# *Chatbot System for Healthcare using Artificial Intelligence*

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*Abstract: ChatBot can be described as software that can chat with people using artificial intelligence. These software are used to perform tasks such as quickly responding to users, informing them, helping to purchase products and providing better service to customers. In this paper, we present the general working principle and the basic concepts of artificial intelligence based chatbots and related concepts as well as their applications in various sectors such as telecommunication, banking, health, customer call centers and e-commerce. Additionally, the results of an example chatbot for donation service developed for telecommunication service provider are presented using the proposed architecture. We are using it for educational purpose to solve the quires of users. Chatbots are programs that mimic human conversation using Artificial Intelligence (AI). It is designed to be the ultimate virtual assistant, entertainment purpose, helping one to complete tasks ranging from answering questions, getting driving directions, turning up the thermostat in smart home, to playing one's favourite tunes etc. Chatbot has become more popular in business groups right now as they can reduce customer service cost and handles multiple users at a time. But yet to accomplish many tasks there is need to make chatbots as efficient as possible. in this system we provide the design of a chatbot, which provides an efficient and accurate answer for any query based on the dataset of FAQs using Artificial Intelligence Markup Language (AIML) and Latent Semantic Analysis (LSA). Template based and general questions like welcome/ greetings and general questions will be responded using AIML and other service based questions uses LSA to provide responses at any time that will serve user satisfaction.*

*Keywords: Chatbot, Text to Speech, AI.*

## I.   INTRODUCTION

It was reported that 65% of the world's population live in countries where obesity and overweight kills more people than underweight. Obesity and overweight are the fifth leading risk for global deaths but obesity is preventable. Obese people are at increased risk of many serious health conditions compared to normal or healthy people. Obesity and overweight not only increase the risk of many chronic diseases, but exhibit some modest growth in US, UK, Canada, Italy, South Korea and Spain also. Eight out of the ten leading causes of death in Taiwan are associated with obesity. Obesity appears to be associated with increased cardiovascular mortality and increased mortality from certain types of cancer, but weight loss shows the improvement in many mortality risk factors.

The study objective was to develop a solution called "Smart Wireless Interactive Healthcare System" (SWITCHes) to facilitate data reception and transmission in a real-time manner to web server protected by encryption for further analysis of data extraction. SWITCHes is made up of two main components: an interactive web-based dashboard and a smartphone app. An artificial intelligence (AI)-powered health chatbot lives inside SWITCHes app. The SWITCHes-based clinical trial is set to be carried out after obtaining Institutional Review Board (IRB) approval. This paper presents an overview of development and implementation of SWITCHes. which is set to attain the goals of reducing the health care spending, allow the early detection, diagnosis as well as treatment, and improve clinical outcome. mHealth app can be viewed as a wide reaching approach, which can reach out to many more users who need the medical consultation or treatment throughout the rural or remote areas, if appropriately designed.

## II.   EXISTING SYSTEM OVERVIEW

Currently, one can make a chatbot of various types:

- One that follows a basic set of menu-driven tasks, but with user input in the form of text.
- One that attempts to have a natural conversation with the user.
- One that performs tasks based on user input and returns output of query.

The first type does not require any form of NLP as the input can be processed as in a regular C program. There are existing services that allows a way to implement this type of bots in a convenient user interface. The others require some form of NLP, which can be done in-house or outsourced from an existing service. One of a prominent option of latter is Dialog Flow (previously known as api.ai), now owned by Google. The SDKs contain voice recognition, natural language understanding, and text-to-speech. It offers a web interface to

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build and test conversation scenarios. Voice and conversational interfaces created with Dialog flow works with a wide range of devices including phones, wearable, cars, speakers and other smart devices. Dialog flow also includes an analytics tool that can measure the engagement or session metrics like usage patterns, latency issues, etc.

## III. PROPOSED SYSTEM OVERVIEW

In this project, our aim was to use existing advancements in creating advanced chatbots help to solve tasks in a hospital system. For this, we made a backend to the chatbot, which is connected with a database similar to one used in a hospital. The backend is responsible to use processed input from the chatbot and convert it into an action to be performed in the database. We will also use a web interface for the user to interact with the chatbot.

The following features are supported by the chatbot:

- Look up branches by location and get its contact details.
- Look up doctors by their specialty and also it can update the details of doctor.
- Book an appointment.
- Look up medicines and their availability in the hospital and if it is available then user or patient can order medicines.
- Look up food for patient and their availability in the canteen and if it is available then user or patient can ordered.
- User can view status ambulance is available or not and also the details of ambulance.
- User can chat with the bot regarding the query.

### WORKING

We are making a system with the help of artificial intelligence and machine learning, our system is based on the hospital managements, Each user has to login to the system to use it, we are providing a chatbot for hospitals which will perform operation like appointment booking, surgeon information, doctor presence etc. we making a smart system that will allows user to get overall information of hospital in finger tips. Through chatbots one can communicate with text or voice interface and get reply through artificial intelligence. Typically, a chatbot will communicate with a real person. Chat bots are used in applications such as ecommerce customer service, call centers and Internet gaming. Chatbots are programs built to automatically engage with received messages. Chatbots can be programmed to respond the same way each time, to respond differently to messages containing certain keywords and even to use machine learning to adapt their responses to fit the situation. A developing number of hospitals, nursing homes, and even private centers, presently utilize online Chatbots for human services on their sites. These bots connect with potential patients visiting the site, helping them discover specialists, booking their appointments, and getting them access to the correct treatment. In any case, the utilization of artificial intelligence in an industry where individuals' lives could be in question still starts misgivings in individuals. It brings up issues about whether the task mentioned above ought to be assigned to human staff. This healthcare chatbot system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions. It also helps to generate leads and automatically delivers the information of leads to sales. By asking the questions in series it helps patients by guiding what exactly he/she is looking for.
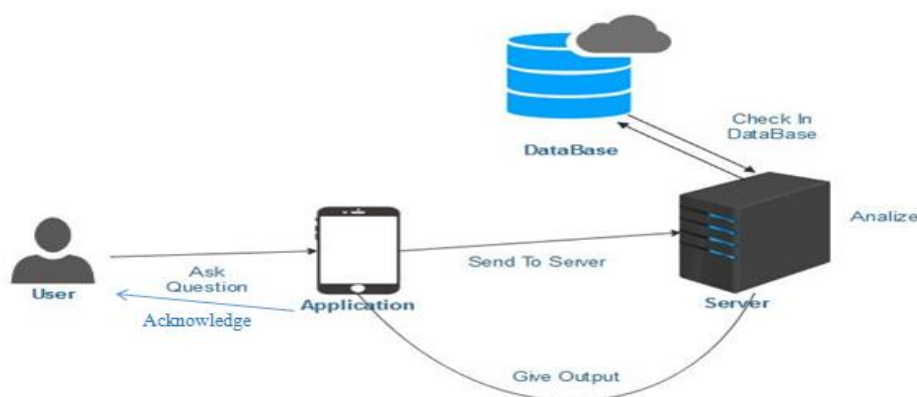
## IV. ARCHITECTURE



Fig. 1: Architecture Diagram

### BACKGROUND

The use of computers for answering textual questions goes back to the early 1960s, when systems implementing question answering algorithms were first built. In this section common paradigms used by computational systems for question answering as well as different types of dialog systems are presented. Finally, an introduction to industrial chatbots is given and the telecommunication chatbot, which is analysed in this work, is introduced.

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## A. *Question Answering Paradigms*

1) Information-retrieval-based Question Answering: Information-retrieval-based question answering systems aim to respond to users questions by finding short texts in a collection of documents available to the system e.g. the web, which contains possible answers to the proposed questions or a database. This paradigm strongly relies on information availability on the web (or in other systems) in form of a vast collection, which can be searched for the answer.

2) Knowledge-based Question Answering: Knowledge-based question answering systems (KB-QA) answer questions in natural language using a structured database. The database can be either a full relational database or a simpler database. For frequently asked questions, rule-based methods are convenient as simple rules can be written for questions that occur often. Systems using a rule-based method typically utilize a knowledge base consisting of facts and rules.
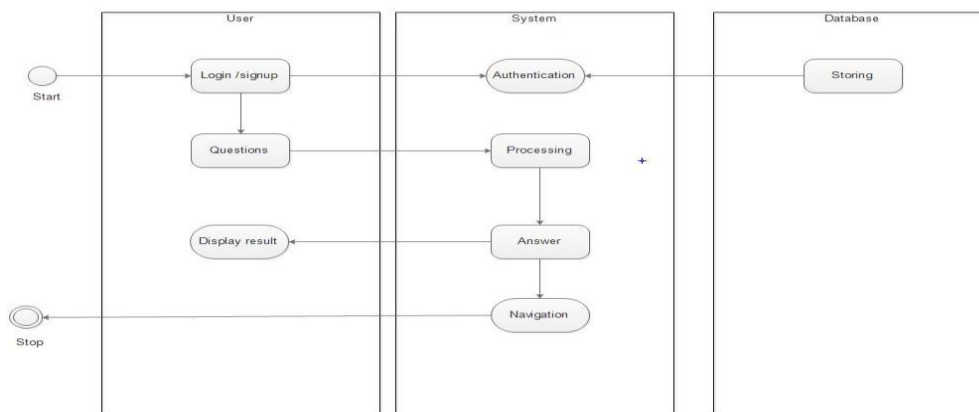


Fig. 2: Activity Diagram

## METHODOLOGIES

### A. AES

The entire document should be in Times New Roman or Times font family. Other font types may be used if needed for special purposes. The Advanced Encryption Standard (AES) is a symmetric block cipher chosen by the U.S. government to protect classified information. AES is implemented in software and hardware throughout the world to encrypt sensitive data. It is essential for government computer security, cyber security and electronic data protection. AES has been adopted by the U.S. government and is now used worldwide. It supersedes the Data Encryption Standard (DES), which was published in 1977. The algorithm described by AES is a symmetric-key algorithm, meaning the same key is used for both encrypting and decrypting the data. AES is based on a design principle known as a substitution–permutation network, and is efficient in both software and hardware. Unlike its predecessor DES, AES does not use a Feistel network. AES is a variant of Rijndael, with a fixed block size of 128 bits, and a key size of 128, 192, or 256 bits. By contrast, Rijndael per se is specified with block and key sizes that may be any multiple of 32 bits, with a minimum of 128 and a maximum of 256 bits.

### B. Hashing and mapping

A hash function is any function that can be used to map data of arbitrary size to fixed-size values. The values returned by a hash function are called hash values, hash codes, digests, or simply hashes. The values are used to index a fixed-size table called a hash table. Use of a hash function to index a hash table is called hashing or scatters storage addressing. A map is a symbolic depiction emphasizing relationships between elements of some space, such as objects, regions, or themes. Many maps are static, fixed to paper or some other durable medium, while others are dynamic or interactive. Although most commonly used to depict geography, maps may represent any space, real or fictional, without regard to context or scale, such as in brain mapping, DNA mapping, or computer network topology mapping. The space being mapped may be two dimensional, such as the surface of the earth, three dimensional, such as the interior of the earth, or even more abstract spaces of any dimension, such as arise in modeling phenomena having many independent variables.

## ADVANTAGES AND DISADVANTAGES

### Advantages
1. User friendly: Our system is easy to use and provided easy GUI for user.
2. Reliable: Reliability is a sub-discipline of system engineering that emphasizes dependability in the lifecycle management of a product. It describes the ability of a system or component to function under stated conditions for a specified period of time.
3. Scalable: Our system will not affect by external noise.
4. This healthcare chatbot system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions.
5. It saves time and money.
6. High performance.

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*Disadvantages*
1. It requires active internet connection.
2. Not all business can use chatbot system.

## V. RESULT

Through chatbots one can communicate with text or voice interface and get reply through artificial intelligence. Typically, a chat bot will communicate with a real person. Chat bots are used in applications such as ecommerce customer service, call centers and Internet gaming. Chatbots are programs built to automatically engage with received messages. Chatbots can be programmed to respond the same way each time, to respond differently to messages containing certain keywords and even to use machine learning to adapt their responses to fit the situation. A developing number of hospitals, nursing homes, and even private centers, presently utilize online Chatbots for human services on their sites. These bots connect with potential patients visiting the site, helping them discover specialists, booking their appointments, and getting them access to the correct treatment. In any case, the utilization of artificial intelligence in an industry where individuals' lives could be in question still starts misgivings in individuals. It brings up issues about whether the task mentioned above ought to be assigned to human staff. This healthcare chatbot system will help hospitals to provide healthcare support online 24 x 7, it answers deep as well as general questions. It also helps to generate leads and automatically delivers the information of leads to sales. By asking the questions in series it helps patients by guiding what exactly he/she is looking for.

### LIMITATIONS AND FUTURE SCOPE

A chatbot is a computer system, which can interact with users by using natural language. Normally, it is designed to serve in a certain domain such as online shopping, online frequently asked questions (FAQ) and also assistant system. Users can easily use it without background knowledge or experiences. Moreover, chatbot can serve many people at the same time with the same topic and without getting bored. Consequently, this may be the suitable capability to be adopted in public service such as the medical service. Hence, the objective of this work is to increase the service capability and decrease the operation cost of medical consultant service by using the chatbot.

### CONCLUSION

It determined that the modern chatbots perform at a very high standard to provide a reliable response to users compared to the traditional chatbots. Unlike existing chatbots which focused on various domains of healthcare. This is the best solution for people who are busy with their job schedules. They do not need to wait in the queue for hours to get an appointment with a doctor every time instead they can chat with the bot.

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