Project I

"A Self-Diagnostic Medical Chat-bot Using Artificial Intelligence"

Submitted in partial fulfillment of the requirements for the degree of

Bachelor of Engineering

by

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This is to certify that the project entitled *Self Diagnosis Medical Chat-bot using AI* is a bonafide work of **Ghare Shifa Shakil (16ET02), Shaikh Sabreen Mohd. Iqbal (16ET06),Shaikh Tasmia Bano Abdul Sajid (16ET07)** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering** in **Department of Electronics and Telecommunication Engineering**.

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Project I
Approval for Bachelor of Engineering

This project entitled *Self Diagnosis Medical Chat-bot using AI* by *Ghare Shifa Shakil(16ET02),Shaikh Sabreen Mohd. Iqbal(16ET06), Shaikh Tasmia Bano Abdul Sajid(16ET07)* is approved for the degree of *Bachelor of Engineering in Department of Electronics and Telecommunication Engineering.*

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Declaration

We declare that the aforementioned composed submission signifies our concepts and ideas in our own words and where other's ideas or concepts have been incorporated, we have appropriately quoted and referenced the origins. We also indicate that we have adhered to all postulates of academic responsibility and integrity and have not falsified or fabricated or misrepresented any idea/data/fact/source in our submission. We concede that any infringement of the foregoing will be a reason for the disciplinary move by the Institute and can also evoke retributive action from the sources which have thus not been correctly cited or from whom proper authorization has not been received when necessitated.

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Chapter 1

Introduction

1.1 Introduction

Artificial Intelligence (AI) as construction for learning complex new living and serving a contin-
uous circle. Artificial intelligence, according to which the phenomena of the engine from which
the competition is to feel and to act and achieve the results, on the machine is that when using
the simulation accurately mimics the expression of the human intellect, the development of the
role of the congestion, to change and ways of solving problems. In short, this study scout. The
"artificial intelligence" is used when the machine performs or simulates a "cognitive" functions
of devices that connect with other human beings, to "exercise" as well as "problem-solving."
Artificial intelligence provides the greatest ability to imitate human thought and behavior in
front of a machine. As AI bots chat with advanced disciplines such as researchers are paving
the way for its safety. Besides, a change takes place and offers reliable medical chatbots that
can be suggested. In identify applicable funding agency here. If none, delete this addition to
other ways of demonstrating the impact of artificial intelligence is an especially innovative sec-
tor of the industry. Taking things that were just to have escalated in the place where doctors
are supplanted by artificial intelligence. Although the changes did not occur shortly, general
medical artificial intelligence will help to deliver an advanced medical diagnosis. Soon the time
will come when human intelligence, are independent of the decrease in safety compared to the
current percentage. So there has the time to chat from the bot AI to recognize and appreciate
the health benefits. Immediate prophecy of the illness can benefit prevent 80complexities [1]
Super-robots, that are responsive to chat are compatible with AI FH which is also a computer.
It's not just a change; This is a criterion turn. To understand the use of this technology and
its consequences, we briefly describe the robot's artificial intelligence chat with revolutionizing
health care.

AI provides us the most reliable power to impersonate the human logic for reasoning and func-
tioning on a machine. Chatbots are a kind of computer-generated program that communicates
or interacts with a person or the user, adopting the natural language. The chatbot functions with
the help of Artificial Intelligence to make more realistic interaction or we can say Human-like
interaction. Using this we have chosen to combine this brilliant aspect with health care infor-
matics. Our main goal is to formulate a text-to-text conversation tool that will help patients
examine their symptoms and condition using our common speaking language. The chatbot asks

several questions to the user e.g., age and gender, and general dominant symptoms that they are suffering from. The three principal elements of our operation are:

1. classification and extraction of symptoms of the discussion with the user
2. detailed mapping of derived symptoms to documented indications
3. Stipulating the disease and connecting to the appropriate specialist if needed.

In its modern form, the robot's most useful purpose is a readiness diagnostic tool that patients can reasonably manage the robot specialist for diagnosis, which patients can use to evaluate their symptoms before proceeding with the doctor.

Our project focuses exclusively on studying the natural language to remove symptoms, which can make it relatively easy for older and technical users to associate their symptoms and promote spoken language by combining various components. In its contemporary form, the most advantageous use of chatbot will perhaps be a basic diagnostic tool that the chatbot specialist can use to evaluate their symptoms before returning to the experts, applying the reference feature to select the right supplier. for help.

1.2 Symptom Inspectors and Previous Systems

Symptom inspectors hold the potential to ease the load on overly strained healthcare systems. Supposing this to occur, healthcare specialists and the more extensive public need to have belief in the execution of symptom inspectors and utilization of AI to medication is more commonly. The prior trials have examined the diagnostic and triage efficiency of bidding symptom inspectors and highlighted notable differences in courses of clinical precision [Semigran et al., 2015]. Whilst presenting a valuable benchmark, that research did not assess the efficiency of symptom inspectors upon the gold-standard representation of doctors. This continued to evaluate during the follow-up research, where the contributors recorded that doctors significantly exceed symptom inspectors, rendering a relevant contribution to our perception of comparable diagnostic administration [Semigran et al., 2016]. Nevertheless, the system used in this follow-up research did not sufficiently estimate the data gathering method through which patients typically associate with symptom inspectors or doctors, moreover, the outcomes are not based on a reasonable or practical illustration. Demonstrative correctness is not routinely included in the medical discipline, but a broad spectrum of researches have ventured to predict the frequency of diagnostic inaccuracy. Irrespective of whether the actual failure rate rests more confined to the 10-20

1.3 Objective of the Study

This study has its roots for investigating the attitudes and attributes on the basics of the usage of healthcare chatbot this includes the benefits, challenges, and short-comes in patient's self-diagnosis. Doctors across the globe have struggled with patients who read a few articles on websites regarding their symptoms believe they can do their diagnosis on their own. Those websites like WebMD can be helpful for their diagnosis. Those websites can only provide a basic idea of what are the dominant symptoms in patients. However, Some of the patients are under the impression that they can do diagnosis on their own by themselves without taking any medical help. In cases like this chatBot are very helpful and dependable as they conduct a general diagnosis with some medical background stored in their database and conduct a proper textual conversation with their natural language processing and learning algorithm.

AI-based chatbot helps the user whether they need to consult their nearest doctor's office or hospital. This is different from only showing a list of symptoms and leave them hanging. Many startups are already working on the same to provide a better experience to the user. Your.MD is free of cost application that comes pre-installed in Samsung mobile phones. This a diagnostic chatbot that has the potential to improve symptom analysis. Such programs require stacks of information from doctors, medical professionals, and hospitals around the world. One such is Telehealth that has been growing rapidly in 2020 due to this pandemic. It has offered a more convenient way rather than visiting a doctor and getting in contact with the virus outbreak. This is a great alternative during this pandemic, as the user can consult the doctor staying indoors and seeking help in diagnosis using the chatbot.

A better example of this is the growing connection between healthcare providers that are available for post-operative information and precaution in such situations. Telehealth is a useful way of answering questions and providing recommendations. This way it will be very helpful for people who are suffering from chronic illness and need care while traveling. Typically, telemedicine is convenient and is available for 24hours, but answering and attending too many calls can end up in a packed schedule and low-quality service. This is where chatbot plays a heroic role by being a convenient and essential tool that can provide a better experience and hassle-free service. In this system, they can just streamline the appointments and gather any important information early. Chatbot stores the patient's database and their general information to make a record of their medical history. This information such as height, weight, age, gender, and allergies by just performing QandA through text to text conversation. This will help to get a better idea while interacting with the patient before contacting the doctor face to face prior to the appointment. In some cases, the patient can get the most generic questions for instance such as their body temperature or cough and cold symptoms.

1.4 Research Methodology

The term 'philosophy' signifies an "investigation of and justification for the specific technique or strategies utilized. For this examination practical methodology or blended strategy is applied.

1.4.1 Pragmatic Approach or Mixed Method for Research

A sober way about science involves using the strategy that best suits the exam question and not participating in philosophical discussions, which is the best approach. Hence, the experts allow other to use any of their strategies and methods for analysis. Designs that are linked to quantitative, qualitative, and individual research. Others observe that every system holds its conditions and different methods can be common. Likewise, different systems can be used simultaneously or with continuous progress. For example, they can conduct in person interviews with other people or to gather the center and utilize the outcomes to survey to evaluate mentality with a test, to do a measurable study.

Depending on the measures taken, the information collected is divided appropriately. Since, it is conceivable to modify subjective information into quantitative information, even though the conversion of quantitative gather information to subjectively gathered information is not normal.

Having the option to blend various methodologies has the benefits of empowering triangulation.

Triangulation is a part of homogeneous techniques thinks about. It has, for instance:
The use of an assortment of sources (information triangulation)
The use of distinct scientists
The use of different points to decipher the results (hypothesis triangulation)
The use of different techniques to examinee issue (methodological triangulation)
And some research, active and quantitative when the technique was used. In other words, the first method is to use it in a few days, while the second part is what could be the development of the first investigation. In fact, for example, from picking the news center director's name between the top of the meetings or until the end of the transaction, you need to create a touch application to offer a wave of a fixed point. Try to obtain the right to contribute to the advancement of knowledge of the form, which is in the mind of the remedy or, rather, when the condition will be examined in all these things.

1.4.2 Data Sources

- Working with ERP Developers and direction from them.
- Competitors inquire about
- Market overviews
- Internet

1.4.3 Data Preparation and Analysis Method.

Collecting information is the whole of a task which includes sorting, cleaning, discarding, combining, and recording the information and then taking all the valid information and making an information table out of it to use in the examination. The step approach preparing information, for the most part, includes amending any errors The way of arranging includes: Information

Analysis- The information from the resources check the mistakes and errors or any irregularities that are to be removed. For enormous datasets, information readiness applications demonstrate accommodating in creating metadata and revealing issues. Reverse of Cleaned Data – Finally, steps should likewise be taken for the spotless information to supplant the first grimy information sources.

1.5 Limitation of the Study

As with any basic AI, there are risks to consider before implementing a chatbot system. Microsoft learned this lesson in 2016. Publishing their Twitter-based chatbot on the Internet resulted in them introducing racist insults on the day of publication. There is also the problem of inside information about patients that are shared in a networked system. Although this is unlikely, HIPPA-compatible chat systems can be compromised by sharing private patient information with hackers. There are security measures to prevent such a possibility, e.g. B. the use of a high level of data encryption, which makes hacking conversations difficult or almost impossible. Chatbots are playing an increasingly important role in the future of healthcare computing. However, we are far from having a complete chatbot system that benefits patients at all levels. The application created by Yours.MD and other similar projects are the first steps in turning these applications into a really beneficial tool for the medical industry.

Chapter 2

Literature Review

2.1 AI Technology used for Chat-bot

Chatbot's research examines self-diagnostic medical robots for precise analysis with artificial intelligence. Document [1] examines the current evidence for the feasibility and effectiveness of online mental health interventions using text-synchronized chat. Synchronized written conversations (or "chats") are becoming increasingly popular on the Internet as mental health interventions. This review provides an assessment of personal web-based synchronous chat technologies such as advice and support. Based on current knowledge about the application of this technique in this area of mental health research, we see temporary support for this intervention method. Interventions with text-based synchronous communication, as usual, showed better results than waiting list conditions and overall equivalent treatment results and were at least good in comparison to comparable interventions. However, the question of whether these techniques are effective in clinical practice is a consideration for future research. In the document [2] the chatbot acts as a virtual doctor and enables the patient to interact with the virtual doctor. Natural language processing algorithm and pattern matching for the development of this chatbot. It is developed in the Python language.

Based on the survey given it is found that the no of correct answer given by the chatbot is 80

The AIML-based chatbot is optimized to convert natural language queries to relevant SQL queries. A total of 97 sample questions were collected and these queries were split into AIML-based chatbots which were adapted to convert natural language queries to relevant SQL queries. A total of 97 sample questions were collected, which were then classified by type of question. The resulting categories were classified according to the number of questions for each category. Most questions were based on categories, depending on the type of question. The resulting categories were classified according to the number of questions for each category. Most requests were based on requests, of which 47The different documents served in web, thecontent is checked by tagging the dataset using n- gram based low di-mensional demonstration, TF-IDF matrix that generates S, U, and V and finally multiplying the 3 matrices cosine similarity is calculated. [8]Here the chatbot is created for the customer service that functions as public health service[7]. The application uses Ngram, TF-IDF and cosine similarity. The knowledge base is created for storing the question and answer. The application clearly shows extracted the key-

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word from the question ad by using unigram, bigram, and trigram which helps in fast answering.

A similar paper "Pharmabot: A Pediatric Generic Medicine Consultant Chatbot" proposed by Benilda Eleonor V[9]. Comendador,and team provides a design for a stand-alone medical Chatbot that is implemented using MS Access and Visual C. For using the proposed design, the user has to navigate using the four options provided by the applica-tion.[10]This design aims to work by converting the user input to SQL queries and execute it on MS Access to retrieve the solution to the illness. Also a research paper "MedChatBot: An UMLS based Chatbot for Medical Students" proposed by Hameedullah Kazi, B.S. Chowdhry and Zeesha Memon focuses on a design for an AIML based Medical Chatbot. This Chatbot design is implemented using a JAVA based AIML interpreter called Chatter bean [11]. To use the proposed design, the user has to type a message that should contain the illness name and it detects the illness names using AIML patterns. [11]Once the illness is detected, the Chatbot provides the user about the necessary information about the problem. However the previous proposed designs in the past did not focus in understanding the intensity of the illness that the user is suffering through. Our proposed design aims to ask more questions to the user until it gets confident about the probable illness that the user is suffering through. Also our Chatbot design has the concept of threshold level that helps it to detect the intensity of the problem and connects the user directly to the doctor if it feels that the problem is too serious for the Chatbot to handle.Sometimes, it may happen that the problem is too serious for the Chatbot to handle. In this case the Chatbot would connect the user directly with the doctor and also provide the doctor with the chat history of the user.[12]By the time the doctor is available to chat, the user is provided by the first-aid solution. To trigger this process, the seriousness score should hit or rise above the threshold level.

2.2   System Background

The intended system user dialog is an ongoing project which progresses the ancestry of indications to the mapping of symptoms, in which it recognizes a similar symptom, then diagnoses the victim if it is a severe or minor illness. In the case of a severe illness, a proper doctor will provide to the patient, the physician, or Md's report that is to be extricated database, patients preference is recognized through contact data deposited in the database.

To obtain an exact diagnosis, this logic of the phase changes is achieved, natural language production models, and the ambition of the operation for the user also for gathering answers of the user has been practiced. In an extension of his addresses and farewells, our doer has three principal conversation phases: basic information retrieval, symptom uprooting, and analysis. Our robot commences by gathering the information of the user such as their residential address, email address, age, height, weight, and gender. Then another series of questions are asked for extracting the symptoms which the patient is suffering from to get more reliable information out of the general diagnosis. The patient who is the chatbot user has the choice to interact with the doctor on a different set of symptoms after getting done with the first diagnosis. The added feature for users is that they have access to the chat history of the conversation that has taken place during diagnosis.

2.3 User Extraction of Symptoms

The user login aspects transpire hither. Formerly Symptoms are obtained utilizing the String Searching Algorithm which is a substring describing signs that are recognized in the manuscript. The user transmits immediately the symptom which they are suffering from so as(e.g. "I have a cough, fever, and nausea"), the system recognizes that. The system likewise should be capable to manage information similarly, "When I read, I'm okay at first, but over time, my eyes seem to get tired, and I start to see double." This situation should select substrings similar "eyes tired" also "see double" (not substrings alike "read" or "okay").

2.4 Mapping Symptoms with Datasets

Presented a string extricated of the user data, that produce a listing from the nearest proposed indications. Consequently, require the client to verify that if he has any of the proposed indications. On the basis of the answer, a certain type of illness was picked. Additional descriptions of symptoms including hints of symptoms do cause by suggesting client a range regarding inquiries, and symptom detecting on a specific disease is presented.

2.5 Detecting the Disease and Consulting a Doctor

This step consists of a list of diseases in the database and targeted symptoms included are contrasted to some common illness symptoms. The symptoms are cross-checked continuously so that a dominant symptom regarding a particular illness can be determined. The diseases are diagnosed on the basis of end-user participation and their estimated interest. A particular conversation can recognize certain symptoms while interacting with a chatbot. This helps the chatbot to recognize the symptoms that the user is talking about refers to minor or chronic illness. If the chatbot detects a severe illness it indicates the user to consult the doctor in person and communicate the details regarding their illness. If the symptoms depicted by the user are of minor diseases such as cold and flu the chatbot elaborates it to the user so that there is no misconception regarding the disease. It will also suggest some first aid and precautions measures and call to see a doctor.

Chapter 3

Basics Skills for Development Framework of Chat-bot

3.1 Technical Skills Requirement

In this period, we started to know that what are the technologies or courses that are required to build a website. We started to learn those courses. Since the web development is a huge field itself, so there are lot many courses that are used to build a responsive websites.

So basically web development is divided into 3 sections,

1. Front End
2. Back End
3. DataBase(DB)

1. Front End:

What is Front End? Whatever the contents that you see on website, these all comes under front end section. You can achieve it using two of the languages i.e HTML CSS

2. Back End:

What is Back End? The actions that are performed on a webpage completely based on the back end section. For eg. When you click on any button on a webpage so after clicking what event should occur is determined by backend programming. We can say that backend is responsible for the behaviour of a webpage.

Languages that we have learned is required to build our project is explained below

3.1.1 HTML

HTML stands for Hyper Text Markup Language. Current version of HTML that is being used is HTML5. It is a client side scripting language. It's not a programming language, it is markup language. It is used to design static webpages. In HTML, Hyper means a link or a reference link to where you want to navigate, Text means data or information whatever the data you want to display on a webpage, Markup is a predefined terms that are present in HTML, Language is nothing but communication. HTML consists set of markup tags, that are used to design the layout of the webpage. Whatever the data we write we save it using .html extension. Currently

HTML5 is used widely in web development because in previous version audio and video format was not supported and HTML5 supports both of it.

Figure 3.1: HTML5
[Link: http://www.webzip.in/tag/web-design-institute-in-chandni-chowk]

3.1.2 Cascading Stle Sheets

The Cascading Style Sheets is also known as CSS. It is a custom language that utilizes to define the appearance and formatting of the doc file written in the markup language. CSS is commonly practiced with HTML to improve the style of webpages or user interface. There are mainly three types of CSS.

1. Internal CSS

2. External CSS

3. Inline CSS

The main question rises is Why CSS?
Like every webpage, they have more than one or multiple pages but if you want to show same images on different pages or same contents on different pages so what are you going to do?? Write it multiple times? Well CSS does it for you, you can just determine the contents that you want to display on different page and just assign a class to it. Now import that CSS file to every page and use the class where you want to print those contents. That's it, this is how it makes to display contents easily. Same things can be done for any event like animation of page, colour of page, styling of page etc. CSS makes it simple. It reduces the line of program. That's why it saves a lot of time.

3.1.3 Bootstrap

Bootstrap is an available open-source and the usual modern HTML, CSS, and JavaScript framework advanced by Twitter to build interactive web applications. Incorporates HTML and CSS layout templates for standard user interface elements such as buttons, drop-down menus, typography, tabs, forms, tables, etc. Including arbitrary javascript additions. Bootstrap framework is

based on all open standards, which means it can be used with various platform. We can practice it in every web application developed with any technology such as PHP, JS, etc.

Why Bootstrap?

1. Supports responsive designs.

2. Saves a lot of development time.

3. Consistency.

4. Customizable.

5. Support.

Bootstrap is a pre build templates whose classes is used in order to make a web page attractive and responsive.
Following the successful prescription case details extraction by several mechanisms, our system will take charge of scheduling and handling the time supervision method and will serve as a mechanism for triggering the events.

Product ID	Product Name	Product Quality	Product Quantity
1	Wheat	Good	200 Bags
2	Rice	Good	250 Bags
3	Sugar	Good	200 Bags
3	Sugar	Good	200 Bags
3	Sugar	Good	200 Bags

Figure 3.2: Bootstrap Table
[Link:https://www.jquery-az.com/bootstrap-table-with-6-demos-and-free-code/]

3.1.4 JavaScript

JavaScript is one of the most celebrated and extensively used programming languages in the world. It is rising speedy than any other programming language and huge corporations like Netflix, Paypal, and Walmart develop internal applications utilizing JavaScript. For a long time, JS has signified practice in web browsers to build interactive web pages, some developers call JS a toy language. Although these days have passed due to the immense development and investments of big corporations like Facebook and Google. Nowadays, it is conceivable to build real-time network applications such as chat, video streaming services, etc.

Figure 3.3: JS Code
[Link:https://forums.couchbase.com/t/about-node-js-use-rxt/14949]

Client-Side JavaScript: Client-side JavaScript is a standard form of language. The text should be incorporated in an HTML doc for the code to be performed by the browser.
JavaScript can be utilized to trigger functions such as button clicks, link navigation, and different actions that the user launches explicitly or inherently.

3.1.5   jQuery

jQuery is a library that is built on top of JS which enables "less write do more" which means that you can do things that takes lot of line of code in javascript and you can do it in single or couple of line in jQuery. jQuery is fast, small, featurable library of JS. The main idea of jQuery is to execute it much simpler to work JS on your website and it is one of the most widely used JS library. It's a old library but it is still being used by lot of developers. One of the best part of jQuery is it is cross browser compatible, open source.
Primary features of jQuery are:

1. HTML/DOM Manipulations.

2. CSS Manipulations.

3. HTML event methods.

4. Effects and animations.

5. AJAX.

6. Utilities.

Figure 3.4: jQuery Example Code
[Link: https://opsway.com/blog/javascript-use-cases-magento-2]

3.1.6   SQL

SQL stands for Structured Query Language. Data is all around us, we used to store data on papers or in file cabinet but eventually now we store it online what we call Databases. SQL is the language which communicates with databases. If you want to add, remove, delete data from database then you can use SQL to perform such actions. We can perform by using SQL queries like UPDATE, INSERT, DELETE etc.

Figure 3.5: SQL Example Code
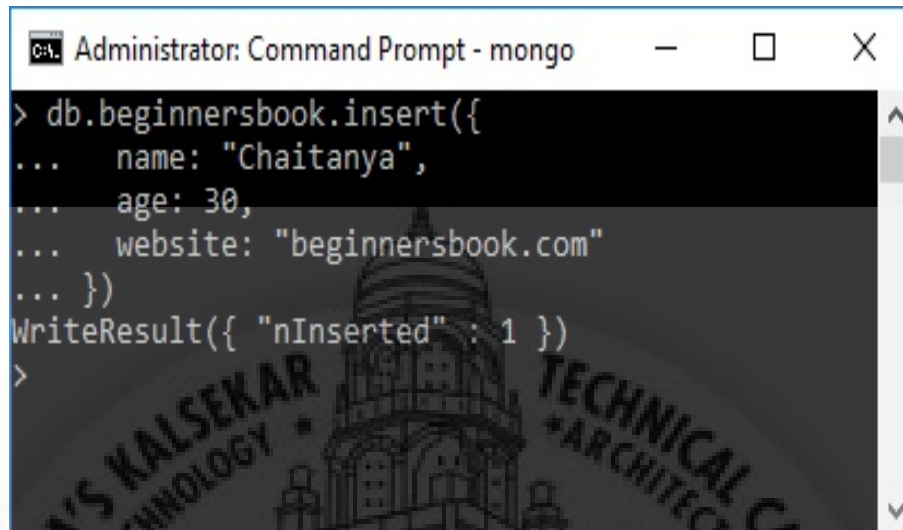[Link: http://www.sqlservertutorial.net/sql-server-stored-procedures/variables/]

3.1.7   MongoDB

MongoDB is an unrelated data store for JSON documents. It stores data as key-value pairs, just like Python's dictionaries. The non-relation means that it does not store its data in the form of tables as does a relational database. Stores JSON documents. JSON is a JavaScript object

notation. MongoDB is open-source which provides excellent performance as well as modeling and managing data from huge data collections in one application.

It provides an automatic resizing function. MongoDB is, therefore, a multiplatform database, it can be installed on different platforms such as Windows, Linux, etc. It has a huge query language that supports all major CRUD operations. It has the function of automatic replication.

Figure 3.6: MongoDB Example Code
[Link:http://beginnersbook.co/]

3.2   Methodology

The Chatbots are Artificial Intelligence-based software that can interact with the users through text to text conversation or basic message they can also communicate through a voice interface. The conversation carried out by bots is straight to the point and relevant topic related questions, for example asking bot about the latest update on the news or some more complex questions like troubleshooting Bluetooth or wifi services. As this is a general flow of most of the chatbot which is already available more like Alexa and Siri, but our main focus is to create a healthcare chatbot that will be our medical assistant.

Following is the list of steps required to develop a chatbot:

a. Determine the outcomes and advantages of AI-based chatbot.
b. Evaluate the main goal of developing a chatbot.
c. Creating and Designing intents and entities for chatbot conversation.
d. Search for non-coding platforms for developing and framework.

3.2.1   Opportunities For an AI-Based Chatbot:

Ere to the construction of a chatbot, we must know the opportunities for an AI-based chatbot.
The businesses cooperation examine the best way to implement new ChatBot software in their business, they require a plan to which sorts of work should be automated through Artificial Intelligence resolutions.
Toward a distinct kind of work venture, Artificial Intelligence explications can be estimated

based on two criteria:

1) Work Complexity

2)Data Complexity

The coupled analysis of task complexity and data complexity sequences in four main kinds of motion prototypes:

1. Performance

2. Authority

3. Effectiveness

4. Novelty

3.2.2 Goals and Requirements of Customers:

To be more precise to understand what are the client's needs and what they require in their chatbot or how the customer wants to run it. clearing out these questions to guide the developer to create the conversation base that is meeting the end and goals of the client. It becomes more ease of a task whent] the developer knows the requirements and needs of the customer and client, and why the chatbot is being made. This to design better conversation methods and not just ask repetitive questions.

3.2.3 Designing Conversation:

For developing a text to a text conversation, we need to do some research and read, refer to blog articles, journals, and papers on How to conduct and design conversations for chatbots. Chatbot conversation is divided into various segments of structure and type and unstructured and its type. As it suggests, the structured type interaction is about the logical flow of the information, which includes the forms, choices, and menus into the account. The unstructured type of interaction is that interaction where the conversation is more of a freestyle plain text. This type of conversation is usually carried out between our family and friends which are more of a nonprofessional type. During the construction of the scripted message, it is very crucial to keep it small and crisp according to the chatbot. For the developer, guessing the probability of the user's answer is very important while making the script for the conversation interface. The main focus of the developer is mainly on open-ended and close-ended conversations which are used while natural communication.

3.2.4 Chatbot Platforms:

These are some of the websites that we have come across while searching for chatbot making software's and articles. These are some of the renowned and most reliable website to work on and they are easily accessible to the user. Most of these are free resources to work on and provide grate experience.

1.Chatfuel
2.Botsify
3.Flow XO
4.Beep Boop
5.Bottr
6.Motion AI
7.Chattypeople
8.QnA Maker
9.Recast.AI
10.Botkit
11.ChatterOn
12.Octane.ai
13.Converse.io
14.Gupshup

3.2.5 Framework of Codes

The farmework of the codes require programming language and also has the advantage of storing data into database, through code-based framework. This incorporates AI analytics to make it more efficient and accessible to store database.

The most reliable code-based framework for developing chatbot that we have came across are Microsoft Bot Framework, Wit. Ai Aspect CXP-NL, and lastly API.ai. There are many more code based framework available but these are focused on AI based using Python as their main language in backhand programming.

3.3 Work done for Sypn.co Pvt.Ltd.:

3.3.1 Landing image:

1.Creating this section consist of 2 rows in which 1 row consists of 2 columns.

2.We start by placing the image in the second column, where the size of the image plays an important role in website performance. The dimensions will give the website a classy look.

3.The dimension of the image is 600X600 pixels. The link to the image is https://pro.spyn.co/wp-content/uploads/2019/09/xFootball-1.jpg.pagespeed.ic.1KoS2LQxMw.webp. The size of the image is 64.0 KB (65,536 bytes).

4.The next column uses two widgets one the special heading and the other one is the button titled 'try AcademyPRO for FREE'.

5.The row which consists the columns have the specification as follows background: rgba(15,153,15,0.11); padding:16px 16px 0px 16px ; background-color:rgba(15,153,15,0.11).

6.The next row is made for the sponsors and it is created by the widget of partner/logo element when the cursor is on the logo the hover effect of logo name.

7.For the mobile view, a similar templet is arranged vertically so that it can be more visible and engaging.

Facebook is the most popular social networking site for both businesses and individuals.
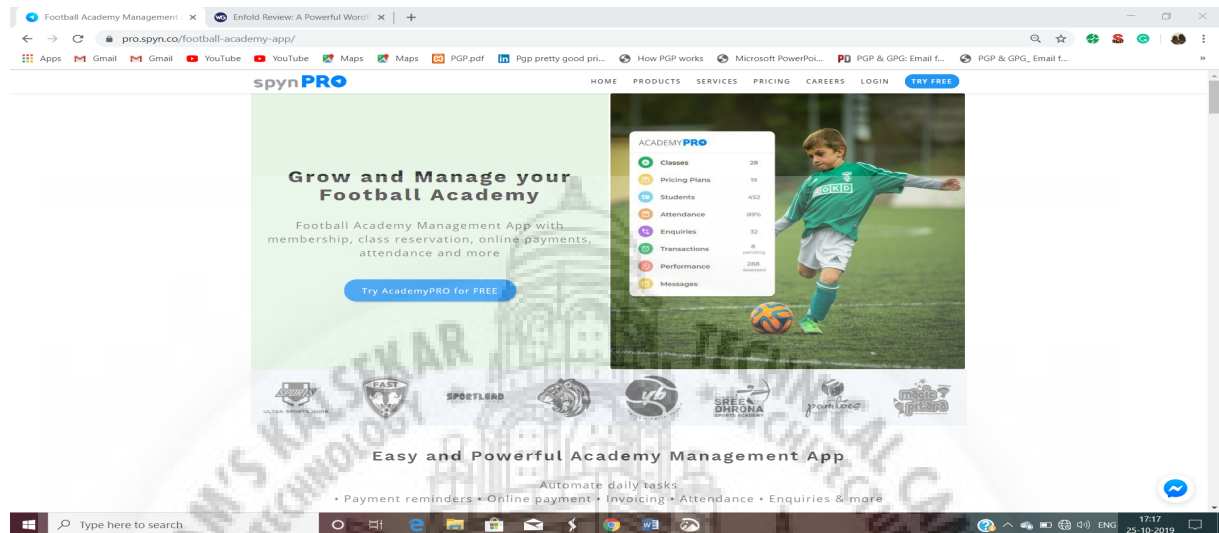
Figure 3.7: Landing Section
[Link:https://pro.spyn.co/football-academy-app/]

3.3.2 All devices:

1.In this image there is a single row using three widgets namely special heading, image and text block.

2.The special heading is the type of text block which is having the title font range from H1 to H6 and normal text for sub title.

3.The image is of size of 80.0 KB (81,920 bytes) and the dimensions as height="530" width="12 92"

4.the alt attribute plays an important role in search engine optimization, the given alt attribute is 'Football Coaching Academy Management App - Cloud based Software'.

5.The last widget is text block, the text can be written in the subtitle of the first widget but this widget is used for better look of website.
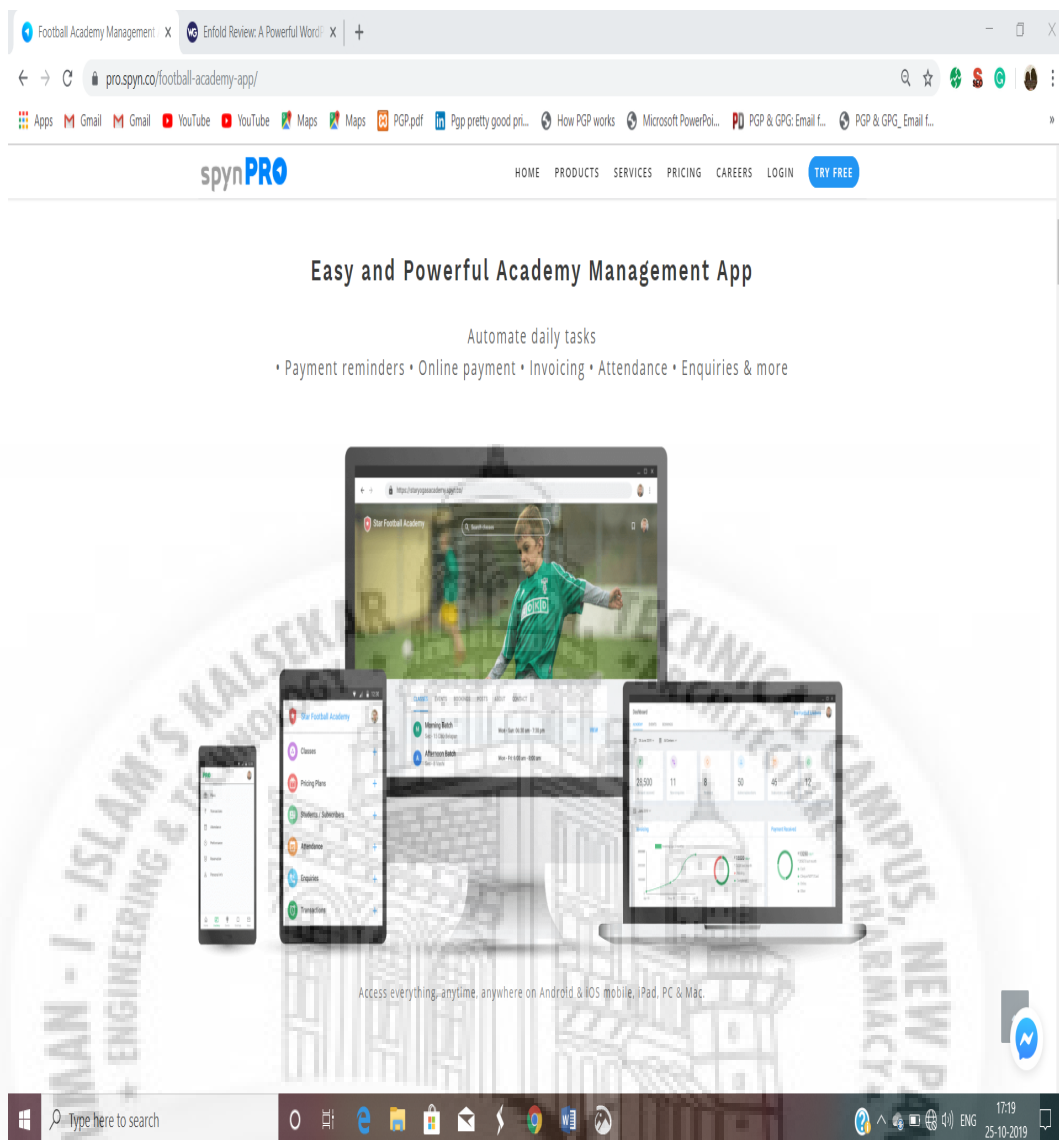
Figure 3.8: Academic Management App Section
[Link:https://pro.spyn.co/football-academy-app/]

3.3.3   Features:

1.The feature section has total 10 features namely 'Get paid in time', 'Mark attendance', 'View Subcribers Details', 'Manage enquiries detail', 'Messaging', 'Acedamy Report', 'Students Performance Report', 'App for your Students', 'Expense Reporting' and 'Refer Win'.

2.For making this section first we have to select a colour section in which we can arrange all the features properly.

3.Then comes the special heading widget which will indicate that it's feature section.

4.20 columns are then arranged and the size of each column is selected as so that it will occupy only half of the space of the colour section.

5.Click on the setting of the column like 'equal height columns' this will make the height of two column equal. 'vertical alignment' is set as middle because if a column is larger than is

content, were we want it to align the content.

6.The top margin and bottom margin are set as 80 pixels. Inner padding is done so that the content will get some padding-top is 50 pixels, padding-right is 50 pixels, padding-bottom is 0 pixel and padding-left is 50 pixels.

7.After setting all the details of the column then the widget is added to write the content of the feature.

8.Next column is used for the image similarly how we uploaded the image above, the background colour is set as rgba(244,219,53,0.15) and the padding is given as padding: (50px, 0px, 0px, 0px).

9.Similarly, all the 10 feature is done the gradient is different for all the feature and it is alternately arranged for a better appearance.
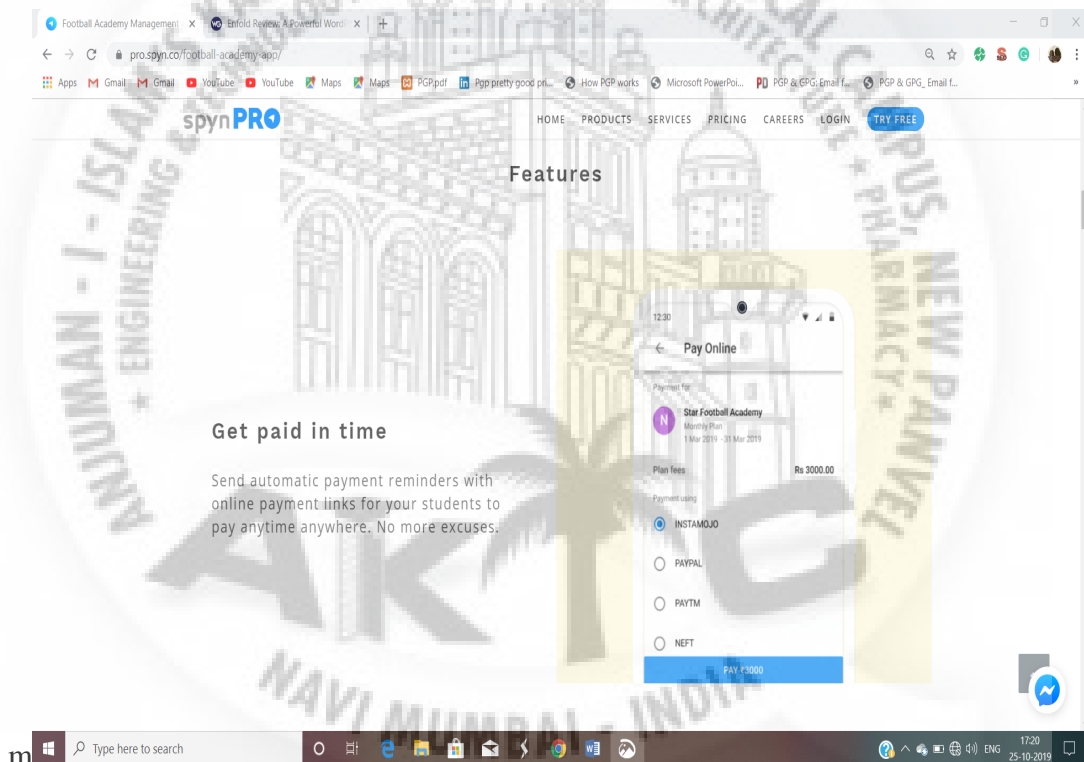
Figure 3.9: All Features
[Link:https://pro.spyn.co/football-academy-app/]

3.3.4   Video:
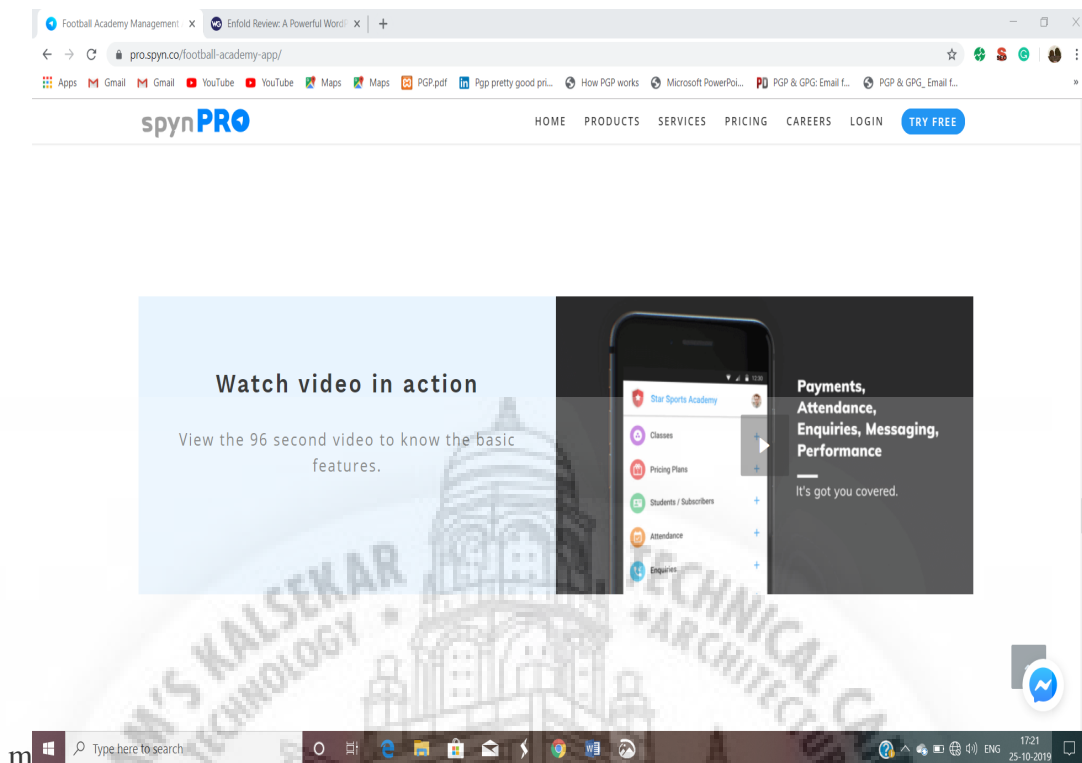
Figure 3.10: Video Section
[Link:https://pro.spyn.co/football-academy-app/]

1.In this section there is there is only 2 columns.

2.There is no spacing between the columns.

3.First column has the normal text block.

4.Next column uses the widget call video in this widget we have to insert the video, the image the video aspect ratio is set as 16:9 and the image is selected which is to be shown on the website.

5.There is two option where the video is played automatically without the interaction of the user and other the user interaction is important to play the video.

3.3.5 Loved by Academy:
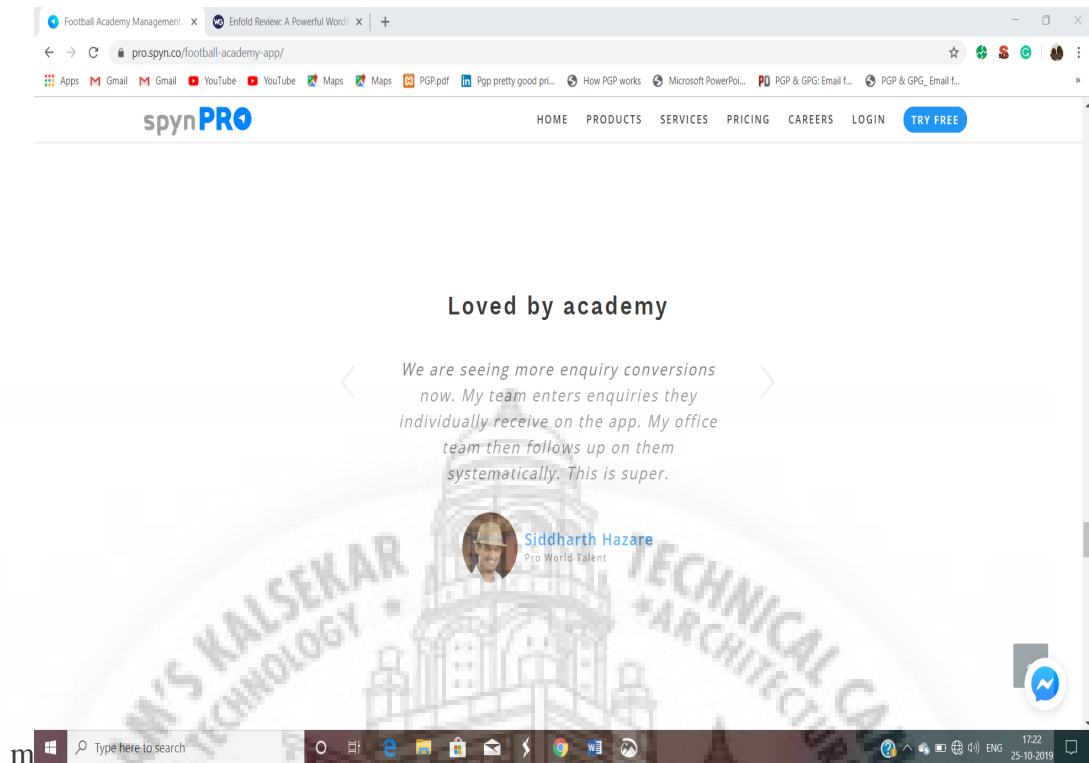
Figure 3.11: Testimonial Section
[Link:https://pro.spyn.co/football-academy-app/]

1.For creating this segment, a colour section is created in which there is the slider of the comment given by the coaches and the teacher who all are using the SpynPRO app.

2.Special heading widget is taken first in the colour section and heading type is selected as H2, the heading type is also important in SEO. The heading type H1 is only for the main title and the rest headings should be in H2. There is no subtitle in this heading so we have set 'no subtitle' in the settings.

3.For centring the comments, we have to take 3 columns in which the sectioning is done as 1/5, 3/5 and 1/5 respectively.

4.The column which having section of 3/5 is used for this. The widget called 'testimonial' is drag into this column.

5.Testimonial features are we can add comment by the person and we can also add their image, name and designation. Here we want the name should take us to the social media profile of that person.

6.Using the href attribute this will specify the destination of the social media profile or website it started with the tag <a> and ended with the . example of this is link text.

7.The slider duration is set as 3 second, after 3 second the slider will change.

3.3.6 The next step:
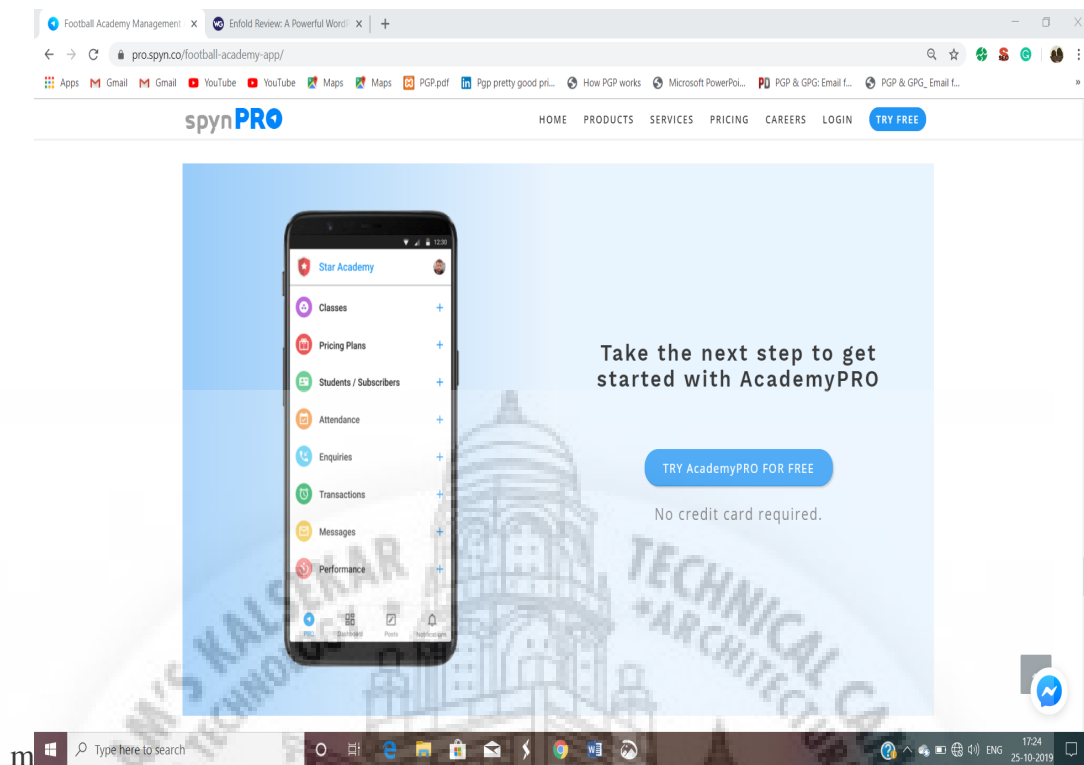
Figure 3.12: Next Step Section
[Link:https://pro.spyn.co/football-academy-app/]

1.The first column has the image and has the gradient and padding is background:linear-gradient(to right,99ccf9,ebf5fe); padding:50px 0px 50px 0px ; background-color:2196f3; border-radius:0px;

2.The second column has the text and the button titled 'TRY AcademyPRO for FREE'.

3.The gradient and the padding of the second column is background: rgba(33,150,243,0.1); padding:0px 24px 0px 0px ; background-color:rgba(33,150,243,0.1); border-radius:0px.

4.The alternative text to the given as alt= 'Academy PRO Homepage' the title of the image is given as title= 'Pro Biz Home Page' the size of the image is height= '600' width= '298'.

3.3.7 Business Types:
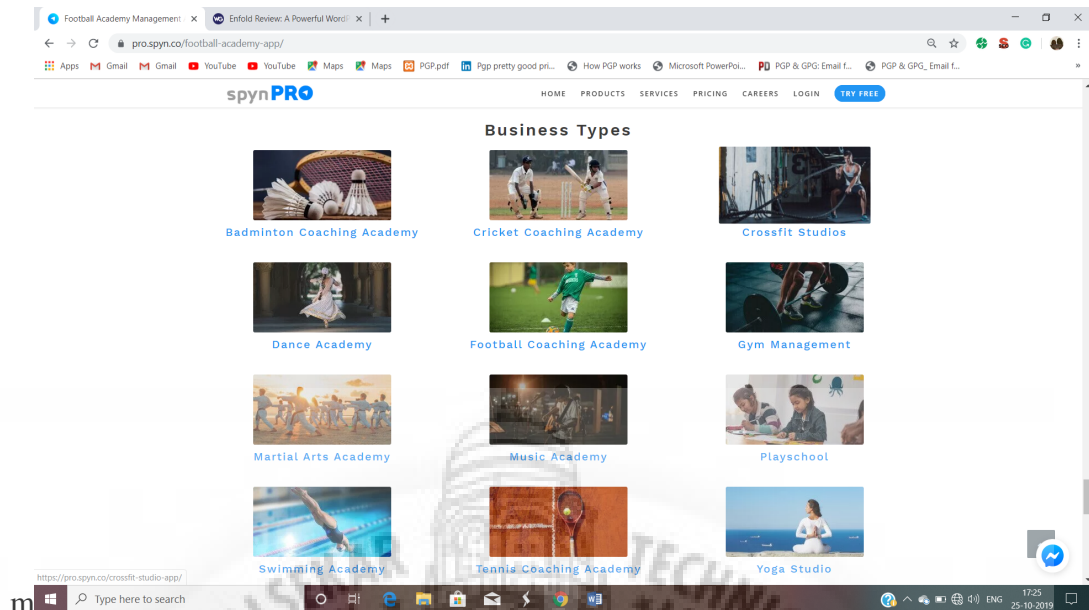
Figure 3.13: Business Type Section
[Link:https://pro.spyn.co/football-academy-app/]

1.This is the section where all the pages are on the single section.

2.Similar to the above section there is a special heading widget having a title name as 'Business types'.

3.In this section, there are in total of 12 columns each column for a page. The column section is divided as 1/3 so that three columns will appear in a row.

4.In each column, there are two widgets one is an image and the second is a special heading.

5.In image widget the overlay effect is given, overlay effect is nothing but when the cursor is on the image the image expends a little. It is given by class="image-overlay overlay-type-extern".

6.The dimension of the image is 250X150 pixels. The alternate text and title gave similar like alt= 'GYM' title= 'GYM'.

7.The text widget is given the URL link of the page by using the 'href' tag.

3.3.8 Contact us:
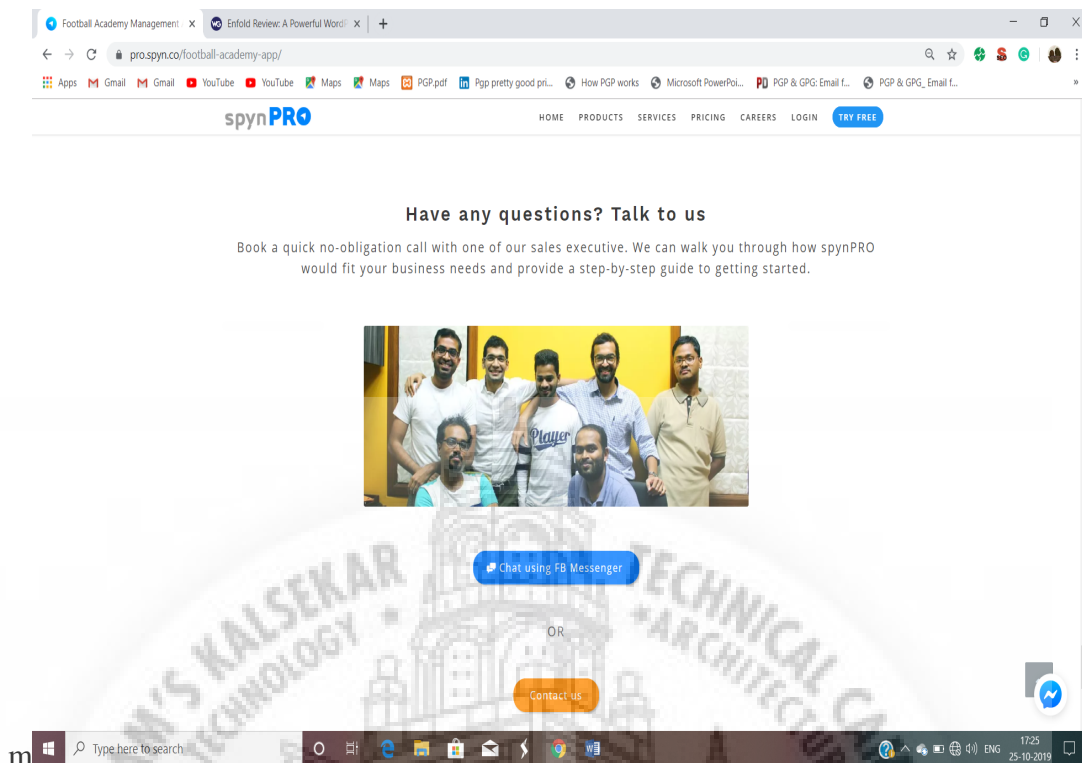
Figure 3.14: Contact Section
[Link:https://pro.spyn.co/football-academy-app/]

1.This colour section consists of 2 text blocks two buttons one image and one special heading.

2.The special heading is same as that of above sections.

3.The image dimensions are 1080X400 pixels.

4.Three columns are sectioned as 1/5, 3/5 and 1/5 respectively, the 1/5 sectioned column are empty and all the buttons and image is put sequentially in the 3/5 sectioned column.

5.The separator or whitespace is given between the button and the image, between text and the buttons and at the bottom of the last button. The whitespace in this column having a height of 50 pixels.

This is how the page is completed, now the steps are almost similar for all other business types pages so each of the colour section is saved as a template. This template will help us to make all the other pages in minimum time. Other pages are made using the drag and drop system of WordPress. After the page completion we have to take care about the search engine optimization and it is done using Yoast SEO plugin of WordPress.

3.3.9 Yoast SEO:
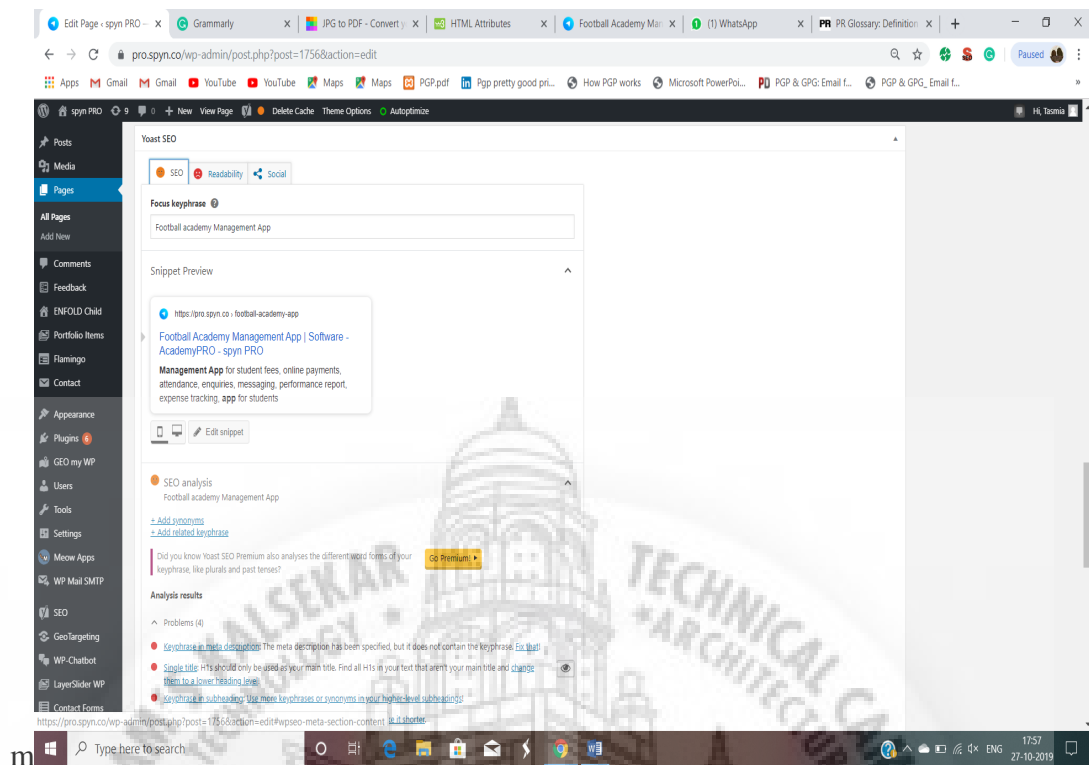
Figure 3.15: SEO Analysis
[Link:https://pro.spyn.co/football-academy-app/]

1.First, we set the focus keyphrase like in this page the focus keyphrase is 'Football acedamy Management App'. This will help your page to focus on a single phrase.

2.After keyphrase our focus will be on how a browser will show our page so for this we have to set snippet. For setting the snippet there is a button called 'Edit snippet' by clicking this button different option will be available like SEO title, Slug and Meta description.

3.The SEO title option is used in which you can create your own template using home,pages or post. This will help you in the ranking of the search appearance. 4.Slug is something which will give your page a URL what you want.

5.The Meta description is something which is of 155 character or more than that but it will not affect the ranking but it will help in the search appearance. The description should be in mixed metaphor form. The description should contain the words from the keyphrase.

Chapter 3. Basics Skills for Development Framework of Chat-bot

3.3.10   Result:
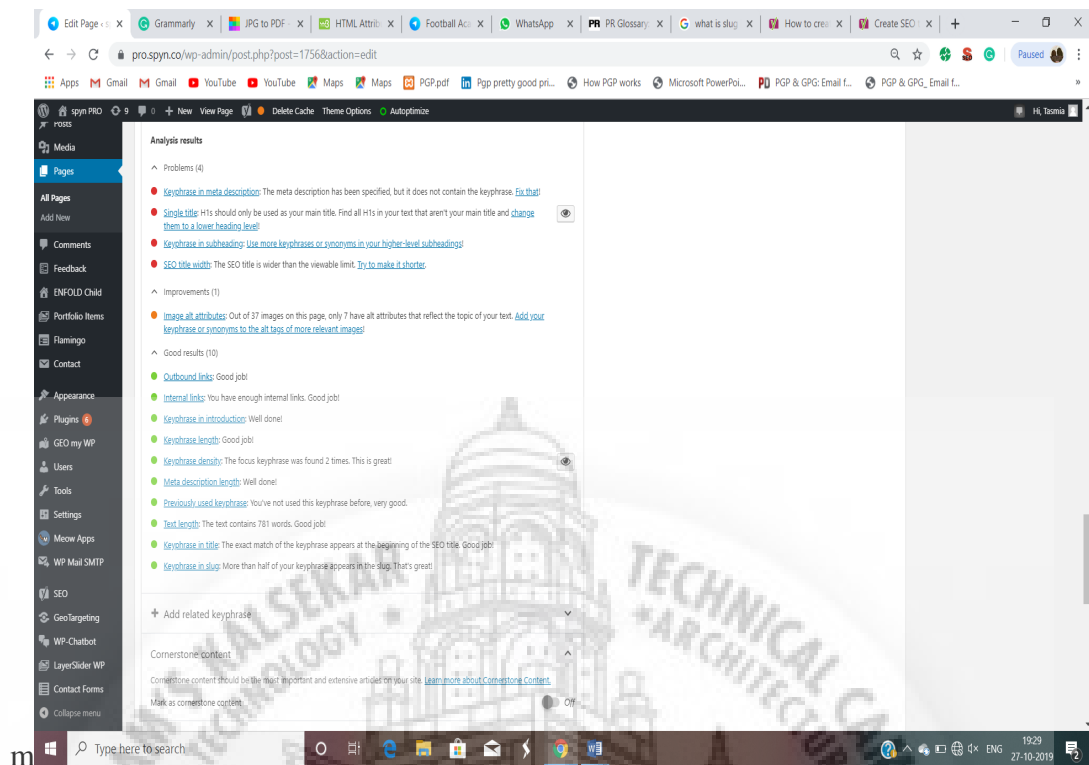
Figure 3.16: Result of Analysis
[Link:https://pro.spyn.co/football-academy-app]

1.The analysis result shows the problems, improvements and good results.

2.It will show the over all result of the page.

3.This will be focusing on the SEO and readability. The readability analysis helps us to write text in easy to read and understand manner. The readability analysis includes several check as follows

3.1.Sentence length

3.2.Paragraph length

3.3.Subheading distribution

3.4.Consecutive sentences

3.5.Use of passive voice

3.6.Use of transition words

3.7.Flesch reading ease score

3.8.Text presence

4.If you write a text based on the above criteria the plugin will reward you with a green bullet.

For SEO analysis first we have to enter the focus keyphrase. The SEO analysis will check the presence of the keyphrase in:

a.The title of the page

b.The introductory paragraph

c.Headings

d.The URL

e.The content of the article

f.The Meta description

g.The image alternate tags

h.The plugin will calculate the number of words and frequency of the focus keyphrase in the article. It checks whether we are using the exact same focus keyphrase on other pages of our website so we don't accidently compete with ourselves.

3.3.11 GTmetrix:
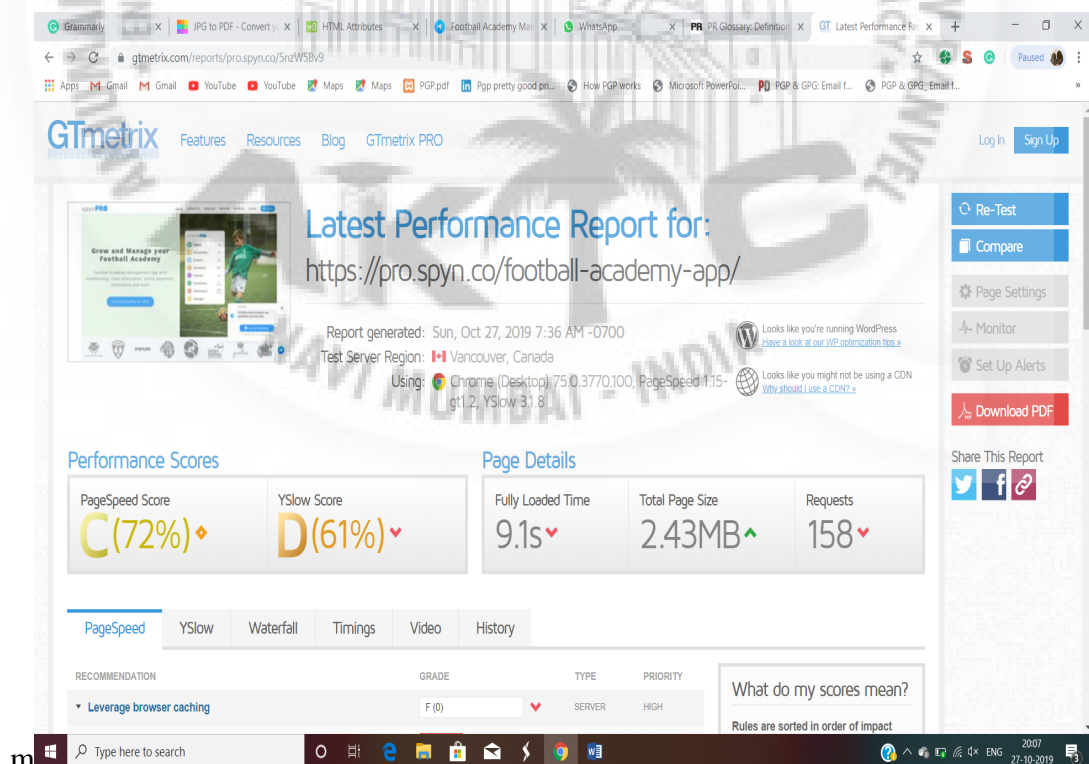
Figure 3.17: Site Performance Analysis
[Link:https://gtmetrix.com/analyze.html]

1.GTmetrix website is use to check the performance and the optimization of the website page.

2.By copying the URL of the page for which we want to check on the GTmetrix it will fetch the website. The testing server of the GTmetrix is Vancouver, Canada.

3.Waterfall section plays an important role because it will show the speed of each section, images and videos.

4.It will also show the size of the page and the time required to load the website.

5.It will also provide the page load time historical graph.

6.Pagespeed section will provide grades for different types like leverage browsing caching, Minify JavaScript, Optimize images etc.

7.We can compare our website with other website and we can also download the PDF of the report.

3.3.12 Blog website:

1. This website consists of a landing page which was having all the recent blogs on it

2. The header which was having logo of the website and the menu bar.

3. Menu bar was made in such a way having the options Home, three categories which having two blogs in each category, About.

4. Each categories page was a having two blog post with comment section and sharing buttons.

5. About page was all about the author. When she started this blog and other information of author.

3.3.13 iLearnopedia website:

1. Created the landing page of the website with header, footer and Menu bar.

2. Created the summer camp page with all the images and videos which was required for page.

3. Created patron page, this page was the most important page of the website having details of chief patron and patron member with the messages they stated.

4. Created About page which focuses on the vision and the mission of iLearnopedia and the details of the founder, co-founder, the development team and the history of the iLearnopedia.

3.4 Work done For Centillion Pvt.Ltd.

Centillion is a software-based corporation where Web development is the heart of the corporation. The usual solid technology advising organizations holding expertise in technologies before-mentioned which are PHP, Javascript, Angular, including other latest technology stack. We produce custom web application explications classifying from ERP, Business Automation, E-commerce to Cross-platform mobile, and desktop application. Centillion Company is a member of Amex Business Solutions Pvt Ltd previously identified as Amex Technologies. It is a Software Corporation positioned at Belapur CBD, Navi Mumbai.

Basically the training was based on PHP i.e. Hypertext Preprocessor. It is an back end language or could be called as Server side language. Any application when build has PHP program in its backend and this PHP language works when in build in HTML. HTML is used as a frame where the php coding is used. This language plays an important role in making any application or a website. It is like a backbone of website.

PHP is also used in LARAVEL: FRAMESETS. These framesets has the frames about the websites and the web developer needs to add on some changes to it. PHP is also used in building a Registration Form. This form basically requires four files which will be used. They consist of Index.php, Index1.php, Sidefile.php, Welcome.php. These files were used in making the Registration Form.

The user has been given a Username and a Password for entering into the webpage. Unless the user enters the correct username and password he/she would not be allowed into it. The webpage would consider them as an intruder. The username here is 'user' and the password is 'root'. The working basically happens with the IF statement. This statement is like a comparison statement . Where it compares two or more given statements and which ever statement is proved True is echoed or shown as an output.

3.4.1 Code for index.php:

This Index page consist of the form where the user will be giving its inputs. Such as user name and password and the submit button. When the user gives the input through the form, the user then clicks on the submit button. This page also consist of session. Session is basically used for easy programming of pages or could be said as proper coordination between the different pages of the website. The form is build by using HTML coding. Using HTML coding makes the form easier in reading by the user as well as by the developer.

Second comes the Index1 page. This page consist of the connection with the Database. This connection is between the server and the database. All the data that is given by the user through the form is collected and stored in the database. It is then compared with the original username and password and after the comparison if the given input is a true then the user is allowed access to the webpage or else the user is allowed to check again with the username and password.

When the connection takes place, there are prepared statements formed by the PDO. Since the database only understands prepared statements and executes them. For the database, PHP my admin is used as a database for this task. The database usually has a username and a password. When the data is entered by the user, it is then checked by the if statement and if the

data is true it then allows the user to login the webpage or else it asks the user to check for the password or the username. That is to check if the data which is entered is entered properly or not.

When the username and password is entered the session is enable and the data is verified. If the data entered is correct then the user is send to the Welcome page of the desired webpage. Further, the important page which is the Welcome page. That is the login page about the webpage page. The welcome page consist of the session that was made in the Index page and was carried onto the Index1 page. This session helps the user to login the webpage.

There is this condition used that when both the login that is the password and the username is correct the session allows the user to enter the webpage. The session consist of AND and OR conditions. The output is based accordingly to these conditions. When the login is true the user is allowed to the Welcome page by the statement on the screen as " YOU HAVE SUCCESS-FULLY LOGGED IN..!!" or else the user is redirected towards the Index page if the login is not successful or if there is any error about it.

The Welcome page consist of logout button. When the user has logged in he/she can then logout using the logout button. This procedure is done with the help of Sidefile. The sidefile consist of the logout button through which the user can exit from the webpage. This happens eventually better on the same page without letting the user know about it.

This file can be called as a special file where all the work happens in the same tab as the webpage and logs out in the same tab. And when the user logs out he/she gets the Index page where the form exists and where the data can be re-entered.

After the completion of the Registration task there was the Register task. This task consist of the work of the pages like Register, Login , Server, Index, Errors and Style. Here only the Style file consist of CSS and the rest file are based on the language of PHP. This task consist of the Registration where the user enters the Webpage.if he/she has already registered or if he/she has not been registered can register with making an account in it. All these data has been saved in the database. And for the database we use PHP my admin. And by connecting the server with the database he/she can work ahead.

First we start with the Login page. This page consist of the Login form where the user needs to login if he/she has not been registered in the webpage. The form consist of the input about the username and password and then he/she can enter the webpage . If he/she are not the member of the webpage then they can register in. All the input data is actioned to the Server page.

With the login page we also require Register page. The Registration System consist of session that has the file of the server page. It also consist of the error file that has the error file and coding. The register file consist of the username, email, and password. Here the user needs to confirm the password since he/she has to use the same password for the login purpose. If the user has been already registered or is the member of the webpage then he/she can directly Log in the webpage.

For this task, we also require server page for this webpage. Also we require error file for the webpage .The Error file consist of foreach conditions where errors are checked in the loop and by using endforeach and also closing the loop with endif

The webpage consist of the Server page. Where the user data is stored and if the user has been already registered then the input data is cross checked and if the user has not been registered then when the user registers then the input data will be stored in the server.

Chapter 4

Development Framework of Chat-Bot

4.1 Softare Programs required For development Famework

Some steps are needed to be followed beforehand when we start developing a chatbot. Every question that we mention can be considered in different ways. This depends upon the user how thwy depict that question that can be in many other ways. Lets take the example of Alexa, we comdand the Alexa to turn on the lights. This command can be given in many other ways such as Alexa, can you turn on the lights. Alexa can you please turn the lights on and many more. These are some of the ways that the user can give command to turn on the lights. All this questions have the same intention behind them that is to turn the lights on but they are seperated by the expressions and way to asking. We have to write all the possible logically asked question that the user may ask to them link in the deed by recognizing what their intention is. Lets take another medical condition example to understand it more clearly. Lets say we have created a chatbot for booking an appoinment with your doctor so what would be some questions that user has to provide. It will start from basic such as name, age, gender, weight, have they visted before, and chose the time slot to book an appoinment.

4.2 Decision Tree within Chat-Bot

It is easy to write and follow the decision tree, but they are a very important and meaningful representation of the solution for a particular problem. It acquires a different experience to support us to recognize several elements.

• Aides build a comprehensive understanding of the difficulty in the problem. If we glance at the decision tree, we undoubtedly learn what is needed or what necessitates changes are to be made.

• This Assists with the debugging process of errors. Decision trees act similar a compact Bible or, for instance, a perceptible image of software demands stipulation report that developers, product administrators, or officials can lead to teach predicted performance or cause adjustments, if important.

• AI is not yet in the phase where it can train with a lot of data and work with 100 percent accuracy. It still requires a lot of control when writing business logic and rules.

Decision trees help where it is a bit difficult to ask a machine to learn and run. Chapter 1 Dear Chatbots 22 . Let us consider a general example of this and understand how this helps to develop a chatbot. The diagram mentioned below depicts it very nicely, as this chatbot is for buying clothes online the first interaction is the bot asks the user if they are looking for skirts or jeans. Then based on the user's answer, the flow in the diagram continues to provide options regarding products through asking specific questions. For this, we don't have to create a whole decision tree, but at least you have to have a particular flow or structure of questions beforehand while creating a chatbot. Let us consider we have to create a similar chatbot of this kind to buy clothes from an online website. Firstly we need to create a decision tree or flowchart so we have a series of questions that the chatbot can ask the user for more detailed preference. This is crucial to determine each step of the stage and what will be the next step. The state diagram or flowchart of the chatbot is very important. It should be simple and not complex as much as possible and then we can add some advanced features to it. The major advantage of this is that the developing time is reduced and smooth functionality is achieved within not much time. For example, after developing basic functions, it is possible to add more options for the user to choose from such as material, color, dress length, discounts, etc.
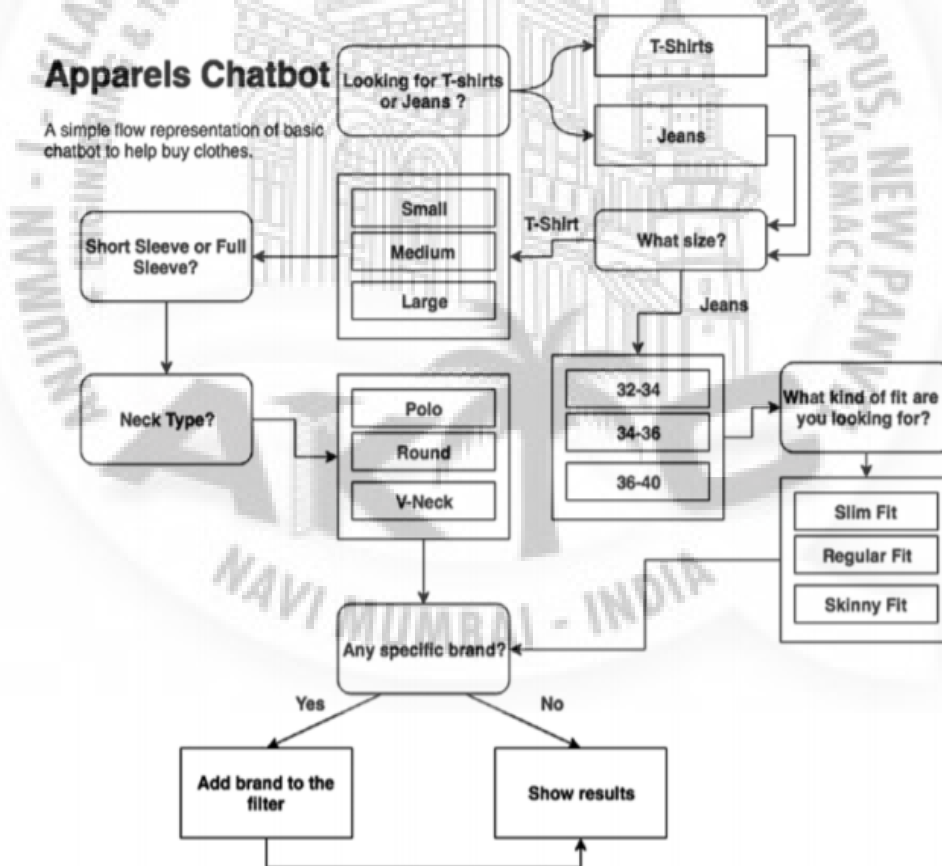

Figure 4.1: Representation of an apparel chatbot
[Link:https://apparelresources.com/technology-news/retail-tech/chatbots-the-new-buzzword-and-a-boon-for-retailers/]

4.3 Working Softwares

For building a chatbot using python, getting its basics and clear idea about NLP (Natural Language Processing). The most reliable chatbot framework is accessible on woebot.ai, dialogflow.com, qnamaker.ai, core.rasa.ai, wit.ai, and botkit.ai. The basic terminologies applied for chatbots are intent, entities and utterances training of bot and confidence score of the bot.As we are operating with python for designing the chatbot we can run it on Anaconda, Jupyter, Notebook or Python itself. We have adopted a 3.7 version of python on the jupyter notebook. Why do we require to understand natural language processing for building a chatbot, the question arises. They are in the field of artificial intelligence which helps the computer to recognize and analyze human language and to implement NLP we should understand Natural Language Understanding(NLU). BLU is the subset of a bigger picture of NLP. We can also create a chatbot without NLP but the ranges will be restricted without NLP. NPL processes the raw data for which it is considered as the chatbot brain, which mugging up clean it and gives appropriate actions.

4.3.1 SpaCy

SpaCy is a library for NLP. It implements natural APIs to take its plans conducted by deep learning principles. The SpaCy along with English, French, Dutch also offers German, Portugese and French and also multi-language NER. Features for spacy mentioned on the official website of SpaCy.

Figure 4.2: spaCy
[Link:https://nlpforhackers.io/complete-guide-to-spacy/]
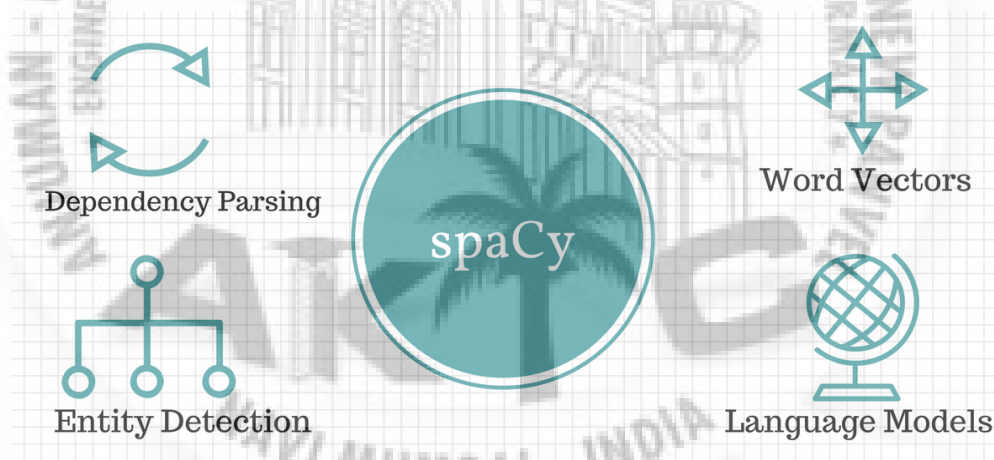
4.3.2 Introduction to Dialogflow

Dialogflow communicate with the output in distinct ways with the help of text and voice conversational interface, which are through chatbot. Dialogflow is recognised through Artificial intelligence. It keeps the communication intact through user and website, other means of it are such as applications on mobile phones, google assistant, messenger, Amazon Alexa, and other related platforms. The data regarding Diseases, Symptoms and Remedies needs to be stored in an organized manner for making it easier for the engine to access it. Our Chatbot stores data in XML format. The idea is that the Medical Professionals would write this data and feed this data

to our Chatbot and the Chatbot engine would interact with this data. We have separate divisions for every disease that is present in our records. The data is properly organized and is compatible to be parsed by standard XML parsers [13].

Figure 4.3: Dialogflow
[Link:https://medium.com/analytics-vidhya/dialogflow-chatbot-with-webhooks-using-python]

There are different types of agents in Dialogflow system that can easily explain us the Natural Language Understanding (NUL) modules. The operator comprises of software to generate the communication structure in that pathway. This can be easily achieved with the help of guidance of circumtances, the priorities of intents, filling the slot, achieving the responsibilities and then completing it through web hook. The chatbot de-veloped here for healthcare purposes for the android appli-cation. We will evaluate our Chatbot design using General Word Percentage (GWP) analysis and combining the result with terminology detection test analysis that would show us an average percentage about how many time our Chatbot detects medical terminologies with the increase in general non-medical terminology as compared to the other Chatbots [14].

Figure 4.4: DialogueFlow Architecture
[Link:https://www.researchgate.net/Google-Dialogflow-Agent-architecture.png]

For building a chatbot we have used FLASK, PUSHER channel, DIALOGFLOW. In this bot we are using the symptoms the body location diagnosis based on both body and symtptoms. We are trying to build a bot in such a way that the conversation between the user and chatbot will be real time conversation. The prerequisite are as follows

- Python 3.6 (or may be the newest version of python)

- Pusher channel

- JavaScript (jQuery)

- Dialogflow

- Ngrok

Started with checking the version of our python. So for writing the code we needed a simple structure of our project. For this we have created folders and file in our system like
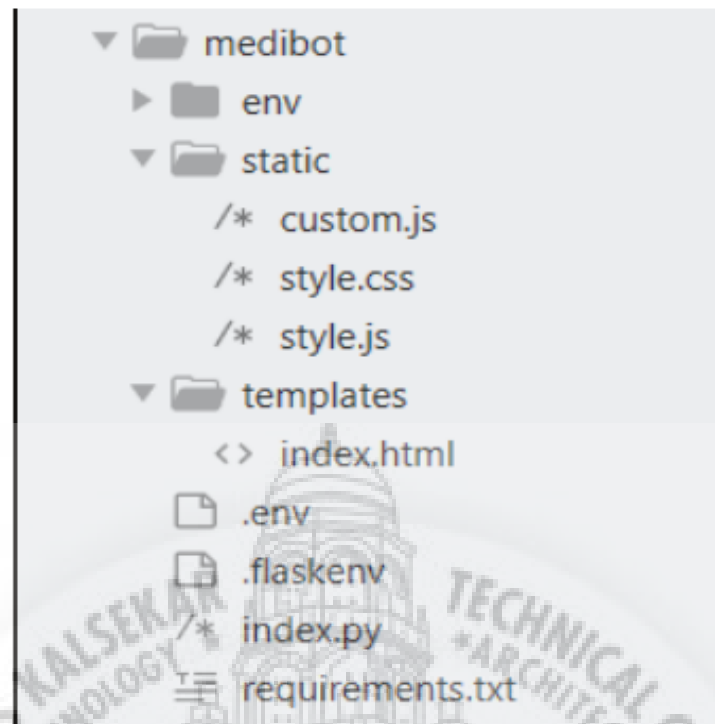
Figure 4.5: Folders and Files of system
[Link:https://]

This folders and file can be created using codes in the console or you can manually create it.
The description of file are as follows:

- index.py : It is the main entry point for the project
.
- requirements.txt : all the libraries which we are going to use are contained in this file.

- Static : this file contain file like css and js.

- Templates : our HTML files will live here.

- flaskenv : this file will store the flask environment variables.

- env : the file will help us to store the private keys
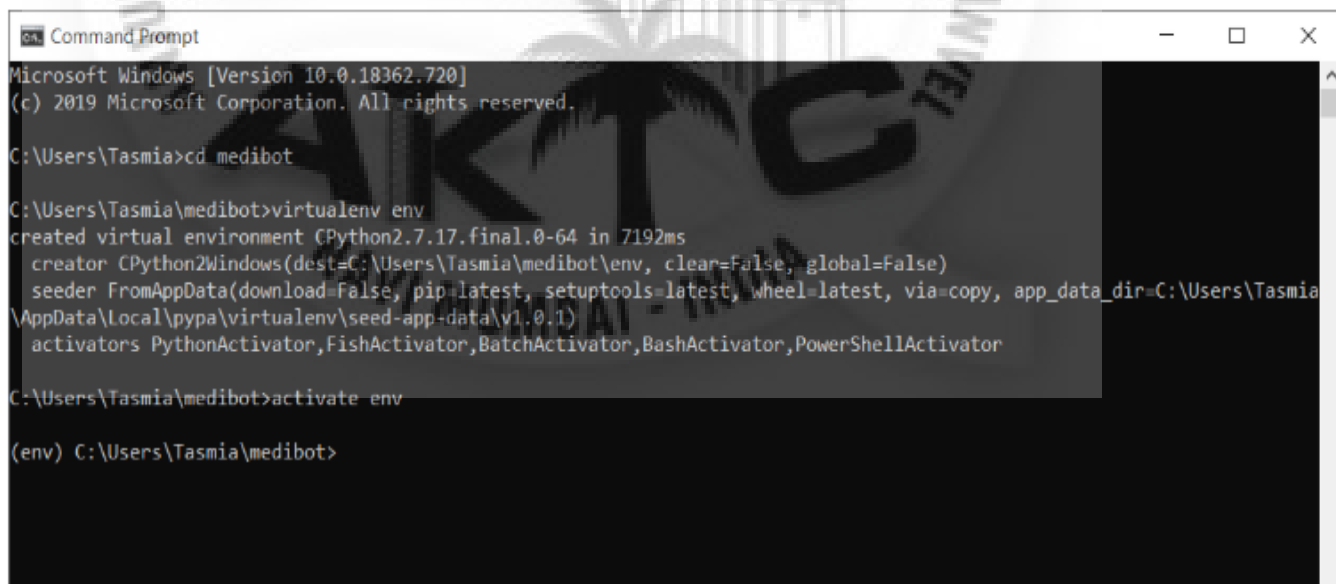
Then adding the libraries in requirements.txt

Figure 4.6: Flask Command

●requests: this a library that is utilized to request external URLs.

●dialogflow: It is used to interact with API of Dialogflow.

●Python-Dotenv: that list will be applied through flask to store environment configurations data.

●Pusher: this file is used to add realtime to our chatbot.

After that we have created a virtual environment for isolating our python environment. There are different methods for creating an environment depending upon the prompt we are using. Since we are using windows10 command prompt we have used the codes accordingly. Here we are making an environment named env it is up to us which ever name you want to give to your environment. The output of this will give you a (env) besides your folder name as you can see below.

Figure 4.7: Command Prompt

Then we will add files to .flaskenv file . the file we are adding will instruct the Flask to use the index.py as the main entry.

For starting up with Flask we have to add code to index.py file. This code will direct you to the index.html file which is in the folder name templates. After we added the files, we have to install the libraries which we saved in the requirements.txt file. Once the installation is complete we have to run the flask app. The output of the flask run syntax is shown below

Figure 4.8: Command Prompt

4.3.3 Working on API:

Api stands for Application Programming Interface. The api is used to allow two application or software to communicate with each other. The api key we used is from rapid api website. We requested to provide the api key. Than that key is added to .env file. The response of this will be in JSON object.

Figure 4.9: Command Prompt

We have already made an account on dialigflow website to start working on it. Dialogflow is owened by Google developer used for communication between human and computer. This

Chapter 4. Development Framework of Chat-Bot

technology is based of natural language. First step in dialogflow is to set an agent here our agent name is medibot. After creating the agent, there on the sidebar of the dashboard is smalltalk. By enabling the smalltalk we can customize the responses the way we like. Save all the changes we made in the small talk. Now for training the bot we need to understand the intents and accordingly should be added in the intent. An intent describes something the user's statement indicates, or what they expect to perceive from the AI chatbot. For instance, if someone states "show me today's weather news report", the user expects to view a schedule of weather headlines. Intents are usually specified with a verb and a noun. We have created a intent named as Fever. After that there is are options like training phrases, context and events. In training phrases add the textx which is likely going to be asked by the user.it is shown below.
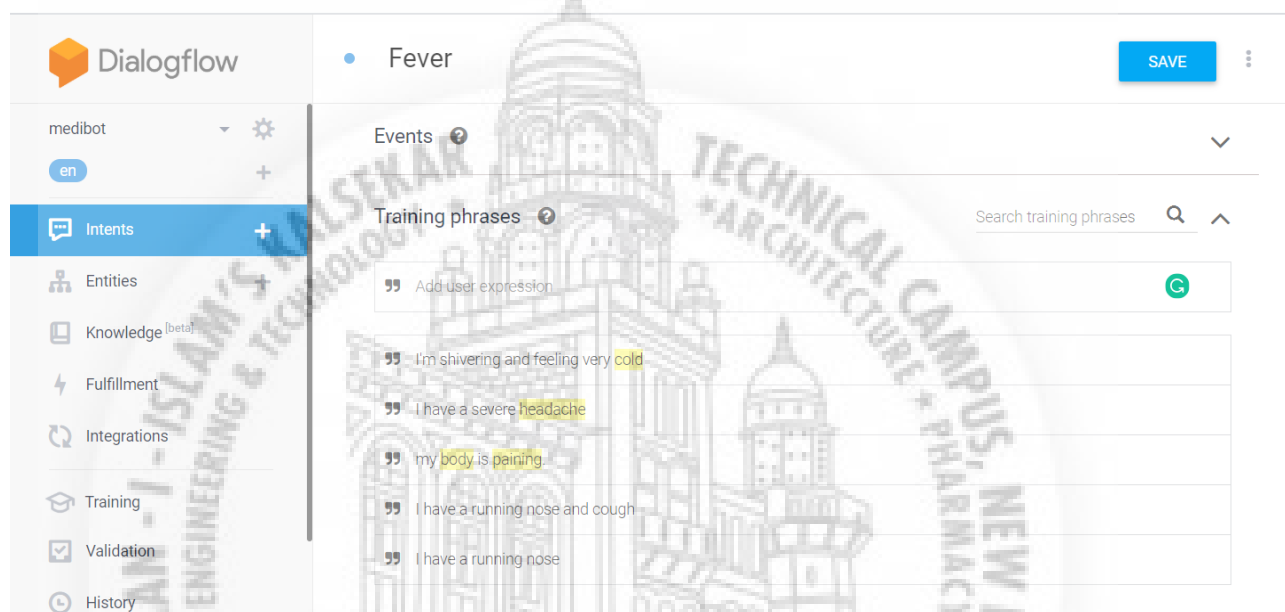
Figure 4.10: Intents in Dialogueflow

Entity creation is used to extract the values of the parameters from the user input. An entity is generally a keyword that makes the user's intention or commands more precise. Applying our illustration, if a user signs "show me today's weather news", the entities act "today" and "weather". Entities are assigned a name, such as "DateTime" and "new style". After saving the intention and the entities, it is important to connect the entity to the intention, the sentences that we have saved in the training sentence by right-clicking on the word whose entity has been created and it will display the entities present which select the desired one. Finally, scroll down to the same page where full fill is present, activation will help us use Webhook and then save the changes. The more you add the phrases and response, the conversation between user and bot will be more of realtime conversation. For making the use of dialogflow and python libraries , it is required to have api key. We need to get it from Google Cloud Platform.
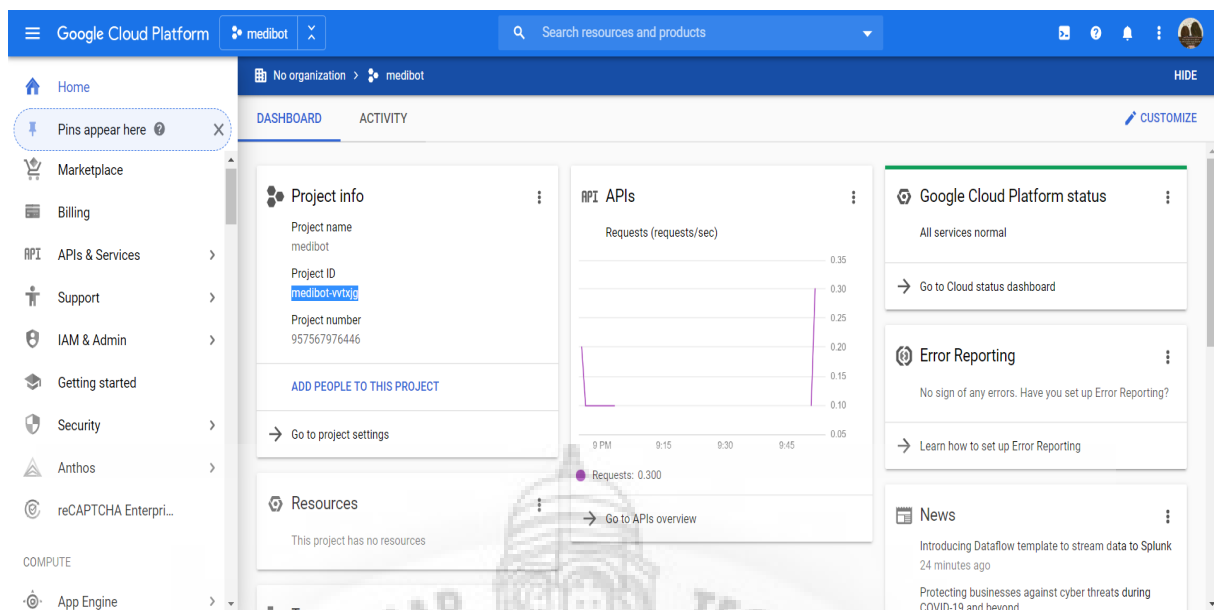
Figure 4.11: Google Cloud Platform

It is first important to create your project, here the name of our project is med-bot. The ID of our project is also saved in the .env file. Now, to create the API key, go to API and services, then Credentials. Click the service account key, select Dialogflow Integrations under Service Account, and then select JSON under the key type. Finally, click the Create button to download the API key. The name of the downloaded API key will also be saved in the .env file. The downloaded file must be rooted in our project folder.

4.3.4 WebHook:

When our robot detects the keyword, it sends a request to our webhook using the keyword. Using the keyword, we will query RapidAPI for more details on the keyword. Then return the result to Dialogflow. Creation of a new path that we will use as our webhook. This code will also be added to the index.py file. Nor to expose our localhost to the world, we have to download Ngrok from the website. The website will provide us with a zip file that we need to unzip. Then move it to the desktop or your project folder. We moved it to the desktop, it's easier to manage than run at the command prompt, as shown.

Figure 4.12: ngrok prompt

The URL which is on the forwarding should be copied to the fulfilment on the sidebar of our Dialogflow console and save the changes. The thing we have to note here is whenever your connection is lost we have the copy the URL to the fulfilment. Because the forwarding will be change everytime you run th Ngrok.
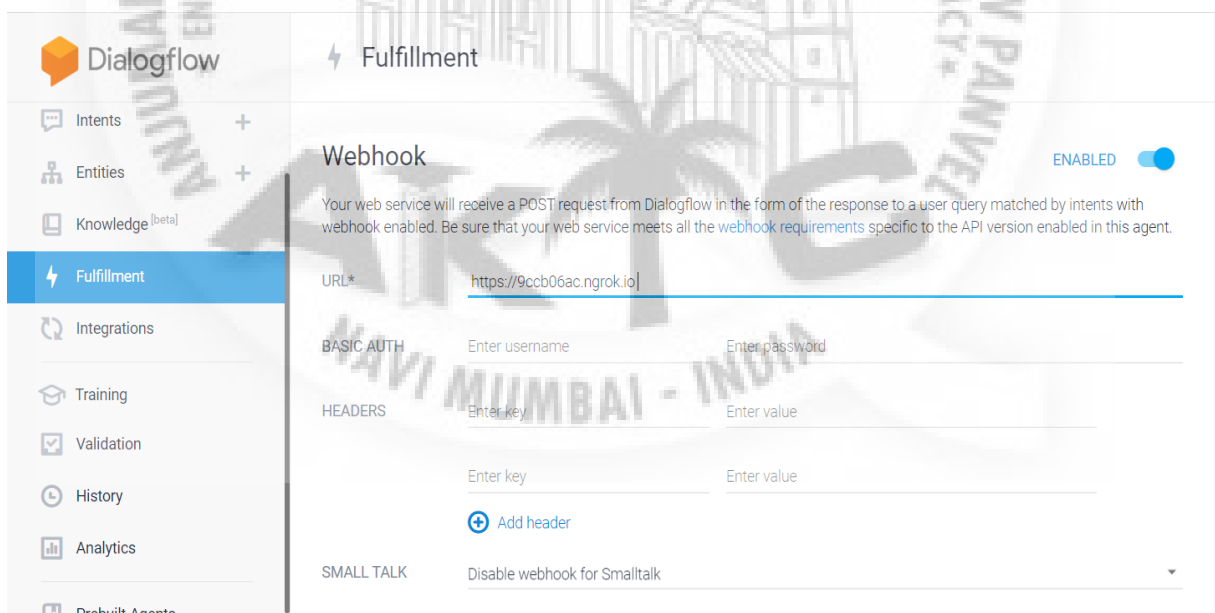
Figure 4.13: WebHook Webpage

4.3.5 Pusher API key

Pusher channels does the job of adding realtime functionality to our application. For using this platform we needed an API key. For getting the API key we have to create a free account on

pusher. Once we logged in, create a new app and take the id, key, secret and cluster, we will need it later. Now copy those to the .env file.
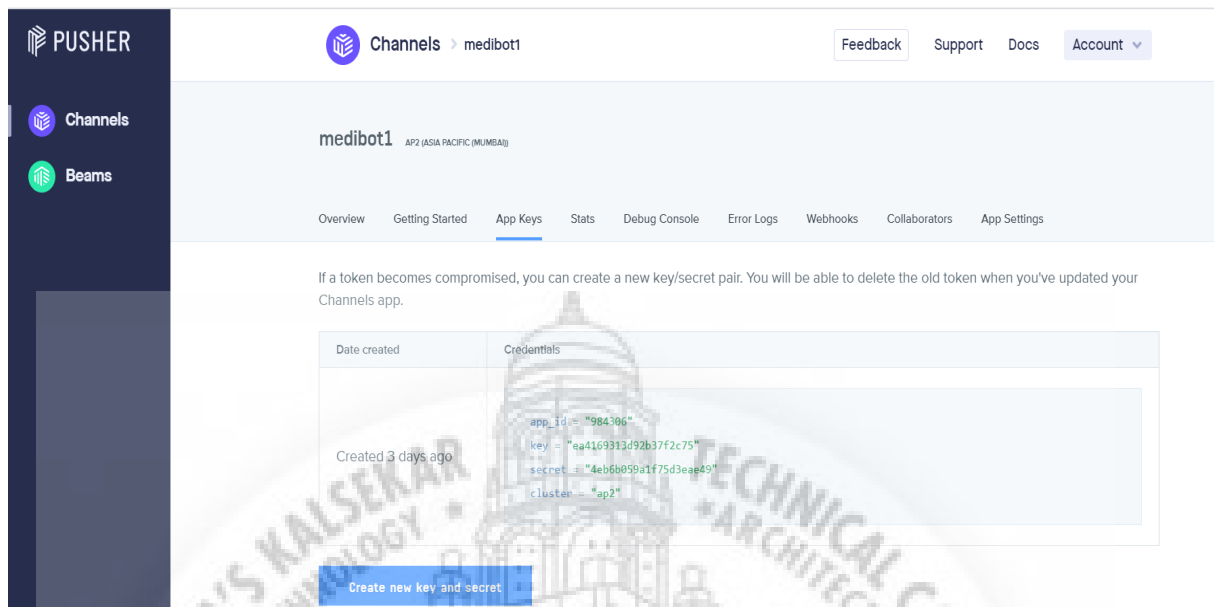
Figure 4.14: Pusher Api

4.3.6   Chatbot user interface

We will create a simple interface where users can type a message and send and on the same page they should also see their message and that of our chatbot. Here we are using Bootstrap to create the page and the add the HTML markup to index.html in this file we are importing bootstrap, jQuery, Pusher library, style.css and custom.js file. Now adding the styles to style.css.

When the user sends a message, it should be send to Dialogflow to detect the intent of the message. Dialogflow will work on the text and it will send back a fulfilment response for this action we have add the codes to the indexpy file. Now it is important to create a route in which the text will be submitted. For all the above actions, the code is in the index.py

Displaying messages For displaying all the messages and responses of our chatbot's page. The js coding is added to custom.js which is in the folder static. The preceding code will listen when the user submits the message, then call the submit message function to submit the text from the user.

Adding the Realtime functionality As we know the real time functionality is provided bye the pusher channel. It is important to initialize the Pusher Python library by adding the code in the index.py. this code will be just after the import line. And the code for triggering the event will be exactly before return jsonify(response text). This will trigger an event to Pusher on a channel medibot1 with a event name new message.Now for listening the new message event on the medibot1 channel. We will attach the message to HTML DOM. For this will add the code to custom.js at the topmost part of custom.js in static folder.Now restart the server and ensure the Ngrok is running.

Chapter 5

Conclusion

From the gathered information from various resources, we conclude that chatbots are user-friendly software application and can be easily understood and run by the users. Who has experience with smartphones and can comfortably type in their language through a text message on the application as we do on social platforms. A healthcare chatbot provides the user, interactive, contact-free, and trustworthy diagnoses based on their symptoms. In this era of the pandemic, these chatbots can greatly improvise the experience of seeing medical help without actually visiting the doctor. The idea of medical or healthcare chatbot in the future can evolve more to deliver advanced medical features to ascertain the severeness of symptoms that the patient is going through. This can be done by getting detailed information on patients such as their medical history and previously consulted doctors and many more. The process of normalizing the application of personalized healthcare assistant or aide based on AI can be exceeding the time.

This project has guided us to build a medical chatbot using Flask and Dialogflow. From this, we have accomplished how to implement real-time interaction in chatbot using the pusher channel. The database of our project was taken from the webservice RapidAPI and we had requested to give us the API key. The training of our chatbot was done using dialogflow. In our project the main entry is done in index.py file. Our project faced many problems like database collection. After researching for 2 to 3 days continuously we got the webservice which provided us the api. Our project was supposed to be on Jupyter but there were some issues with it, so we have shifted to Flask Python platform. As this was just the basic chatbot we are going to train our chatbot, because the training will help our chatbot to be realistic. Then we have got a new experience of Google Cloud Platform and get to know about. The internship work was very helpful for solving the error which was there in HTML file, .css file and .js file. There was an indentation error in our python file which has taken our lot of time in solving it, there was some syntax error too which was resolved. The project was successfully implemented on the localhost.

Chapter 6

Thesis Plagarism Report
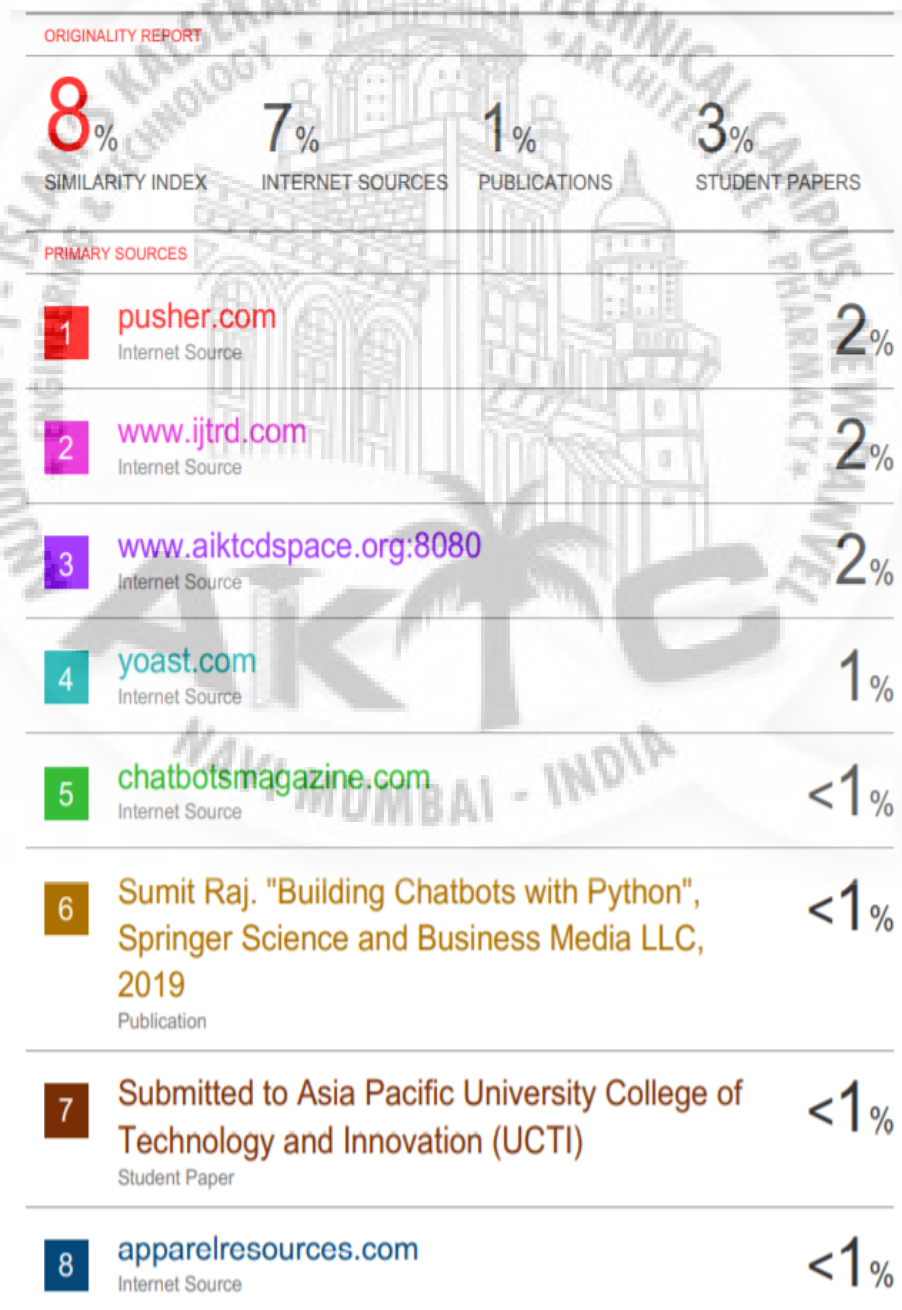
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Chapter 7

Internship

7.1   Shaikh Sabreen's Feedback Letter

7.2 Shaikh Tasmia's Offer Letter

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Internship Agreement

14 August, 2019

Sub: *Offer of Internship*

Dear **Tasmia Shaikh,**

On behalf of Atzos Ventures Pvt Ltd and team Spyn, I am pleased to confirm our offer of internship. We extend this offer, and the opportunity it represents, with great confidence in your abilities. This offer is conditional upon (i) satisfactory reference check of all qualifications (ii) the acceptance of the terms & conditions of your assignments as set forth below.

Position: **Wordpress Developer**
Reporting and assignment: You will be reporting to *Sudarshan Karnavat*, Co-Founder
Date of Internship commencement: **16 Aug 2019**
Duration: **6 months**
Stipend: **Rs.2000.00** per month

Our values

Energy	Be proactive. Be cheerful. Go all in.
Passion	Work with passion. Get guaranteed satisfaction. Keep stress away.
Creativity	Your creative juices can change the world. Let them out.
Integrity	In Sports and in Spyn, rules are not meant to be broken. Be a Sport.
Determination	It ain't over until it's over. Keep at it. Own it.
Fun	The underlying principle of any sport. And of life.

Terms and conditions:
Your Internship with us will be governed by our Terms and Conditions as detailed in *Annexure B.* At the time of joining, it is mandatory for you to submit the documents mentioned in the acceptance agreement.

Tasmia, we wish you all the best and hope you will achieve your learning goals with Atzos Ventures Pvt. Ltd.

Sincerely,
For Atzos Ventures Pvt. Ltd.

Authorized Signatory

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Chapter 8

International Confrence

Title of Conference: Convergence-2020

Venue of Conference : Poornima Institute Of Engineering Technology, Jaipur.

Title of Paper : Self-Diagnosis Medical Chat-Bot Using Artificial Intelligence.

Author Names : Awab Habib Fakih, Ghare Shifa Shakil, Shaikh Sabreen Mohd. Iqbal, Shaikh Tasmia Bano Abdul Sajid.

Paper Acceptance Date : 05-03-2020

Accepted : Springer AIS [ISSN: 2524-7565]

Date of Conference : 20th March, 2020

Mode of Presentation : Online

8.1 Acceptance E-mail

M Gmail   **Shifa Ghare <shifaghare88@gmail.com>**

Congratulation for Paper Acceptance
1 message

Convergence 2020 <convergence2020@easychair.org>   7 March 2020 at 10:03
To: Shifa Ghare <shifaghare88@gmail.com>

Dear Shifa Ghare,

!!Greetings from ICSEC-2020!!

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Your paper entitled Self- Diagnosis Medical Chat-Bot Using Artificial Intelligence was accepted and recommended for presentation in one of the followings Series/special issue of journals:

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Thanking you
Dr. Dinesh Goyal
(General Chair ICSEC-2020)

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Ghare Shifa Shakil [Student, Aashiyana Apt. Flat np-204, Bandar Road, Old Panvel, Navi Mumbai, Maharashtra-410206],
Shaikh Sabreen Mohd. Iqbal [Student, Raza Tower, 6th floor 602, Rak Marg, Sewri Cross road, Maharashtra-400015],
Shaikh Tasmia Bano Abdul Sajid [Student, 182/Sagar Niwas, Room no-19, Pipe Road, Kurla West, Maharashtra-400070].
(the "**Author**")
whereas, in the event that the Author is more than one person, *Ghare Shifa Shakil* serves as corresponding author
(the "**Corresponding Author**")

on the one part and

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If the Author is in material breach of any of the Applicable Laws or otherwise in material breach of accepted ethical standards in research and scholarship, or becomes the subject of any comprehensive or selective sanctions issued in any applicable jurisdiction (e.g. being subject to the OFAC sanctions list) or if, in the opinion of the Publisher, at any time any act, allegation or conduct of or about the Author prejudices the production or successful exploitation of the Contribution and the Work or brings the name and/or reputation of the Publisher or the Work into disrepute, or is likely to do so, then the Publisher may terminate this Agreement in accordance with the Clause **"Termination"**.

8.3   The Publisher reserves the right to amend and/or require the Author to amend the Contribution at any time to remove any actual or potential breach of the above warranties and representations or otherwise unlawful part(s) which the Publisher or its internal or external legal advisers identify at any time. Any such amendment or removal shall not affect the warranties and representations given by the Author in this Agreement.

§ 9 Author's Discount and Electronic Access

9.1   The Author, or each co-author, is entitled to purchase for their personal use the Work and other books published by the Publisher at a discount of 40% off the list price, for as long as there is a contractual arrangement between the Author and the Publisher and subject to any applicable book price law or regulation. The copies must be ordered from the affiliated entity of the Publisher (Springer Nature Customer Service Center GmbH or Springer Nature Customer Service Center LLC, respectively). Resale of such copies is not permitted.

9.2   The Publisher shall provide the electronic final published version of the Work to the Author, provided that the Author has included their e-mail address in the manuscript of the Contribution.

§ 10 Consideration

10.1   The Parties agree that the Publisher's agreement to its contractual obligations in this Agreement in respect of its efforts in considering publishing and promoting the Contribution and the Work is good and valuable consideration for the rights granted and obligations undertaken by the Author under this Agreement, the receipt, validity and sufficiency of which is hereby acknowledged by the Author.

The Parties expressly agree that no royalty, remuneration, licence fee, costs or other moneys whatsoever shall be payable to the Author, subject to the following provisions of this Clause.

10.2   The Publisher and the Author each have the right to authorise collective management organisations (**"CMOs"**) of their choice to manage some of their rights. Reprographic and other collectively managed rights in the Contribution (**"Collective Rights"**) have been or may be licensed on a non-exclusive basis by each of the Publisher and the Author to their respective CMOs to administer the Collective Rights under their reprographic and other collective licensing schemes (**"Collective Licences"**). Notwithstanding the other provisions of this Clause, the Publisher and the Author shall each receive and retain their share of revenue from use of the Contribution under Collective Licences from, and in accordance with the distribution terms of their respective CMOs. To the fullest extent permitted by law, any such revenue is the sole property of the Publisher and the Author respectively and, if applicable, the registration and taxation of that revenue is the sole responsibility of the respective recipient

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party. The Publisher and the Author shall cooperate as necessary in the event of any change to the licensing arrangements set out in this Clause.

§ 11 New Editions

11.1　The Publisher has the sole right to determine whether to publish any subsequent edition of the Work containing an updated version of the Contribution, but only after reasonable consultation with the Author. Once notified by the Publisher that an update of the Contribution is deemed necessary, the Author agrees to deliver an updated manuscript in accordance with the terms of the Clause **"The Author's Responsibilities"** and the other relevant provisions of this Agreement, together with the material for any new illustrations and any other supporting content including media enhancements, within a reasonable period of time (as determined by the Publisher) after such notification. Substantial changes in the nature or size of the Contribution require the written approval of the Publisher at its sole discretion. The terms of this Agreement shall apply to any new edition of the Work that is published under this **"New Editions"** Clause.

11.2　If the Author, for whatever reason, is unwilling, unable or fails (including as a result of death or incapacity) to submit an updated manuscript that meets the terms of this Agreement within the above stated period, then the Publisher is entitled to revise, update and publish the content of the existing edition or to designate one or more individuals (which, where co-authors have entered into this Agreement, may be one or more of the co-authors) to prepare this and any future editions provided that the new editions shall not contain anything that is a derogatory use of the Author's work that demonstrably damages the Author's scientific reputation. In such case, the Author shall not participate in preparing any subsequent editions. The Author agrees that the Publisher shall be entitled but not obliged to continue to use the name of Author on any new editions of the Work together with the names of the person or persons who contributed to the new editions. Should the Author or the Author's successors object to such continuing use then they must notify the Publisher in writing when first contacted by the Publisher in connection with any new edition.

§12 Termination

12.1　In addition to the specific rights of termination set out in the Clause **"The Publisher's Responsibilities"** and the Clause **"The Author's Responsibilities"**, either Party shall be entitled to terminate this Agreement forthwith by notice in writing to the other Party if the other Party commits a material breach of the terms of the Agreement which cannot be remedied or, if such breach can be remedied, fails to remedy such breach within 45 days of being given written notice to do so.

12.2　Termination of this Agreement, howsoever caused, shall not affect:
(a) any subsisting rights of any third party under any licence or sub-licence validly granted by the Publisher prior to termination and the Publisher shall be entitled to retain its share of any sum payable by any third party under any such licence or sub-licence;
(b) except where stated otherwise in this Agreement, any claim which either Party may have against the other for damages or otherwise in respect of any rights or liabilities arising prior to the date of termination;
(c) the Publisher's right to continue to sell any copies of the Work which are in its power, possession or control as at the date of expiry or termination of this Agreement for a period of 6 months on a non-exclusive basis.

§13 General Provisions

13.1　This Agreement, and the documents referred to within it, constitute the entire agreement between the Parties with respect to the subject matter hereof and supersede any previous agreements, warranties, representations, undertakings or understandings. Each Party acknowledges that it is not relying on, and shall have no remedies in respect of, any undertakings, representations, warranties, promises or assurances that are not set forth in this Agreement. Nothing in this Agreement shall exclude any liability for or remedy in respect of fraud, including fraudulent misrepresentation. This Agreement may be modified or amended only by agreement of the Parties in writing. For the purposes of modifying or amending this Agreement, "in writing" requires either a document written and signed by both the Parties or an electronic confirmation by both the Parties with DocuSign or a similar e-signature solution. Any notice of termination and/or reversion and, where applicable, any preceding notices (including any requesting remediable action under the Clause **"Termination"**) must be provided in writing and delivered by post, courier or personal delivery addressed to the physical address of the relevant Party as set out at the beginning of this Agreement or any replacement address notified to the other Party for this purpose. All such notices shall become effective upon receipt by the other Party. Receipt is deemed to have taken place five working days after the respective notice was sent by post or left at the address by courier or personal delivery. If the Publisher is the terminating Party the notice need only be provided to the address of the Corresponding Author. If the Author is the terminating Party a copy of the notice must also be sent to the Publisher's Legal Department located at Heidelberger Platz 3, 14197 Berlin, Germany.

13.2　Nothing contained in this Agreement shall constitute or shall be construed as constituting a partnership, joint venture or contract of employment between the Publisher and the Author. No Party may assign this Agreement to third parties but the Publisher may assign this Agreement or the rights received hereunder to its affiliated companies. In this Agreement, any words following the terms "include", "including", "in particular", "for example", "e.g." or any similar expression shall be construed as illustrative and shall not limit the sense of the words preceding those terms.

13.3　If any difference shall arise between the Author and the Publisher concerning the meaning of this Agreement or the rights and liabilities of the Parties, the Parties shall engage in good faith discussions to attempt to seek a mutually satisfactory resolution of the dispute. This Agreement shall be governed by, and shall be construed in accordance with, the laws of *the Republic of Singapore*. The courts of *Singapore, Singapore* shall have the exclusive jurisdiction.

13.4　A person who is not a party to this Agreement (other than an affiliate of the Publisher) has no right to enforce any terms or conditions of this Agreement. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the

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commits a material breach of the terms of the Agreement which cannot be remedied or, if such breach can be remedied, fails to remedy such breach within 45 days of being given written notice to do so.

12.2 Termination of this Agreement, howsoever caused, shall not affect:

(a) any subsisting rights of any third party under any licence or sub-licence validly granted by the Publisher prior to termination and the Publisher shall be entitled to retain its share of any sum payable by any third party under any such licence or sub-licence;

(b) except where stated otherwise in this Agreement, any claim which either Party may have against the other for damages or otherwise in respect of any rights or liabilities arising prior to the date of termination;

(c) the Publisher's right to continue to sell any copies of the Work which are in its power, possession or control as at the date of expiry or termination of this Agreement for a period of 6 months on a non-exclusive basis.

§13 General Provisions

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13.2 Nothing contained in this Agreement shall constitute or shall be construed as constituting a partnership, joint venture or contract of employment between the Publisher and the Author. No Party may assign this Agreement to third parties but the Publisher may assign this Agreement or the rights received hereunder to its affiliated companies. In this Agreement, any words following the terms "include", "including", "in particular", "for example", "e.g." or any similar expression shall be construed as illustrative and shall not limit the sense of the words preceding those terms.

13.3 If any difference shall arise between the Author and the Publisher concerning the meaning of this Agreement or the rights and liabilities of the Parties, the Parties shall engage in good faith discussions to attempt to seek a mutually satisfactory resolution of the dispute. This Agreement shall be governed by, and shall be construed in accordance with, the laws of *the Republic of Singapore*. The courts of *Singapore, Singapore* shall have the exclusive jurisdiction.

13.4 A person who is not a party to this Agreement (other than an affiliate of the Publisher) has no right to enforce any terms or conditions of this Agreement. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the Publisher. If one or more provisions of this Agreement are held to be unenforceable (in whole or in part) under applicable law, each such provision shall be deemed excluded from this Agreement and the balance of the Agreement shall remain valid and enforceable but shall be interpreted as if that provision were so excluded. If one or more provisions are so excluded under this Clause then the Parties shall negotiate in good faith to agree an enforceable replacement provision that, to the greatest extent possible under applicable law, achieves the Parties' original commercial intention.

The Corresponding Author signs this Agreement on behalf of any and all co-authors.

Signature of Corresponding Author:

Date:

18/04/2020

Appendix "Author's Self-Archiving Rights"

The Publisher acknowledges that the Author retains rights to archive the Contribution but only subject to and in accordance with the following provisions:

1. **Preprint:**
   A **"Preprint"** is defined as the Author´s version of the Contribution submitted to the Publisher but before any peer-review or any other editorial work by or on behalf of the Publisher has taken place.
   The Author may make available the Preprint of the Contribution for personal and private reading purposes only on any of:
   (a) the Author's own personal, self-maintained website over which the Author has sole operational control; and/or
   (b) a legally compliant, non-commercial preprint server, such as but not limited to arXiv, bioRxiv and RePEc; provided always that once the "Version of Record" (as defined below) of the Contribution has been published by or on behalf of the Publisher, the Author shall immediately ensure that any Preprint made available above shall contain a link to the Version of Record and the following acknowledgement:
   "This is a preprint of the following chapter: [author of the chapter], [chapter title], published in [book title], edited by [editor of the book], [year of publication], [publisher (as it appears on the cover of the book)] reproduced with permission of [publisher (as it appears on the copyright page of the book)]. The final authenticated version is available online at: http://dx.doi.org/[insert DOI]".

2. **Author's Accepted Manuscript:**
   The "Author's Accepted Manuscript" ("AAM") is defined as the version of the Contribution following any peer-review and acceptance, but prior to copyediting and typesetting, by or on behalf of the Publisher.
   The Author may make available the AAM of the Contribution on any of: (a) the Author's own, personal, self-maintained website over which the Author has sole operational control; and/or (b) the Author's employer's internal website or their academic institution or funder´s repository; provided that in each case the respective part of the AAM is not made publicly available until after the Embargo Period.
   The "**Embargo Period**" is a period ending twelve (12) months from the first publication of the "Version of Record" (as defined below) of the Contribution by or on behalf of the Publisher.
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3. **Version of Record:**
   The "**Version of Record**" is defined as the final version of the Contribution as originally published, and as may be subsequently amended following publication in a contractually compliant manner, by or on behalf of the Publisher.

4. Any linking, collection or aggregation of self-archived Contributions from the same Work is strictly prohibited.

Appendix "Author's Reuse Rights"

1. The Publisher acknowledges that the Author retains the ability to copy, distribute or otherwise reuse the Contribution, without the require¬ment to seek specific prior written permission from the Publisher, ("Reuse") subject to and in accordance with the following provisions:
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   (b) Reuse of the Version of Record (as defined below) of the Contribution or any part of it is permitted in a thesis written by the same Author, and the Author is entitled to make a copy of the thesis containing content of the Contribution available in a repository of the Author's academic institution; and
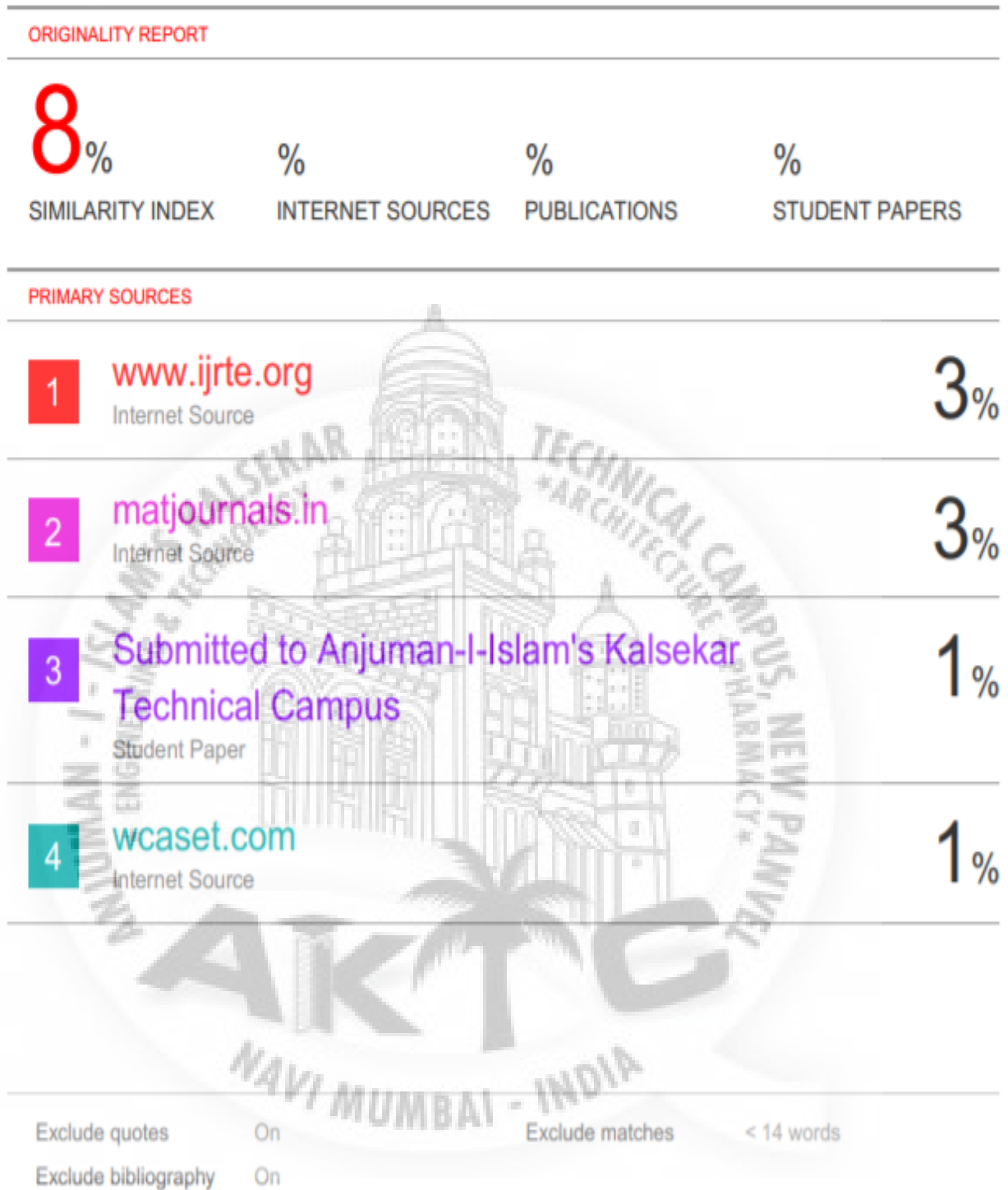   (c) any other Reuse of the Contribution in a new book, book chapter, proceedings or journal article, whether published by the Publisher or by any third party, is limited to three figures (including tables) or single text extracts of less than 400 words; and
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2. Any Reuse must be based on the Version of Record only, and provided the original source of publication is cited according to current citation standards. The **"Version of Record"** is defined as the final version of the Contribution as originally published, and as may be subsequently amended following publication in a contractually compliant manner, by or on behalf of the Publisher.

3. In each case where the Author has Reuse rights or the Publisher grants specific use rights to the Author according to the above provisions, this shall be subject always to the Author obtaining at the Author's sole responsibility, cost and expense the prior consent of any co-author(s) and/or any relevant third party.

4. Any linking, collection or aggregation of reused Contributions from the same Work is strictly prohibited.

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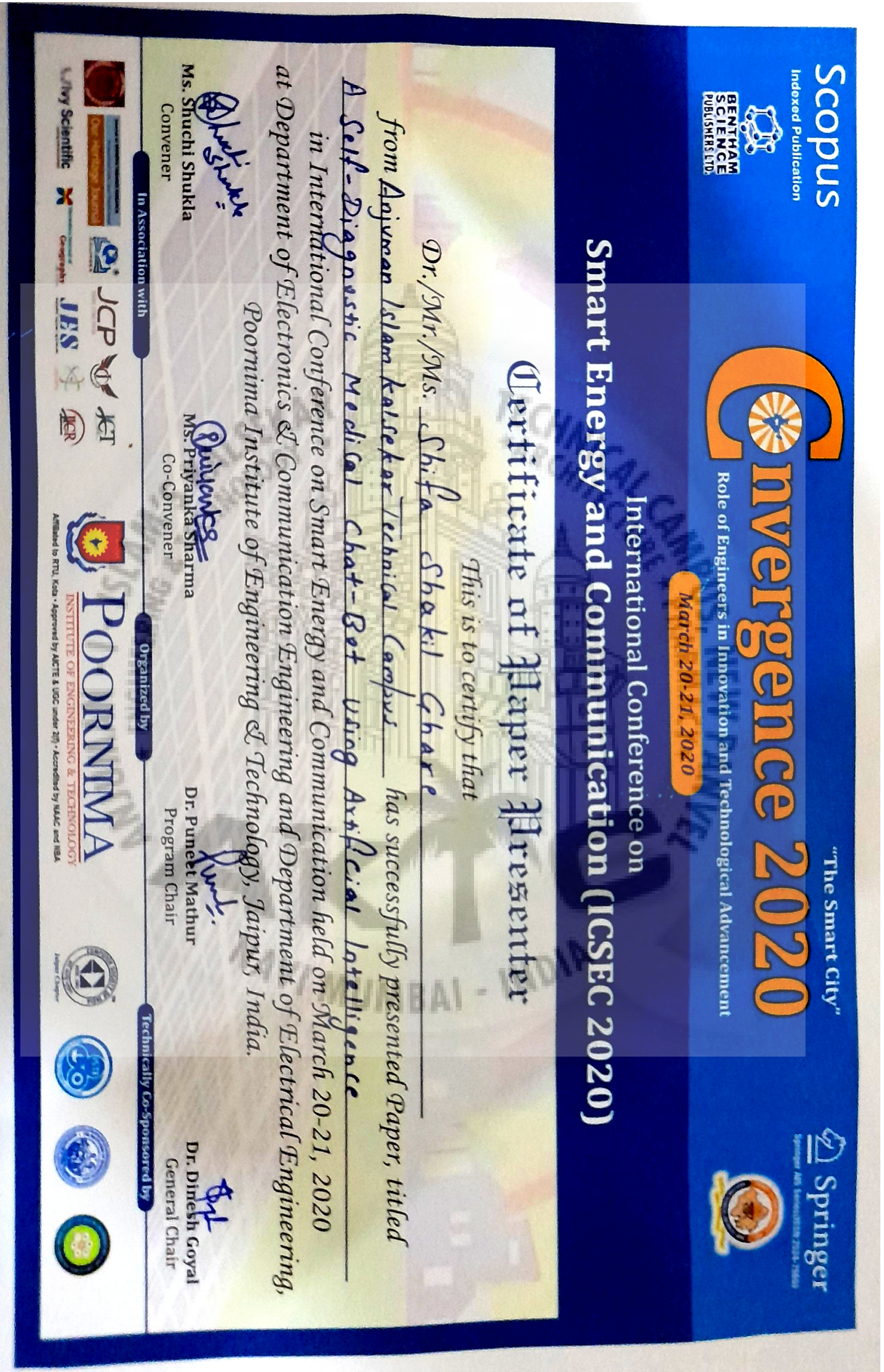
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Chapter 9

Codes

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