

## **ARTIFICIAL INTELLIGENCE BASED CHATBOT**

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### **ABSTRACT**

*A chatbot is emerged as an effective tool to address the user queries in automated, most appropriate and accurate way. Depending upon the complexity of the subject domain, researchers are employing variety of soft-computing techniques to make the chatbot user friendly. It is observed that chatbots have flooded the globe with wide range of services including ordering foods, suggesting products, advising for insurance policies, providing customer support, giving financial assistance, schedule meetings etc. However, public administration-based services wherein chatbot intervention influence the most, is not explored yet. This project discusses about artificial intelligence based chatbots including their applications, challenges, architecture and models. It also talks about evolution of chatbots starting from Turing Test and Rule-based chatbots to advanced Artificial Intelligence based Chatbots. AI-Chatbots are providing much kind of services, which this project outlines into two main aspects including customer based services and public administration based services. The purpose of this survey is to understand and explore the possibility of customer & public administration services based chatbot. The survey demonstrates that there exists an immense potential in the AI assisted chatbot system for providing customer services and providing better governance in public administration services. And even among the AI assisted chatbots conversational interfaces have been a trending topic in recent years. As of the last decade, CIs have emerged with the aim of simplifying human-machine interactions and found a wide use case in the market. For example, Siri and Google Assistant are some of the most well-known CIs developed by the tech giants Apple and Google. The digital landscape has evolved from web, to mobile apps, to recently CIs. Nowadays, CIs, in particular chatbots and voicebots, are becoming increasingly common. Whether navigating the web or messaging on a phone, it is likely that CIs have been confronted offering the user help. However, CIs have not managed to reach a large-scale use. Furthermore, the reasons regarding the challenges faced by CIs as well as their usability are not greatly explored. Here in our project we combine the features of an AI chatbot with the conversational interface to provide services to people in public and customer based services.*

### **INTRODUCTION**

Ever since the rise over the internet, it has influenced the way humans communicate. Instead of locally conversing with a small group of people, the internet provided us with the possibility to reach out to a much greater number of people on a global scale. Starting two decades ago, social media has played an important role in changing the way people communicate (Mihailidis, 2014). However, since the last two years, social networks are losing terrain while messenger applications flourish. The number of monthly active users of the four largest messenger applications surpassed the four largest social networks recently (Statista, 2017). In the last few years, people shifted from social broadcasting to a more personal variant: social messaging. This trend is not limited to social interactions but can be extended to customer behavior as well. Consumers want access to personalized information on demand, preferably 24/7, and in any language. This trend has strengthened due to the recent advancements in machines, especially in artificial intelligence and mobile internet. As businesses acknowledge the urge to adapt to this trend, a rising number of early adopters consider deploying text-based conversational agents (McTear, Callejas, & Griol, 2016, pp. 51–72), also called chatbots, as a method of communicating with its customers (Van Eeuwen, 2017).

This paper attempts to contribute to overcoming these challenges by proposing a novel approach for the advanced exploitation of chatbots in the public sector towards addressing a crucial issue: the improvement of the communication between government and citizens. It enables the development of a new, ‘richer’, more expressive and intelligent digital channel of communication between citizens and government, in everyday natural language, for both information seeking and transactions conducting purposes; this new digital channel will be appropriate for a wider range of citizens' interactions, with higher levels of complexity, ambiguity and uncertainty, than the existing digital channels (see section 2.1).

### **LITERATURE SURVEY**

Now a days many people have queries regarding various topics to which answers had to be provided manually by people. This takes up a lot of time and requires a lot of manpower which in turn increases the cost. In order to make this process fast and efficient these questions can be stored and answered by using the latest AI technologies where answers can be generated

according to the date provided previously.

In literature survey many approaches have been made by various researchers to build a conversational AI Based Chatbot through various approaches such as supervised and unsupervised. As time progressed various new algorithms have been applied and various models have been developed. With the analysis of various models and algorithms, past researchers have found many problems regarding conversational AI chatbot.

According to AM Rahman, Abdullah Al Mamun, Alma Islam chatbots require vast logic and linguistic resources which are input, output and entities phrases. Chatbot with complex queries handling need high attention in using singular and plural forms, need to take care of synonyms, hyponyms, and finally, the sentimental analysis should be done carefully. According to Alamira Jouman Hajjar the basic issues of conversational chatbots are

- ✓ They do not use the exact same words as in the frequently asked question
- ✓ This can stop them from finding the right answers if the website uses simple search functions.
- ✓ Their question may involve a combination of questions which can result in a lengthy answer
- ✓ The FAQ section may not be mobile friendly
- ✓ They may just not like using FAQs and prefer a chat-like interface.

We handle these problems by using NLP capabilities and providing answers in an intuitive chat interface. According to the business needs the developers can choose from 3 types of chatbots which are Rule-based, AI/NLP, Hybrids.

### DESIGN

The purpose of the design phase is to plan a solution of the problem specified by the requirement document. This phase is the first step in moving from problem domain to the solution domain. The design of a system is perhaps the most critical factor affecting the quality of the software, and has a major impact on the later phases, particularly testing and maintenance. The output of this phase is the design document. The design document is similar to a blue print or plan for the solution, and is used for later during implementation, testing and maintenance. The design activity is often divided into two separate phases: system design and detailed design. System design, which is sometimes also called top-level design, aims to identify the modules that should be in the system, the specifications of these modules, and how they interact with each other to produce the desired results. At the end of system design all the major data structures, file formats, output formats, as well as the major modules in the system and their specifications are decided. A design methodology is a systematic approach to creating a design by application of a set of techniques and guidelines. Most methodologies focus on system design. The two basic principles used in any design methodology are problem partitioning and abstraction. A large system cannot be handled as a whole, and so for design it is partitioned into smaller systems. Abstraction is a concept related to problem partitioning. When partitioning is used during design, the design activity focuses on one part of the system at a time. Since the part being designed interacts with other parts of the system, a clear understanding of the interaction is essential for properly designing the part. For this, abstraction is used.

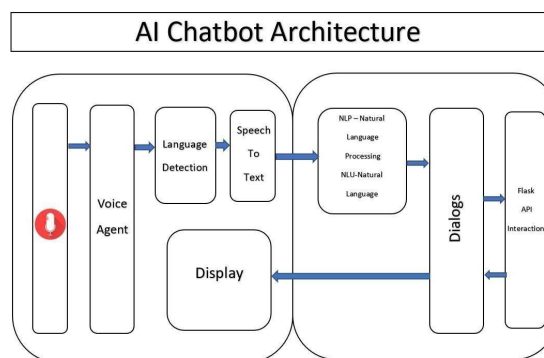


Fig: Architecture of Ai Chatbot

The architecture of the project is described as , the user has the predefined dataset which contains some of the questions are their corresponding answers. Later python libraries are imported for the dataset. The libraries include NumPy, pandas, sklearn. Pandas is an open-source, Python library providing high-performance, easy-to-use data structures and data analysis tools for the Python programming language. Python with Pandas is used in a wide range of fields including academic and commercial domains including finance, economics, Statistics, analytics, etc.

NumPy, which stands for Numerical Python, is a library consisting of multidimensional arrayobjects and a collection of routines for processing those arrays. Using NumPy, mathematical and logical operations on arrays can be performed. This tutorial explains the basics of NumPy such as its architecture and environment. It also discusses the various array functions, types of indexing, etc.

## RESULTS

This chapter is about explaining the outputs of the project

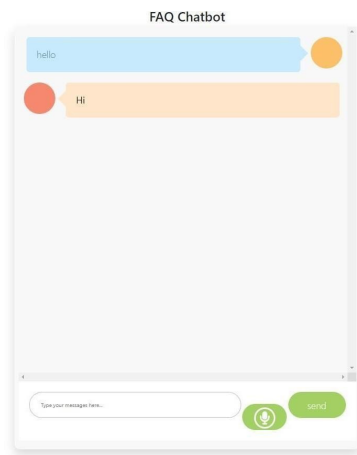


Fig 8.1 Test Case 1

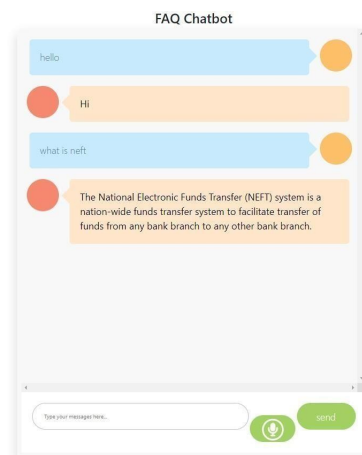


Fig 8.2 Test Case 2

Actual Output:

**Input:** What is neft

**Expected Output:** The National Electronic Funds Transfer (NEFT) system is a nation-wide funds transfer system to facilitate transfer of funds from any bank branch to any other bank branch.

## CONCLUSION

Chatbot are programs that mimic human conversation. It is designed to be the ultimate virtual assistant. Chatbot and specifically FAQ Chatbot has become more popular in business groups right now as they can reduce customer service cost and handles multiple users at a time. In this project we provide the design of a FAQ chatbot, which provides an efficient and accurate answer for any query based on the dataset of FAQs. We looked into the best approach to develop a simple Chatbot. The proposed method is one of the simple and automated solutions to transport data from a computer without having to think for proper keywords to look up in a search or browse several web pages to collect information, it allows organizations to handle many customers at once, and simultaneously. AI chatbot allows to assist customers regarding their query's either through voice or chat the ability to handle multiple datasets simultaneously allows it to be one of a kind. The proposed method can help major companies in helping there customers by solving query's in an effortless way.

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