

Megabot- Your Financial info Superhero in a Digital Cape!

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Abstract:- In an era of digital transformation, access to government-sponsored financial schemes is vital for individuals and businesses. The development of "MegaBot," an interactive chatbot, addresses this need by consolidating information on all government-sponsored loans and insurance schemes into a single accessible platform. MegaBot tackles the challenge of accessing government-sponsored financial schemes by offering a centralized, user-friendly chatbot platform. Integrating information from institutions like NABARD and RBI, it leverages natural language processing and advanced search to guide users through loans, insurance plans, eligibility, applications, and more. This empowers individuals, businesses, and organizations to leverage financial support and bridge the gap between government initiatives and beneficiaries, promoting financial inclusion.

Keywords:- Component, Formatting, Style, Styling, Insert.

I. INTRODUCTION

Chatbots are computer programs that can simulate conversations with humans. They are increasingly used in many applications, including e-government. Chatbots for e-government can provide citizens with 24/7 access to government services, simplify the process of applying for government services and tracking their status, and provide citizens with personalized information and support.[1]

Chatbots can be particularly useful for assisting with loan and insurance applications. They can help users understand the different types of loans and insurance that are available, compare different products, and complete and submit applications. Chatbots can be used to provide support for a customer after the loan or the insurance policy is issued.

Chatbots can be accessed 24/7, from anywhere with an internet connection. This makes them ideal for people who live in rural areas or who have difficulty visiting government offices in person. Chatbots can provide personalized and responsive customer service. They can answer questions quickly and accurately, and they can help users to resolve problems quickly and easily.

A Chatbot can help users to understand the different types of loans that are available, such as loans for students, home, and their personal needs. The Chatbots can also help users to compare different loan products from different lenders.

Recent advancements in natural language processing (NLP) and the advancement of artificial intelligence-based chatbots(AI) have slowly changed the way users deal with companies[2,3].In a world brimming with government financial schemes, navigating their complexities can be daunting. Fear not! 'MegaBot' enters the scene, an innovative chatbot designed to streamline your access. Think of it as a user-friendly portal, housing all loan and insurance schemes, powered by advanced search and natural language processing. No more wading through bureaucracy! MegaBot empowers you to access vital information, make informed decisions, and unlock a world of financial opportunity. Get ready to bridge the gap between government aid and prosperity.

Chatbots have become an important part of our daily digital lives, are becoming widespread in messaging, and are used as digital assistants in the technological environment. Customer service leaders have moved from initial chatbot testing to the mainstream. It is recommended that the chatbot-based e-services e-government project be put into wide use by expanding the environment that can provide all government e-services as a digital assistant greater than the

first chatbot. It is important for three reasons: results, convenience, and future positioning. With good design and implementation, more than 80 percent of the interaction in e-government services is solved by chatbots. In today's rapidly evolving landscape of digital transformation, access to government-sponsored financial schemes has become increasingly vital for individuals and businesses alike. These financial initiatives are pivotal in fostering economic growth, aiding in disaster recovery, supporting agriculture and rural development, and promoting entrepreneurship. However, navigating the complex maze of these schemes, understanding their intricacies, and staying informed about the latest updates can be a formidable challenge for many. In response to this critical need, the innovative "MegaBot" chatbot emerges as a powerful solution. MegaBot serves as a cutting-edge, interactive chatbot designed to consolidate and streamline information on all government-sponsored loans and insurance schemes. It brings together data from various authoritative sources, including the National Bank of Agriculture and Rural Development (NABARD) and the Reserve Bank of India (RBI), providing users with a centralized, user-friendly platform to access a wealth of information. MegaBot harnesses the power of natural language processing and advanced search capabilities, making it a user-friendly virtual assistant that empowers individuals, entrepreneurs, and organizations to effortlessly find relevant information on loans, insurance plans, eligibility criteria, application procedures, and more. It offers a comprehensive, up-to-date resource that not only simplifies the process of accessing information but also aids in making well-informed decisions.

By bridging the gap between government schemes and the people they are intended to serve, MegaBot represents a significant stride towards financial inclusion, efficiency, and empowerment. It paves the way for a future where all can access and leverage the financial support offered by government initiatives, ensuring that no one is left behind in this era of digital transformation. In essence, MegaBot is the gateway to a world of financial opportunity and prosperity.

II. RELATED WORK

In [4], the article emphasizes the need for a multidimensional approach to understanding Public adoption and use of the chatbot. This requires further investigation of the interaction between these factors and the role of specific IT vendor partners.

In [5], this Research Paper examines consumers reaction to the Use of AI Chatbots in municipal Distribution insurance in Singapore. The study found that consumers are generally positive about the use of chatbots, but they also have many concerns

In [6], it describes the development and evaluation of a chatbot named Krushi, which is designed to help Indian farmers access agricultural information and advice. Krushi is trained on a large corpus of farmer call center logs and can answer a wide range of questions, including those related to crop cultivation, pest and disease management,

market prices, and government schemes. The research paper describes the development and evaluation of a chatbot named Krushi, which is designed to help Indian farmers access agricultural information and advice.

In [7], this research paper describes the development and evaluation of a chatbot named FANCY, which is designed to help people with disabilities learn about financial literacy in a way that is accessible and engaging. FANCY is powered by artificial intelligence And it can communicate with users in natural language.

In [8], this research paper describes LOAN PAL, An interactive platform that helps users clarify their doubts about loans and schemes provided by the government. NABARD, RBI, SBI etc. It is an Artificial Intelligence (AI) chatbot that receives data from various important sources such as. It is built mainly using TensorFlow and Python.

In [9], this paper talks about Chatbots being more and more adopted by governments to provide citizens with information and services. However, little is known about the factors that influence citizens' satisfaction with chatbots and their use in electronic government. This study examines the role of information quality, system quality, Efficiency, service quality, trust and approval will explain the public's satisfaction with the use of chatbots in e-government. The study uses survey data on citizens in the United States. The findings suggest this quality of information, quality of the system, and quality of service, have all positive impacts on citizen satisfaction with chatbots. In [10] they talked about Chatbots being more and more adopted by governments to provide citizens with information and services. This article reviews the research literature on chatbots for e-government and identifies several advantages and disadvantages of using chatbots in this context. In [11], this paper provides a comprehensive overview of AI-based chatbots and their potential applications in finance This document lists several benefits of using chatbots in the financial industry, including the enhanced customer services, reducing costs and increasing efficiency. Paper discusses the challenges associated with the implementation of chatbots in the financial industry, such as ensuring data security and privacy and developing chatbots they understand and respond to complex financial questions The document suggests several recommendations for future development and implementation of chatbots in the financial industry.

In [12], he talks about Natural Language Processing (NLP), which has received a lot of attention lately due to the representation and analysis of human speech. Its application is widely used in many areas such as machine translation, spam detection, information retrieval and summarization, medical, and answers to questions, etc. In this document, we first distinguish the four stages of discussions of the different levels of NLP and natural language generation and show the history and development of NLP. We will discuss in detail the current technology, current trends, and challenges representing many NLP applications. Finally, we provide a discussion of some existing data, models, and evaluation methods in NLP.

In [13], The authors aim to create a state-of-the-art chatbot by leveraging the power of neural networks and optimizing resource consumption. This approach promises significant improvements in efficiency, reliability, security, and flexibility, making the chatbot suitable for various applications. The purpose of this article is to improve the performance of traditional chatbots and other automated chat systems. Build a more reliable, secure, and flexible chatbot.

III. METHODOLOGY

The system plans to use botpress technology to provide information on all government support loan/insurance plans. The general architecture of the system is shown in Figure 1. The planning process includes: 1) User interface 2) Data set creation 3) Training 4) Testing

A. Dataset Creation

The information is collected from reliable sources such as RBI, Nabard, and other government websites. This system requires large amounts of data, the data will be stored in a botpress knowledge base.

B. Training

- Training data: This consists of curated user queries and corresponding chatbot responses, usually formatted as intents and entities. You can manually build this data or import it from existing datasets.
- Knowledge base: Botpress offers a powerful knowledge base tool where you can organize information relevant to your chatbot’s domain. This allows the chatbot to answer factual questions and retrieve specific data.
- Conversational log analysis: By analyzing past conversations, Botpress can identify common patterns and improve its understanding of user intent and response generation.

C. Testing

Manually test the chatbot by completing scripts that allow users to interact with the bot. Chatbot responses are tested against the following criteria. • Answer user questions • Provide answers to users • Ask follow-up questions • Continue the real conversation If the response meets one of the above criteria the machine has been trained successfully. Otherwise, the training phase continues until the chatbot gives the best answer to the user’s question.

- Answer customer questions
- Provide users with relevant answers
- Ask additional questions
- Keep the conversation in real terms. If the response matches any of the above criteria, the machine is trained. Otherwise, the training phase continues as long as the chatbot can provide the best answer to the user’s question.

IV. DESIGN

A. Architecture

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.

➤ Activities:

- User: sending a message, clicking a button, making a selection.

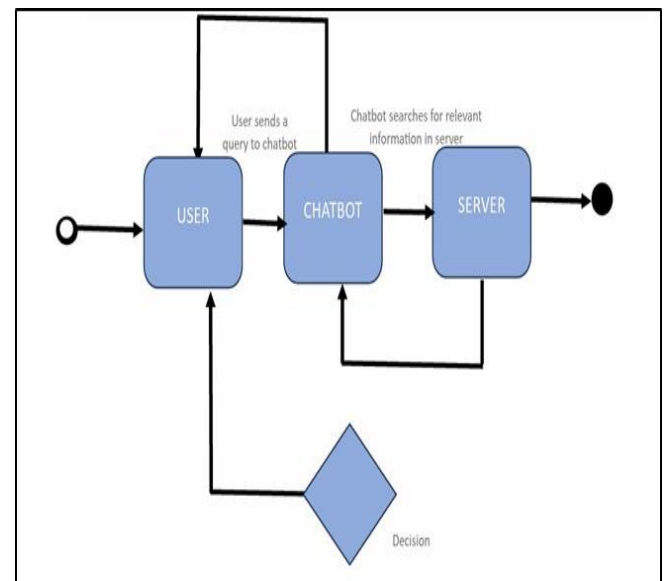


Fig 1 Architecture Diagram

- Chatbot: receiving a message, analyzing the input, searching for information from the server, generating a response, and sending a response to the user.
- Decision box: The diamond in the diagram represents decision points where the chatbot needs to make a choice based on the user’s input or the data it has access to.

B. DFD Diagram

A Data Flow Diagram (DFD) is a traditional way to visualize the information flows within a system. A neat and clear DFD can depict a good amount of the system requirements graphically.

➤ External Entities:

- Environment: The physical surroundings where the robot interacts with the computer.
- Data Stores: Training Data: Stores the data used to train the machine learning model.
- Chatbot State: Stores information about the robot’s current internal state, such as its sensor readings and past actions.
- Processes:

- **Data Acquisition:** This process involves collecting data from various sources, likely including the trainer’s input, sensor readings from the robot, and screen capture data from the computer and gathers data from various sources and feeds it into the Preprocessing and Training processes.
- **Preprocessing:** The collected data is cleaned, formatted, and organized for further analysis and uses the data to update the machine learning model.
- **Training:** The preprocessed data is used to train a machine learning model, which could be a reinforcement learning model or another type suitable for learning motor skills and computer interaction.
- **Action Selection:** Based on the current state of the environment and the robot’s internal state, the trained model determines the next action for the robot to take and uses the current state information to select the next action for the chatbot.
- **Execution:** The robot executes the chosen action, manipulating its physical body and interacting with the computer.

➤ *It Sends Commands to the Robot’s Actuators and Sensors to Perform the Chosen Action*

- **Evaluation:** The trainer and the system itself evaluate the robot’s performance based on its actions and the achieved outcome. It analyzes the chatbot’s performance and feeds the results back into the Data Acquisition and Training processes for continuous improvement.

C. Use Case Diagram

A use case diagram presents a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. Actors:

- **User:** This could be anyone who wants to access the website depending on the specific system.
- **System:**
- **Take Data:** This represents the process of acquiring data, which could be medical records, sensor readings, or survey responses.
- **Preprocessing:** The data is prepared for analysis by cleaning, formatting, and handling missing values.
- **Training:** The processed data is used to train a machine-learning model. The diagram doesn’t specify the type of model, but it could be for classification, regression, or clustering tasks.

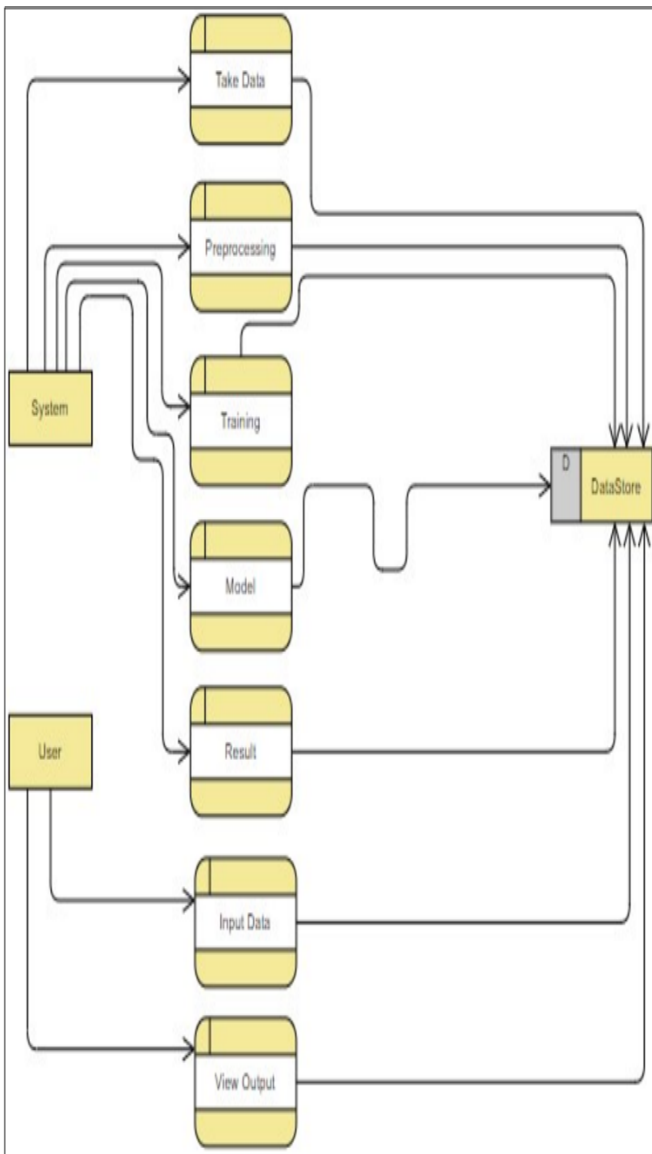


Fig 2 DFD Diagram

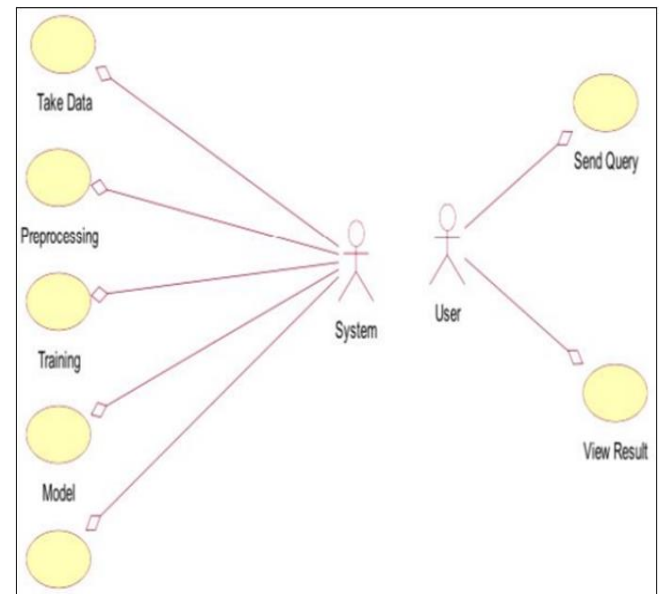


Fig 3 Use Case diagram

- **Model:** This represents the trained model, which can now be used for making predictions or inferences.
- **Send Query:** The user submits a query or request to the system.
- **View Result:** The system returns the results of the query, which could be predictions, diagnoses, or insights derived from the trained model.
- **Relationships:** The user interacts with the system by taking data, sending queries, and viewing results. The system takes data, preprocesses it, trains a model, and uses the model to generate responses to queries.

D. Sequence Diagram

The diagram outlines a sequential flow of actions, starting with data acquisition and ending with result presentation. The steps are :

- Take Data: The system initiates the process by acquiring data from an external source or user input.
- Preprocessing: The system prepares the data for analysis by cleaning, formatting, and handling any inconsistencies or missing values.
- Training: The preprocessed data is used to train a machine learning model, allowing it to learn patterns and make predictions.
- Model: The trained model is now ready for use. Input
- Query: The user submits a query or request to the system.
- Result: The system utilizes the trained model to generate a response or prediction based on the user’s query.
- Give Results: The system presents the resulting insights or predictions to the user

V. IMPLEMENTATION

The proposed method is an integrated platform designed to streamline access to various government-sponsored financial programs. It employs a chatbot interface that aggregates data from authoritative sources like NABARD and RBI, offering comprehensive information on loans and insurance schemes. Through natural language processing, users can easily access, compare, and apply for relevant programs, promoting financial inclusivity and informed decision-making.

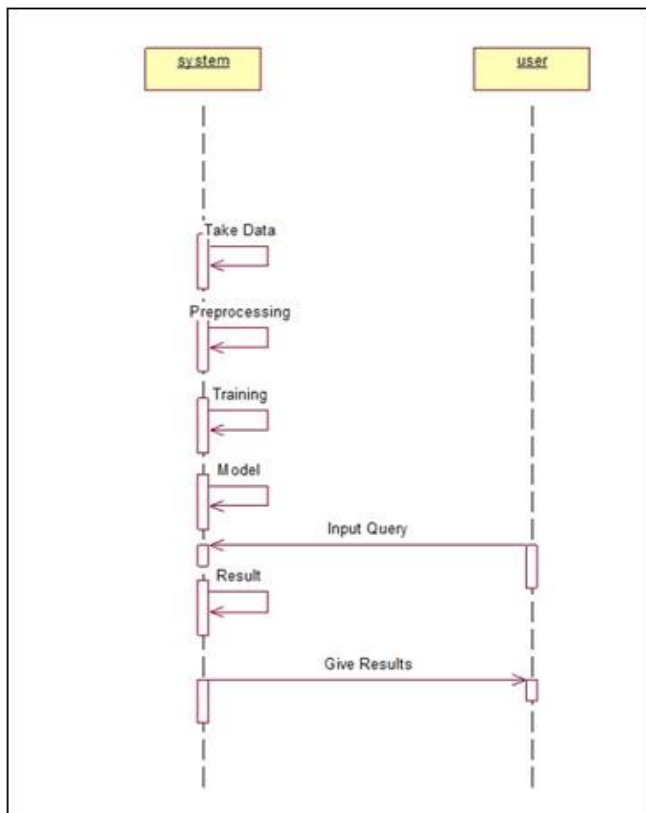


Fig 4 Sequence Diagram

Registration

Registration signifies that an entity or document has been officially recognized and validated by a relevant authority, granting it credibility and standing. It often involves establishing ownership, rights, and responsibilities, and offering protection against misuse, unauthorized access, or infringement. It creates a formal record, enabling easy retrieval, verification, and tracking of information, ensuring transparency and accessibility. Every user registers by entering all the required fields like name, email address, password and repeat password. The password has to match with the repeated password. Click on the submit button to register. After entering all the details it will create an account for the user. It allows the user to create a password for their email address for further login purposes. If the user already has an account they can directly go to login.

Login

Logins act as gatekeepers, restricting access to specific resources or information to authorized users only. This protects sensitive data from unauthorized access, preventing misuse or theft. Login credentials like usernames and passwords help secure individual accounts, safeguarding personal information and financial assets. Logins provide a record of user activity, enabling tracking and ensuring accountability for actions taken

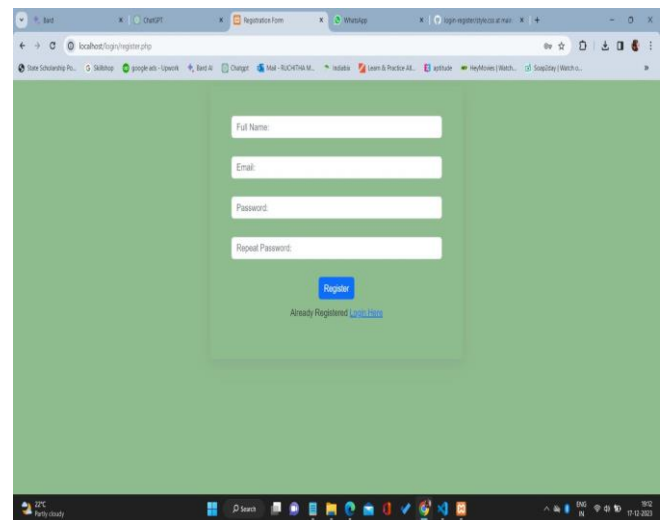


Fig 5 Registration

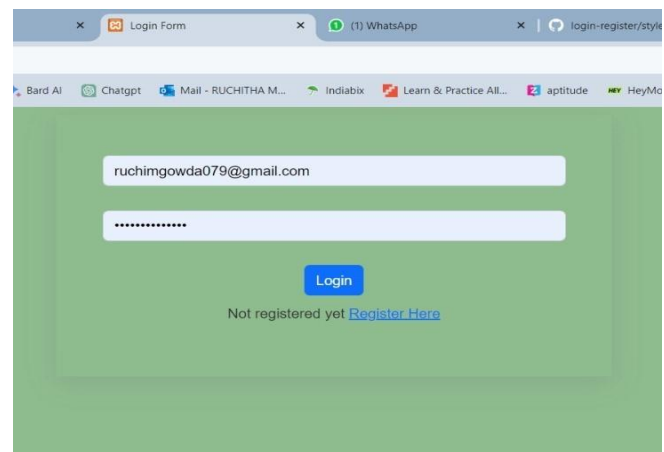


Fig 6 Login

Within a system. After entering the correct email address and password the user can log into a web page to access the chatbot. If the user’s email address and password do not match with registered details the user will not allow to log into a web page.

➤ *Accessibility for Color Blind People*

The webpage is built for the colorblind people to make it more inclusive and special colors are used in the "colorblind mode" to make the webpage more accessible.

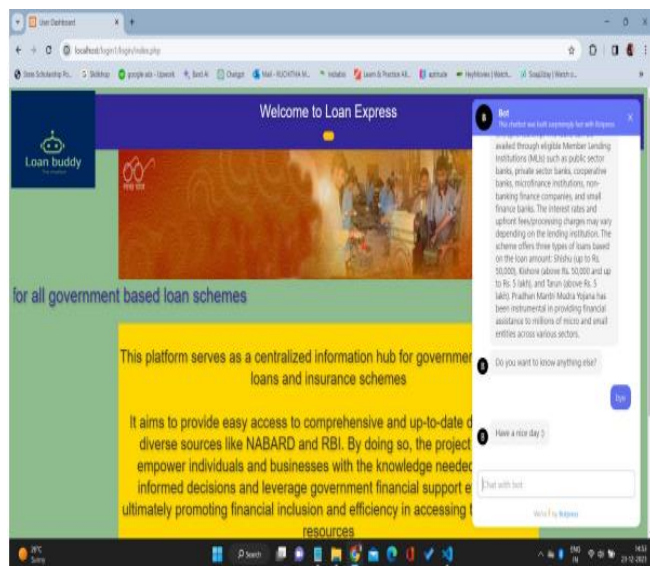


Fig 7 Color Blind



Fig 8 Chatbot

➤ *Chatbot*

Chatbots provide 24/7 availability, handle routine inquiries, personalize interactions, and resolve issues quickly, leading to increased customer satisfaction and loyalty. Chatbots automate repetitive tasks, freeing up human agents for complex issues and reducing the need for additional staff, resulting in cost savings. Chatbots can gather valuable customer data through interactions, providing insights into preferences and behaviors, which can be used for targeted marketing, product development, and

improved service offerings. After entering the correct details the user will be directed to a webpage where he/she can use the chatbot to know all the government-related loans/insurance schemes.

VI. CONCLUSION

The development of MegaBot marks a pivotal advancement in the era of digital transformation. By consolidating information on government-sponsored financial schemes and making it readily accessible to individuals and businesses, MegaBot promotes financial inclusion and empowers users to tap into valuable resources. This user-friendly virtual assistant, with its comprehensive and up-to-date data, strengthens the connection between government initiatives and the people they are intended to serve. MegaBot not only simplifies the process of understanding and accessing loans and insurance schemes but also fosters informed decision-making, ultimately contributing to economic growth and prosperity.

REFERENCES

- [1]. V. V. Kumar et al , “On Chatbots for E-Government: Opportunities and Challenges”.In International Conference on Advances in Computing, Communications and Informatics (ICACCI) (pp. 798-804).
- [2]. Dale, R.“The return of the chatbots”. Nat. Lang. Eng. 22, 811–817 (2016)
- [3]. Følstad, A., Brandtzaeg, P.B.“ Chatbots and the New World of HCI”. Interactions. 24, 38–42 (2017).
- [4]. Chen, Tzuhao, Mila Gasco-Hernandez, and Marc Esteve. ”The Adoption’ and Implementation of Artificial Intelligence Chatbots in Public Organizations: Evidence from US State Governments.” The American Review of Public Administration (2023): 02750740231200522.
- [5]. TAN, Lai Hing. ”Consumer reaction to the use of artificial intelligence chatbot on distribution of general insurance in Singapore.” (2023).
- [6]. Momaya, Mihir, et al. ”Krushi–the farmer chatbot.” 2021 International Conference on Communication information and Computing Technology (ICCICT). IEEE, 2021.
- [7]. Apriyanti, Rizma Drajad Siti, et al. ”FANCY (FINANCIAL TECHNOLOGY): CHATBOT-BASED DIGITAL FINANCIAL LITERACY INNOVATION AS A DISABILITY-FRIENDLY EDUCATION EFFORT.” EXTENDED ABSTRACT e-BOOK (2023): 75.
- [8]. LOAN, PROFFERSPECIFICS ON. ”LOAN PAL–A CHATBOT TO PROFFERSPECIFICS ON LOAN SCHEMES.”
- [9]. SHWETHA SINGH,YI-CHENG CHEN,XIN-LUO.”THE ROLE OF QUALITY,TRUST AND EMPOWERMENT IN EXPLAINING SATISFACTION AND USE OF CHATBOTS IN E-GOVERNMENT”.

- [10]. Yannis Charalabidis, Nikos Karacapilidis, Aggeliki Androusoyopoulou. "Chatbots for E-Government: A Review of the Literature and Research Agenda".
- [11]. Okuda, Takuma, and Sanae Shoda. "AI-based chatbot service for financial industry." *Fujitsu Scientific and Technical Journal* 54.2 (2018): 4-8
- [12]. Khurana, Diksha, et al. "Natural language processing: State of the art, current trends and challenges." *Multimedia tools and applications* 82.3 (2023): 3713-3744.
- [13]. Regin, R., S. Suman Rajest, and T. Shynu. "An automated conversation system using natural language processing (nlp) chatbot in python." *Central Asian Journal of Medical and Natural Science* 3.4 (2022): 314336.