Effective Back Channel Response to User Queries using Banking Bot Artificial Intelligent System

M. Senthamil Selvi, A. Kayalvizhi, C. Premalatha

Abstract: *The banking bot project is to create an Intelligent machine for banks to read the users queries and respond at a faster rate. The aim of the project is to develop a system for banks where users/ customers can ask any bank related questions like loan, services, account, schemes, policy etc. The application will be developed for web users. The machine recognizes the queries and answers appropriately. Even if the user does not frame sentence properly, system will understands the query and answer accordingly based on the frequent matching datasets. There is no specific format to follow for the user to ask questions. This project helps to create a user friendly Artificial Intelligent system to resolve user's basic queries.*

Keywords: Banking Bot, Web users, Artificial Intelligence System

I. INTRODUCTION

Banks play an important role in modern economic world. In our daily basis we are in need to access banks for its schemes and services. People who are less prone to mobile phones do not know the services that are offered in banks struggle to know the basic process requires completing their work done. Currently banks have their own web-sites, mobile applications and facilities like internet banking, mobile banking but sometimes, these sources can be a bit overwhelming for most of the users who are either not well versed with technology or in some cases where the information is too scattered to search for easily. Banks provide services like Net Banking facility, Mobile Apps for the customers to carry their work from the place they reside. This project is actually designed to help the users who are not used to mobile phone usage. By using this Bot all the basic questions will be answered by it, hence reducing the long waiting queue and time. Hence we can prevent the wastage of Manpower for inquiry in banks.

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Chat bots are smart and intelligent machines that understand user's natural language queries and respond accordingly in a voice and in text message. In banks, at customer care centers the availability of human is insufficient and hence take a long time to process a single request. In the proposed system the customer will be interacting with the bot rather than a real person and hence the user queries are addresses and resolved at a faster rate.

II. RELATED WORK

The Chat bots are developed by training the system based on the pre-compiled knowledge. The system once trained will be able to retrieve the data from the dataset using frequent pattern matching algorithm. The Intelligent system is associated with activities like human thinking, decision making, and problem solving process. The main advantage was that AI machines are increasing rapidly by providing better solutions.

A reference to the intelligent chat bot which used to give information or answers to any question asked by user related to bank has been made in [2]. In this paper the chat bot receives input/queries from the customer either in Text or Voice format and process it and produces results in a more accurate way.

In paper [3] a chat bot is created to resolve the problems faced by the users in banks at the enquiry section. This paper dataset is created based on Frequently Asked Questions in Banks. Various classification algorithms have been used to improve the efficiency and faster response time for getting the reply. Algorithms are tested for cross-validation score and recall score, Comparison with classification algorithms was made and finally feedback from Random Forest classifier and Support Vector Machine classifier were taken as more accurate algorithms.

A chat bot system demonstrating Intelligent Behavior using NLP has been made in this paper [4]. This paper focus on identifying the percentage of fake news spread across social media in day to day basics. Bot score has been computed using the Bot meter service. Bot meter then evaluates the similarity index of data spread by bots from websites, articles and tweets which are vulnerable to the individuals and to the society.

In paper [5] a survey of various chat bot implementation is taken into consideration and the performance and working of different chat bots is analyzed. A comparison from the first chat bot ELIZA to the latest ALEXA has been made.

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Chat bot are considered as a intelligent personal assistants also called as virtual assistants on mobile devices. The developed machine uses Artificial Intelligence Machine Language as a source to store set of user queries. It ensures the correctness of both patterns matching of user input and chat bot response. The result is a well performing fully functional AIML interpreter tailored around AIML 1.0 specification. A chat bot is software that is used to interact between a computer and a human in natural language. The implemented chat bot suffers from limited language support options and hence this limitation will be overcome in the future chat bots.

III. PROPOSED SYSTEM

The proposed system will help the user by answering the bank related queries. User does not have to follow standard format while asking any queries. System will answer to the query of the user as if real person is answering to the query. The built in artificial intelligence system will realize users requirements and provide suitable answers to the user. System uses a graphical representation of a person speaking while giving answers as a real person would. First system will take input from user either in text or voice format. If the input is in voice format then it will converted to the text format. If the input is in text format then it will be considered as it is Received queries using the response generation module, which makes use of a data repository Search in Database appropriate answer.

The modules for chat bot creation is as follows:

A. Effective GUI Module

The user can easily handle the system and also user get fillings like they are talking with another person. Languages like HTML, CSS and JavaScript were used in creating the GUI screen with navigation options. The UI has two entry screens for chatting – Text based chat and Voice based chat, where user can slide over according to their convenience.

B. Text-to-Text Module

The text-to-text module part accepts the input in text format and processes them to reply back to the user. In this module, the input gets processed as question-answer system depending on matching types, such as simple statements. It concentrates on the best match to build a sensible default answer. An artificial technology is new as well as it will help us to create very interactive system.

C. Speech-to-Text Module

The module works based on the concept of speech analysis. Speech analysis is done in three stages:

1. **Voice recognition and conversion to text**
2. **Text processing**
3. **Response and action taking**

If the user uses voice input format then this module convert voice to text format and then it will pass to the query interpreter will interpret the input query, the meaningful word of question we take from question processing module and it will be send to server then server will match the appropriate patterns from repositories and after the matching the answer will be send to the user into proper format.

IV. WORKING PRINCIPLE

A chat bot is computer program /intelligent machine that represents human conversation either in voice or text message. By deploying/ developing datasets from the most frequent questions asked in the enquiry section of banks it allows computers to learn by them without programming natural language processing. The figure given below shows the Process Flow Diagram in a chat bot, where the INPUT is received from the source and fed into the Process block. In the process block the user request is processed using NLP and compared with he datasets using frequent pattern matching algorithm. The best match is found and reply is made to the user in the form of aText message.

A chat bot is developed as a standalone machine for query processing. User can ask their questions in their own language and they can also ask their queries in any random order. There is no specific format in asking queries it can be in any order, the system is developed in such a way that it can understand the queries using NLP and compares with the dataset and respond based on the knowledge database available to it at that point in time. The system will train automatically from the interactions as well as from future interactions.
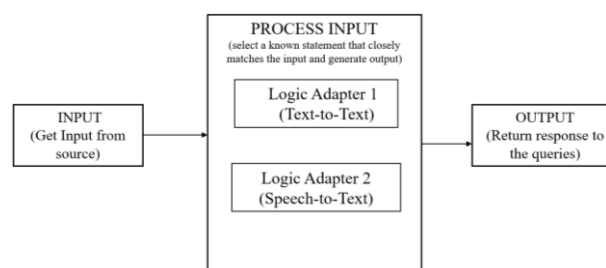

Fig. 1.Process Flow Diagram in a chat bot

V. IMPLEMENTATION METHODS

Chat bot creation includes the following operations:
A. Training a Chat bot
B. Implementation Methods
C. Chat bot Learning on live

A. Training a chat bot:

Training a chat bot is the major part in creation of a chat bot. The system is first trained with the most frequently asked queries at the customer care section/enquiry section at banks. Later based on the user interactions the system automatically trains itself from the current as well as the future conversations also. The machine performs exact pattern matching algorithm technique to provide exact answer to the user queries.

B. Implementation Methods

Chat bot implementation involves the following operations:

1. Pattern Matches:

Pattern matching technique is used by the Bots to find exact matching of datasets to be searched. Hence it uses Artificial Intelligence Markup Language method is used in pattern matching for retrieving relevant response for user queries.

2. Natural Language Understanding (NLU):

Entities: This essentially represents an idea to your chat bot.

Context: Provide response to the queries asked by the users when data is matched with the dataset. This implies that, if it gets a response to a question it has been recently asked, it won't recall the inquiry.

Expectations: Ensuring the relevant delivery of data for the customer inquiry

3. Chat bot learning on Live:

Once the chat bot is created and start interacting with customer in live, feedback loops can be implemented. During the conversation when users ask any query, the bot try to give a couple of answers for the same question. In this way the system try to learn themselves on live based on the frequent data or pattern matching method. Hence the system gets trained by itself based on conversation. Hence once the system gets trained it will provide accurate results.

In spite of all the advantages, the bot should be created in such a way that model should not change / confuse when the users are not driving the bot in right direction. Creating and deploying a highly trained chat bot is essential as it is used to resolve the bank related queries which leads in developing customer relationship in banks.
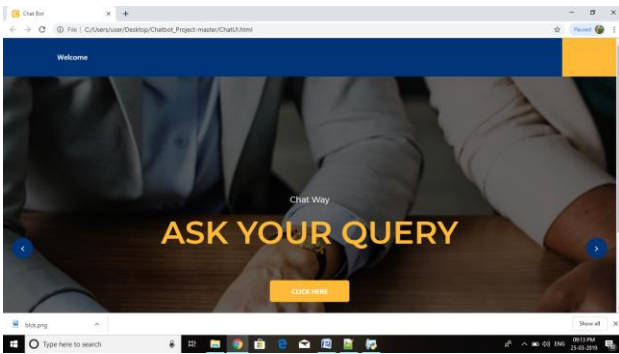
VI. SCREENSHOTS AND RESULTS

Fig. 2. UI option for Voice Chat

In Fig. 2 the user is asked to put forth their questions using Voice Chat
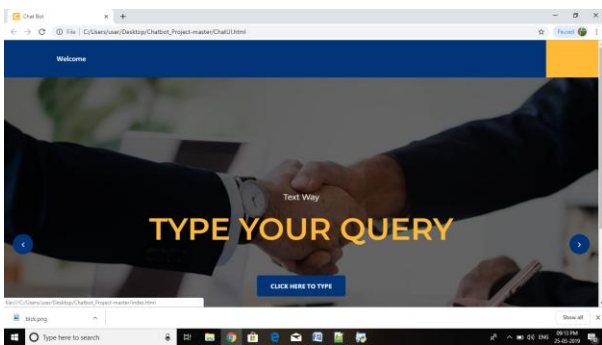

Fig. 3. UI option for Text Chat

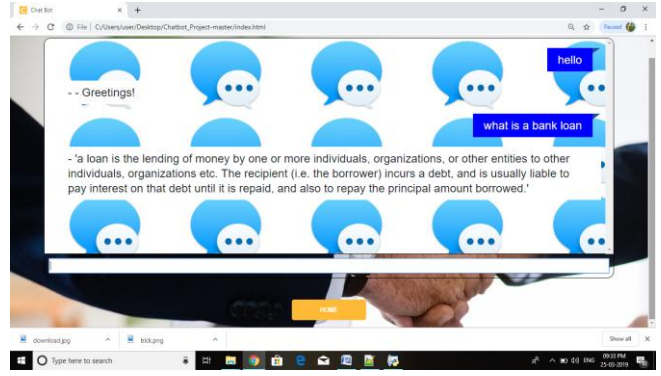The above figure debits the user interface screen for Text Chat

Fig. 3. Text based Chat

In Fig. 3. The Chat Bot responds to the user queries in Text manner as shown above
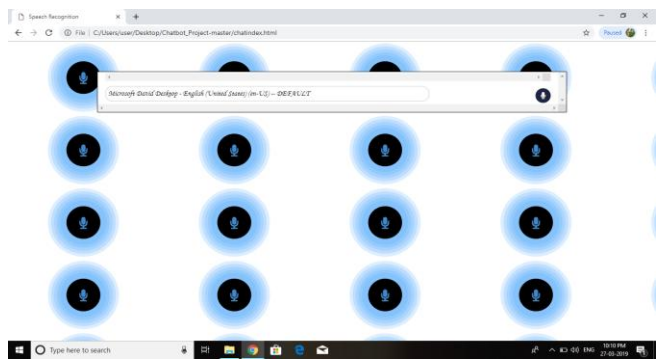

Fig. 5. Voice Based Chat

In Fig. 5. The Chat Bot responds to the user queries in Voice manner as shown in the given figure.
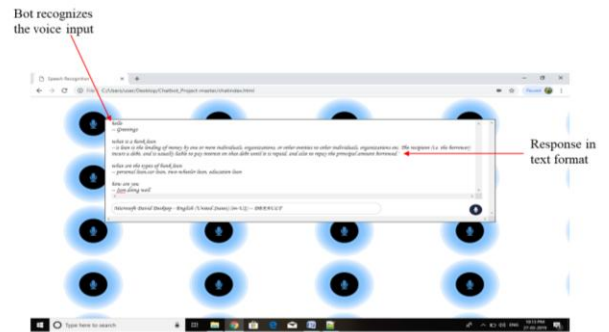

Fig. 6. Request and Response of Voice Chat

In Fig. 6. The bot recognizes the voice input and responds in text format

VII. CONCLUSION AND FUTURE SCOPE

Due to greater increase in customer requirements and customer expectation and evolution of new technologies like Artificial Intelligence, Deep Learning and Machine Learning etc leads to development of chatbots in banking sector.

Effective Back Channel Response to User Queries using Banking Bot Artificial Intelligent System

The proposed system support banks by developing an Intelligent and a smart machine called the banking bot. Though banks provide various online facilities like Internet Banking and Mobile Apps, the customers can resolve their queries from their place of work. Despite of providing online banking access facility, people who are not used to mobile phones or people who are unaware of using internet facilities move to bank for their queries to get resolved.

By taking all these issues and feedbacks under consideration, a smart intelligent banking bot has been created and deployed in banks. These bots helps to improve customer service by itself thereby increasing not just the quality of customer service but also reducing human load, increase in productivity.

The future enhancement of banking chat bot is to implement Speech-to-speech conversation. The Chat bot that provides retail banking customers their credit score, enable them to set and manage their budgets, and notify them about transactions.

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