AI Assistant Chatbot for Loan Eligibility Prediction System

Project ID: 24-25J-268

Project Proposal Report

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Declaration

I declare that this is our own work, and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of our knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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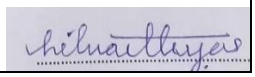
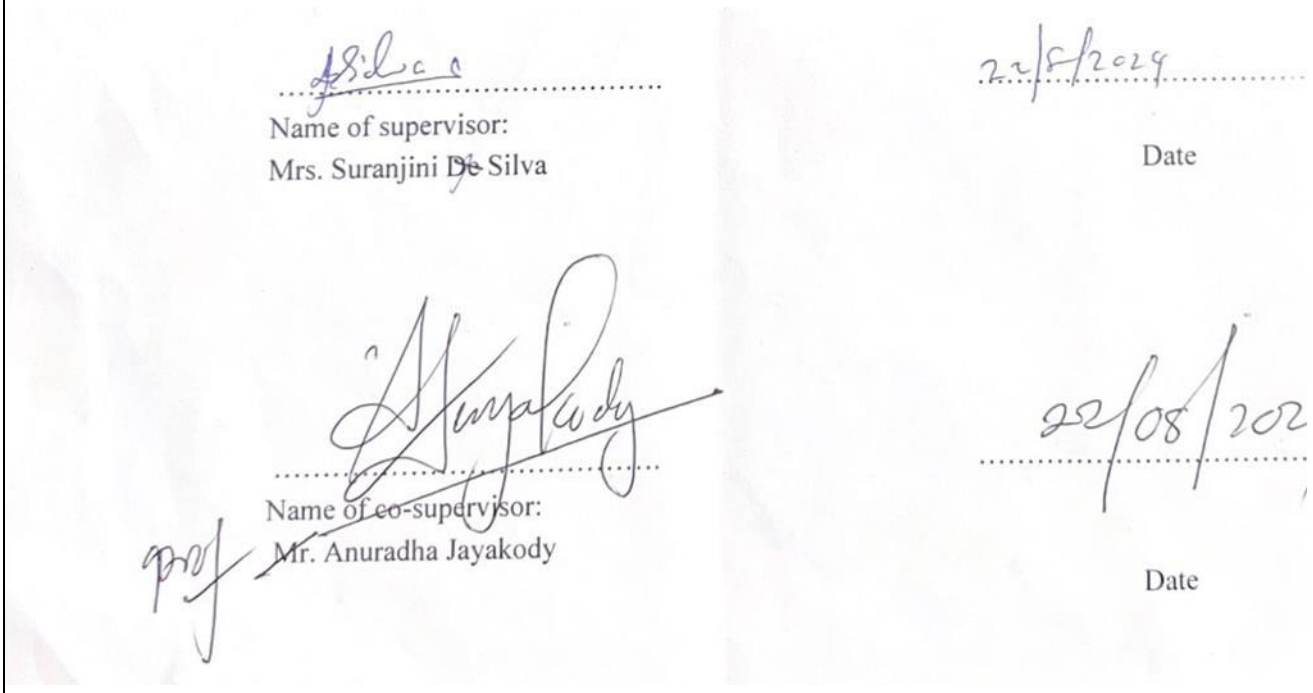
Hilma M.I.F	IT21142178	

The above candidates are carrying out research for the undergraduate Dissertation under my supervision.



Abstract

In the constantly changing financial world, there is a growing need for effective and customer-focused loan management solutions. This project aims to improve the loan eligibility system by developing an AI Assistant Chatbot that enhances interactions between customers and bank staff. The chatbot will assist new clients in completing the loan application process by offering them detailed guidance and immediate feedback on necessary paperwork. The AI Assistant will provide current customers with easy account management options, such as monitoring their loan progress, calculating possible loan amounts, and scheduling repayments.

Moreover, the chatbot will provide bank employees with immediate access to detailed loan information and customer records, assisting in making informed decisions and offering personalized customer assistance. The goal of the AI Assistant is to make loan management more efficient by using interactive tools and real-time reporting to shorten processing times and provide a better customer experience. This new method improves operational efficiency and raises the bar for customer service in banking sector

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1. Introduction

Efficient and accurate processing of loan applications is an important factor in determining a bank's success in the constantly changing financial industry. Outdated loan processing approaches, which involve lengthy procedures and heavy manual involvement, frequently result in delays and customer dissatisfaction. As financial institutions work towards satisfying the rising need for fast and customized services, they must utilize advanced technologies to streamline operations and improve customer experiences.

This project suggests creating an AI Assistant Chatbot made to improve the loan eligibility process. The chatbot will provide real-time help to customers and bank employees by combining artificial intelligence and machine learning, making the loan application process easier and enhancing decision-making precision. This new method aims to not only shorten processing times but also provide a more customized and quick service, putting the bank at the forefront of digital transformation in the financial sector. The main objective of the project is to improve operational efficiency and customer satisfaction by setting an example for the future of AI-driven financial services.

1.1 Background

In the last decade, the banking sector has experienced a major change due to the swift progress in digital technology. Traditionally, the loan approval process involved manual tasks such as extensive paperwork, lengthy approval times, and several face-to-face meetings. The inefficiencies caused customer dissatisfaction and strained bank resources, resulting in a demand for streamlined and efficient processes. Banks have started investigating the use of artificial intelligence (AI) and machine learning (ML) to automate intricate processes, improve decision-making, and provide more customized customer interactions.

AI-driven chatbots are now being recognized as a valuable resource during this digital transformation, providing immediate, precise, and reliable customer support. By incorporating artificial intelligence into loan management systems, banks can enhance the quickness and precision of loan eligibility evaluations, decrease mistakes made by humans, and offer customers a smooth process. This project aims to take advantage of the latest technological progress by creating a personalized AI Assistant Chatbot for the loan qualification process. The chatbot will improve customer interactions, offer real-time help during the loan application process, and assist bank employees with useful information.

The research gap in this project is focused on the restricted application of AI-driven solutions in evaluating loan eligibility in the financial services industry, especially in emerging markets. Despite significant advancements in using artificial intelligence to automate and improve financial processes, existing systems mainly target developed markets with advanced technology infrastructure. On the other hand, customized AI solutions specifically designed for loan eligibility assessments in developing countries are scarce, due to challenges like data scarcity, regulations, and varied customer needs.

Additionally, current AI models show effectiveness in evaluating credit and approving loans, but they often do not have the required transparency and user interaction functions needed for customer trust and approval. The lack of AI assistant chatbots that assess loan eligibility and provide personalized financial advice, increase customer engagement, and adjust to changing financial environments in various markets is the identified research gap. This project is focused on bridging the gap by creating an AI chatbot assistant that caters to the unique requirements of financial institutions and customers in developing countries, ultimately enhancing accessibility and ease of use for financial services.

1.2 Research Problem

The primary research problem addressed in this project is the lack of an advanced, AI-powered solution for loan eligibility assessment in the financial sector, particularly within emerging markets. Present systems frequently lack efficiency, personalization, and the necessary capabilities to navigate the varied and ever-changing financial environments present in emerging markets. Financial institutions often depend on traditional techniques that do not offer immediate, precise evaluations, resulting in inefficiencies and possible discrepancies in loan authorizations. The deficiency in current systems prevents financial institutions from efficiently serving their customers and restricts credit access for individuals, especially those with non-traditional financial histories.

The aim of this research project is to create an AI assistant chatbot tailored to tackle these obstacles through offering a more comprehensive, clear, and effective loan eligibility evaluation procedure. The plan entails using sophisticated data analysis, machine learning methods, and intuitive interfaces to guarantee precise, unbiased, and personalized loan eligibility evaluations for each customer. This project seeks to improve financial inclusion and enhance the efficiency of loan processing in emerging markets by tackling the drawbacks of existing systems.

	Personalized assistance	**Tracking of loan status**	**Provide bank staff with instant access to existing customers' loan details**
Ceyloan	Unavailable	Unavailable	Unavailable
Ceylon Loan	Unavailable	Unavailable	Unavailable
Money X	Unavailable	Unavailable	Unavailable
AI assistant chatbot for loan eligibility prediction systems	Available	Available	Available

Figure 1: Comparison with existing Chatbots

2. Objectives

The proposed project seeks to achieve several objectives. The main objective is to develop a system to meet the user requirements. To do this, specific objectives must be identified. These include determining user requirements, functional requirements, and non-functional requirements. By understanding user needs and expectations, the project team can create a system that meets their needs. Additionally, the functional requirements must be identified so that the system can perform the necessary tasks to satisfy the user requirements. Lastly, non- functional requirements should be identified to ensure the system meets the necessary quality standards. With all these objectives in mind, the project team can move forward with the development of the system.

2.1 Main Objectives

The main objective of this project is to create an AI assistant chatbot that will be incorporated into the loan eligibility system in order to improve user experience and simplify the loan application process. The AI helper will offer users assistance in real-time, helping them navigate eligibility requirements, application processes, and tailored financial guidance. The chatbot will be created to give immediate answers to user questions, analyze financial information for eligibility evaluations, and assist users with customized suggestions. The main goal is to enhance the loan application process efficiency, minimize manual intervention, and improve user experience with accessible and interactive support.

2.2 Specific Objectives

The specific objectives of the AI assistant chatbot are to ensure accurate loan eligibility assessments and offer personalized assistance throughout the application process. The chatbot will be equipped to handle a wide range of user inquiries, from basic eligibility questions to detailed financial advice. It will also integrate with existing loan management systems to fetch real-time data, use Natural Language Processing (NLP) for natural, conversational interactions, and provide status tracking and notifications to keep users informed throughout their loan application journey. The goal is to create a seamless, user-friendly experience that simplifies the loan application process and improves decision-making for users.

2.2.1 User Requirements

- The system should accurately assess loan eligibility based on the financial data provided by the user.
- The system should provide users with personalized guidance on loan application procedures and requirements.
- The user should be able to interact with the AI assistant chatbot through natural, conversational language.
- The system should enable users to track the status of their loan applications in real-time.
- The system should be user-friendly, with good interface and easy navigation.

2.2.2 Functional Requirements

- The system needs to gather, save, and analyze user financial information to determine eligibility for loans.
- The system should have the capacity to give immediate feedback and suggestions according to user inputs.
- The system needs to smoothly blend with current loan management systems for data retrieval and updates.
- The system needs to offer updates on status and send notifications during the loan application progress.
- The system must keep a record of user interactions to ensure quality and make future enhancements.

2.2.3 Non-Functional Requirements

- The system must guarantee data privacy and safeguard user information in accordance with the applicable regulations.
- The system needs to be dependable, with low downtime and steady performance.
- The system needs to be able to scale and manage different levels of user interactions effectively.
- The system needs to uphold a high level of accuracy when assessing loan eligibility and providing appropriate responses.

3. Methodology

The Agile methodology will be used to develop the AI assistant chatbot for the loan eligibility system, promoting flexibility, adaptability, and iterative progress. The project is best suited for agile methodology because it focuses on quick development cycles, working closely with stakeholders, and quickly adapting to changing requirements. The procedure starts with thorough planning and collecting requirements, then moves on to incremental sprints concentrating on enhancing and perfecting individual features of the chatbot. Every sprint includes feedback from stakeholders, guaranteeing that the system develops in line with user requirements. Incorporating continuous testing and quality assurance is essential to uphold high levels of performance and reliability. By making use of Agile's iterative method, the project will effectively adjust to evolving needs, improve communication with stakeholders, and provide a strong and user-focused AI chatbot.

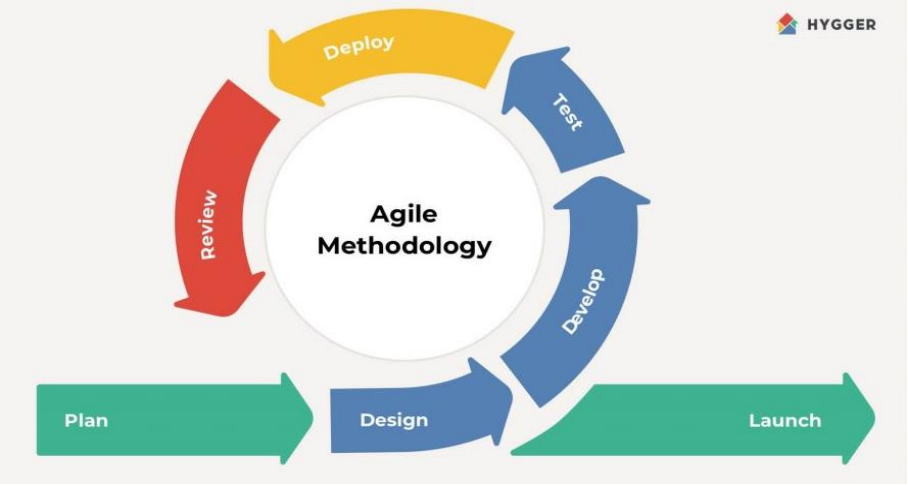

Figure 2: Agile software development life cycle

3.1 Requirement Gathering and Analysis

Requirement gathering and analysis are vital stages in building an AI assistant for a loan eligibility system. This process entails gathering and examining essential data to guarantee the AI assistant satisfies the requirements of users and financial institutions. Extensive research was carried out by utilizing resources like financial institutions' websites, industry reports, and journal papers to gather the requirements. This aided in grasping the different loan procedures, qualifications, and the requirements of potential applicants.

Besides utilizing online tools, feedback from stakeholders, such as banks, was also solicited to better comprehend the loan procedures and obstacles encountered by both applicants and institutions. Interviews, surveys, and workshops were used to collect thorough requirements, making sure the system tackles the most important issues and improves the loan application experience.

During the analysis stage, the primary focus was on assessing the potential for integrating the AI assistant with current loan management systems, guaranteeing its ability to accurately handle and address user inquiries. The requirements that were collected were utilized to form a thorough specification document that will direct the development of the AI assistant, guaranteeing it is easy to use, dependable, and able to offer precise loan eligibility evaluations.

3.2 System Architecture

The system architecture visually displays the AI assistant for the loan eligibility system, highlighting its main components and their interactions. The structure is created to guarantee smooth incorporation with current loan management systems, enabling instant data processing and engagement

In this setup, individuals, mainly those seeking loans and representatives from financial institutions, engage with the AI assistant through a interface that is easily accessible to users. The AI assistant uses Natural Language Processing (NLP) to have conversations with users, assisting them with understanding loan eligibility requirements, applying for loans, and receiving custom financial guidance.

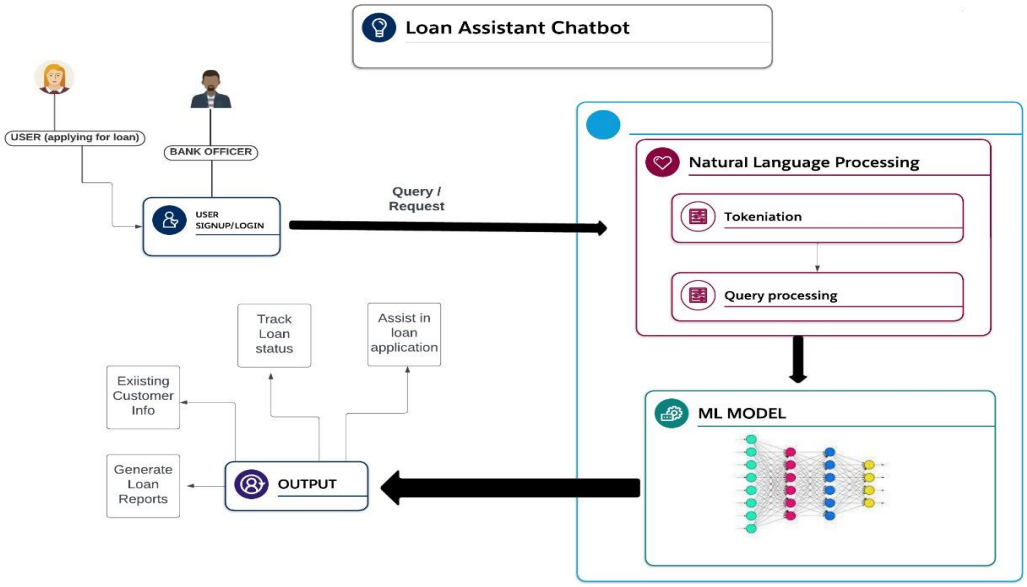

Figure 3: System diagram of the AI Assistant Chatbot

3.3 Technical Architectural Design

Prior to starting the project execution, it is crucial to define the technical needs of the system and create a suitable architectural plan. The main elements of this project's structure are the database and the backend of the application.

- **Database Architecture:**

The system will utilize MongoDB as its choice for a NoSQL database solution. MongoDB is selected for its ability to handle a wide range of data types effectively and efficiently, making it ideal for storing user interactions, loan application data, and other important information. This database structure guarantees effective data storage and retrieval, aiding the AI assistant in its functionality and performance.

- **Application Architectural Design:**

The backend of the system will be built using Python. By making use of NLTK and spaCy for natural language processing and employing TensorFlow for machine learning functions. Rasa will be used to handle the chatbot's conversational features and connect it with the backend services. React JS will be used to manage the frontend user interface and interactions to offer a web-based experience that is both responsive and intuitive. Trello will be utilized for project management and teamwork, with Figma and Draw.io assisting in design and architectural planning. In addition, Git will be utilized for version control, while Firebase Cloud Messaging will manage real-time notifications. This design guarantees a loan management AI assistant system that is well-integrated, scalable, and effective.

4. Tools and Technology

The following are the tools and resources that will be used for the proposed project.

- **Programming Languages –**

Python, ReactJS

- **Database –**

Mongo DB

- **Project Management Tools –**

Microsoft Planner

- **Other Tools –**

GitHub, Figma, Fire base cloud messaging

5. Work Breakdown Structure (WBS)

The WBS is an essential tool for planning that divides intricate activities into more manageable tasks. The WBS is structured based on the stages for creating the AI assistant for the loan management system. This method guarantees that every part of the project is well outlined and controllable, making it easier to carry out and supervise effectively.

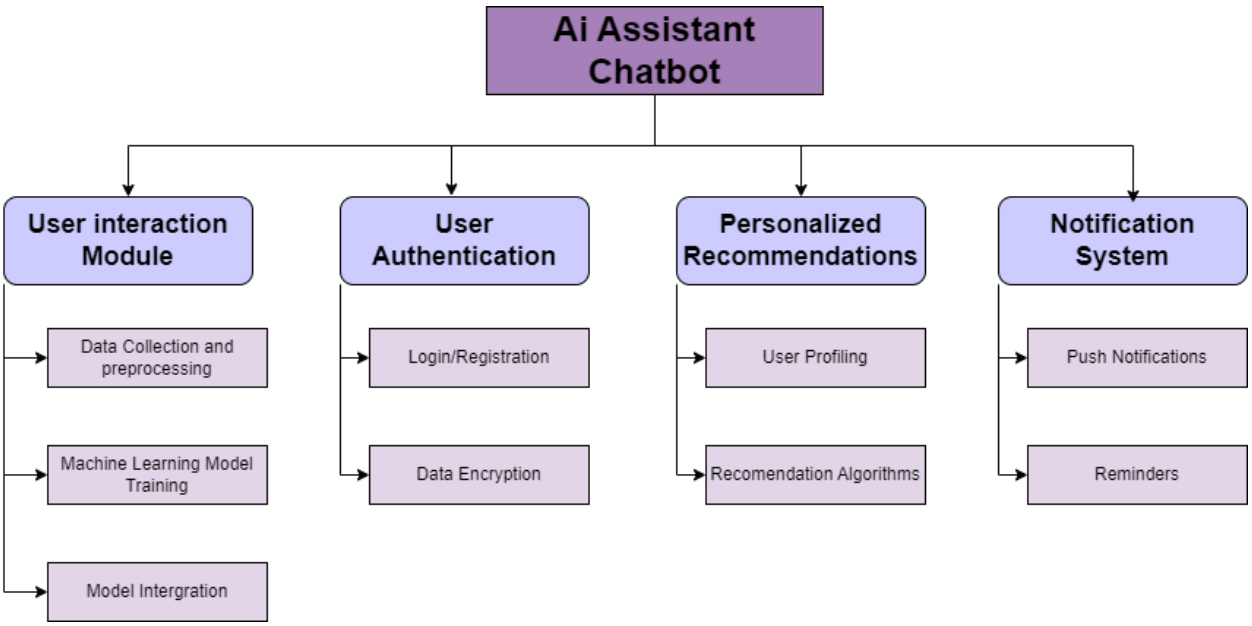

Figure 4: Work Breakdown Structure (WBS)

6. Gantt Chart

The primary goals of the project and their respective timeframes are detailed in the Gantt chart within this section. This diagram represents the timeline of the project, dividing important milestones and tasks into smaller time frames. It depicts the sequential steps in the development process, starting from feasibility study, all the way to implementation, testing, and deployment. Every task is connected to particular deadlines, emphasizing interdependencies and guaranteeing the efficient achievement of all project goals.

Figure 5: Gantt chart of the project

7. Commercialization

The first step in launching the AI assistant for loan management commercially is conducting in-depth market research to discover the requirements of financial institutions and loan applicants, and to gain insight into the competitive market. A specific value proposition will be created to showcase the AI assistant's unique characteristics, including real-time eligibility evaluations and personalized advice. The item will be launched via a Minimum Viable Product (MVP) to collect initial feedback and improve the solution. An effective go-to-market strategy encompasses a pricing model that mirrors the AI assistant's worth, collaborations with financial institutions for integration, and a variety of sales and distribution channels. Marketing will concentrate on both digital and traditional channels, utilizing case studies and testimonials to establish credibility. Assistance and training will be available for customers to ensure optimal utilization of the AI assistant, with ongoing performance tracking to drive ongoing enhancements. Prioritizing data protection regulations compliance and implementing robust security measures is crucial for preserving user trust and legal compliance.

8. Budget

Type	Cost
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**

Figure 6: Budget

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