

Loan Management System

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Abstract. The Loan Management System is crucial for any credit institution as it helps in ensuring the success of the institution by minimizing loan losses. Mortgage loans are often associated with higher risk, and thus it is essential to have a well-designed system to manage them. The current system may have several limitations such as poor data security, slow processing, and lack of efficiency. Therefore, a new user-friendly computerized system needs to be developed, which can store data securely, process information quickly, and minimize errors. The Financial Management System is designed to perform the back-office functions of a bank or any non-cash financial institution. It offers various types of loans, and the system needs to be capable of adding, editing, and retrieving customer information, maintaining and issuing new loans, and changing loan rates. The project scope also includes the development of a loan details process, settlement process, and payment approval process. The new Loan Management System will address several issues such as data shortage, data inaccuracy, and time inefficiency. It will provide better control and management of the loan process, thereby minimizing errors and ensuring the efficient management of customers. The system will also support other loan processes such as refinancing, restructuring, and forgiveness. The implementation strategy for the new system will involve a thorough analysis of the existing system, identification of issues and limitations, and the design of a new system to address these issues. The new system will undergo rigorous testing to ensure that it meets the financial targets and is free of errors. The new Loan Management System will provide more robust management information and enhance the effective management of consumers.

Keywords: Loan Management System, Financial Management System, Mortgage System

1. Introduction

The loan management system we propose aims to simplify the process of loan application and approval, making it more efficient for both customers and financial institutions. By automating the loan process, we can reduce the amount of time and effort required for customers to apply for a loan, as well as streamline the approval process for banks [8].

Our system will allow customers to view various loan options, including the rates of interest and the required documentation. This will enable them to make more informed decisions about the loans they apply for, and to submit their applications quickly and easily online.

On the bank's side, our system will automate much of the loan approval process, including the verification of customer data and the assessment of credit risk. This will enable loan officers to process applications more quickly and accurately, reducing the likelihood of errors or delays. [1]

2. Objective

1. To provide a clear understanding of the various types of loan accounts, documents, and terms and conditions required for loan sanctioning, in order to help streamline the loan application and approval process.
2. To analyze the loan sanctioning process at Veritas Private Limited and identify areas for improvement, with a view to making the process more efficient and customer-friendly.
3. To identify the creditworthiness of borrowers and to develop a system for assessing and managing credit risk, with the aim of reducing the risk of loan defaults.
4. To study the disbursement and loan recovery process at Veritas Private Limited, and to identify areas where the loan management system can help to streamline and automate these processes.
5. To analyze the profits generated by money lending activities for the bank, and to identify ways to increase profitability while minimizing risk.
6. To identify the proportion of advances against deposits, and to develop strategies for managing loan portfolios to maximize returns while minimizing risk.
7. To provide recommendations and suggestions for improving loan management processes, including the use of technology and automation tools to simplify and streamline loan applications, approvals, disbursements, and recoveries.

3. Existing System

The existing system for managing loans at Veritas Private Limited is primarily a manual system that relies on paperwork and does not have any automated features. As a result, it is time-consuming and inefficient, with a high risk of errors and delays.

One of the main issues with the existing system is that it does not provide proper security to the data stored. This can lead to data breaches and loss of important information. In addition, it is difficult to track information and retrieve data quickly and easily. [4][9]

The existing system also does not allow customers to easily view their loan profile, which can lead to customer dissatisfaction. Any modifications or additions to the data require a lot of time and effort, which can slow down the loan processing time.

Another issue with the existing system is that it does not have the functionality for fast retrieval of information, such as customer details and loan details. [3][6] This can lead to delays and errors in loan processing and can result in customer dissatisfaction.

The current system also relies on admins to calculate the customer's CIBIL score based on their repayment history, which is a manual and time-consuming process. This can lead to delays in loan approvals and customer dissatisfaction.

Finally, the existing system does not provide proper guidance to customers on how to repay their loans. This can lead to confusion and misunderstanding, which can result in delays and defaults in loan repayments.

4. Proposed System

Online Application Submission: The proposed system will allow customers to submit their loan applications online, eliminating the need for physical paperwork.

Online Document Verification: The system will allow customers to upload scanned copies of their documents, which will be cross-verified at the server. This will speed up the verification process and reduce the chances of errors. [2]

Real-time Loan Status Tracking: The system will allow customers to track their loan application status in real-time, giving them regular updates on their application progress.

Automated Loan Approval Process: The proposed system will have an automated loan approval process, reducing the time taken for loan approval. [7] [10]

Secure and User-friendly Interface: The system will have a secure and user-friendly interface, making it easy for customers to use and access their loan information.

Reminders and Notifications: The system will send reminders and notifications to customers about their loan payments, reducing the chances of missed payments.

Efficient Data Management: The system will maintain all loan-related data in a centralized repository, making it easy for banks to access and manage customer data. [5]

5. Problem Definition

The problem with the existing system is that it is manual and lacks efficiency in managing tuition invoices and communication between students and administrators. It leads to a lack of transparency in the allocation of funds to student accounts and delays in communication regarding payment deadlines and variances. This can cause dissatisfaction among students and administrators and may lead to errors in the management of tuition fees. Therefore, there is a need for an automated system that can streamline the management of tuition fees and improve communication between students and administrators

6. Module Description

Login Page: The Login page where loan management system users will submit their system credentials to access the features of the system and manage the all data.

Home Page: The Home page where the users will be redirected by default after logging into the loan management system. This page displays a summary of calculations of some data of the borrowers.

Loan Types Page: The customer may need to take out any type of loan such as a student loan, car loan or consumer credit. Therefore, it should be included within the data.

Loan Plans Page: The Loan plan page where a staff will manage the all loan plans of their company offers.

Borrowers Page: The Borrowers page where all customer are listed and can be managed by the system users.

Loans Page: The Loans page where listed the all list of loans, including the loan applications. The page where the system user will manage the borrower's loan data.

Payment Page: The Payment page where all payments are listed and can be managed by user.

Users Page: The Users page where all loan management system user is listed and can be managed by system users.

6.1 Data Flow Diagram

A Data flow diagram (DFD) is a graphical representation of the “flow” of data through an information system. DFD can also be used for the visualization of data processing (structured design). On a DFD, data items flow from an external data source or an internal data store or an external data sink, via an internal process.

LEVEL 0: The level 0 DFD shows the complete flow of data through the proposed system (Online shopping cart). Admin will add the items in the store and the customer will purchase that. Admin can control and view all the information.

Figure 1 and 2 shows the data flow diagram for the zero level and first level. The transactions and the flow are represented as pictorial format. The Admin flow of control is shown in the figure 2.

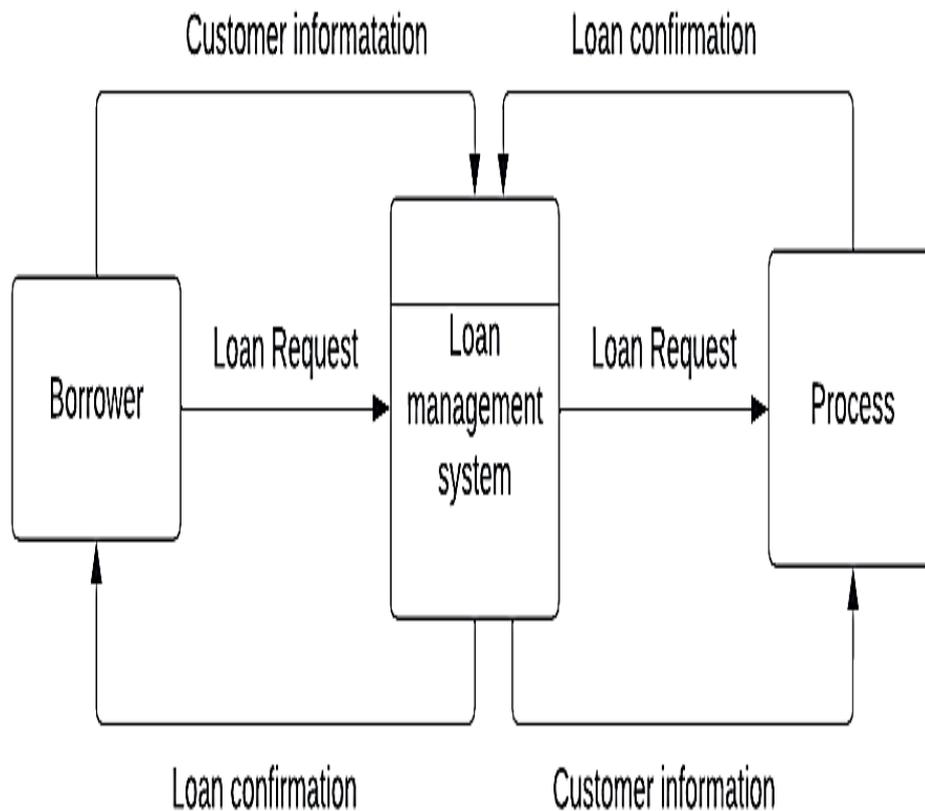


Figure 1: Level 0 – DFD.

LEVEL 1: Admin

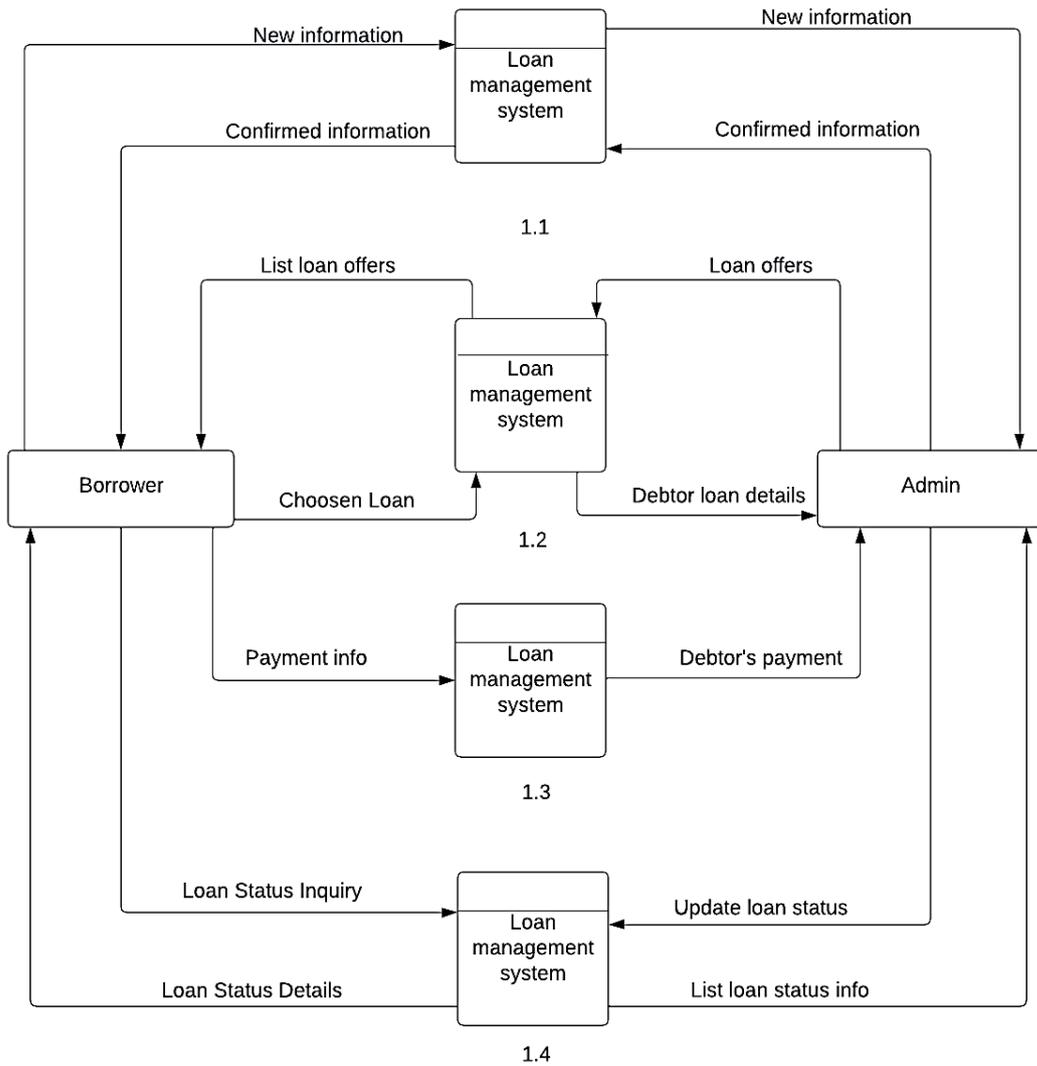


Figure 2: Level 1 – DFD.

6.2 ER Diagram

An ER diagram is a visual representation of an ER model that depicts the entities, attributes, and relationships among them in a graphical way. It helps to design and understand the structure of a database and is commonly used in software engineering and database design.

Figure 3 represents the ER diagram of the Loan Management System. It mainly covers the customer side flow of control with the application system.

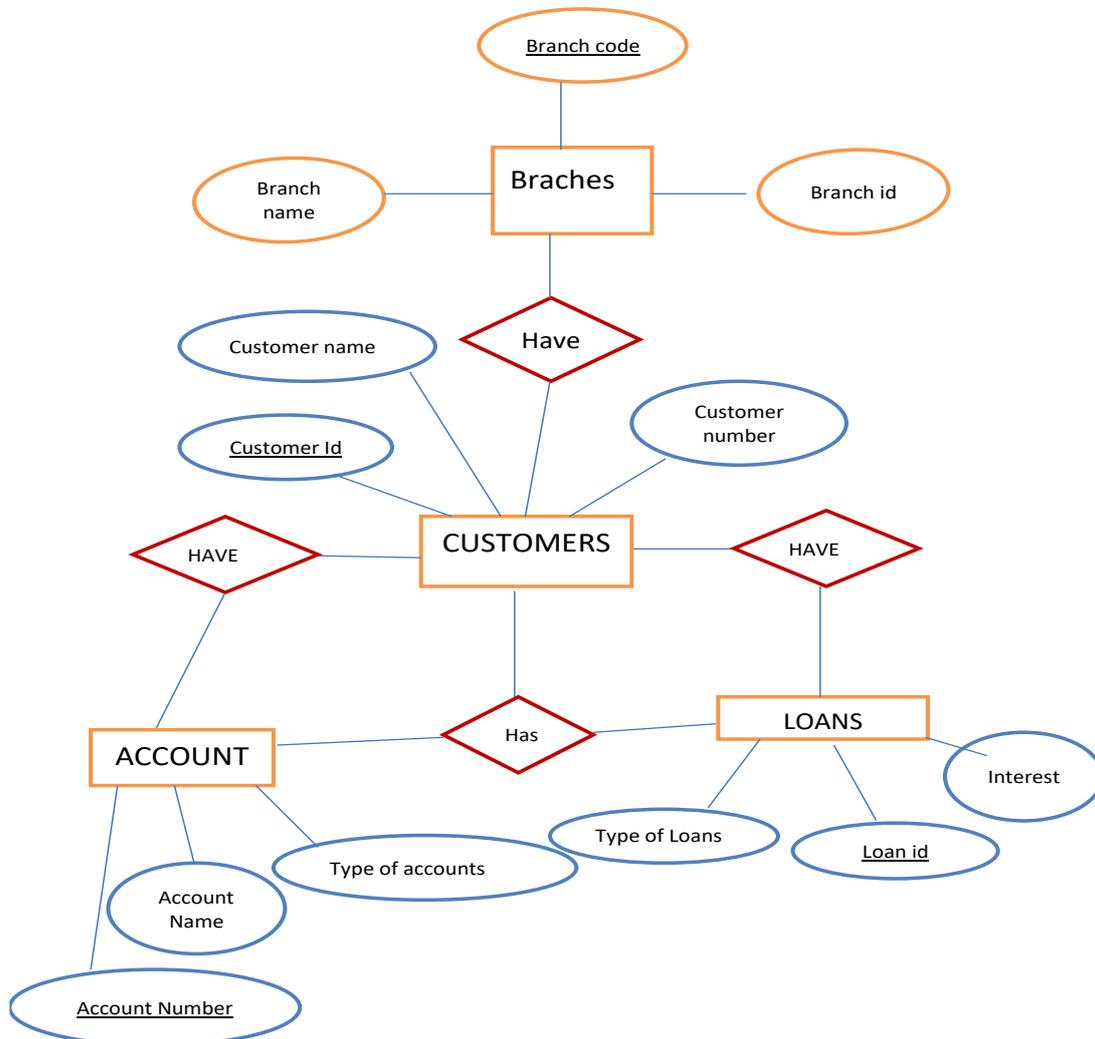


Figure 3: ER Diagram

6.3 Input Design

1. Loan Application Form: This form will allow borrowers to input their personal and financial details when applying for a loan.
2. Document Upload Form: This form will allow borrowers to upload required documents such as proof of income, address proof, and ID proof.
3. Payment Details Form: This form will allow borrowers to input their payment details such as the amount paid, date of payment, and mode of payment.
4. User Registration Form: This form will allow new users to register for the loan management system by providing their personal details such as name, email, and contact information.

5. Loan Approval Form: This form will allow loan officers to input their approval or rejection decision, along with any comments or reasons for the decision.
6. Loan Repayment Form: This form will allow borrowers to input their repayment details such as the amount paid, date of payment, and outstanding loan amount

6.4 Output Design

The output design is GUI based activity; this project provided a best user interface model. Effects and well define an output design improve the relationship of system and the user, thus facilitating decision making for both seeker and provider.

1. Borrower details: Borrower form will generate the report of the information of borrower.
2. Loan details: The loan form will know the details of loan information.
3. Loan plan: The form will know the information of loan plans.
4. Loan types: The form will know the information of types of loan details.
5. Payment Details: Payment Details form will add the payments information made

6.5 Database Design

The relationships between these entities can be represented using a relational database model. For example, each loan will be associated with a borrower and a loan plan, and each payment will be associated with a borrower and a loan. The loan type entity can be used to group loans into categories, and the user entity can be used to control access to the system based on user roles and permissions

Table 1 details: Table Name: Login Table

Primary Key: User Name

Table 1: Login Table

SNo	Column Name	Data Type	Example
1	User Name	nvarchar(10)	admin
2	Password	nvarchar(10)	admin

Table 2 details: Table Name: Borrower Table

Primary Key: TAX id table

Table 2: Borrower Table

S.No	Column Name	Data Type	Example
1	ID	Int	123
2	Customer Name	nvarchar(20)	SURYA A
3	Address	nvarchar(50)	ATTUR, SALEM
4	Phone number	Int	9876541235
5	EmailId	nvarchar(30)	20207052@hicet.ac.in
6	Tax ID	nvarchar(50)	134
7	Date created	Int(11)	12.04.2021

Table 3 details: Table Name: Loan list Table

Primary Key: Borrower Id

Table 3: Loan list Table

Sno	Column Name	Data Type	Example
1	Id	Int(30)	1
2	Reference no	nvarchar(50)	1453456
3	Loan type Id	Int(15)	1
4	Borrower Id	Int(20)	1
5	Purpose	nvarchar(20)	personal
6	Amount	Int(60)	87654
7	Plan Id	Int(30)	2
8	Status	nvarchar(10)	2
9	Date released	Timestamp	12-04-2021
10	Date created	Timestamp	12-09-2021

Table 4 details: Table Name: Loan plan Table

Primary Key: Id

Table 4: Loan plan Table

Sno	Column Name	Data Type	Example
1	Id	Int(30)	1
2	Months	Int(11)	34
3	Interest percentage	Float	7
4	Penalty rate	Int(20)	4

Table 5 details: Table Name: Loan schedules

Primary Key: Id

Table 5: Loan Schedules Table

Sno	Column Name	Data Type	Example
1	Id	Int(30)	10
2	Loan Id	int(30)	13
3	Date due	Int(30)	12-09-2021

Table 6 details: Table Name: Loan types Table

Primary Key: Sno

Table 6: Loan types Table

Sno	Column Name	Data Type	Example
1	Id	Int(30)	1
2	Type name	nvarchar(20)	Small business
3	Description	nvarchar(70)	Personal loan

Table 7 details: Table Name: Payment Table

Primary Key: Semester

Table 7: Payment Table

S.No	Column Name	Data Type	Example
1	Id	Int(30)	2
2	Loan id	Int(30)	3
3	Payee name	Nvarchar(30)	john
4	Amount	Float	3000
5	Penalty amount	Float	0
6	Overdue	tinyint(1)	0
7	Date created	Time stamp	12-03-2021

6.6 Test Case

A primary purpose of testing is to detect software failures so that defects may be discovered and corrected. Testing cannot establish that a product functions properly under all conditions but can only establish that it does not function properly under specific conditions. Table 8,9,10,11,12 represents the test conditions of various entry forms with test data, actual result, expected result and final result.

Table 8: Login Form Validation

Test condition	Test data	Actual result	Excepted result	Final result
Username can be in alphabets and numbers, and it is in case sensitive.	ADMIN	System Accepts.	System Accept the data.	PASS
Username can be in alphabets and numbers, and it is in case sensitive.	ADMIN	System Doesn't Accept	System Not accepts The data.	FAIL
Password can be in alphabets and numbers, and it is in case sensitive.	ADMIN	System Accepts.	System Accept the data.	PASS

Password can be in alphabets and numbers, and it is in case sensitive.	ADMIN	System Doesn't Accept	System Not accepts The data.	FAIL
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Table 9: Borrower Details Form Validation

Test condition	Test data	Actual result	Excepted result	Final result
Tax_Id can be in alphabets and numbers, and it is in case sensitive and the text box should not be empty.	12DF345	System accepts.	System Accept the data.	PASS
Borrower Name should be only in alphabets and the text box should not be empty.	John	System Accepts.	System Accept the data.	PASS
Address can be in alphabets and numbers, and it is in case sensitive and the text box should not be empty.	289/B3 Salem	System Accepts.	System Accept the data.	PASS
Mobile Number should be in numbers, and the text box should not be empty.	9876543254	System Accepts.	System Accept the data.	PASS
Email ID should be in format [____@.com], and the text box should not be empty.	aranmani6602@gmail.com	System Accepts.	System Accept the data.	PASS

Table 10: Loan details Form Validation

Test condition	Test data	Actual result	Excepted result	Final result
Check whether the Borrower table will default show the entered name list.	John	System Accepts.	System Accept the data.	PASS
Check whether the loan plan table will default show the entered loan plan list.	23months [4%,2%]	System Accepts.	System Accept The data	PASS
Purpose table should be only in alphabets and the text box should not be empty.	Personal loan	System Accepts.	System Accept the data.	PASS
Check whether the Loan type is default show in the types.	Home loan	System Accepts.	System Accept the data.	PASS
Loan amount should be in numbers, and the text box should not be empty.	120000	System Accepts.	System Accept the data	PASS

Table 11: Loan Type Form Validation

Test condition	Test data	Actual result	Excepted result	Final result
Loan type should be only in alphabets and the text box should not be empty.	Personal loan	System Accepts.	System Accepts.	PASS

Description should be only in alphabets and the text box should not be empty.	Small business loan	System Accepts.	System Accepts.	PASS
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Table 12: Loan plan Form Validation

Test condition	Test data	Actual result	Excepted result	Final result
Loan_plan months should be in numbers, and the text box should not be empty.	2yrs and 2months	System Accepts.	System Accept the data.	PASS
Loan interest should be in numbers, and the text box should not be empty.	34	System Accepts.	System Accept the data.	PASS
Monthly Over due's Penalty should be in numbers, and the text box should not be empty.	34	System Accepts.	System Accept the data	PASS

6.2 System Implementation

1. Coding: In this phase, the loan management system is developed based on the design specifications created during the design phase. The programming language and software development tools are used to develop the system.
2. Testing: The newly coded system is tested on different levels to ensure that it performs its intended functions. The testing process involves unit testing, integration testing, system testing, and acceptance testing.
3. Planning and implementation: In this phase, the implementation plan is developed to outline how the new system will be rolled out. This includes determining which departments will be affected, how training will be provided, and how the system will be deployed.
4. Post-implementation: This is the final phase of the implementation process, where the system is reviewed to ensure that it is meeting the intended goals. Any issues that arise are addressed, and system updates and modifications are made as necessary.

During the implementation phase, the system development team should work closely with end-users, stakeholders, and other interested parties to ensure that the system meets their needs and requirements. The team should also provide training and support to end-users to ensure that they are comfortable using the system and can effectively utilize its features and functions

7. Conclusion

Efficiently, making loan management easier and more effective. With proper planning, design, development, testing, and implementation, this loan management system can bring significant benefits to

both lenders and borrowers. It can improve the accuracy, speed, and security of loan processing, as well as provide better customer service and more transparent communication. It can also help lenders to mitigate risk, monitor performance, and make informed decisions based on data analytics. Overall, the loan management system is a valuable tool for the financial industry, and its successful implementation requires a thorough understanding of the system development lifecycle and best practices in software engineering.

8 Future Enhancement

- An online EMI payment for the company.
- A live chat with the customer.
- A live chat about the user's email mailing system.
- It includes media subscription field.
- Build online transaction.
- Build email facilities.
- Add on SMS facilities.

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