces. Professional UI elements, organized navigation, and responsive layouts were all made with Bootstrap. The system was made to be both aesthetically pleasing and simple for non-technical consumers to operate.

3.6 Reporting, Analytics, and Dashboard Development

Features for advanced reporting were created, such as:

- Reports on loan distribution
- Reports on EMI payment status
- Performance analysis by branch
- Metrics for officer performance
- Analytics for customer loans
- Summaries of finances

Data aggregation logic and backend queries were used to construct dynamic dashboards. Administrators and management were able to make informed decisions and assess performance with the help of these dashboards.

3.7 Testing, Debugging, and System Integration

Throughout the course of the project, extensive testing and debugging were done. Among the responsibilities were:

- Model and view unit testing
- Workflow testing by hand
- Resolving migration issues
- Resolving routing and template problems
- Resolving problems between permission and authentication
- Verifying the accuracy of data used in EMI computations
- Testing the results of reports

To guarantee seamless communication between authentication, loan processing, EMI administration, reporting, and dashboards, system integration testing was also carried out.

3.8 Documentation and Project Structuring

Clean code techniques, well-organized folders, and consistent naming standards all contributed to the project's appropriate structure. Project reports, logical file organization, and code comments were used to maintain documentation.

This duty made guaranteed that future developers and stakeholders could maintain, expand, and comprehend the system.

3.9 Professional and Practical Skill Development

The initiative promoted professional development in addition to technical advancement by:

- Debugging and problem-solving abilities
- Architecture planning and system thinking
- Prioritizing tasks and managing time
- Interpreting requirements and translating systems
- Writing technical documentation
- Reporting and presentation abilities

Strong hands-on exposure to actual software development procedures in the banking and financial technology industry was given by this project.

Chapter 4

Workflow of the Project

The methodical process used to implement the Loan Management System is described in this section. It explains how the system was created, how various modules work together, how testing was done, and the project's ultimate results.

4.1 System Implementation

The anticipated architecture and design were transformed into a fully functional web-based application throughout the system implementation phase. The Django framework was used to implement the project in a modular and scalable manner.

Setting up the Django project structure, configuring the database, and developing the essential applications for user management, loan processing, EMI management, reporting, and dashboards were the first steps in the implementation process. Data structures were first defined by models, then business logic was handled by views, and user interfaces were displayed using templates.

To guarantee that officers, administrators, and clients can only access their designated functionalities, role-based authentication was put in place. To ensure stability and accuracy, each module was progressively integrated, and system functionality was checked following each significant implementation stage.

Temenos T24, Java, Spring Framework, and Oracle Database were the technologies utilised.

4.2 Module-wise Description

The system was divided into multiple functional modules to ensure clarity, maintainability, and ease of development.

4.2.1 User Management Module

Role administration, login, logout, and user registration are all handled by this module. For clients, loan officers, and administrators, it guarantees safe authentication and role-based authorization. Additional data, including position, branch assignment, and account status, is stored in user profiles.

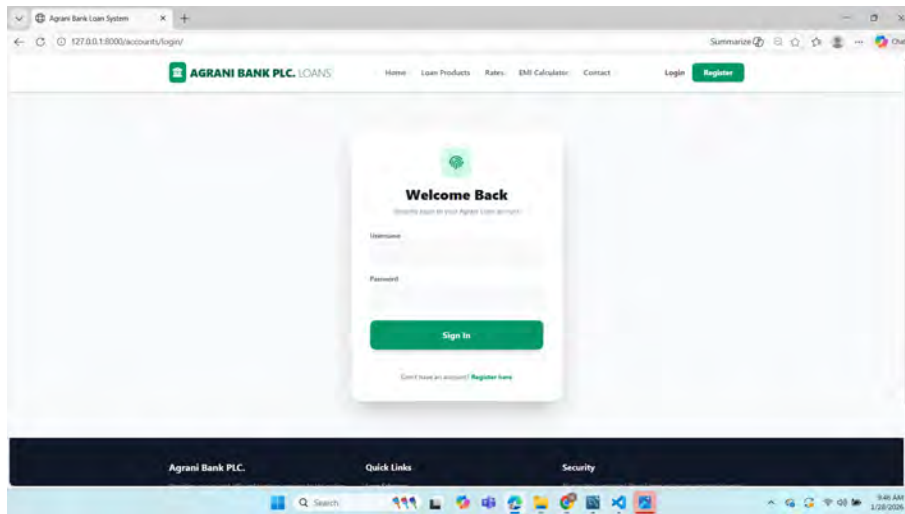


Figure 4.1: Login Window

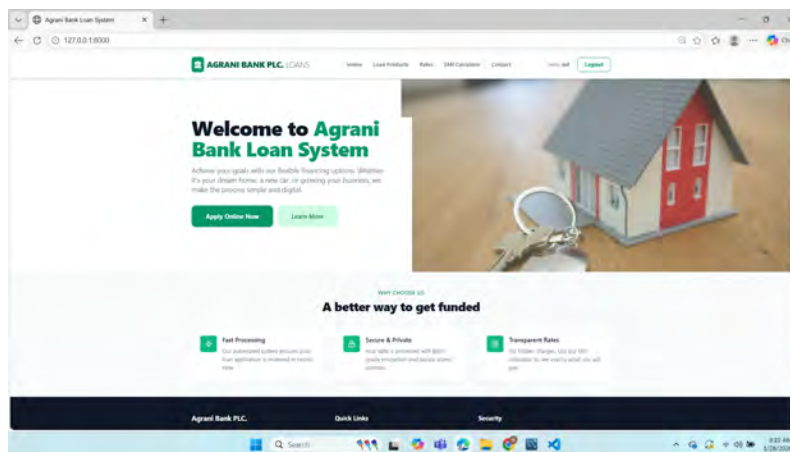


Figure 4.2: Home page

The screenshot displays a web browser window with the URL `127.0.0.1:8080/apply-form`. The page header for 'AGRANI BANK PLC. LOANS' includes navigation links: Home, Loan Products, Rates, EMI Calculator, and Contact, along with a 'Logout' button. The main content area is the 'APPLICATION PORTAL' for the 'Loan Application Form'. It contains the following fields:

- Loan Type:** A dropdown menu with 'Personal' selected.
- Amount (\$):** A text input field with '1000' entered.
- Tenure (months):** A text input field with '12' entered.
- Monthly Income:** A text input field with '1000' entered.
- Purpose of Loan:** A text input field with 'For other commitments, Business' entered.

 A prominent blue 'Submit Application' button is located at the bottom of the form. Below the button, a small note reads: 'By submitting, you agree to our terms and conditions policy.' The browser's taskbar at the bottom shows the time as 9:01 AM on 8/26/2020.

Figure 4.3: Loan Application Form

4.2.2 Loan Application Module

Customers can apply for loans using this module by providing the necessary information. Loan requests are sent to officers or administrators for review after being kept in a pending status. Based on eligibility and verification, officers have the authority to accept or refuse loan applications.

4.2.3 Loan Approval and Sanction Module

Once a loan is approved, the system generates a sanction record containing loan amount, interest rate, tenure, and EMI details. A digital sanction letter is generated and made available to the customer for viewing or download.

4.2.4 EMI Management Module

Following loan approval, this module automatically creates EMI schedules. It computes principle, interest, installment amounts, due dates, and outstanding balances. EMI schedules, payment status, and penalties for past-due payments are all visible to customers.

4.2.5 Customer Dashboard Module

An overview of loan status, EMI information, payment history, and sanction paperwork are all provided by the client dashboard. This module guarantees openness and makes it simple for clients to monitor their loan lifecycle.

4.2.6 Officer Performance Module

This module monitors the actions of loan officers, including loans that have been granted, loans that are still pending, and general performance indicators. It makes it possible for management to assess operational effectiveness and officer productivity.

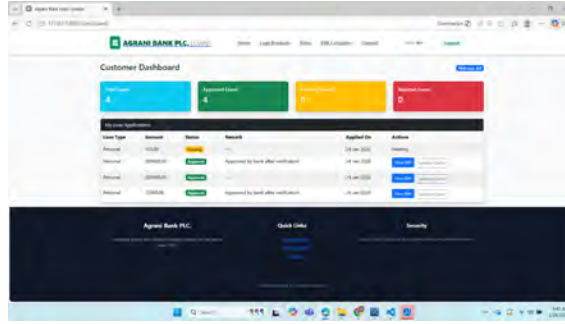


Figure 4.4: Customer Dashboard

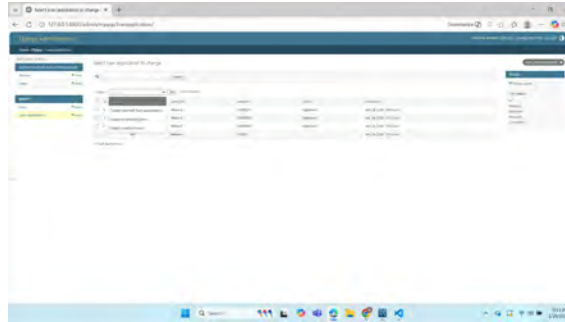


Figure 4.5: Admin Panel

4.2.7 Branch-wise Loan Management Module

This module uses branches to organize loan data. In order to aid in strategic planning and decision-making, administrators can examine loan distribution, approval rates, and performance per branch.

4.2.8 Reports and Analytics Module

Administrative reports such branch-wise summaries, officer performance reports, delinquent loans, EMI collection status, and total loans granted are generated by this module. These reports give management data-driven insights.

4.3 Testing and Validation

Throughout the development lifetime, testing and validation were carried out to guarantee the accuracy, dependability, and security of the system.

User workflows, including registration, login, loan application submission, approval procedures, EMI production, and dashboard navigation, were manually tested. Correct computations for loan balances, penalties, and EMI amounts were guaranteed by backend validation.

Testing for permission and authentication was done to make sure users could only view pages that were allowed. In order to find and fix system problems including missing templates, improper routes, and authorization mistakes, error handling and exception testing were also carried out.

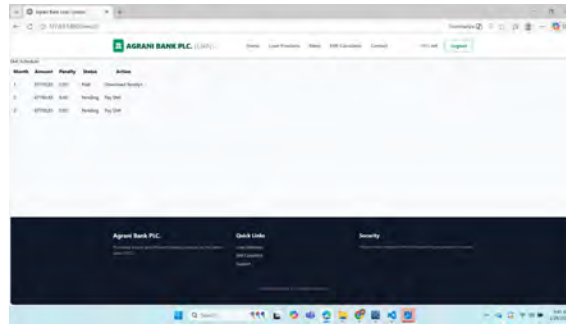


Figure 4.6: EMI Calculation of Customer

4.4 Results and Outcomes

A fully operational Loan Management System that automates significant banking tasks associated with loan processing was successfully delivered by the project. By automating loan approvals, reporting, performance tracking, and EMI calculations, the system decreased manual labor.

Important results consist of:

- Effective digital loan application and approval process
- Precise EMI computation and payment monitoring
- Secure access control based on roles
- Enhanced customer transparency
- Reports and statistics that administrators can use
- System architecture that is both scalable and manageable

Overall, the project's goals were met by offering a workable, dependable, and useful loan management system.

Chapter 5

Challenges and Limitations

This section discusses the challenges encountered during the development of the Loan Management System, the limitations of the current implementation, and potential future enhancements that can improve the system further.

5.1 Challenges Faced and Solutions

A number of implementation and technical difficulties arose throughout the Loan Management System's development. Learning and system improvement were greatly aided by addressing these issues.

Implementing role-based authorization and authentication presented a significant hurdle. Django's authentication mechanism and custom user profile management had to be carefully configured to guarantee that customers, officers, and administrators could only access their appropriate dashboards and features. By creating user roles and imposing access restriction using decorators and conditional logic in views, this was fixed.

EMI computation and scheduling logic presented another difficulty. Careful validation of financial formulas was necessary to accurately calculate EMI amounts, penalties for past-due payments, and ensure payment status consistency. By using validated EMI formulas and carefully evaluating the computations using various loan circumstances, this problem was resolved.

Incorrect URL mappings and missing templates were examples of template and routing problems. By adhering to Django's standard project structure, correctly arranging templates, and making sure the URL setup was accurate, these problems were fixed.

Furthermore, ensuring that real-time loan and EMI data were appropriately displayed for various users presented difficulties due to dashboard data integration. By optimizing database queries and making sure that model relationships and query annotations were correct, this was resolved.

5.2 Limitations of the System

Even though the system was implemented successfully, it currently has several limitations.

EMI payments are simulated rather than handled by actual banking or third-party payment systems because the application lacks online payment gateway integration. Furthermore, real-time alerts for loan status updates and EMI reminders, such as SMS or email alerts, are not used.

The system's existing single-database architecture may restrict its ability to scale when managing a high number of users and transactions. Additionally absent are sophisticated security measures like encryption of private financial documents and multi-factor authentication.

Additionally, while the reporting and analytics module offers fundamental information, it is devoid of sophisticated visualizations and predictive analytics features.

5.3 Future Scope and Enhancements

There are a lot of chances to improve and grow the Loan Management System in the future.

Automated transaction tracking and real-time EMI payments would be made possible by the integration of online payment gateways. Reducing missing payments and increasing client interaction are two benefits of implementing email and SMS reminders.

Deeper insights into loan trends, risk analysis, and payback behavior can be obtained by adding advanced data analytics and visualization dashboards. Machine learning algorithms for loan default prediction and credit rating can also be added to the system to improve it.

Scalability, accessibility, and performance can be further enhanced by extra features like cloud deployment, mobile application development, and multi-branch support with real-time synchronization.

The system can develop into a complete enterprise-level banking solution with these improvements. The website will be created with the help of:

- Python Django is the backend framework.
- Frontend technologies include Bootstrap, HTML, and CSS.
- MySQL is the database.

Development Environment: Visual Studio Code In order to ensure scalability and structured organisation, the design follows to a three-tier architecture: the presentation layer (frontend), application layer (backend), and data layer (database).

5.4 Proposed Modules

The following modules were proposed and partially tested :

5.4.1 System of User Authentication

To enable users to safely access the system, a straightforward login and registration interface have to be developed. Two categories of users were subject to role-based authentication:

- Client: Able to sign up and submit a loan application.
- Administrator: Has the authority to examine, accept, or deny loan applications.

The built-in authentication features of Django have to be used in the development of this module.

5.4.2 Application for a Loan

A dynamic loan application form creation will allow users to enter important information like:

- Type of Loan (Home, Business, Personal, etc.)
- Requested Amount
- Time frame
- The Loan's Objective

The form data is supposed to automatically saved in the MySQL database so that the administrator can review it. To guarantee the accuracy of the data, validation checks were used.

For administrators to view loan applications that have been submitted, a draft dashboard interface has to develop. The dashboard shows:

- Name of the Applicant
- Type of Loan
- Date of Application
- Present Situation (Awaiting, Accepted, or Denied)

This module lays the groundwork for more sophisticated features like filtering and report generation while offering a concise summary of the active applications.

5.5 Future Scope

Only the fundamental framework of the Loan Management Website is represented by the current prototype. The following features will be added to the system in the upcoming phases:

- Automated Verification of Loan Eligibility
- Uploading Documents and Verification Module
- Notification System for Updates on Loan Status
- Generating Comprehensive Reports for Management

A comprehensive, fully operational web-based loan management system will result from the incremental deployment of these modules.

Chapter 6

Conclusion

6.1 Summary of the Internship

The design and construction of an extensive loan management system utilizing Django and associated web technologies was the main emphasis of the internship. The project, which included user identification, loan processing workflows, EMI scheduling, reporting, and role-based dashboards, advanced from requirement analysis to complete system development throughout the internship.

Several modules, including client registration and login, loan application and approval, EMI management, officer performance tracking, branch-wise loan reporting, and administrative analytics, have to be developed. Building an organized, safe, and scalable system that mimics actual banking activities was prioritized.

This internship effectively illustrated the planning, development, testing, and refinement of enterprise-level programs in a professional setting.

6.2 Application of Academic Knowledge

The internship made it possible to apply academic principles learnt in school in an efficient manner. During system design and implementation, ideas from database management systems, object-oriented programming, software engineering, and web development were directly applied.

Designing standardized data models and upholding connections between users, loans, EMIs, and branches required an understanding of relational databases. Django's framework structure allowed for the use of software engineering concepts like MVC architecture, modular design, and separation of concerns. Accurate EMI calculations and penalty logic were also implemented using fundamental financial mathematics that was acquired in school.

This real-world application demonstrated the applicability of academic knowledge in practical systems and strengthened theoretical comprehension.

6.3 Overall Learning Experience

Overall, the internship was a really worthwhile and life-changing educational experience. In addition to technical capabilities, the internship enhanced logical thinking, debugging, and problem-solving ability. Overcoming actual development obstacles improved flexibility and self-assurance in managing intricate systems.

By enhancing documentation procedures, project organization, and technical idea communication, the project also aided in professional development. A solid basis for future professional positions was developed through exposure to best practices in system security, data validation, and authentication.

To sum up, this internship was a major turning point in the development of both technical proficiency and professional preparedness, offering a solid foundation for future employment in software development, data-driven systems, or financial technology solutions.

The official internship offer letter and recommendation letter are attached in Appendix section.

6.4 Project Repository

The complete source code of the Loan Management System developed during this internship is available on GitHub:

<https://github.com/samihat2001/Loan-Management-Project.git>

This repository includes all source files, database models, and documentation.

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Appendix A: Offer Letter

TELEPHONE :02-223357355
E-mail: dgmhrd_training@agranibank.org
Website: www.agranibank.org

বিদ্যুতের অপচয় রোধ করুন
দেশের স্বার্থে সজাগ থাকুন।

 **অগ্রণী ব্যাংক পিএলসি.**
Agrani Bank PLC.
Committed to serve the nation
এইচআর প্র্যাকটিং, ডিপ্লোমেন্ট অ্যান্ড অপারেশনস্ ডিভিশন (এইচআর)
HRPDOD/INT./35/25

HEAD OFFICE : MOTIJHEEL, DHAKA.
Date: 16.03.2025

Sadia Hamid Kazi, Ph.D.
Chairperson and Associate Professor
Department of Computer Science and Engineering
BRAC University
66 Mohakhali
Dhaka-1212.

Sub: Placement of Internship Program.

Dear Sir,

In pursuance of your letter we are pleased to inform that our management has approved your proposal to allow the following student/students of your institution to perform internship for maximum 03 (three) months without any financial benefit.

Sl. No.	Name	Program	Roll/ID No.	Proposed Division/Branch
1.	Samihat Muhtashimah	BSc	20101543	IT & MIS Division (IT), Head Office, Dhaka

We would, therefore, request you to arrange his/her/their reporting to our said branch/branches immediately and start the program under the supervision of the Head of the respective branch/branches.

This is for your kind information and necessary action.

Best wishes
sd./-

(Shahinoor Begum)
Deputy General Manager

CC.
1. Head of the Branch, Agrani Bank PLC., IT & MIS Division (IT), Head Office, Dhaka is requested to allow the person/persons to complete internship and preserve his/her/their record file.
2. Samihat Muhtashimah is requested to commence internship program with our said branch.
3. Office Copy.

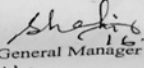

Deputy General Manager
16.03.2025

Figure 1: Offer Letter

Appendix B: Recommendation Letter

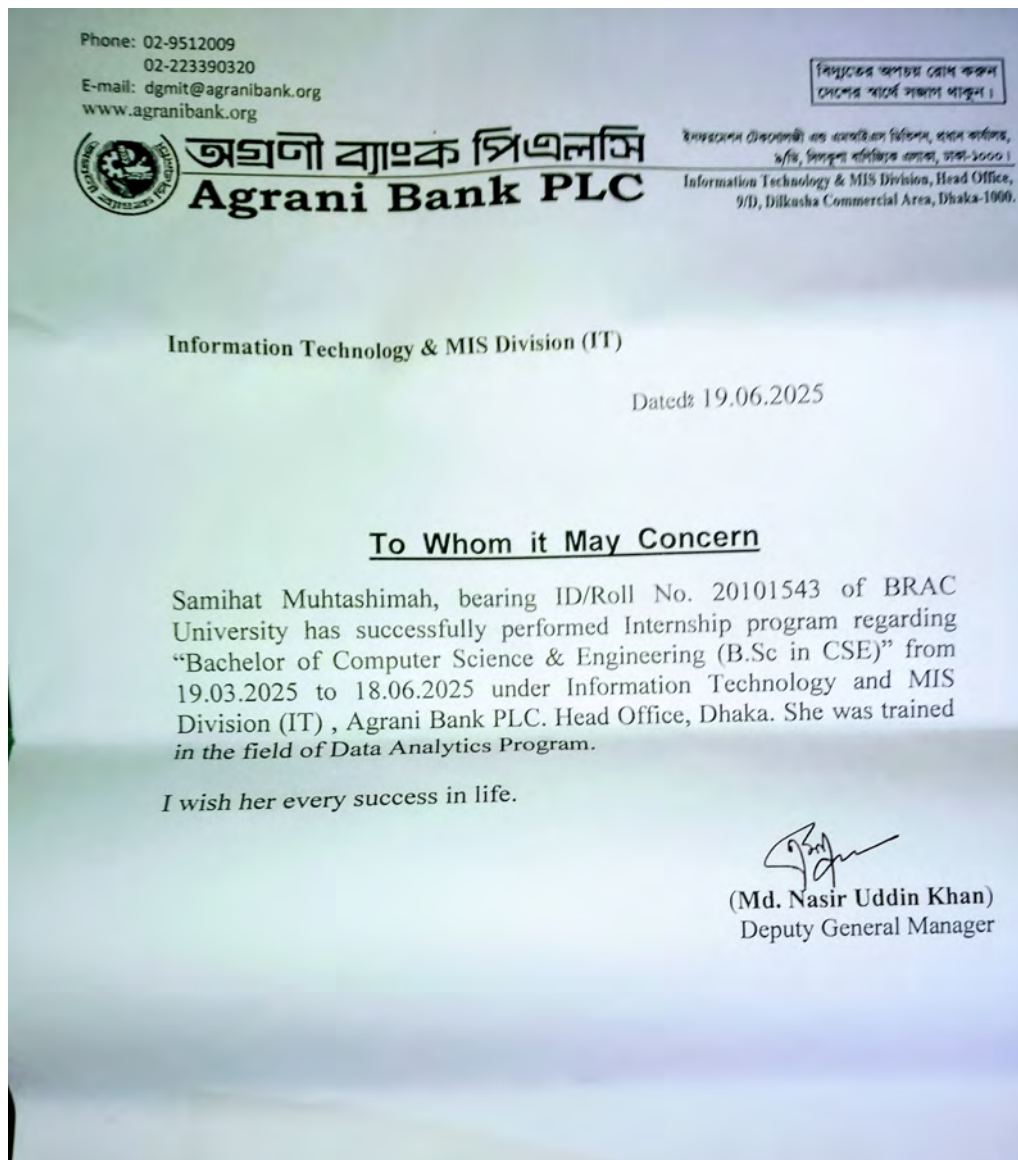


Figure 2: Recommendation Letter