LOAN PREDICTION SYSTEM

24-25J-268

OUR TEAM

D N PATHIRATHNA

P R I PRAVEAN

M I F HILMA

INTRODUCTION

PROBLEM DOMAIN / BACKGROUND

RESEARCH PROBLEM

RESEARCH GAP

OBJECTIVES

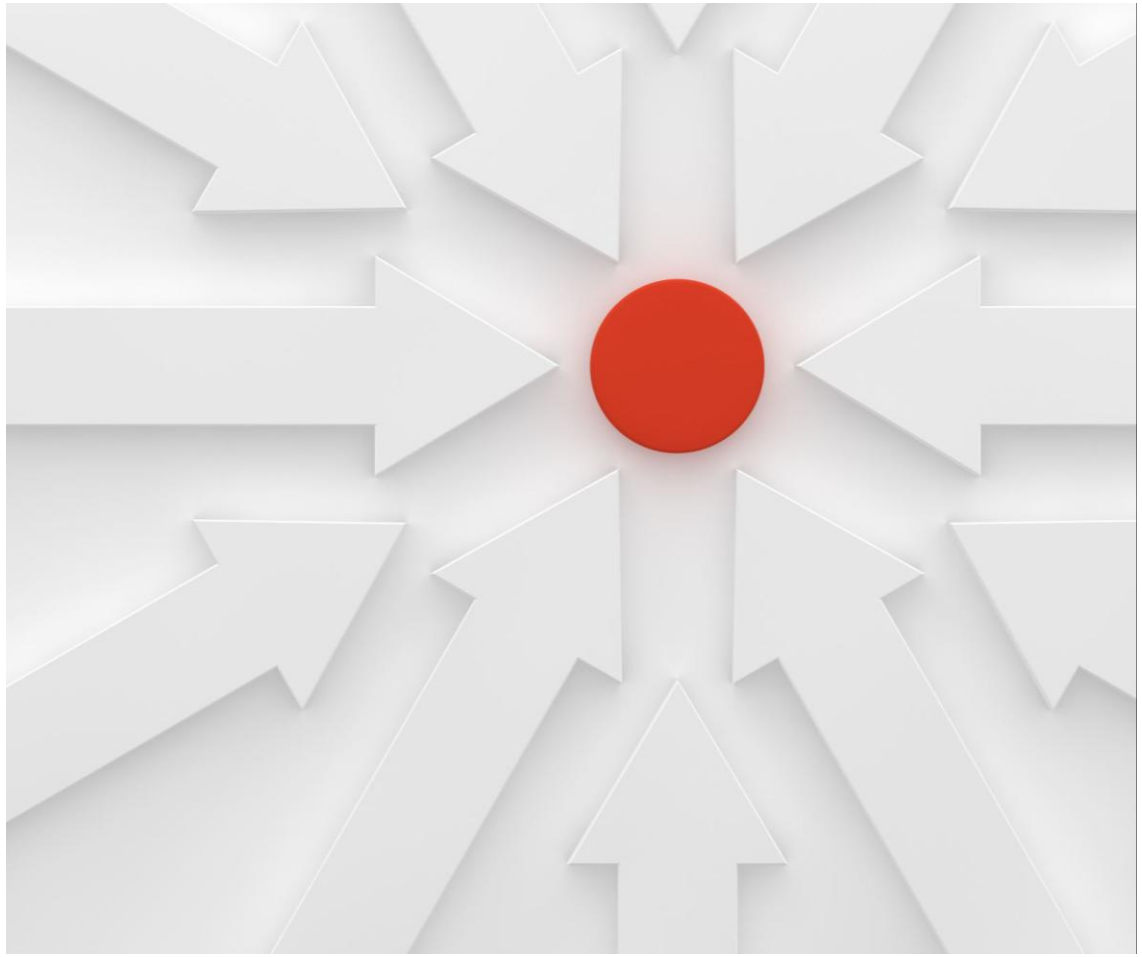
BACKGROUND


How To Get a Bank Loan
• Build and understand your credit
• Settle on the right loan amount
• Decide on the type of loan
• Shop around for a lender
• Understand and budget for the loan
• Apply
• Go through underwriting

RESEARCH PROBLEM

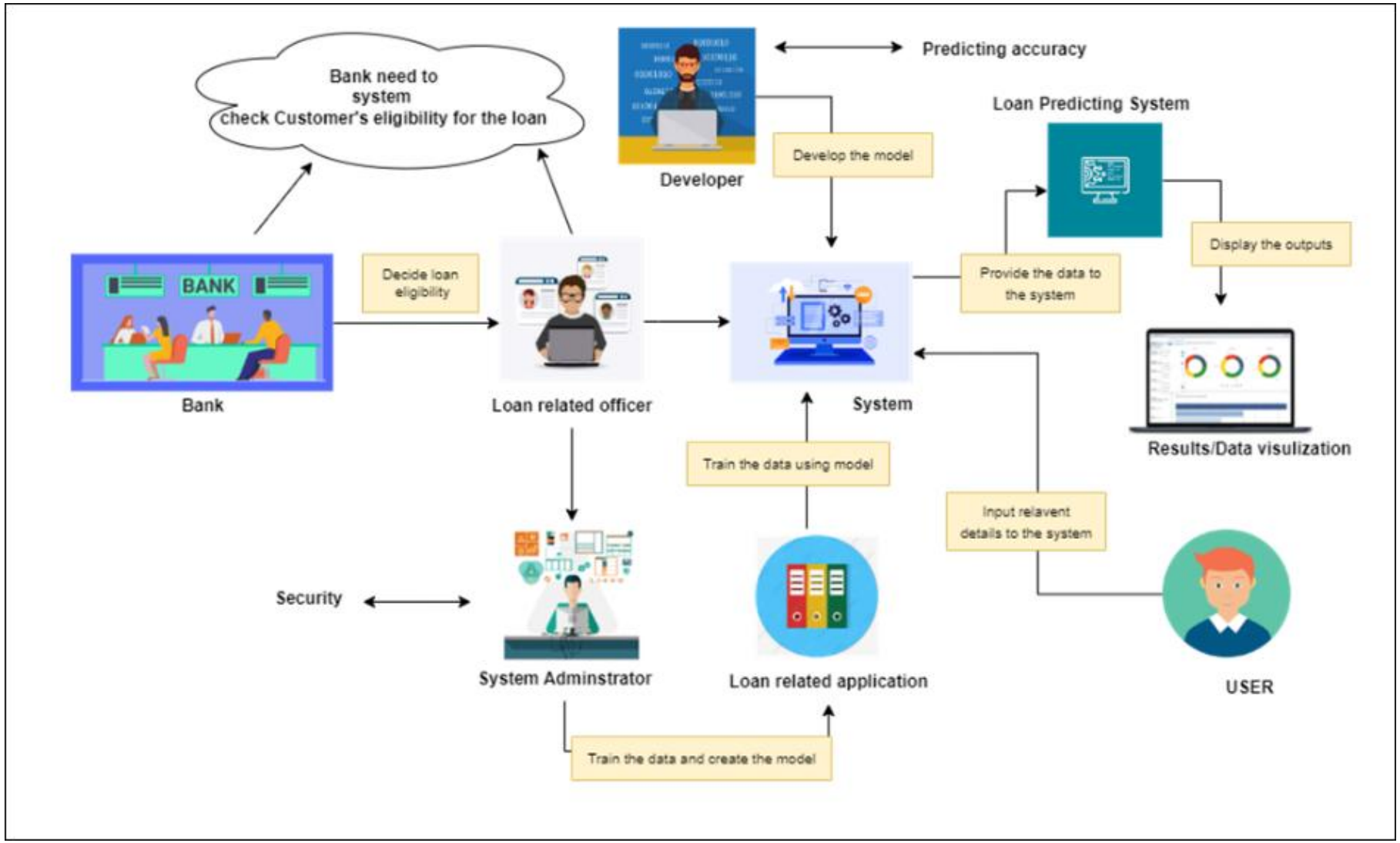
- Traditional loan eligibility systems use fixed criteria (e.g., credit score, income) which might not be sufficient in predicting loan approval accurately.
- Current loan systems are not leveraging modern data-driven techniques such as machine learning for dynamic decision-making.
- Existing loan eligibility systems often ignore non-financial data like education, marital status, or social media behaviors that might be relevant in determining an applicant's loan repayment ability.

OBJECTIVES



- To develop a more accurate and flexible loan eligibility prediction model based on a wider set of variables, including credit score, income, employment history, and social factors.
- To integrate machine learning algorithms (such as decision trees, neural networks, or random forests) for predicting loan eligibility based on historical data.
- To explore and integrate additional demographic or social factors that might enhance loan prediction accuracy.
- To incorporate risk prediction models into the loan eligibility prediction system to better estimate default probabilities.

OVERALL SYSTEM DIAGRAM



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Information System Engineering

INTRODUCTION

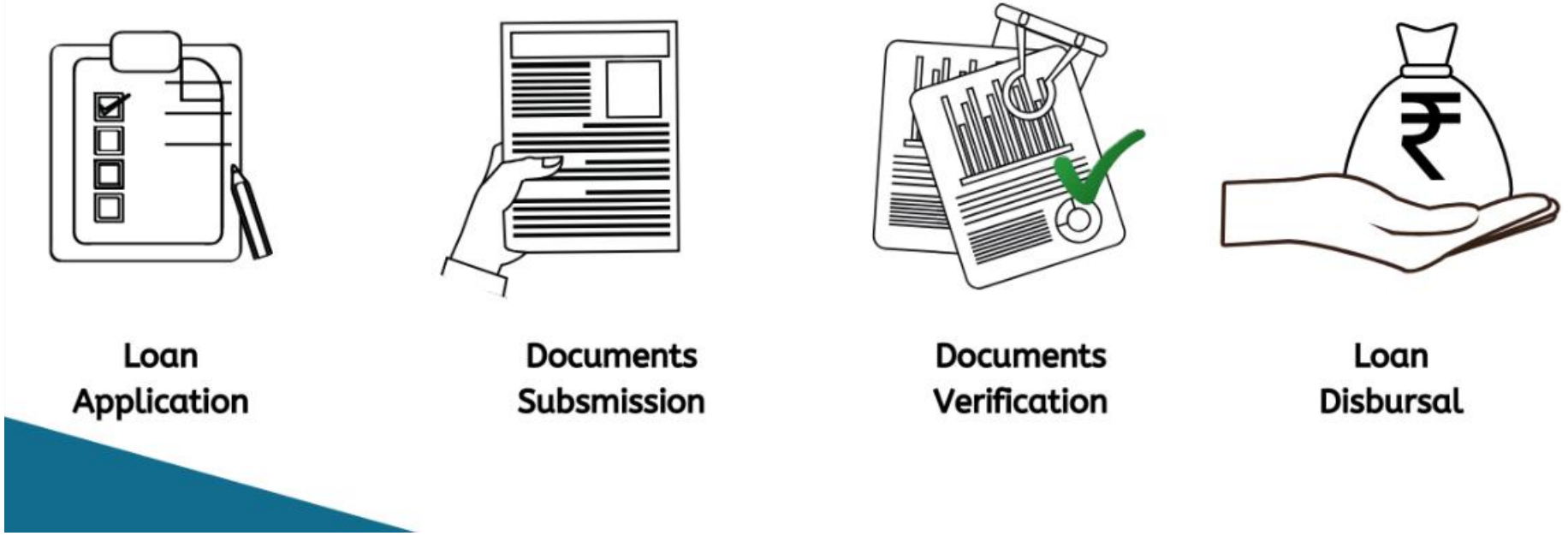
Problem Domain / Background

Research Problem

Research Gap

Objectives

BACKGROUND


Loan
Application
Documents
Subsmission
Documents
Verification
Loan
Disbursal

Research problem

How to provide real time customer eligibility for bank loans.

How to forcast credit limits in realtime.

Research Gap

	Widely recognize	Real time prediction	High Accuracy
Traditional Credit Scoring (FICO)	YES	NO	NO
Rule-Based Systems	YES	NO	NO
Machine Learning-Based Systems	YES	YES	YES
Bank Loan Systems	YES	NO	NO
Credit Unions and Microfinance	YES	NO	NO

OBJECTIVES

MAIN OBJECTIVE

- To design, implement, and evaluate machine learning models that can effectively predict a customer's eligibility for a bank loan and determine the appropriate credit limit for each client, with the goal to improve credit decision-making efficiency, accuracy, and fairness.

SUB OBJECTIVES

- Loan Eligibility Forecasting
- Credit Limit Prediction
- Model Interpretability and Effectiveness

METHODOLOGY

System Diagram

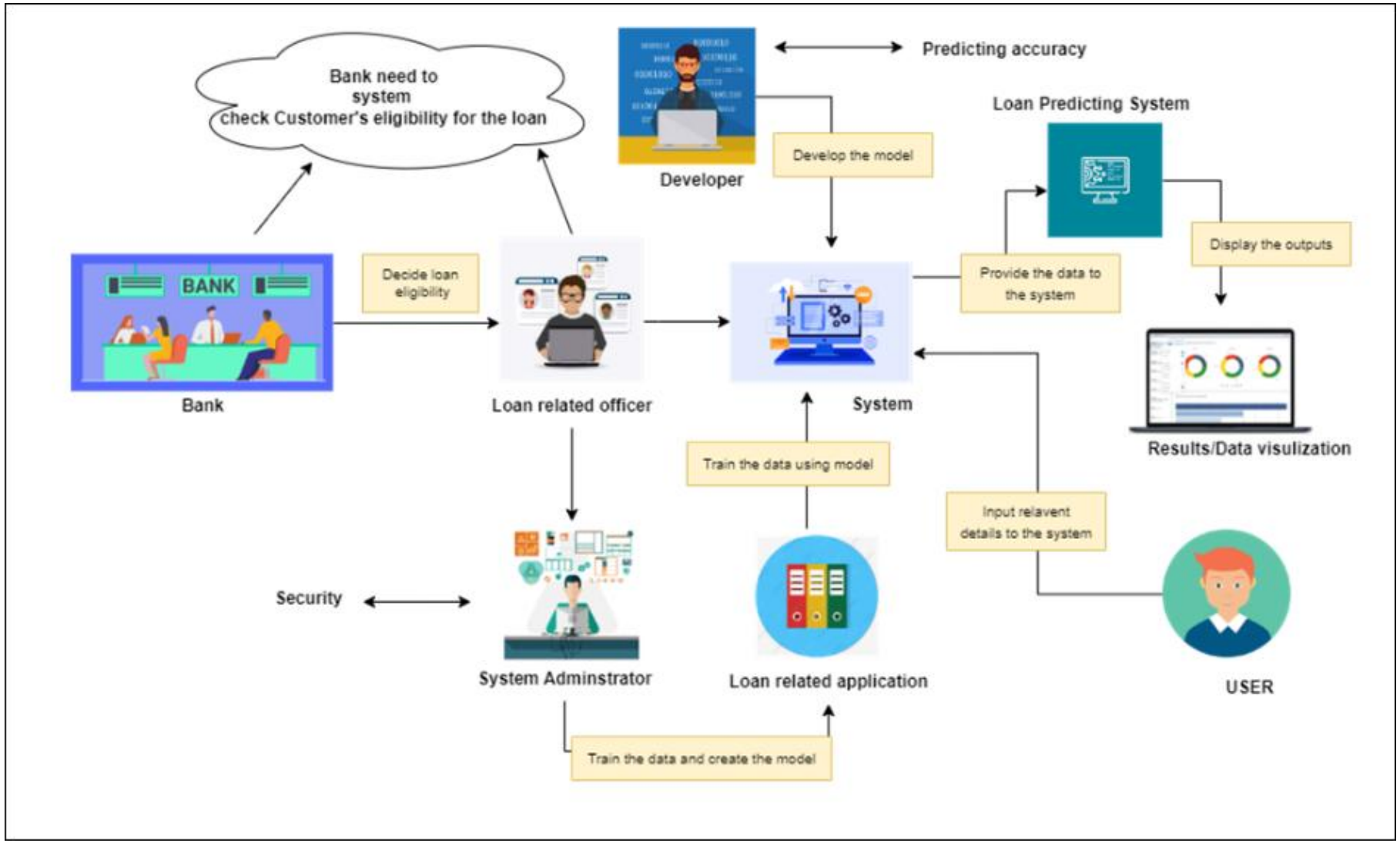
Technologies

Requirements

Work Breakdown Structure

Gantt Chart

SYSTEM DIAGRAM



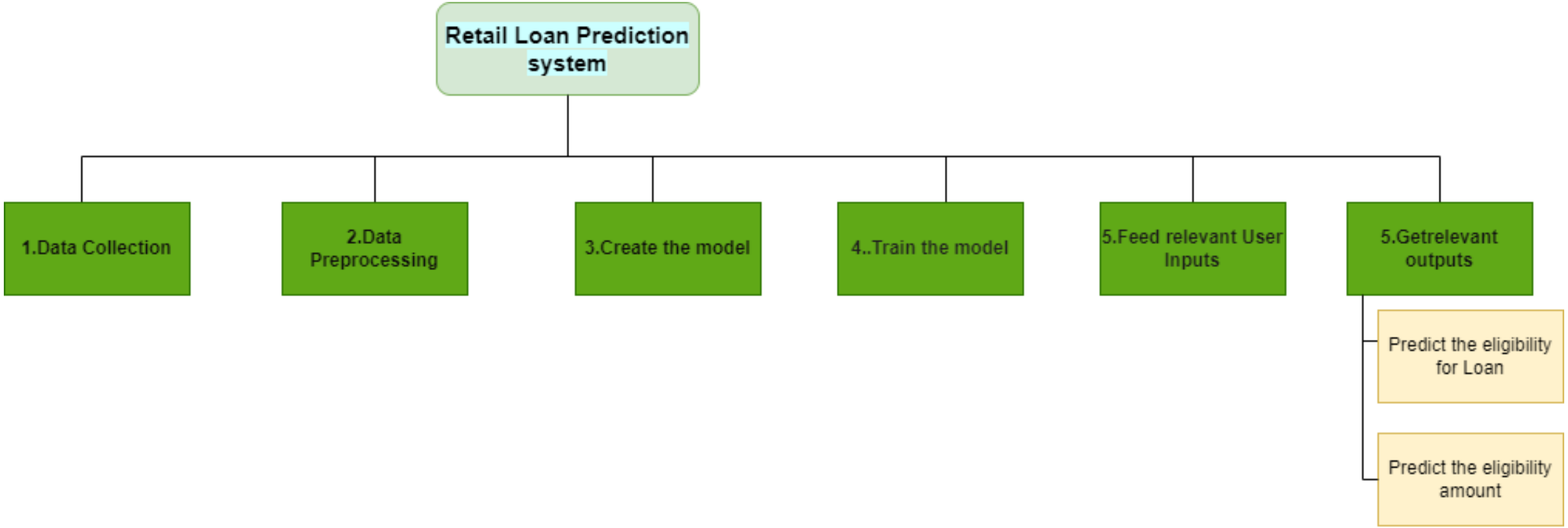
TECHNOLOGIES

Component	Tool / Technology
Programming Language	Python, NODEJS, REACT
Machine Learning Libraries	Pandas, NumPy, Scikit learn, Matplotlib
Web Framework	REACT
Integrated Development Environment	Visual Studio Code, Jupyter Notebook

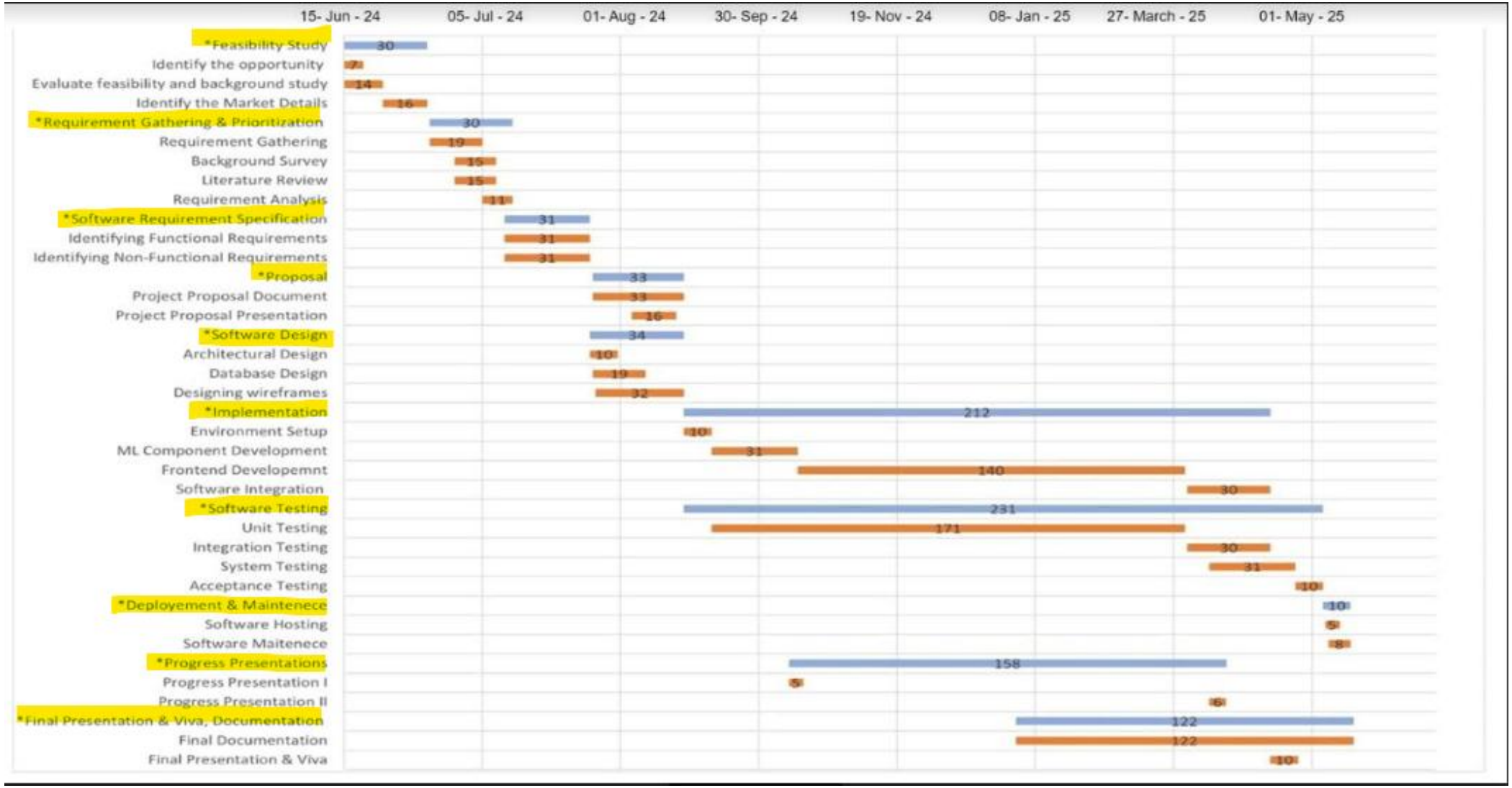
REQUIREMENTS

Skill Requirement	Software Requirement	Hardware Requirement	Data Requirements	Functional Requirements	Non Functional Requirements
Research Skills	Mongo DB	Core i5 Processor or above	Kaggle and Google Dataset Search.	User can log in to the system	Accuracy
Programming Skills	Figma/Draw. Io	16GB RAM		User can Input relevant details to the system	Performance
Testing skills	Google Colab	Disk space 100GB or above		System should be able to Predict Customer eligibility	Security
Project Management	MS Office/ Mendeley/ Google doc	Screen resolution 1360*768		System should be able to Predict Customer eligible loan amount	Reliability
Presentation skills	Google Drive/Git Hub/Git Lab			Execute the ML Model	

WORK BREAKDOWN STRUCTURE



GANTT CHART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- [1] Mrs. S. Y, “Predicting bank loan eligibility using machine learning,” *INTERANTIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT*, vol. 08, no. 04, pp. 1–5, Apr. 2024. doi:10.55041/ijsrem31910
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- M. Udhbav, R. Kumar, N. Kumar, R. Kumar, M. Vijarania, and S. Gupta, “Prediction of Home Loan Status Eligibility using Machine Learning,” SSRN Electronic Journal, Jan. 2022, doi: 10.2139/ssrn.4121038.

PLANS

COST MANAGEMENT PLAN

COMMERCIALIZATION

PROJECT MANAGEMENT

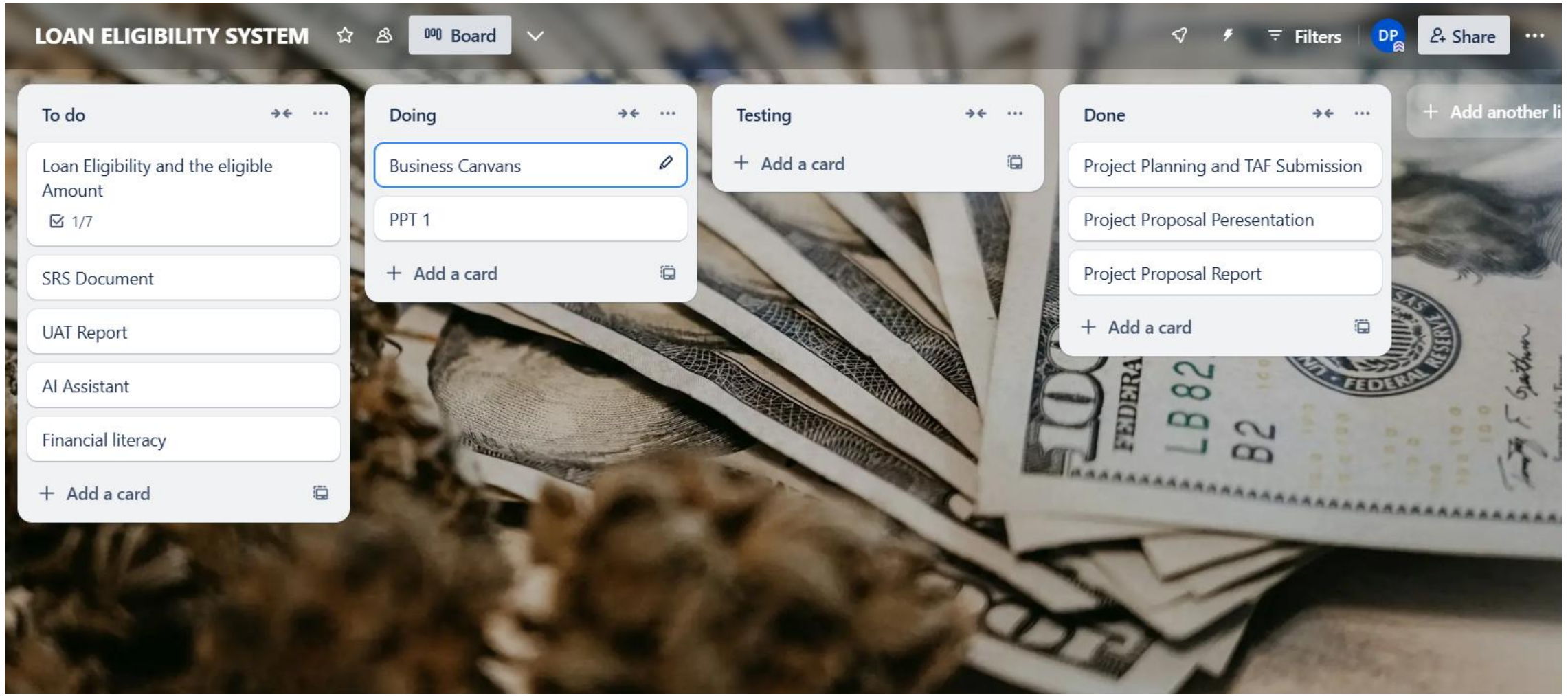
COST MANAGEMENT PLAN

TYPE	COST [LKR]
Personnel Costs	300 000
Hardware and Software Cost	100 000
Model Development and Training	50 000
Integration and Deployment	60 000
Project Management and Administration	40 000
Total Project Budget	**550 000**

COMMERCIALIZATION

- **Software-as-a-Service Model**
- **Partnering and Reselling**

PROJECT MANAGEMENT PLAN



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P r I PRAVEAN

Information System Engineering

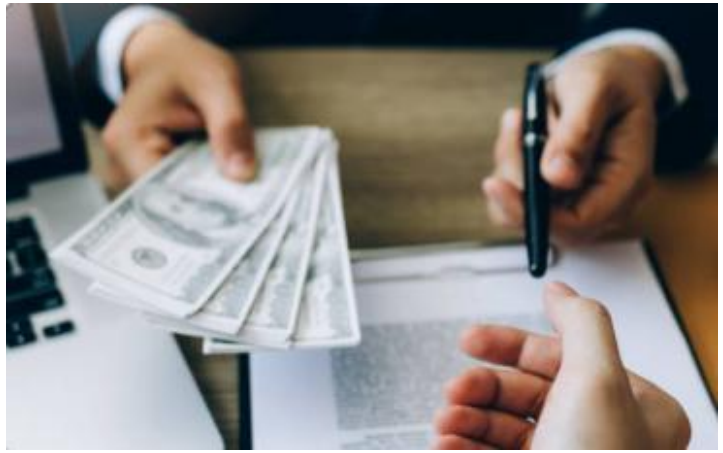
Provide financial literacy and appropriate financing practices among customers

BACKGROUND

What is financial counselling ?

Why are we focusing on this topic?

Why are we doing Provide financial literacy and appropriate financing practices?



RESEARCH PROBLEM

- Reasons why the customers getting rejecting the loan

- Reasons of the customers not aware about financial literacy and financing practices

OBJECTIVES

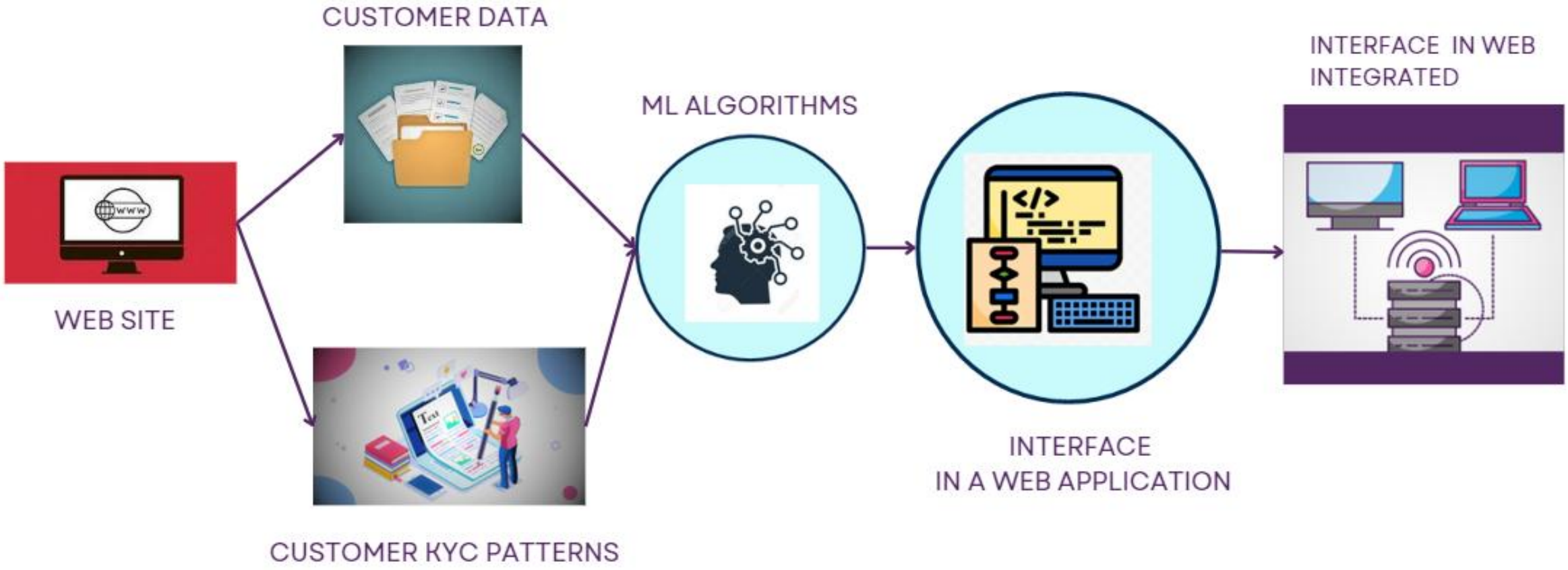
MAIN

- Provides suitable prediction to fulfill the gap of the Provide financial literacy and appropriate financing to the customers

SUB MAIN

- Integrate KYC Information to Customize Financial Advice
- Facilitate Financial Goal Setting and Strategic Planning

OVERALL SYSTEM DIAGRAM



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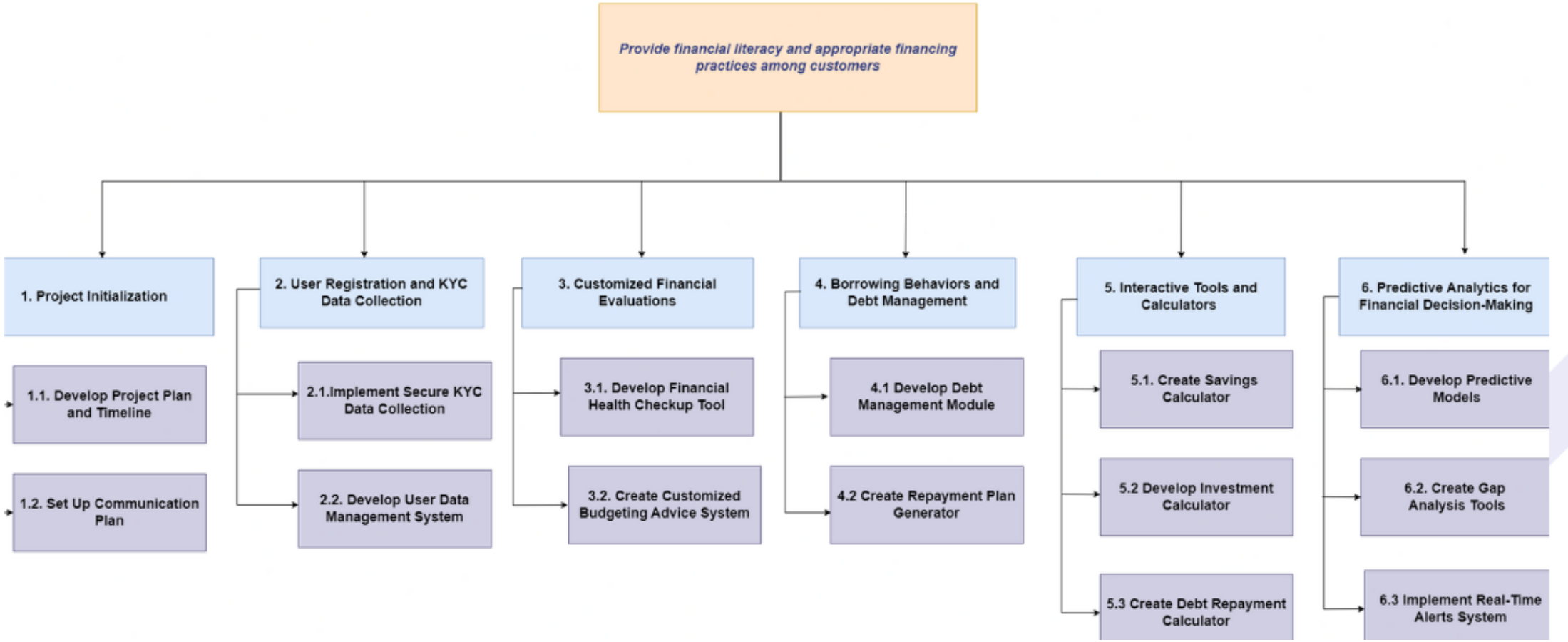

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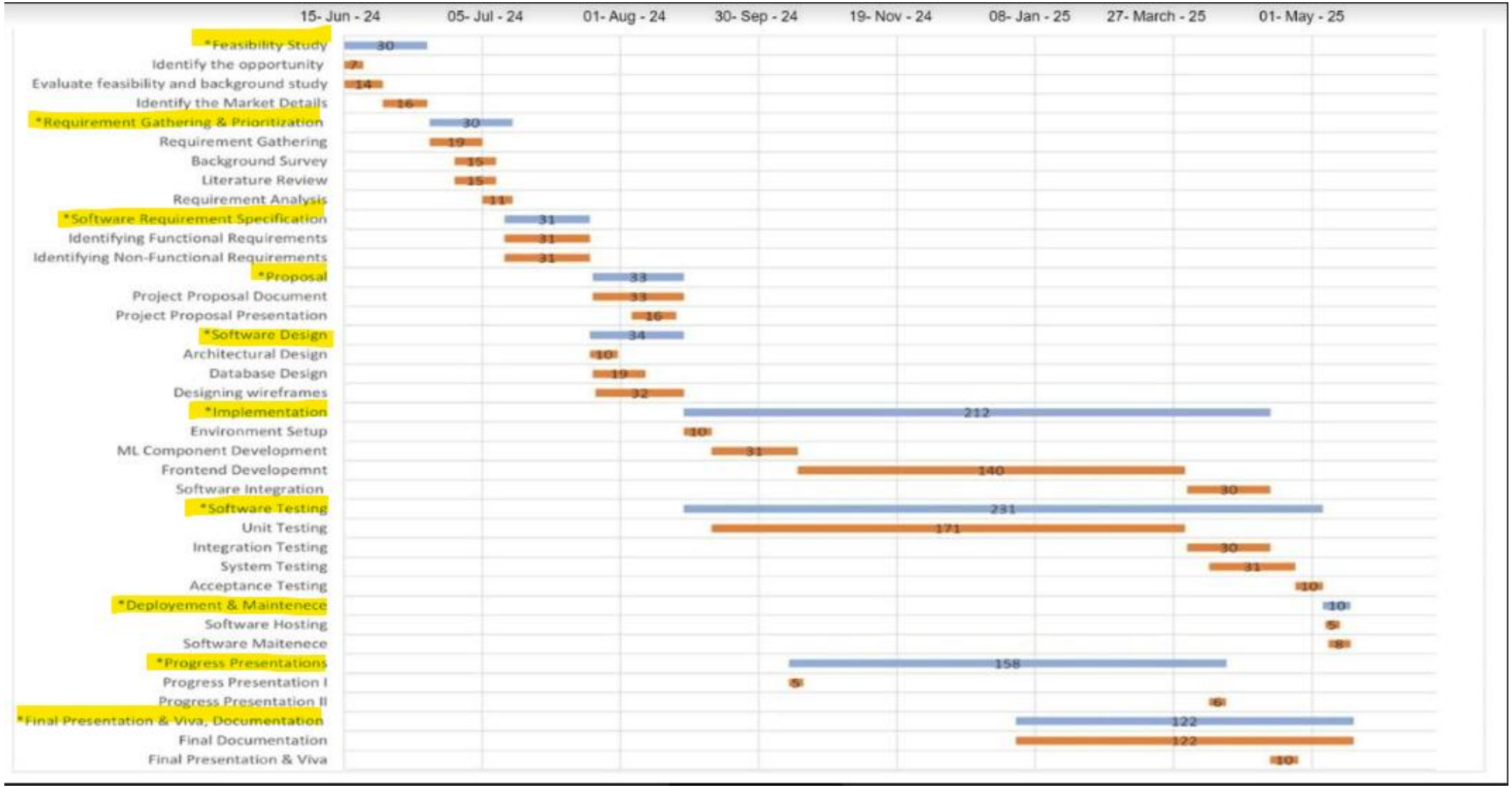
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Completion of the project PP1

Loan Eligibility Advisor

Analyze loan eligibility and provide personalized suggestions.

Database Configuration

Database: LoanEligibilityApp

Collection: Loans

Input Parameters

Select a Document

Document 3

Analyze Loan Eligibility

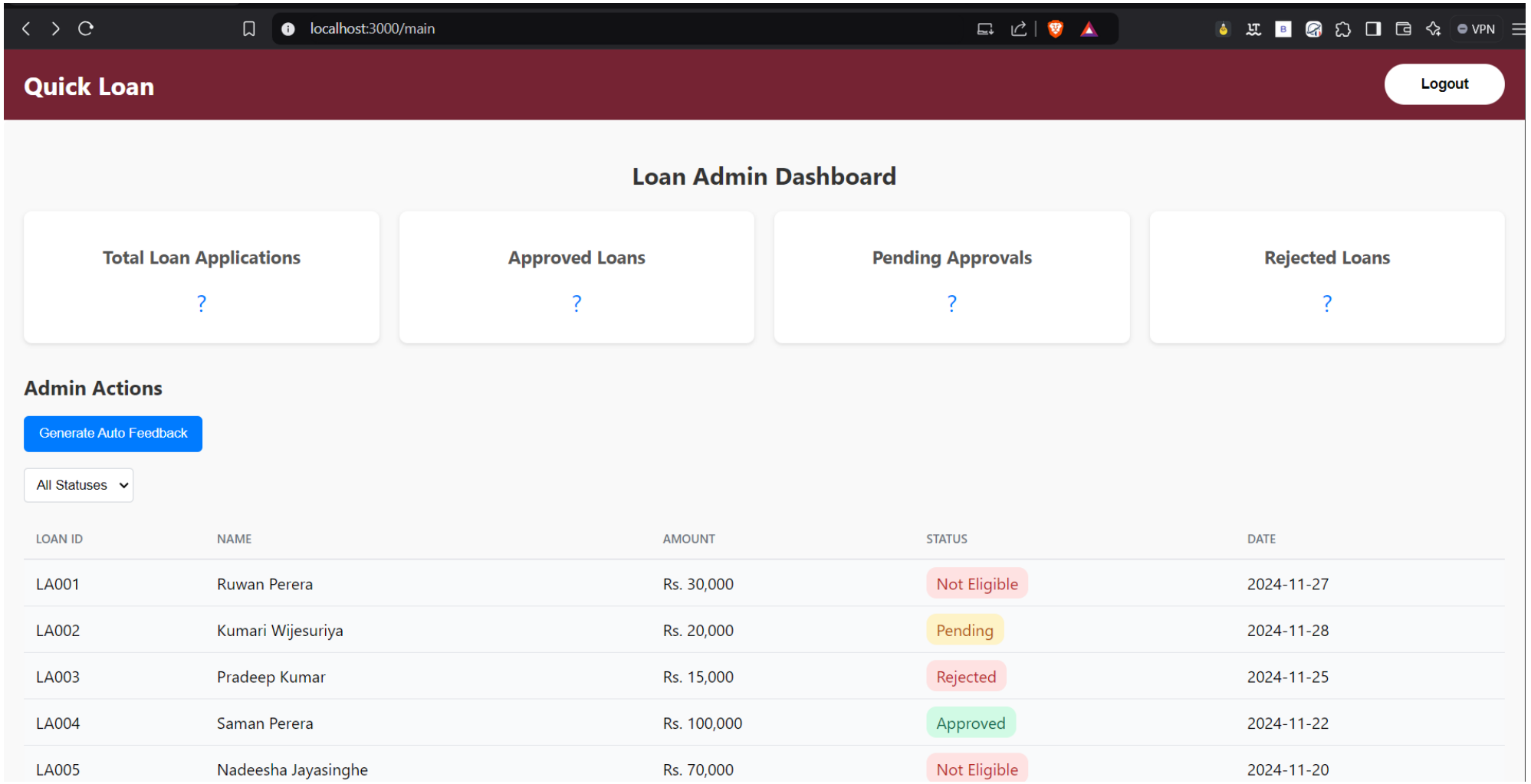
Selected Document

```
67470331349e9aed5732658b 5f8d0a58b54764421b7156c6 {'full_name': 'Ruwan Perera', 'nic': '936721348V', 'title': 'Mr.', 'home_town': 'Galle', 'residential_address': '20 Be
```

Analysis Result

```
---------------------------------------------
        Loan Eligibility Evaluation
---------------------------------------------
*Full Name:* Ruwan Perera
*Loan Request Amount:* LKR 30,000
*Total Monthly Income:* LKR 0

*Collateral Provided:*
1. Bank Guarantee: LKR 0
2. Land Value: LKR 0
3. Gold Value: LKR 0
4. Vehicle Value: LKR 0

*Total Collateral Value:* LKR 0

---------------------------------------------
           Evaluation Results
---------------------------------------------
*Loan Status:* NOT ELIGIBLE
*Identified Gap:* LKR 30,000

---------------------------------------------
```

Completion of the project PP1



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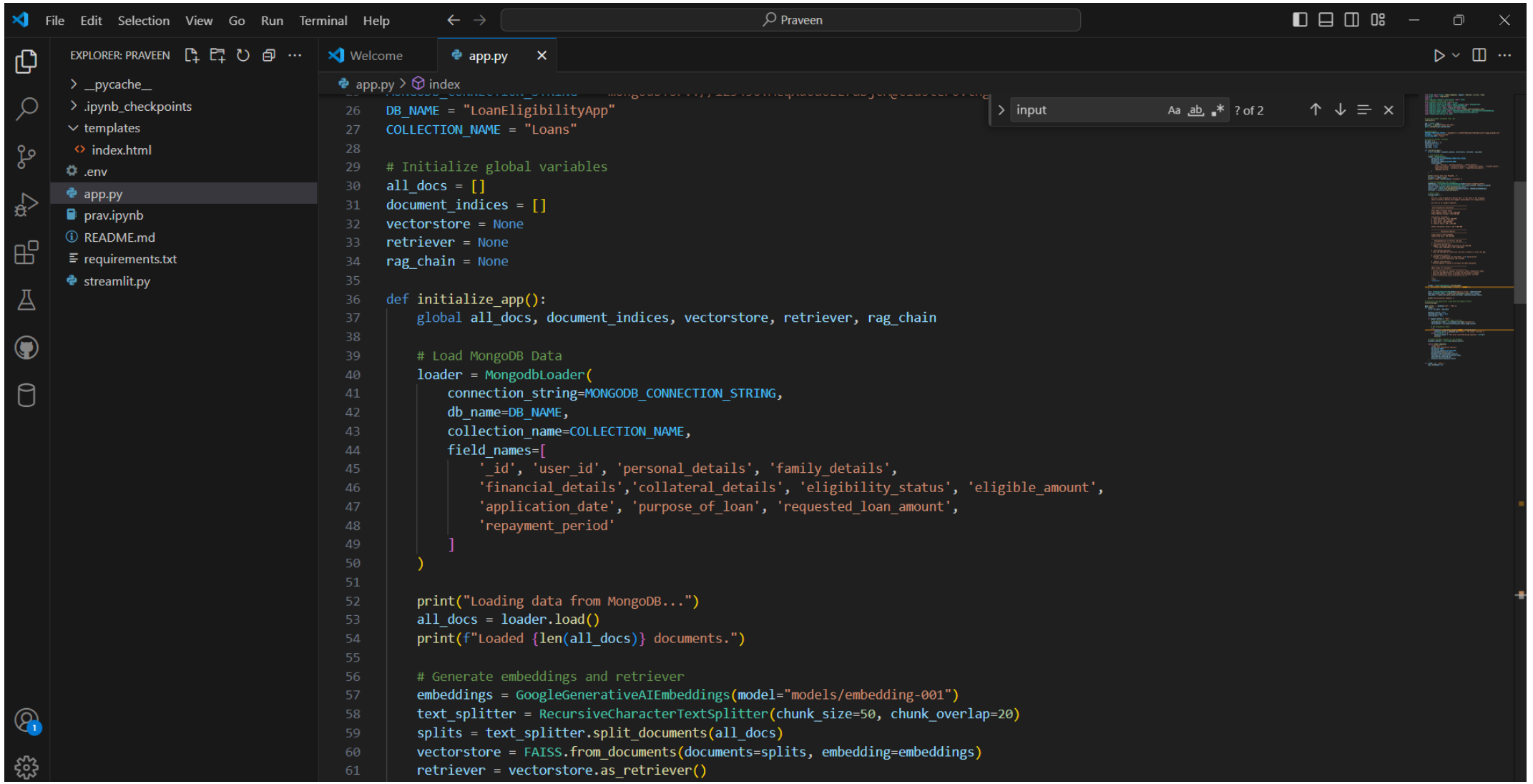

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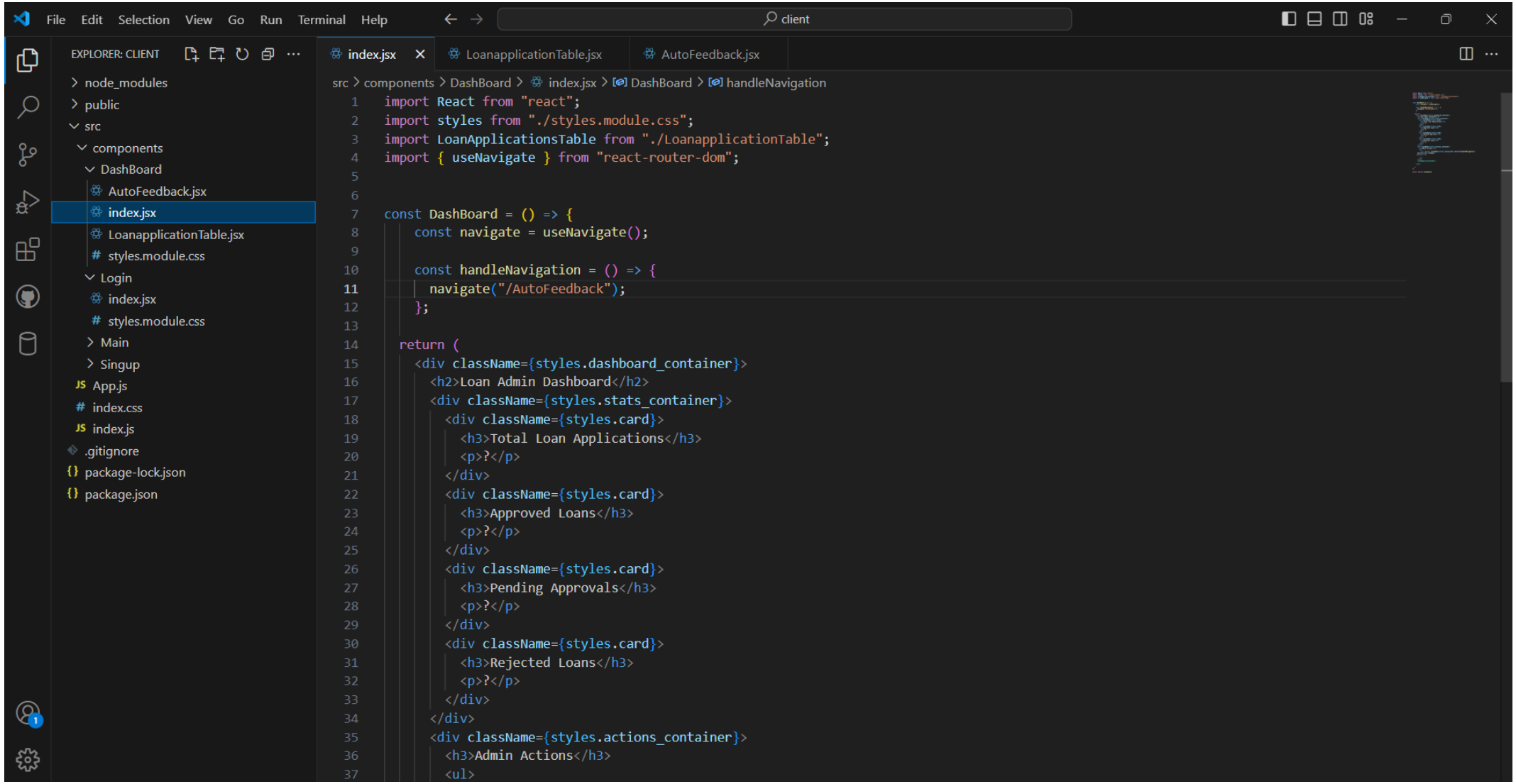

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- Natasha Robinson and Nidhi Sindhwani, "Loan Default Prediction Using Machine Learning," in IEEE, 2024.
- H. K. Sarisa, V. Khurana, V. C. Koti, and N. Garg, “Loan prediction using machine learning,” IEEE, 2023.

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Hilma M.I.F

Information System Engineering

An AI Assistant for Bank Staffs and Customers

INTRODUCTION

Background

Research Question

Research Gap

Main and Sub Objectives

BACKGROUND

•Traditional loan management systems are often manual and involve multiple layers of data retrieval.

•This process is time-consuming and prone to human errors, particularly in accessing accurate customer and loan details.

•Financial institutions face increasing pressure to deliver efficient, customer-friendly solutions.

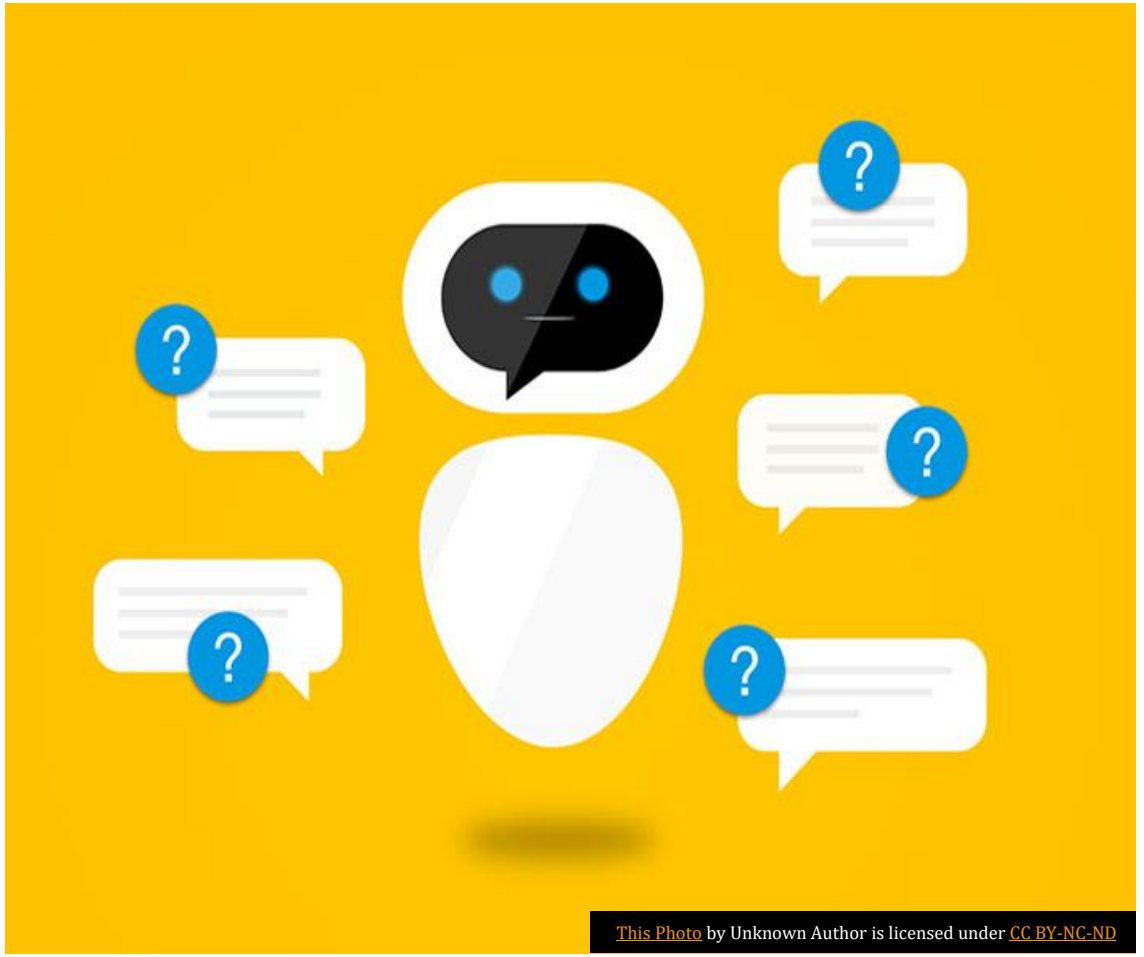
•Artificial Intelligence is transforming the financial sector by automating repetitive tasks and improving decision-making.

•AI chatbots and assistants are widely adopted for customer service, providing instant, accurate responses.

RESEARCH PROBLEM

- **How can we smoothen the process of retrieving detailed customer and loan information from databases to reduce the complexity and time burden for employees?**

- **What innovative solutions can be implemented to ensure customers receive quick and accurate responses to their queries regarding loans, repayments, and schedules?**



Research Gap

Feature	System	Our AI Powered Assistant
Chatbot Integration	No chatbot or AI assistant for customer support.	Integrated AI chatbot that automates responses for loan queries.
Query Response Time	Manual responses with a delay.	Instant, automated responses from the AI assistant.
24/7 Availability	Limited to office working hours.	Available 24/7 for customer queries.
Scalability	Dependent on human resources, which limits scalability.	Can handle multiple simultaneous customer queries without additional human intervention.
Customer Support Efficiency	Manual processing of requests and queries.	AI automates common inquiries, allowing employees to focus on complex cases.
Personalization	Limited personalization in customer support.	AI offers tailored responses based on loan and customer data.
Cost Efficiency	Higher costs due to manual labor.	Reduces operational costs by automating responses and minimizing the need for additional staff.

OBJECTIVES

- To develop an AI-powered loan management assistant that smoothen the retrieval of detailed customer and loan information for bank employees while providing quick and accurate responses to customer queries about loans, repayments, and schedules.

SUB OBJECTIVES

- Enable fast and efficient access to detailed customer and loan information from the database.
- Simplify complex data retrieval tasks using natural language processing (NLP).
- Offer accurate, real-time answers to queries about loans, repayments, schedules, and associated details

METHODOLOGY

System Diagram

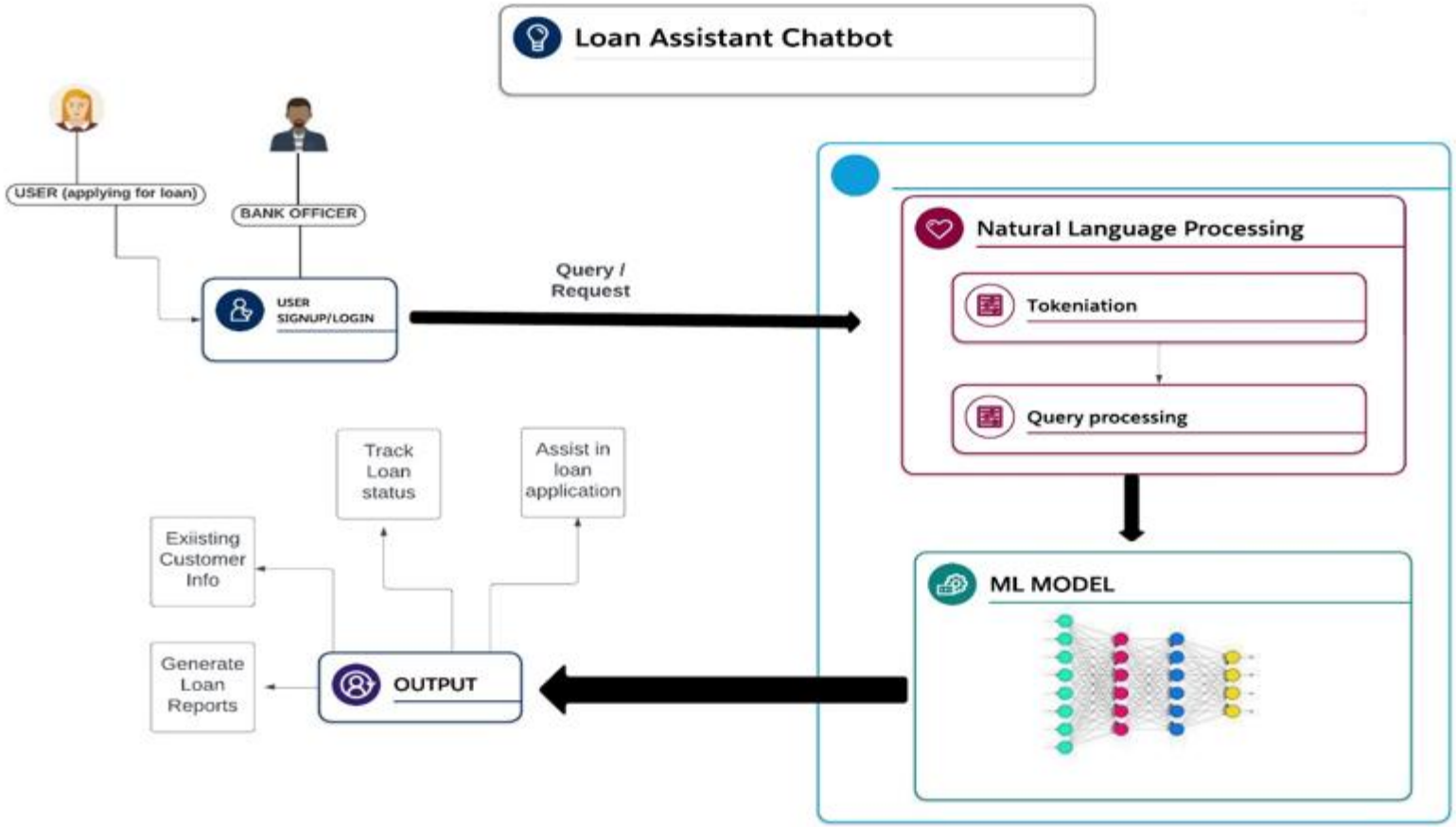
Technologies

Requirements

Work Breakdown Structure

Gantt Chart

SYSTEM DIAGRAM



TECHNOLOGIES

Component	Tool / Technology
Programming Language	Python,, Javascript
Machine Learning	Google Gemini AI
Web Framework	REACT, Flask
Other	Visual Studio Code, Mongo DB, FAISS (Facebook AI Similarity Search)

REQUIREMENTS

- Functional

•Customer Information Retrieval
•Loan Status Inquiry
•Repayment Schedule Generation
•User Login and Authentication

Non Functional

•Performance
•Scalability
•Reliability
•Security
•Usability

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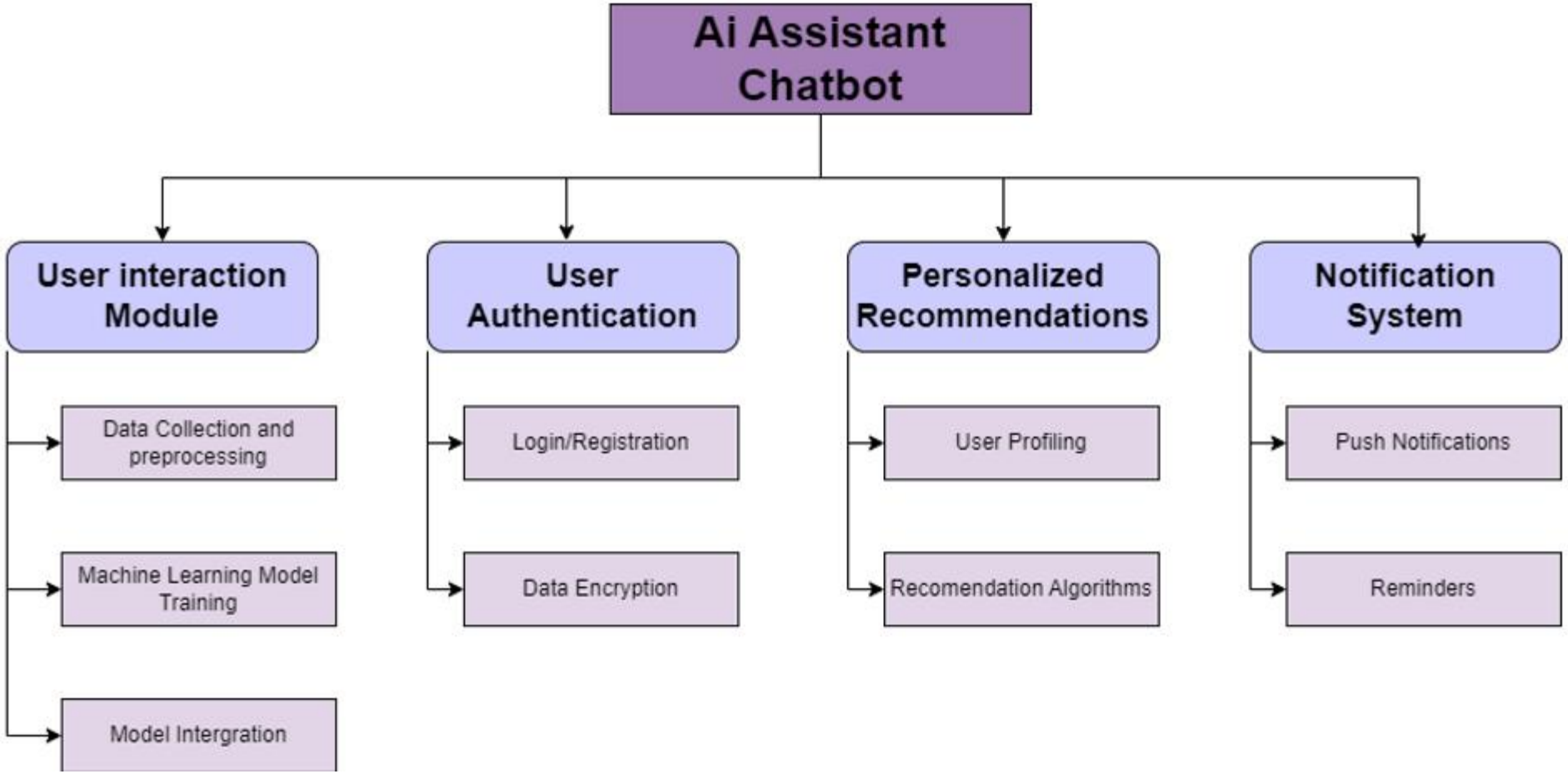

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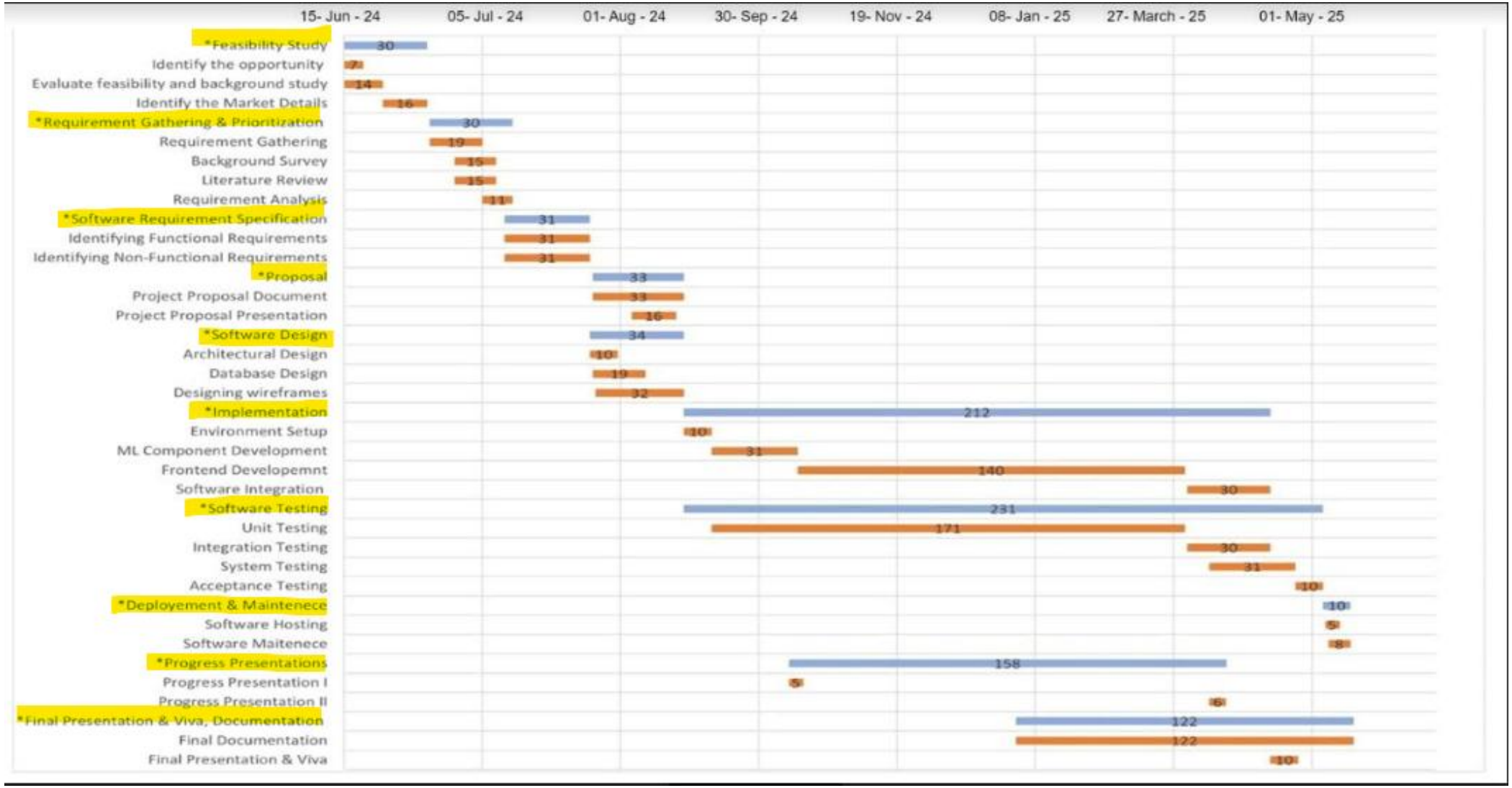
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Completion of Project

- Data Collection
- Model Selection
- Fine Tuning the LLM
- RAQ Implementation

Tasks to be done

- Authentication
- Security Implementation
- Alerts and notifications
- Client/ Customer Side Application

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- [1] B. Kumar, A. V. Singh, and P. Agarwal, "Trust in Banking Management System using Firebase in Python using AI," in 2021 9th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO), 2021

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