An Intelligent Business Automation with Conversational Web Based Build Operate Transfer (BOT)

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Abstract

The field of AI chatbots with voice help capabilities has seen significant advancements recently because to the usage of NLP (Natural Language Processing), NLG (Natural Language Generation), and (DNN) Deep Neural Networks. Using the expanding skills of chatbots, which are assisted by AI and ML technologies, a variety of business challenges may be handled. Profitability is one of the most crucial features of a business. This is only achievable if top-level management is aware of the company's costs, revenues, and human resource performance. In this case, an AI-powered chatbot with voice help may be utilised to evaluate corporate data and provide a report. The Bot knows the meaning of words and responds to them thanks to the wordnet in the corpus. Corpus is basically a dictionary for ChatBot. Top management may ask the Bot anything, and the Bot will quickly undertake exploratory data analysis and create a report. The Bot first understands the data using feature selection and then performs exploratory data analysis. After the EDA technique, Bot activates the voice recognition mode to understand the question and give answers. The Bot can use a male or female voice (depending on the developer). Then BOT provides a data table and visualisations for better understanding.

1. Introduction

A piece of computer software that can mimic human discussions is known as a virtual chatbot. Online consumers may now get enhanced rich site summaries (RSS) feeds and skilled content processing tools. Text-based web bots can be connected to serve as an informational resource and a source of entertainment. Chatbots are conversational agents that let users communicate in natural language to get information and services. Particularly on mobile platforms, artificial intelligence (A.I.) is becoming more and more popular for emulating human-bot conversation. [1]. Large and small organisations may concentrate on more important tasks while using the capability of the Bot to swiftly analyse their interactions. Top-level management typically asks their subordinates for information when they need to know about specific product or service data. As a result of their associates' frequent requests for a few hours or even days, this process takes a lengthy time. The researcher's objective in the field of human-computer interaction is to improve human-computer voice interaction in order to mimic human-human speech contact because speech is one of the most effective forms of human communication. [2]. But what if management has to make quick judgments about branding or capturing a big market share as the competition grows? Speech recognition will work similarly to Alexa or Google in this case, and they will have access to this voice chatbot to

provide insights into a specific product or even the operations of the company, such as the most popular product in a specific region, the highest-paid employee, or even the KPIs (Key Processing Indicators) to track the employees' performance in real-time, because BOT is directly connected to the company's database and is programmed to analyse fresh data. The BOT is able to provide better and more educated insights. Companies should also have a cloud connection so that the Bot may operate 24 hours a day, seven days a week. When someone requests a certain insight, this Bot may display the data table with visualisation at any time, even at midnight. BOT aids in improving functioning, enhancing the company's efficiency and effectiveness, and BOT will also aid in the organization's growth in a variety of ways. BOT uses artificial intelligence (AI) processes to analyse and sort data in order to gain a better knowledge of the user. BOT also aids in the reduction of duplication of effort and needless mobility within the company. Finally, BOT aids in the achievement of organisational objectives in a more effective and efficient manner. e chatbot will be accessible via portable mobile devices or PCs that students may use from anywhere on campus at any time, giving a 24-hour online service [3]. By creating and gaining access to sophisticated software and devices known as intelligent agents that are capable of carrying out a range of activities, artificial intelligence (A.I.) has changed how we go about our daily lives. [4]. Speech offers potential as a human-computer interaction modality, thanks to significant improvements in artificial intelligence, particularly natural language processing [5]. A similar situation occurred at a university, and in order to address the issues, they created a chatbot that assists in analysing the amount spent on various items. This voice-based A.I. chatbot can also work in this manner, as the ultimate aim is to raise earnings while lowering expenses in order to meet the final goal.

2. Related Works

An intelligent speech recognition chatbot's design and development are discussed in this study. A technological demonstration is provided in the study to assess a suggested framework for allowing such a bot (a web service). All clients can communicate with the server from any platform while using a black box strategy since the web service controls the communication structure to and from the web service. The service may be accessible through a unique interface that enhances its lifespan and enables quick XML processing. The web-based bot uses an artificial brain to include personalized user answers that are catered to the intended character. When an online intelligent research assistant responds to a question that the bot doesn't understand, the response is kept and used to improve the artificial intelligence's capacity to generate responses in the future. [6].

 The human race is increasingly reliant on technological advancements to address problems in a world where people's needs for comfort are expanding. Home automation systems have gained popularity in recent years. In the paper that follows, we demonstrate a home automation system that effectively integrates machine learning, natural language processing, and the internet of things. This system's primary feature is that it provides users with both text and voice communication choices. A voice assistant will give the user's vocal input, whereas a chatbot application will supply the user's text input. The action that the user wants the computer to execute will be ascertained through the use of natural language processing. The Internet of Things Raspberry Pi component would carry out actions like turning on or off lights and fans in a homeroom. [7].

We can hardly avoid AI-based chatbots because they are used to book hotel rooms, confirm pizza orders, schedule meetings, and much more. It's crucial to comprehend how these chatbots work and what characteristics they have in order to grow a business, increase customer satisfaction, and save time and money for both customers and staff. Chatbots are frequently used for amusement, customer support, and advertising. In this project, an effort was made to provide users with a platform where they could ask questions and obtain information from Google on a certain issue, which was then expressed in different audio or textual messages. Currently, available chatbots (like Alexa and Siri) do not learn from and enhance their dataset in response to individual user queries. Due to the limited dataset, the chatbot occasionally cannot react to particular inquiries. The end effect is that the users get irate. The objective of this project was to develop a chatbot that can respond to unanswerable inquiries and keep both the

query and the response in a dataset. To make the process more effective and to help the user solve problems, BOT will be able to react to the question if it is asked in the future. The pattern-matching algorithms used by earlier chatbots were quite simple. In this work, concepts from artificial intelligence and machine learning were used. Later in the paper, we delved into further detail on the applications of chatbots before drawing a conclusion to wrap up the research. [8]

3. Proposed Method

The system architecture consists of three components: 1. Client, 2. Server,3. Content. When the client demands from the server. The server runs the codes and generates content. The BOT is made using a white box approach meaning that the working and infrastructure are known to the client as the client will ask questions in the server and the bot responds by giving graphs and data tables.
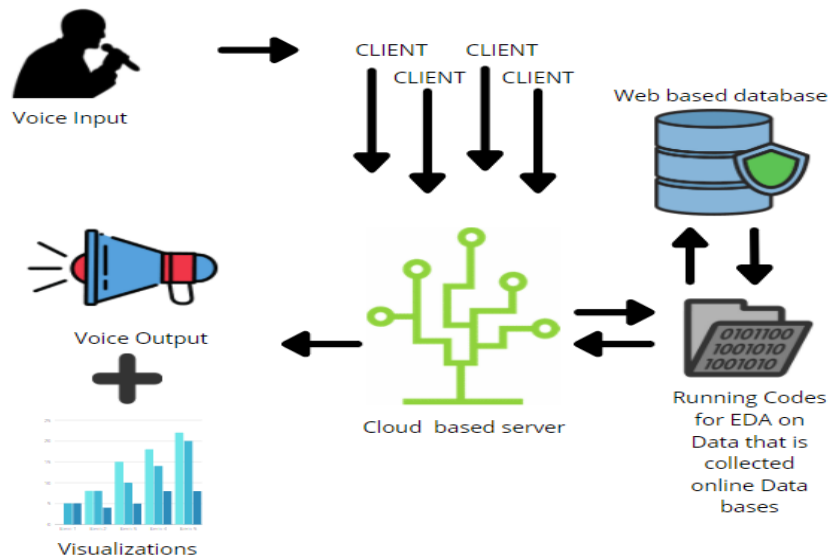

Fig 1 Voice Recognition System Architecture of the Build operate transfer (BOT)

The system structure can be understood by observing Fig 1. The user is giving an input command to the client. The client is contacting the server to get the information. Then, the server is running the web-based codes. The codes are making changes in the data to give better insights to the user. Then the responses are sent back to the server and the server is giving a response through voice plus BOT will show a few visualizations.
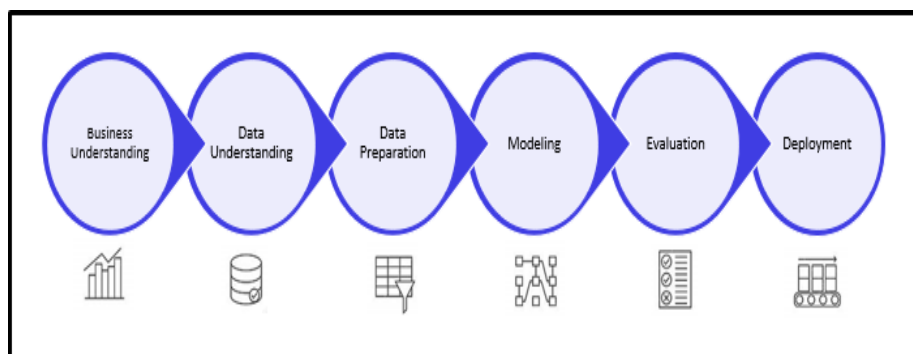

Fig 2 Exploratory Data Analysis Architecture of the BOT

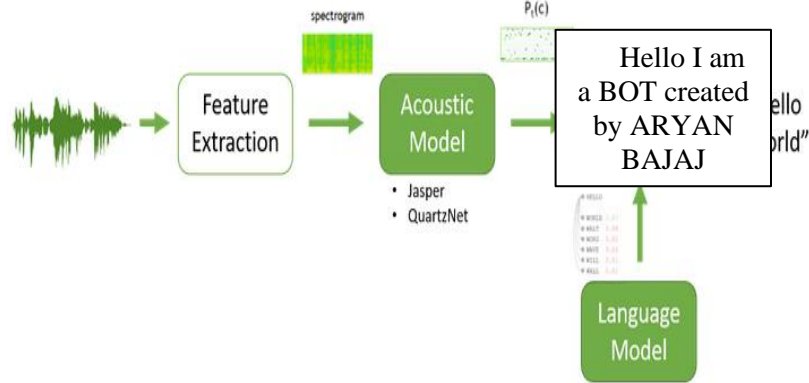In fig 2, This can be observed how a Bot functions Exploratory Data Analysis technique.

Fig 3 Voice Recognition Process of BOT

In figure 3, can be observed how a Bot functions voice recognition technique.

4. System specification

The system presented in this paper meets the following specifications (1) the Bot understands voice and stores the voice in plain text (2) the Bot understands a few words that occurred in the sentences to give a response (3) the Bot uses a white box theory (4) Bot allows user to get any information that is stored in the company's cloud-based servers

5. System Implementation

The data was taken from an internal database of a major Indian Analytical Solutions firm. The raw extracted dataset contains data on all employees and their salaries in the last three years. The dataset was unbalanced in terms of the response variable, which necessitated balancing whenever possible. The data had different variables like department, salary, Employee ID, Name, and Hiring Date. A few variables were calculated like monthly salary. Then for making the analysis easy this voice recognition bot was made to show visuals and give data tables.

6. Results and Discussion

The main language used to develop this is python3 and MySQL language to connect the database. There are numerous libraries used to develop this voice chatbot. The bot is functioning in such a way that, first BOT understands the data and then analyzes the data using the Exploratory Data Analysis technique, like
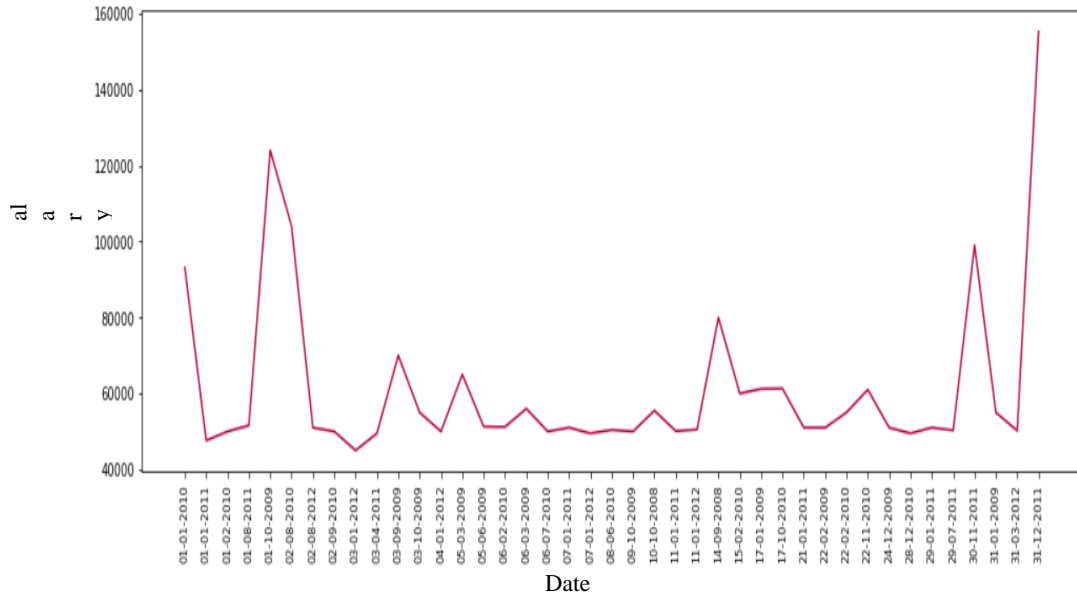
Fig 4 Date of Hiring and Annual Salaries

Figure 4 is all about the hiring date of employees and their annual salaries. When the question is asked like 'show me the annual salary with the hiring date', the bot will understand the keyword like annual salary and hiring date and then show this graph.
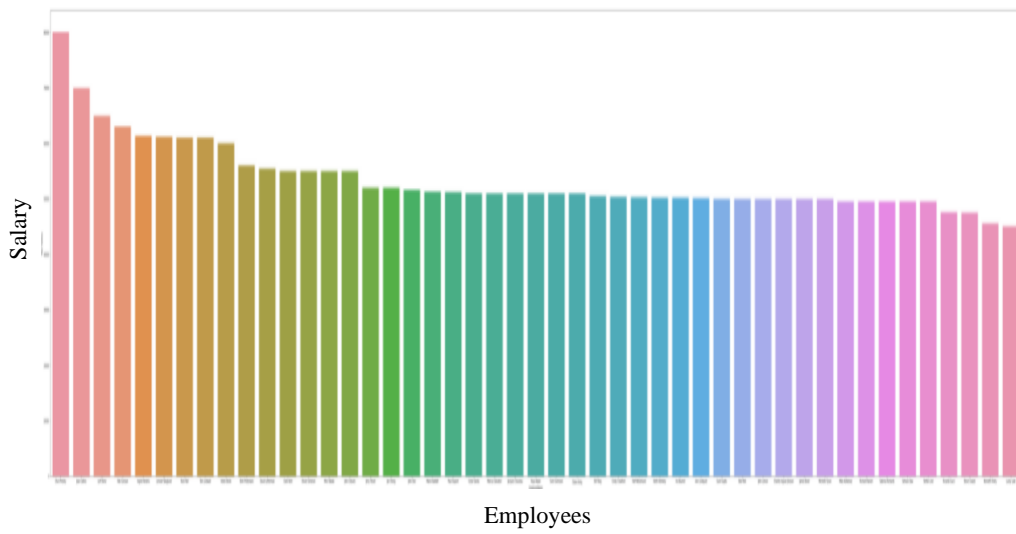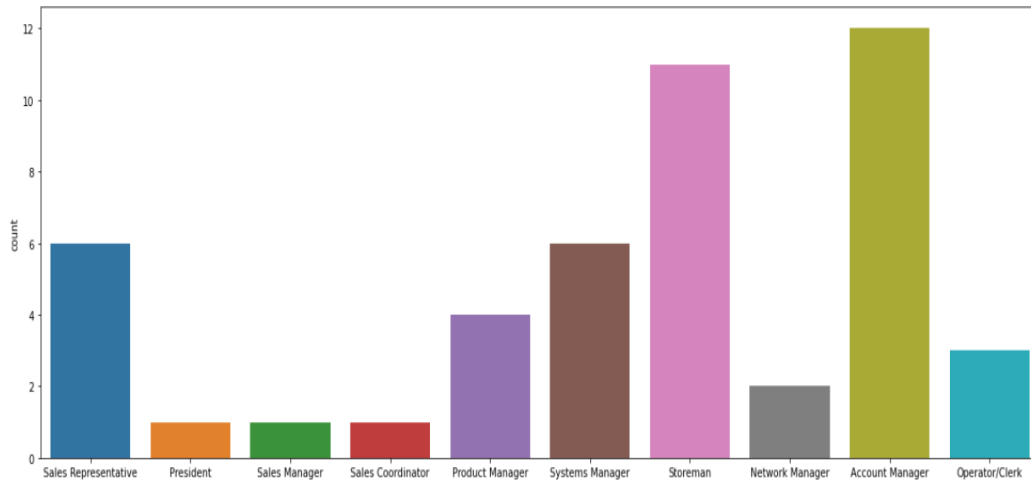

Fig 5 Highest paying employees

Fig 6 Organization Department list

Figures 5 and 6 show the highest paid employees in the company. By this, one can interpret which department has the highest paid employees by this the need for human resources can be understood. And if there is a need more resources can be hired to improve efficiency. Fig 7 shows the working of Voice Assistance after understanding and analyzing data (i.e., after the EDA process).

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Loading your AI personal assistant Rama Kant
GOOD AFTERNOON 😊
Listening...
user said:Aryan

#####################
Welcome Mr. aryan
#####################
Listening...
user said:what can you do

For Example : Say tell me the Highest Paid Employees
Listening...
user said:tell me the highest paid employees

Would you like to see it the basis of Yearly distribution or Monthly ?
Listening...
```

Fig 7 Functioning of Voice Recognition Feature

7. Conclusion

From the above research, one can conclude that there are a lot of uses for the Voice Recognition Chat Bot than the normal Chat Bot. As BOT can increase the efficiency of the organization or in other words BOT can be a boost to the company. There are a lot of future aspects for this Voice Recognition Chat Bot like a few more languages that can be included for a better GUI (Graphic User Interface) like Java and React.js, etc. Then a webpage can be built using HTML for login as the access can be restricted for different departments and only a few people in the top-level management can have full access for security purposes. If used this Bot efficiently and effectively no one can stop the company to grow and achieve its organizational goals much faster than expected.

8. References

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