VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI – 590018, Karnataka

INTERNSHIP REPORT

ON

"Chatbot for Healthcare System Using AI"

Submitted in partial fulfilment for the award of degree(18CSI85)

BACHELOR OF ENGINEERING IN COMPUTER SCIENCE AND ENGINEERING

Submitted by:

KARTIKEY RAI

1DB19CS066

Conducted at
COMPSOFT TECHNOLOGIES

DON BOSCO INSTITUTE OF TECHNOLOGY
Department of CSE

Accredited by NBA, New Delhi

Kumbalgodu, Karnataka. 560074

DON BOSCO INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Accredited by NBA, New Delhi
Kumbalgodu, Bangalore

CERTIFICATE

This is to certify that the Internship titled **"Chatbot for Healthcare System Using AI"** carried out by **KARTIKEY RAI,** a bonafide student of Don Bosco Institute of Technology, in partial fulfillment for the award of **Bachelor of Engineering**, in **CSE** under Visvesvaraya Technological University, Belagavi, during the year 2022-2023. It is certified that all corrections/suggestions indicated have been incorporated in the report.

The project report has been approved as it satisfies the academic requirements in respect

of Internship prescribed for the course Internship / Professional Practice (18CSI85)

Signature of Guide	**Signature of HOD**	**Signature of Principal**
Mrs Prakruthi S T	**Dr. K B Shiva Kumar**	**Dr. Nagabhushana B S**
Asst. Professor,	Dept. of CSE, DBIT,	Principal, DBIT, Bangalore
Dept. of CSE,	Bangalore	
DBIT, Bangalore		

External Viva:

Name of the Examiner   Signature with Date

1)_____

    _____

2)_____

    _____

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

<u>DECLARATION</u>

I, **KARTIKEY RAI**, final year student of Branch, College Name - 560 082, declare that the Internship has been successfully completed, in **COMPSOFT TECHNOLOGIES**. This report is submitted in partial fulfillment of the requirements for award of Bachelor Degree in Computer Science and Engineering, during the academic year 2022-2023.

USN : 1DB19CS066

NAME : KARTIKEY RAI

Date : :

Place :

INTERNSHIP CERTIFICATE

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CERTIFICATE OF INTERNSHIP

This is to certify that **Kartikey Rai** whose USN is **1DB19CS066**, has completed their **Machine Learning With Python(Research Based)** Internship organised and handled by **Compsoft Technologies** from **23rd August, 2022** to **27th September, 2022**.

The person to whom this certificate is addressed to has worked on a project titled **Chatbot for Healthcare System**, As part of the project, They designed the Machine Learning Model, Demonstrated and tested the working of the Model, Prepared a report highligting its flaws by understanding the design briefs and client Specifications that were provided in the Proposal.

During the course of the internship, they demonstrated good design skills with a self-motivated attitude to learning new things. Their performance exceeded expectations and was able to complete the project successfully on time.

To verify this certificate, CLICK HERE

Nithin K S
PROJECT MANAGER
COMPSOFT TECHNOLOGIES
No. 36/2, 19th Main road,
1st Block Rajajinagar
Bangalore - 560010

www.compstechnlogies.com
services@compstechnologies.com

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ACKNOWLEDGEMENT

The satisfaction and euphoria that successful completion of any project is incomplete without the mention of people who made it possible, whose constant support and encouragement made our effort fruitful.

First and foremost, we ought to pay our due regards to this institute, which provided us a platform and gave an opportunity to display our skills through the medium of project work.

We express our heartfelt thanks to our beloved principal **Dr. Nagabhushana B S,** Don Bosco Institute of Technology, Bangalore for his encouragement all through our graduation life and providing us with the infrastructure.

We express our deep sense of gratitude and thanks to **Dr. K. B. SHIVAKUMAR** Head of the Department, Computer Science and Engineering for Extending his Valuable insight and suggestions offered during this Internship.

It is our outmost pleasure to acknowledge the kind help extended by, our internship coordinator **Mrs. SHEEBA S**, Prof, Dept of CSE, and our guide **Mrs. Prakruthi S T**, Asst. Prof. Department of Computer Science for excellent guidance and cooperation which consequently resulted in getting the internship work completed successfully.

Last but not the least I would like to thank all my friends and family for their help and support in completing this Internship

KARTIKEY RAI
1DB19CS066

ABSTRACT

As the demand in Machine Learning and AI keeps growing, new technologies will keep coming in the market which will impact our day-to-day activities, and one such technology is Virtual Assistant Bots or simply Chatbots. Chatbots have evolved from being Menu/Button based, to Keywords based and now Contextual based. The most advanced among all of the above is contextual based because it uses Machine Learning and Artificial Intelligence techniques to store and process the training models which help the chatbot to give better and appropriate response when user asks domain specific questions to the bot. The idea is to create a medical chatbot that can diagnose the disease and provide basic details about the disease before consulting a doctor. This will help to reduce healthcare costs and improve accessibility to medical knowledge through medical chatbot. The chatbots are computer programs that use natural language to interact with users. Our project focuses on providing the users immediate and accurate prediction of the diseases based on their symptoms. For the prediction of diseases, we have used Decision tree algorithm. Chatbots can play a major role in reshaping the healthcare industry by providing predictive diagnosis.

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CHAPTER 1
COMPANY PROFILE

A Brief History of Compsoft Technologies

Compsoft Technologies, was incorporated with a goal "To provide high quality and optimal Technological Solutions to business requirements of our clients". Every business is a different and has a unique business model and so are the technological requirements. They understand this and hence the solutions provided to these requirements are different as well. They focus on clients requirements and provide them with tailor made technological solutions. They also understand that Reach of their Product to its targeted market or the automation of the existing process into e-client and simple process are the key features that our clients desire from Technological Solution they are looking for and these are the features that we focus on while designing the solutions for their clients.

Sarvamoola Software Services. is a Technology Organization providing solutions for all web design and development, MYSQL, PYTHON Programming, HTML, CSS, ASP.NET and LINQ. Meeting the ever increasing automation requirements, Sarvamoola Software Services. specialize in ERP, Connectivity, SEO Services, Conference Management, effective web promotion and tailor-made software products, designing solutions best suiting clients requirements.

Compsoft Technologies, strive to be the front runner in creativity and innovation in software development through their well-researched expertise and establish it as an out of the box software development company in Bangalore, India. As a software development company, they translate this software development expertise into value for their customers through their professional solutions.

They understand that the best desired output can be achieved only by understanding the clients demand better. Compsoft Technologies work with their clients and help them to defiine their exact solution requirement. Sometimes even they wonder that they have completely redefined their solution or new application requirement during the brainstorming session, and here they position themselves as an IT solutions consulting group comprising of high caliber consultants.

They believe that Technology when used properly can help any business to scale and achieve new heights of success. It helps Improve its efficiency, profitability, reliability; to put it in one sentence " Technology helps you to Delight your Customers" and that is what we want to achieve.

ABOUT THE COMPANY

Compsoft Technologies is a Technology Organization providing solutions for all web design and development, MYSQL, PYTHON Programming, HTML, CSS, ASP.NET and LINQ. Meeting the ever increasing automation requirements, Compsoft Technologies specialize in ERP, Connectivity, SEO Services, Conference Management, effective web promotion and tailor-made software products, designing solutions best suiting clients requirements. The organization where they have a right mix of professionals as a stakeholders to help us serve our clients with best of our capability and with at par industry standards. They have young, enthusiastic, passionate and creative Professionals to develop technological innovations in the field of Mobile technologies, Web applications as well as Business and Enterprise solution. Motto of our organization is to "Collaborate with our clients to provide them with best Technological solution hence creating Good Present and Better Future for our client which will bring a cascading a positive effect in their business shape as well". Providing a Complete suite of technical solutions is not just our tag line, it is Our Vision for Our Clients and for Us, We strive hard to achieve it.

Products of Compsoft Technologies.

Android Apps

It is the process by which new applications are created for devices running the Android operating system. Applications are usually developed in Java (and/or Kotlin; or other such option) programming language using the Android software development kit (SDK), but other development environments are also available, some such as Kotlin support the exact same Android APIs (and bytecode), while others such as Go have restricted API access.

The Android software development kit includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and zutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, and Windows 7 or later. As of March 2015, the SDK is not available on Android itself, but softwaredevelopment is possible by using specialized Android applications.

Web Application

It is a client–server computer program in which the client (including the user interface and client-side logic) runs in a web browser. Common web applications include web mail, online retail sales, online auctions, wikis, instant messaging services and many other functions. web applications use web documents written in a standard format such as HTML and

JavaScript,which are supported by a variety of web browsers. Web applications can be considered as a specific variant of client–server software where the client software is downloaded to the client machine when visiting the relevant web page, using standardprocedures such as HTTP. The Client web software updates may happen each time the web page is visited. During the session, the web browser interprets and displays the pages, and acts as the universal client for any web application. The use of web application frameworks can often reduce the number of errors in a program, both by making the code simpler, and by allowing one team to concentrate on the framework while another focuses on a specified use case. In applications which are exposed to constant hacking attempts on the Internet, security-related problems can be caused by errors in the program.

Frameworks can also promote the use of best practices such as GET after POST. There are some who view a web application as a two-tier architecture. This can be a "smart" client that performs all the work and queries a "dumb" server, or a "dumb" client that relies on a "smart" server. The client would handle the presentation tier, the server would have the database (storage tier), and the business logic (application tier) would be on one of them or on both. While this increases the scalability of the applications and separates the display and the database, it still doesn"t allow for true specialization of layers, so most applications will outgrow this model. An emerging strategy for application software companies is to provide web access to software previously distributed as local applications. Depending on the type of application, it may require the development of an entirely different browser-based interface, or merely adapting an existing application to use different presentation technology. These programs allow the user to pay a monthly or yearly fee for use of a software application without having to install it on a local hard drive. A company which follows this strategy is known as an application service provider (ASP), and ASPs are currently receiving much attention in the software industry.

Security breaches on these kinds of applications are a major concern because it can involve both enterprise information and private customer data. Protecting these assets is an important part of any web application and there are some key operational areas that must be included in the development process. This includes processes for authentication, authorization, asset handling, input, and logging and auditing. Building security into the applications from the beginning can be more effective and less disruptive in the long run.

Web design

It is encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of web design include web graphic design; interface design; authoring, including standardized code and proprietary software; user experience design; and

search engine optimization. The term web design is normally used to describe the design process relating to the front-end (client side) design of a website including writing mark up. Web design partially overlaps web engineering in the broader scope of web development. Web designers are

expected to have an awareness of usability and if their role involves creating mark up then they are also expected to be up to date with web accessibility guidelines. Web design partially overlaps web engineering in the broader scope of web development.

Departments and services offered

Compsoft Technologies plays an essential role as an institute, the level of education, development of student's skills are based on their trainers. If you do not have a good mentor then you may lag in many things from others and that is why we at Compsoft Technologies gives you the facility of skilled employees so that you do not feel unsecured about the academics. Personality development and academic status are some of those things which lie on mentor's hands. If you are trained well then you can do well in your future and knowing its importance of Compsoft Technologies always tries to give you the best.

They have a great team of skilled mentors who are always ready to direct their trainees in the best possible way they can and to ensure the skills of mentors we held many skill development programs as well so that each and every mentor can develop their own skills with the demands of the companies so that they can prepare a complete packaged trainee.

Services provided by Compsoft Technologies.

- Core Java and Advanced Java

- Web services and development

- Dot Net Framework

- Python

- Selenium Testing

- Conference / Event Management Service

- Academic Project Guidance

- On The Job Training

- Software Training

CHAPTER 2

INTRODUCTION

As the demand in Machine Learning and AI keeps growing, new technologies will keep coming in the market which will impact our day-to-day activities, and one such technology is Virtual Assistant Bots or simply Chatbots. Chatbots have evolved from being Menu/Button based, to Keywords based and now Contextual based. The most advanced among all of the above is contextual based because it uses Machine Learning and Artificial Intelligence techniques to store and process the training models which help the chatbot to give better and appropriate response when user asks domain specific questions to the bot. The idea is to create a medical chatbot that can diagnose the disease and provide basic details about the disease before consulting a doctor. This will help to reduce healthcare costs and improve accessibility to medical knowledge through medical chatbot. The chatbots are computer programs that use natural language to interact with users. Our project focuses on providing the users immediate and accurate prediction of the diseases based on their symptoms. For the prediction of diseases, we have used Decision tree algorithm. Chatbots can play a major role in reshaping the healthcare industry by providing predictive diagnosis.

Chatbots come in two kinds:

• Limited set of rules

• Machine learning

Chatbot that uses limited set of rules This kind of bots are very limited to set of texts or commands. They have ability to respond only to those texts or commands. If user asks something different or other than the set of texts or commands which are defined to the bot, it would not respond as desired since it does not understand or it has not trained what user asked. These bots are not very smart when compared to other kind of bots.

3.2 Chatbot and Machine learning

Machine learning chatbots works using artificial intelligence. User need not to be more specific while talking with a bot because it can understand the natural language, not only commands. This kind of bots get continuously better or smarter as it learns from past conversations it had with people. Here is a simple example which illustrate how they work. The following is a conversation between a human and a chatbot: Human: "I need a flight from San Jose to New York." Bot: "Sure! When would you like to travel?" Human: "From Dec 20, 2016 to Jan 28, 2017." Bot: "Great! Looking for flights."   In order

to achieve the ultimate goal, I have taken an iterative approach and divided my work into four major deliverables. These deliverables not only helped me in understanding the code structure of Yioop but also enhances Yioop's functionality. In the rest of the report, I will be discussing about the four deliverables. To understand more on chatbot service, I had implemented a Facebook Messenger Weather Bot in deliverable 1, which is discussed in next section. The purpose of deliverable 2 is to introduce chatbots to the Yioop. I have added Bot Configuration settings which is used to add bot users in Yioop. In the next deliverable, I have added a functionality where the user will be able to call bots in a group thread. Activation of bots will happen by calling respective callback URL which is already configured that helps bots to have a conversation with users. More details on this is discussed in deliverable 3 section. As a deliverable 4, I have created a weather bot i.e, a web application in php that calls yahoo API to get weather information. The last section of the report contains the conclusion and future work. I have implemented a Facebook Messenger Bot to get an overview of how chatbot is build. During this implementation, I understood the flow of control for a chatbot service with other services which is explained below. In order to create a Facebook Messenger Bot, a developer needs to be authenticated and approved by Facebook to converse with the public and the web server for security reasons. For a Facebook Messenger Bot, I have created a simple web application using Node.js by installing the necessary dependencies using npm. I ran this locally. I also downloaded and installed ngrok and started it - npm run ngrok. This launched a Forwarding URL to the local running server, that means any requests to Forwarding URL will hit the locally running server. This url is used as a Callback URL in Facebook App which will be explained further. To set up the Facebook App, I have created a Facebook Page and Facebook App using my Facebook account. While setting up a Webhook in the app settings, I have given the Forwarding URL as Callback URL and added code for verification.The access token in page settings is stored as environment variable as it will be used in integration. In order to make webhook to receive messages from this page, the app is subscribed to the page created. To set up the bot to handle the POST calls at webhook, I have created a webhook endpoint in the sample application.

3.2 Artificial Intelligence

AI was coined by John McCarthy, an American computer scientist, in 1956 at The Dartmouth Conference where the discipline was born. Today, it is an umbrella term that encompasses everything from robotic process automation to actual robotics. AI can perform tasks such as identifying patterns in the data more efficiently than humans, enabling businesses to gain more insight out of their data.

Problem Statement

To Design Healthcare chatbot Using machine learning and natural language processing.

CHAPTER 3
SYSTEM ANALYSIS

1. Existing System

Many of the existing systems have chats through texts.Some limitations of such Chatbots are,there is no instant response given to the patient, they have to wait for experts acknowledgement for a long time. And also there are a limited number of diseases in the dataset.Technical issues like voice messages are not accurate in the existing system.

2. Proposed System

In our system the user can interact with the chatbot through text and chat bot will interact using   text manner. With respect to the users queries, the bot identifies the disease if user chatting with the chatbot. According to the diseases of the user, bot gives suggestions for the disease and also prescribe specialist doctors. This system can be used by multiple users at a time without any lagging.

3. Objective of the System

1. To design the user interface which will detect the symptoms and guide the patient accordingly.
2. To develop and train the model for which tells the basic medications about the symptoms.
3. To integrate the HealthCare chatbot to various health care portals.

CHAPTER 4

REQUIREMENT ANALYSIS

Hardware Requirement Specification

1. Processor – i3 or Ryzen 5
2. RAM – 4gb min
3. ROM – 32gb min

Software Requirement Specification

1. Operating System – Windows 10 or Linux
2. IDE – Visual Studio Code
3. Virtual Environment – Anaconda
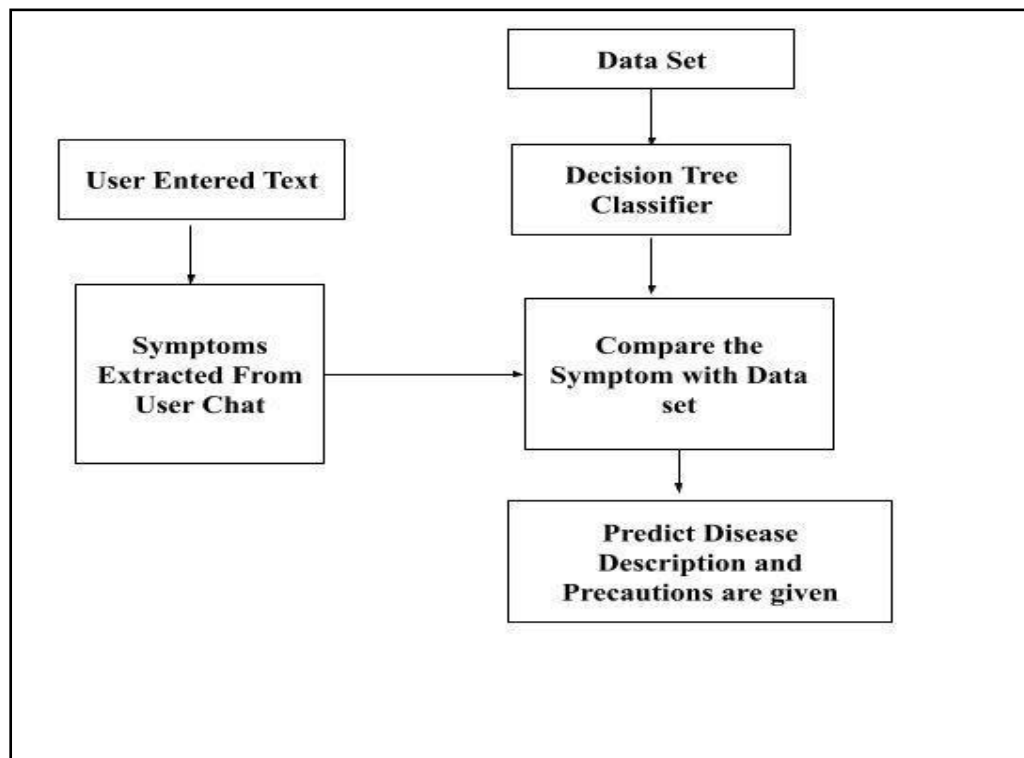4. Framework - Rasa

CHAPTER 5

SYSTEM DESIGN

Fig. Architectural Design

Initially the chatbot ask to enter the name of the user, one major symptom that they are facing and period of facing that symptom. In the next step the chatbot ask the specific symptom the user is facing. for example, type 0 for heavy fever or type 1 for mild fever. Next the bot will ask some series of symptoms, and user have to answer in "yes" or "no" manner. Decision Tree is a Supervised learning technique that can be used for both classification and Regression problems, but mostly it is preferred for solving Classification problems. It is a tree-structured classifier where, internal nodes represent the features of a data set branches represent the decision rules and each leaf node represents the outcome. In a Decision tree, there are two nodes, which are the Decision Node and Leaf Node.

Decision nodes are used to make any decision and have multiple branches, whereas Leaf nodes are the output of those decisions and do not contain any further branches. The decisions or the test are performed on the basis of features of the given data set. Algorithm asks set of question to user and accordingly it arrives at a solution. It predicts the disease and gives necessary precautions based on it.

Chatbot Challenges

Some of the challenges are

- Security
- Understanding user sentiments and emotions in case of voice bots
- Language specialization
- Nonstandard languages

Advantages

The advantages are

- Less cost
- 24/7 Availability
- Learning and updating
- It manages multiple clients
- It is easy to use
- Human effort is less

Disadvantages

Some of the disadvantages are

- It takes more time for installing the app
- Complex interface

CHAPTER 6

IMPLEMENTATION

Implementation is the stage where the theoretical design is turned into a working system. The most crucial stage in achieving a new successful system and in giving confidence on the new system for the users that it will work efficiently and effectively.

The system can be implemented only after thorough testing is done and if it is found to work according to the specification. It involves careful planning, investigation of the current system and it constraints on implementation, design of methods to achieve the change over and an evaluation of change over methods a part from planning.

Two major tasks of preparing the implementation are education and training of the users and testing of the system. The more complex the system being implemented, the more involved will be the system analysis and design effort required just for implementation.

The implementation phase comprises of several activities like, creating a CSS file related to chat (Fig-6.1), creating JavaScript functions to make the chatbot responsive. The required hardware and software acquisition is carried out. The system may require some software to be developed.For this, programs are written and tested. The user then changes over to his new fully testedsystem and the old system is discontinued.

Functions used in building chatbot:-

function action_trigger()
This function is used to send an event to the bot, so that bot can start the conversation by greeting the user.
Then the user send or enters the messages.
If there is no response from rasa server then the bot prints the message "Error from bot end: ".

function setUserResponse(message)
This function is used to set the user message in the chatbot.
Then with the help of function scrollToBottomOfResults() , we can scroll to the bottom of the chats after new message has been added to chat.

function send(message)
This function is used to send the user message to RASA server and also used to send payload from server to the user.
function(botResponse, status), gives the response and status from RASA server.
if there is no response from rasa server the print the message "Error from bot end: ".

function setBotResponse(response)
This function is used to display the bot response.
If there is no response from Rasa, send fallback message to the user, "I am facing some issues, please try again later!!!". Otherwise set results to the function scrollToBottomOfResults().

function createCollapsible(data)
Collapsibles are accordion elements that expand when clicked on.

function showBotTyping() and function hideBotTyping()
These functions are used to show or hide the bot typing animations.

function restartConversation()
This function is used to restart the conversation.

```css
7
8      /* ============= css related to chats ============== */
9      .eshimg{
10       width:25%;
11     }
12   .widget {
13         display: none;
14         width: 350px;
15         right: 15px;
16         height: 450px;
17         bottom: 5%;
18         position: fixed;
19         background: radial-gradient(circle, rgba(238,174,202,1) 0%, rgba(148,187,233,1) 100%);
20         border-radius: 10px 10px 10px 10px;
21         box-shadow: 0 0px 1px 0 rgba(0, 0, 0, 0.16), 0 0px 10px 0 #00000096;
22     }
23
24   .chat_header {
25         height: 60px;
26         background:linear-gradient(45deg, blue, red);
27         border-radius: 10px 10px 0px 0px;
28         padding: 5px;
29         font-size: 35px;
30
31     }
32
33     .chat_header_img{
```

Fig. 6.1 CSS related to chats

CHAPTER 7

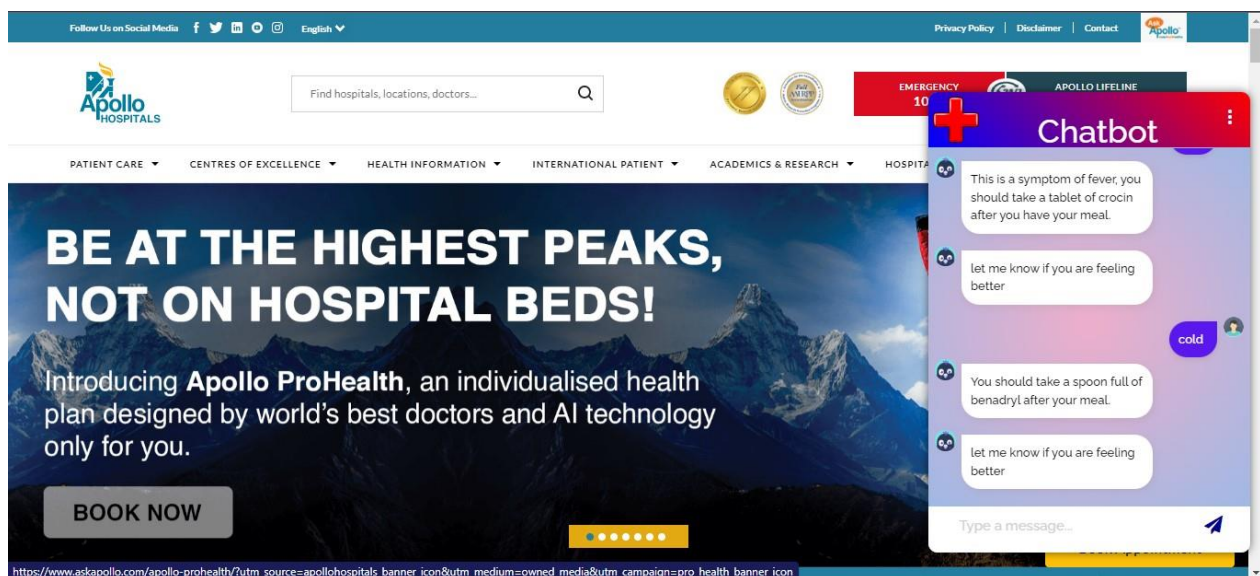## RESULTS

Fig. 7.1 Bot Interface

Fig. 7.2 Final result after integrating the Bot with website.

CHAPTER 8

CONCLUSION

The package was designed in such a way that future modifications can be done easily. The following conclusions can be deduced from the development of the project. Automation of the entire system improves the efficiency. It provides a friendly graphical user interface which proves to be better when comparedto the existing system. It gives appropriate access to the authorized users depending on their permissions. It effectively overcomes the delay in communications. Updating of information becomes so easier. System security, data security and reliability are the striking features. The System has adequate scope for modification in future if it is necessary.

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