

THE FUTURE OF AYURVEDA: HARNESSING THE POWER OF ARTIFICIAL INTELLIGENCE FOR PERSONALIZED TREATMENT AND DIAGNOSIS

23-252

Project Proposal Report


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DECLARATION

I declare that this is my own work, and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

The rapid and busy nature of contemporary living often results in an uneven distribution of daily activities, inadequate dietary habits, insufficient physical exercise and leisure time, and excessive work-related stress, which can lead to poor health and dissatisfaction. While Ayurveda provides alternative solutions for many non-communicable diseases [1] [2], people may have difficulties identifying the appropriate herbs and treatments and consulting with doctors in a timely and cost-effective manner. Additionally, the high cost of Western medicine may be a barrier, and not all illnesses are treatable. The proposed solution aims to assist users in discovering interactive Ayurvedic-based treatments for various symptoms. This solution is anticipated to be beneficial for those seeking alternatives to conventional medicine.

There will be a chat bot in the proposed solution which can discuss health related knowledge. Content sharing inside here which are specifically relating to health will be collected and stored in the knowledgebase. They will be used to service chatbot implementation by labeling as community knowledge. To maintain the consistency of the proposed solution it will be using auto-machine learning, to service users with up-to-date data inside the social network as well as to help in users with symptoms which can be added later. It will be required experienced Ayurvedic-related expertise resources. For supervised machine learning algorithm-based chatbot and we expect to collect data through various publicly available social network communities relating to health.

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LIST OF ABBREVIATION

Abbreviation	Description
AI	Artificial Intelligence
ML	Machine Learning
EHR	Electronic Health Records
AML	Auto Machine Learning
CNN	Convolutional Neural Network
SVM	Support Vector Machine
SDLC	Software Development Life Cycle
WBS	Work Breakdown Structure

1. INTRODUCTION

1.1 Background & Literature survey

Ayurveda is an ancient healthcare system originating in India that emphasizes a holistic approach to health and wellness. It employs natural remedies, lifestyle modifications, and personalized treatments based on an individual's dosha, or body type. Ayurveda has gained popularity worldwide due to its effectiveness and emphasis on prevention and personalized care. However, the fast-paced modern lifestyle has led to an increasing prevalence of non-communicable diseases [1] [2] such as diabetes, heart disease, and cancer, which require a more specialized and personalized approach to treatment. This has prompted researchers and practitioners to explore the integration of Ayurvedic principles with modern technologies such as Artificial Intelligence (AI) to provide personalized and effective treatment.

According to our research, Sri Lankan people have a long-standing cultural and traditional relationship with Ayurveda. Ayurveda has been a part of the country's history for over 3,000 years, and its usage is deeply embedded in Sri Lankan culture. In fact, Ayurvedic treatments have been used in Sri Lanka for thousands of years to prevent and cure various ailments. Ayurveda's popularity in Sri Lanka can be attributed to its holistic approach to healthcare, which emphasizes the balance between mind, body, and spirit. Sri Lankan people have long appreciated the natural and organic nature of Ayurveda, which uses herbs and other natural remedies to treat various health issues. Sri Lankan people prefer Ayurvedic remedies over modern medicine, especially for minor illnesses and chronic health conditions.

Furthermore, Ayurveda has a strong presence in Sri Lanka's healthcare system, with Ayurvedic hospitals and clinics being available throughout the country. Sri Lankan people have access to trained and experienced Ayurvedic doctors, who provide personalized treatments and care for their patients. These doctors use Ayurvedic remedies and traditional healing techniques to treat a wide range of ailments, from common colds to more serious health conditions like cancer and diabetes. In recent years, there has been a renewed interest in Ayurveda in Sri Lanka, as people are becoming more health-conscious and looking for natural and organic alternatives to modern medicine. The government of Sri Lanka has also recognized the importance of Ayurveda in the country's healthcare system and has taken steps to promote and develop it.

Do you have an idea about the Ayurvedic medicine?

47 responses

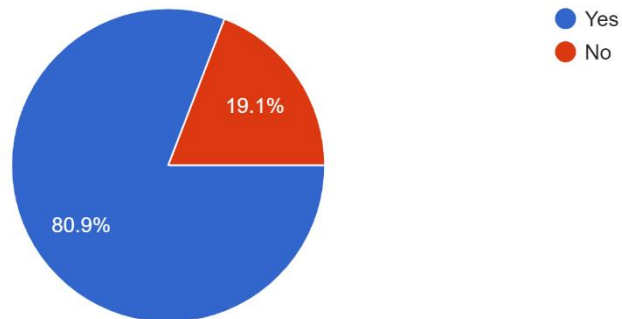


Figure 1: Survey on idea of people about ayurvedic medicine

Did you ever have had Ayurvedic treatments before?

47 responses

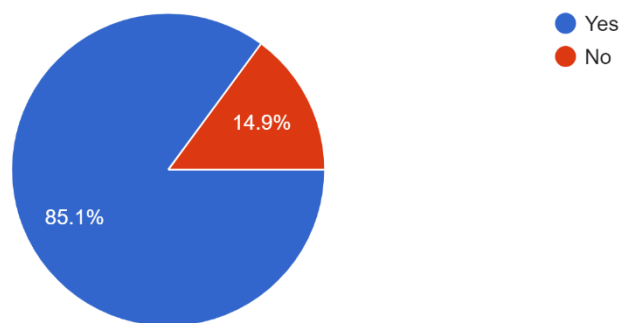


Figure 2: Survey on having ayurvedic treatments before.

From the above two survey results it shows that most of the people in Sri Lanka are aware about the ayurvedic medicine and most people had used them even once in their lifetime. Considering the percentages more than 80% of people are aware of ayurvedic medicine.

Do you frequently use home-based Ayurvedic treatments?

47 responses



Figure 3: Survey on the frequency of home based ayurvedic treatments usage

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60 responses

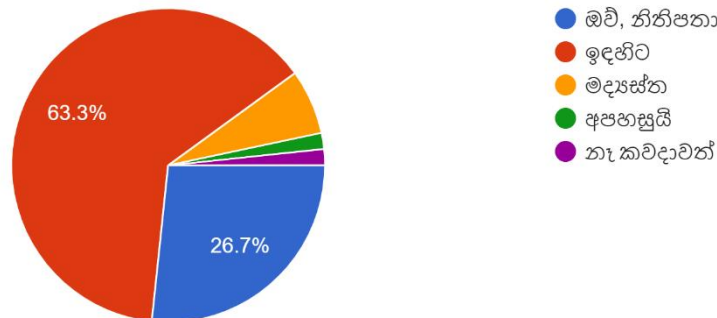


Figure 4: Survey in Sinhala on the frequency of home based ayurvedic treatments usage

Based on the survey results, it can be concluded that more than half of the respondents are frequently using ayurvedic treatments.

Overall, our research indicates that Sri Lankan people have a deep appreciation for Ayurveda and its holistic approach to healthcare. The popularity of Ayurveda in Sri Lanka is expected to continue to grow as people seek out natural and organic alternatives to modern medicine.

Artificial intelligence (AI) is revolutionizing the healthcare industry by offering new and innovative solutions for diagnosis, treatment, and monitoring of diseases. [3] One of the most significant advantages of AI in healthcare is its ability to analyze vast amounts of patient data and medical records to aid in the diagnosis of diseases. AI algorithms can identify patterns in medical images such as CT scans, MRIs, and X-rays to assist radiologists in identifying potential abnormalities or

diseases. [1] [2]

Additionally, AI [3] can help doctors create personalized treatment plans for patients based on their unique characteristics and medical history, by analyzing data on previous treatment outcomes and patient health records. AI can also aid in the discovery of new drugs and treatments by analyzing large datasets to identify patterns and provide insights. Furthermore, AI-powered chatbots and voice assistants can provide initial diagnosis and recommend next steps. AI can also be used to remotely monitor patients and alert doctors to potential issues, analyze electronic health records (EHR) to identify potential issues, and provide personalized health advice and recommendations through virtual assistants. Overall, AI has the potential to significantly improve patient outcomes and provide more personalized and efficient healthcare solutions.

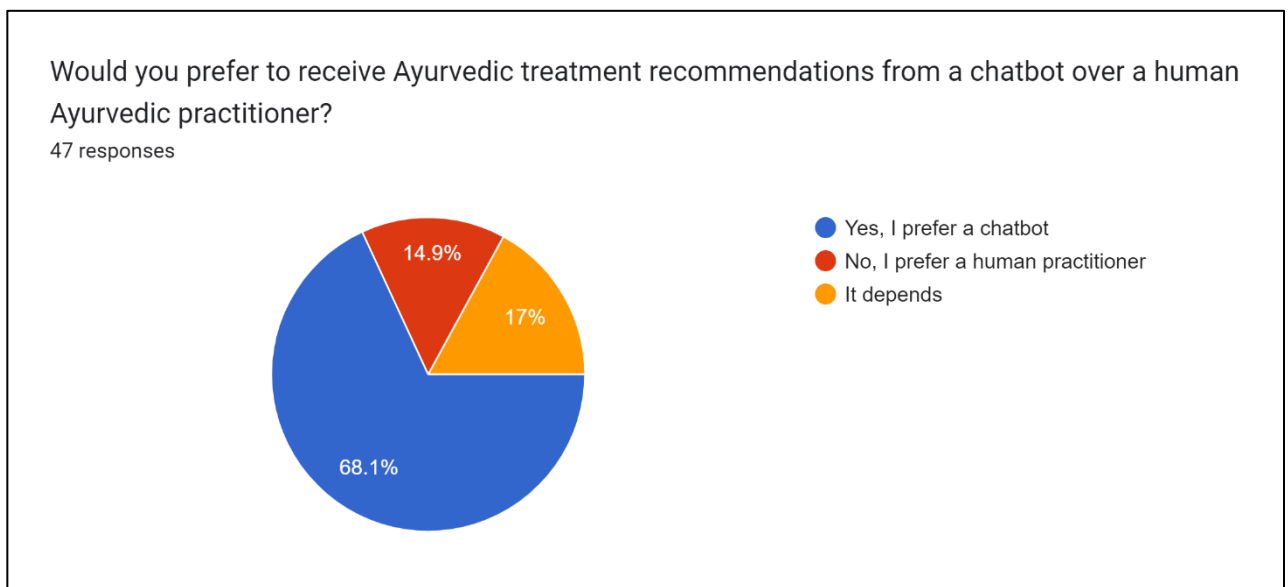


Figure 5: Survey on the preference recommendations from a chatbot over a human doctor.

According to the survey results more than half of respondents are preferring to have ayurvedic treatment recommendations from a chat bot over a human doctor.

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60 responses

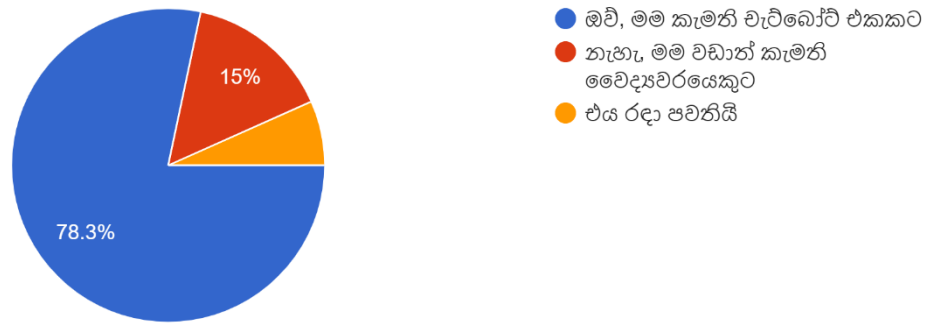


Figure 6: Survey in Sinhala on the preference recommendations from a chatbot over a human doctor.

The results suggest that there are no clear consequences on whether respondents would prefer to receive Ayurvedic treatment recommendations from a chatbot or a human practitioner. It highlights the importance of considering the preferences and concerns of individuals when implementing AI [3] technology in healthcare.

How comfortable are you sharing personal health information with a chatbot to receive personalized Ayurvedic treatment recommendations?

47 responses

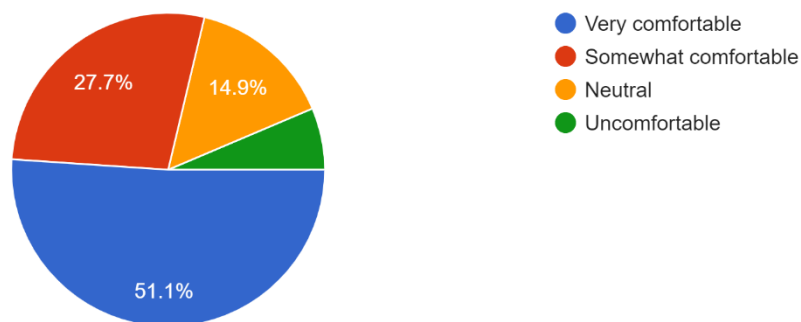


Figure 7: Survey on the how comfortable are people sharing personal health information with a chatbot.

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60 responses

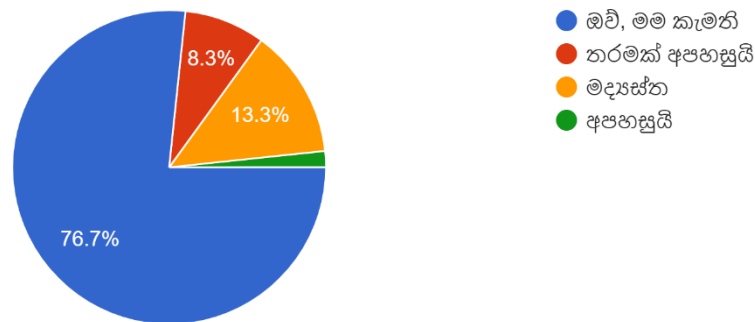


Figure 8: Sinhala survey on how comfortable sharing personal health information with a chatbot.

AI has the potential to revolutionize the field of Ayurveda by enabling personalized treatment based on a patient's unique characteristics, history, and symptoms. By analyzing vast amounts of patient data, AI algorithms can identify patterns and provide insights that can help practitioners make informed treatment decisions. Several Ayurveda-based apps have already been developed that utilize AI to provide personalized treatment recommendations. One such app is AyurMana, which uses AI algorithms to analyze a patient's pulse, tongue, and symptoms to provide personalized treatment recommendations. Another app, Wealthy, uses AI-powered chatbots to provide personalized health advice and recommendations.

The integration of AI in Ayurveda has several benefits. Firstly, it enables practitioners to provide personalized treatment based on a patient's unique needs, which can lead to better outcomes and reduced healthcare costs. Secondly, AI can help identify patterns and insights that can improve diagnosis and treatment of diseases. [1] [2] Finally, AI-powered apps and tools can increase patient engagement and adherence to treatment. Several AI technologies can be used in Ayurveda, such as machine learning, natural language processing, and computer vision. Machine learning can be used to identify patterns and provide personalized treatment recommendations. Natural language processing can enable chatbots and voice assistants to provide personalized health advice and recommendations. Computer vision can be used to analyze images of patients to identify symptoms and provide insights.

Here are a few of the ayurvedic apps that are already available. Yes, these smartphone applications offer Ayurveda remedies. [4]

- E-procto
- MocDocHMS
- MocDoc Clinic Management System
- MyOPD
- Vaidya Manager
- Healcon Practice
- Easy Clinic
- OptiMantra

These apps provide users with access to Ayurvedic solutions and information on Ayurvedic remedies, treatments, and lifestyle modifications. They can be useful for individuals seeking natural remedies and personalized treatment options for various health conditions.

According to the research background and survey discussed above [1] [2] we propose an innovative solution to promote a healthier lifestyle through Ayurveda, as outlined in the previous section. Our solution aims to address Ayurvedic treatments and common healthy guidelines for specific symptoms, such as arthritis, blood sugar, hair loss, infertility, obesity, paranasal sinusitis, cuts/scratches/swellings. Our solution will include a conversational AI chatbot, which will provide a user-friendly platform for individuals to receive personalized solutions and advice through text, based on a knowledge base containing information on these symptoms and their treatments.

In addition to the chatbot, our proposed solution will also feature an image processing component that can identify the herbal plants needed for the treatment of these diseases. [5] [6] [7] A geometry library will map out the locations where these herbs are available and connect patients with Ayurvedic doctors within a specific geographical area. Users can rate doctors to help others find reliable practitioners.

Our solution will also include a social network where users can discuss health-related knowledge. Content shared specifically relating to health will be collected and stored in the knowledgebase for the chatbot to reference, labeled as community knowledge. Auto-machine learning will help maintain the consistency of the solution by keeping the social network up-to-date and helping users with any additional symptoms.

To ensure the accuracy and effectiveness of our solution, we will require experienced Ayurvedic-related expertise resources. We expect to collect data through publicly available social network communities relating to health and images of herbs, as well as details of Ayurvedic doctors with their locations from relevant backgrounds for supervised machine learning algorithm-based solutions such as herb identification, chatbot, and social network implementation.

In conclusion, the integration of AI in Ayurveda has the potential to transform the field of personalized healthcare. By harnessing the power of AI, practitioners can provide personalized treatment and improve diagnosis and treatment of diseases. The development of AI-powered apps and tools can increase patient engagement and adherence to treatment, leading to better health outcomes. With the increasing prevalence of non-communicable diseases, the integration of AI in Ayurveda is becoming increasingly important and holds great promise for the future of healthcare.

1.2 Research Gap

Although Ayurveda offers a wealth of knowledge and effective solutions for various health issues, the implementation of AI technology in Ayurvedic medicine is still in its early stages. There is a significant research gap in Ayurveda and AI integration, particularly in the development of personalized treatment and lacks conversational AI chatbots that allows users to text and receive solutions for non-communicable diseases through Ayurveda. The knowledge bases are not updated and improved.

While there are some existing Ayurvedic mobile apps that offer basic solutions and advice, they often lack the level of personalization and sophistication that can be achieved with AI. Furthermore, there is a lack of standardization in Ayurvedic medicine, making it challenging to develop algorithms that can effectively analyze and interpret Ayurvedic data.

Another research gap is the integration of AI into the manufacturing and quality control of Ayurvedic products. The lack of standardization in Ayurvedic medicine also poses a challenge in ensuring the safety and efficacy of Ayurvedic products. The integration of AI can help to ensure the quality and consistency of Ayurvedic products by analyzing data on the ingredients and manufacturing processes.

The research “A” depicts that a chatbot is a fantastic conversational tool. The application in this case is designed to deliver high-quality responses in a brief amount of time. It lessens the load of the response by employing an expert system, the provider can give the user the solution directly. The project was created for the user to save them time when seeking medical advice from doctors or specialists. Here, we created an application that extracts the keyword from the user query using the N-gram and TF-IDF. Each term is given less weight to get the right response to the query. The web interface was created with users' input queries in mind. By providing user protection, character integrity, and retrieving answers in line with the questions, the application is strengthened in terms of security and efficacy. [8]

The research “B” depicts a new platform for delivering and obtaining healthcare services is emerging: chatbots. The proof is the rise in publicly accessible chatbots that want to actively participate in the delivery of services for prevention, diagnosis, and treatment. This article focuses on the Human-AI interface components and the transparency in AI automation and decision making to examine how these new chatbots address design issues pertinent to the provision of healthcare services. [9]

The research “C” depicts the utilization of Chatbots is user-friendly and can be used by anyone who

knows how to type in their own language in the mobile app or desktop version, according to the evaluation of numerous publications. Based on your symptoms, a medical chatbot offers individualized diagnoses. The performance of the bot's symptom recognition and diagnosis could be significantly enhanced in the future by adding support for more medical parameters, such as the location, duration, and severity of symptoms, as well as more thorough symptom descriptions. Personalized Medical Assistant implementation mainly relies on AI algorithms and training data. Finally, the adoption of tailored medicine would successfully save many lives and raise public awareness of medical issues. As previously said, messaging apps will rule the future because users will spend more time using them than any other apps. The potential for medical chatbots is therefore enormous. People can have this medical dialogue wherever they are. They merely need a basic desktop computer or smartphone with an internet connection. In order for the medical chatbot to be able to manage all types of ailments, the efficiency of the chatbot can be increased by adding more word combinations and expanding the use of the database and to make the system easier to use, voice communication can be included. [10]

Features	Research A	Research B	Research C	Proposed System
Ayurvedic Chatbot	X	X	X	✓
Availability of personalized solutions	✓	✓	X	✓
User Friendly Platform	X	X	✓	✓
Availability of a knowledge base	✓	✓	✓	✓
Chatbot framework	X			✓
Ability to ask to follow back questions	✓	X	✓	✓
Using RASA	X	X	X	✓
Updating Knowledgebase Easily	X	X	X	✓
Technology Used	N-GRAM	-	NLP/RNN	NLP/RNN

Overall, there is also a significant research gap in the integration of AI in Ayurvedic medicine, particularly in the development of personalized treatment and diagnosis and the quality control of Ayurvedic products. More research and development in this area can lead to significant advancements *in the field of Ayurvedic medicine and better health outcomes for individuals.*

1.3 Research Problem

The modern lifestyle has brought about various challenges that often lead to poor health and unhappiness. People are caught up in fast-paced activities that leave little room for exercise, leisure time, and a balanced diet. The excess work-related stress further exacerbates the situation, leading to various non-communicable diseases such as obesity, diabetes, arthritis, hair loss, and sinusitis. While Ayurveda offers alternative solutions to these diseases, people often find it challenging to identify the necessary herbs and treatments and consult with doctors in a timely and affordable manner.

Moreover, the cost of western medicine can be prohibitive, and not all diseases are curable. Therefore, there is a need for alternative solutions that are cost-effective, easily accessible, and personalized to the individual's unique needs. The proposed solution aims to bridge this gap by providing a user-friendly platform that allows individuals to receive personalized solutions and advice through a conversational AI chatbot. The chatbot will be equipped with a knowledge base that contains information relating to various symptoms and their Ayurvedic treatments.

2. OBJECTIVES

2.1 Main Objectives

The main objective of this study is to develop a mobile application through which help individuals achieve a healthier lifestyle through Ayurveda as described in the previous section. During the research we expect to address Ayurvedic treatments and common healthy guidelines for following symptoms specifically.

- Arthritis (joint inflammation)
- Blood Sugar (Glycemia)
- Hair Loss
- Infertility
- Obesity
- Paranasal Sinusitis (Peenasa)
- Cuts/Scratches/Swellings

The proposed solution will be help in finding appropriate Ayurvedic treatments and medical herbs based on above symptoms specifically and common healthy lifestyle guides. It will consist of a conversational AI chatbot which provides a user-friendly platform for individuals to receive personalized solutions and advice through text. It will be using a knowledge base which contains all the information relating to above mentioned symptoms and their treatments in response to users' queries.

2.2 Specific Objectives

- Research and gathering information on the selected non-communicable diseases.
- Creating a knowledge base of symptoms and common health problems related to each disease.
- Pre-processing and cleaning the data to prepare it for AI modeling.
- Training an AI model on the database to identify patterns and relationships between symptoms, common health problems, and Ayurvedic treatments and medical herbs.
- Evaluating the performance of the AI model on a validation set.
- Fine-tuning the model to improve its accuracy.
- Implementing the AI model in a software application or website.
- Verifying the accuracy and validity of the suggestions made by the software application through consultations with Ayurvedic experts.
- A conversational AI chatbot that allows users to text and receive solutions for non-communicable diseases through Ayurveda.

3. METHODOLOGY

The suggested remedy aims to assist in identifying suitable Ayurvedic therapies and medicinal herbs tailored to the mentioned symptoms, as well as general healthy lifestyle recommendations. To achieve this, a conversational AI chatbot will be implemented as a user-friendly tool for individuals to obtain customized solutions and guidance through text. The chatbot will draw from a comprehensive knowledge base containing information about the symptoms and their corresponding treatments to address user inquiries.

3.1 System Architecture

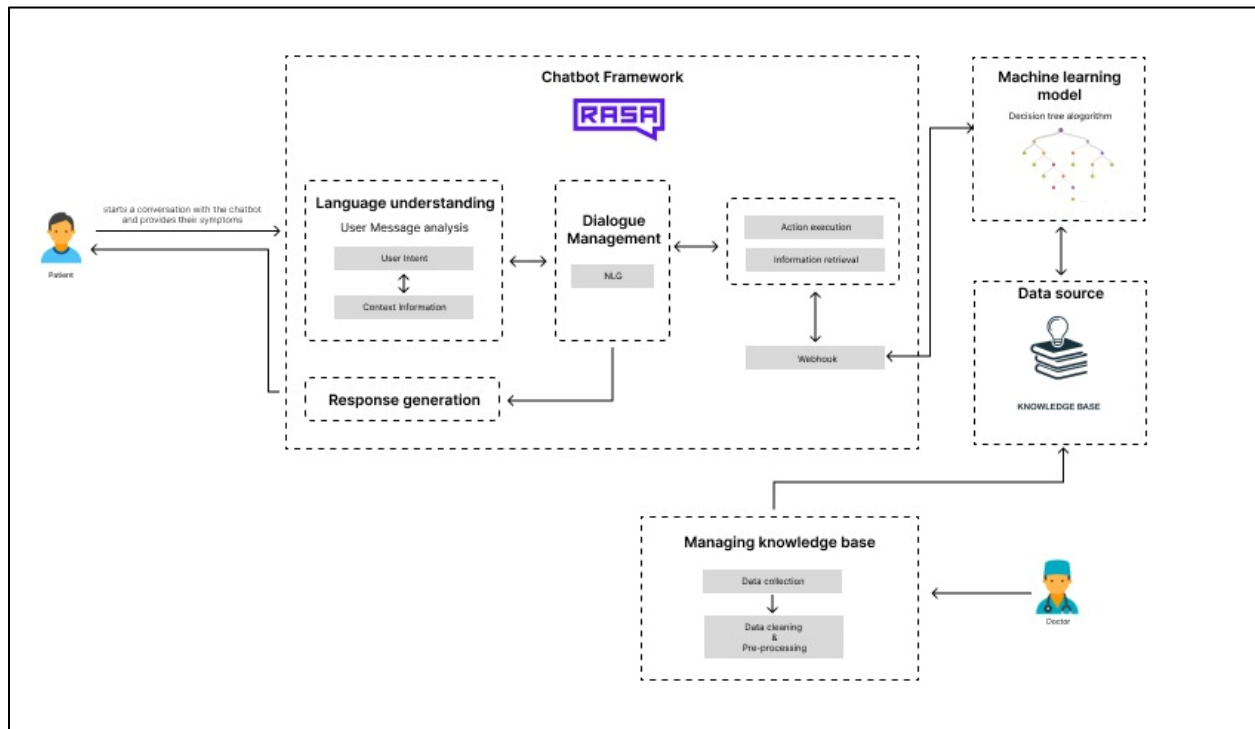


Figure 9: System Architecture

To create a chatbot that can effectively answer patient questions regarding their symptoms and provide treatment suggestions, several steps and technologies can be utilized. One approach is to utilize natural language processing (NLP) technologies, which allow the chatbot to understand the natural language used by patients and generate responses in a human-like way. Additionally, machine learning algorithms can be incorporated to enable the chatbot to improve its responses over time based on the information it receives. [11]

Technologies	React Native, Expo, Python, TensorFlow, Node Server
Techniques	Intent Recognition, Entity Extraction [12], Dialogue Management, Machine Learning Model, Knowledge Base, Sentiment Analysis, Personalization
Algorithms	Recurrent Neural Networks (RNN) [13]
Architectures	RASA [14]

Table 1:Technologies and Techniques used.

3.1.1 Software solution

The Software Development Life Cycle (SDLC) [15] [16] is a structured and systematic approach to software development that aims to ensure code accuracy and consistency. In the conventional approach to software development, when requirements change, developers are often unable to go back to earlier steps and are therefore forced to carry out all the remaining steps in the correct order. However, by using agile methodology in SDLC, developers have more flexibility to adapt to changes.

Agile methodology is all about embracing change and allowing for more flexibility in the development process. Compared to other agile frameworks, Scrum is considered the most effective. It is an agile project management framework that is lightweight and can be used to manage and solve complex adaptive problems. Scrum emphasizes teamwork, transparency, and continuous improvement.



Figure 10:Software Development Life Cycle

The six core processes of Scrum [17] are illustrated in Figure. These processes include product backlog, sprint planning, sprint backlog, daily scrum, sprint review, and sprint retrospective. Product backlog is a prioritized list of features that need to be developed. Sprint planning is the process of selecting items from the product backlog and defining the work to be done during the sprint. Sprint backlog is a list of items that the team commits to completing during the sprint. Daily scrum is a daily stand-up meeting where the team discusses progress and plans for the day. Sprint review is a meeting at the end of the sprint where the team demonstrates the work completed during the sprint. Sprint retrospective is a meeting where the team reflects on the sprint and identifies opportunities for improvement. [15] [16]

In summary, by adopting agile methodology in SDLC, developers can more easily adapt to changing

requirements and have greater flexibility in the development process. Scrum, the most effective agile framework, offers a structured approach to project management that emphasizes teamwork, transparency, and continuous improvement. The six core processes of Scrum provide a framework for managing and solving complex adaptive problems in software development.

1.Requirement gathering

- **Collecting information from Gampaha Wickramarachchi Ayurvedic University**

To collect information on ayurveda and diseases we met **Dr. Janaki Wickramarachchi**, who is the Dean of Chikisthsaka Faculty at **Gampaha Wickramarachchi Ayurvedic University** [18] and had conducted some online meetings conducted with her, with participation of our group members. She agreed to provide us the necessary information related to the ayurveda and the research gap which is having when connecting with modern technologies such as Artificial Intelligence and Machine Learning. She highlighted several main diseases which are fine for the research. She gave us legal approval for the continuation of the research and gave advice about the things we need to focus on in the future while continuing the project.

- **Data gathering**

Firstly, we read a dozen published research for initial understanding and got some basic idea by reading and browsing through few articles. Our supervisors had few meetings with us to discuss the initial methods for data gathering and the external supervisor connected us with a few ayurvedic specialties and pointed out the diseases and the data we are needed continue with. In future the other necessary data and images will be collected from the University of Gampaha as necessities.

- **Conducting a survey**

To get an idea about the knowledge of people about ayurvedic treatments and diseases and their knowledge about the connection between AI/ML with it, we have conducted a survey was conducted with both closed and open-ended questions by distributing a questionnaire.

2.Feasibility study (Planning)

- **Economic feasibility**

Economic feasibility is a critical aspect of any project's success, as it determines whether or not the project is financially viable. The economic feasibility report analyzes the development costs and benefits of the project, and if a proper economic feasibility plan is not in place, the project is likely to fail. Therefore, it is crucial that the proposed system is both cost-effective and efficient in order to ensure its success. [19]

- **Scheduled feasibility.**

Scheduled feasibility is another essential factor to consider when undertaking a project. A schedule feasibility assessment examines the timelines for the planned project, and any delays or missed deadlines can have a significant impact on the project's success. Therefore, it is vital that the proposed system completes each task within the allotted time specified to ensure that the project stays on schedule. [19]

○ Technical feasibility

Technical feasibility planning is also crucial in the development of any system. It involves evaluating the required skills and expertise necessary for mobile and web application development, as well as the ability to understand software architectures and communicate effectively with stakeholders to obtain the necessary information. Without proper technical feasibility planning, it is unlikely that the proposed system will be successfully developed and implemented. Therefore, it is essential to have the necessary technical skills and communication abilities to move forward with the system's development. [19]

3.Design (system and software design documents)

After the planning phase, system and software design documents are created which contributes to the overall system diagram.

○ Use case Diagram.

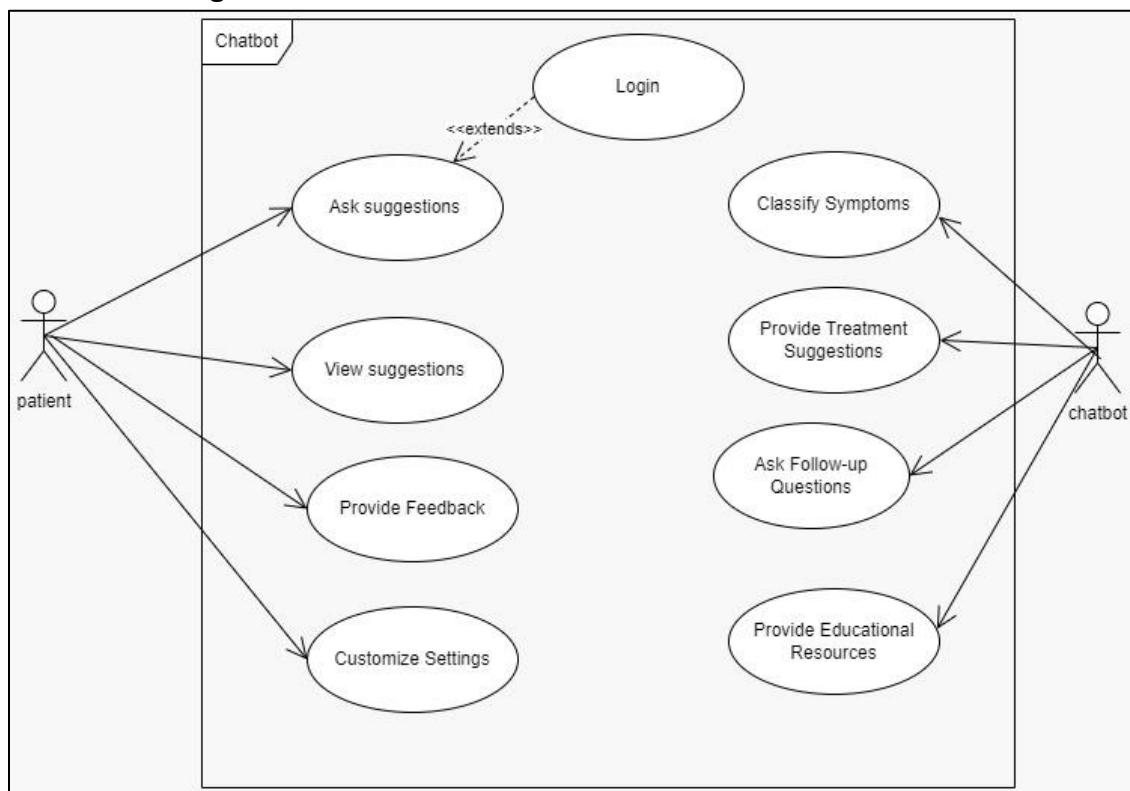


Figure 11:Use case Diagram

- Login: The patient logs in to the chatbot system using their username and password.
- Input Symptoms: The patient inputs their symptoms in natural language.
- Classify Symptoms: The chatbot uses machine learning algorithms to classify the symptoms

input by the patient.

- Provide Treatment Suggestions: The chatbot provides treatment suggestions based on the user's input and the classified disease or condition.
- Ask Follow-up Questions: The chatbot asks follow-up questions to the patient to gather additional information and provide more accurate treatment suggestions.
- Provide Educational Resources: The chatbot provides educational resources or links to reputable sources for more information on specific diseases or treatments.
- Provide Feedback: The patient provides feedback on the accuracy and usefulness of the system.
- Customize Settings: The patient customizes their preferences and settings, such as preferred language, preferred treatment options, and preferred educational resources.

○ Sequence Diagram

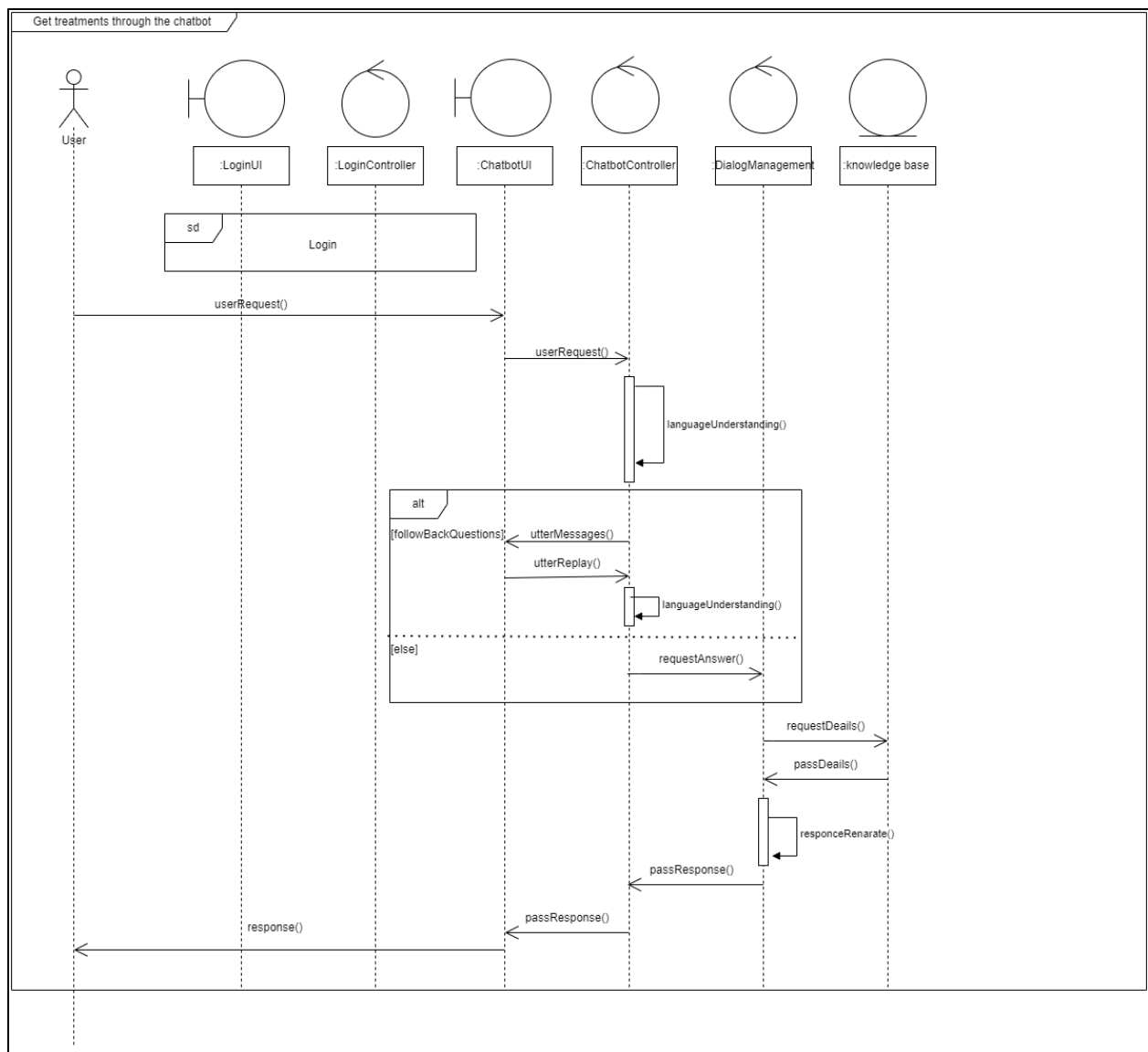


Figure 12:Sequence Diagram

4.Implementation (Development)

The implementation process, as discussed in the methodology, includes the development of below functionalities to satisfy user requirements providing the ultimate solution with high accuracy and reliability.

- Creating a knowledge base of symptoms and common health problems related to each disease.
- Pre-processing and cleaning the data to prepare it for AI modeling.
- Training an AI model on the database to identify patterns and relationships between symptoms, common health problems, and Ayurvedic treatments and medical herbs.
- Evaluating the performance of the AI model on a validation set.
- Fine-tuning the model to improve its accuracy.
- Implementing the AI model in a software application or website.
- Verifying the accuracy and validity of the suggestions made by the software application through consultations with Ayurvedic experts.
- A conversational AI chatbot that allows users to text and receive solutions for non-communicable diseases through Ayurveda.
- The knowledge base will be updated and improved.

5.Testing (Track and Monitor)

During the software development lifecycle, the testing phase is a crucial stage that ensures the quality and effectiveness of the software. This phase involves a comprehensive evaluation of the software to identify any system gaps, missing requirements, errors, and bugs that need to be fixed. The primary objective of this testing phase is to improve the overall quality of the software and ensure that it meets the intended purpose. The testing phase consists of various testing processes that are carried out to achieve the desired outcome. These processes include unit testing, component testing, integration testing, system testing, and user acceptance testing. Each of these testing processes focuses on a specific aspect of the software and is designed to identify any issues that may arise in that area.

Unit testing involves testing each module or component of the software individually to ensure that it functions correctly. Component testing is done to check the software's functionality by combining various individual components. Integration testing evaluates the interactions between different software components and identifies any issues that may arise from their integration. System testing examines the entire software system to ensure that it meets the specified requirements and performs as expected. User acceptance testing evaluates the software's usability and ensures that it meets the user's requirements and expectations. Through these testing processes, the software is thoroughly evaluated and tested to identify any issues that may affect its performance, usability, or functionality. By fixing these issues, the software's quality is improved, and its effectiveness is assured.

3.1.2. Commercialization

- **Future scope**

For the future scope the application will be extended to give solutions to other diseases and improve the user experience.

Target Audience

- Patients
- Ayurvedic Doctors
- Ayurvedic Herbal Stores/Medicinal stores

Market Space

- No need for advanced knowledge in technology.
- No age limitation for users.
- No need for prior knowledge regarding ayurveda.

Future scope

- For the future scope the application will be extended to give solutions to more plant herb identification for diseases, adding more easily and improve the user experience.

4.PROJECT REQUIREMENTS

4.1 Functional requirements

- Patient can ask questions based on their symptoms.
- Patient should be able to provide feedback.
- Chatbot should be able to receive and understand questions related to symptoms from patients.
- Chatbot should be able to identify the disease or condition based on the symptoms provided by the patient.
- Chatbot should be able to provide suggestions and treatments for the identified disease or condition.
- Chatbot should be able to provide information about medications, their dosage, and any possible side effects.
- Chatbot should be able to provide links to credible sources of information about the disease or condition.
- Chatbot should be able to maintain a record of patient symptoms and provide follow-up advice as necessary.
- Chatbot should be able to recognize emergency situations and provide appropriate advice, such as calling emergency services or visiting a hospital.
- Chatbot should be able to provide a user-friendly interface for patients to interact with.
- Chatbot should be available 24/7 to provide support to patients.
- Chatbot should be able to handle multiple conversations simultaneously to avoid delays or

downtime.

4.2 Non-functional requirements

- Performance: The chatbot should respond to patient questions in a timely manner and be able to handle multiple user sessions simultaneously without causing significant delays or errors.
- Security: The chatbot should ensure the confidentiality of patient information by using encryption and secure communication protocols and implementing access controls and authentication mechanisms.
- Reliability: The chatbot should be available 24/7 with a high level of uptime and minimize system failures, errors, or crashes.
- Scalability: The chatbot should be designed to handle a large number of concurrent users and be easily scalable as the user base grows.
- Usability: The chatbot should be user-friendly and easy to navigate for patients of all ages and backgrounds, with clear instructions and a simple interface.
- Accessibility: The chatbot should be accessible to patients with disabilities or impairments, such as those who are visually or hearing-impaired, by providing alternative means of interaction, such as voice commands or text-to-speech technology.
- Compatibility: The chatbot should be compatible with a wide range of devices and operating systems, to ensure accessibility for as many patients as possible.
- Maintainability: The chatbot should be designed with a clear and modular architecture that enables easy maintenance and upgrades to the system.
- Compliance: The chatbot should comply with relevant laws and regulations related to healthcare, privacy and data protection.
- Performance metrics: The chatbot should be regularly monitored for performance metrics such as response time, uptime, and user satisfaction, with appropriate actions taken to address any issues that arise.

4.3 System requirements

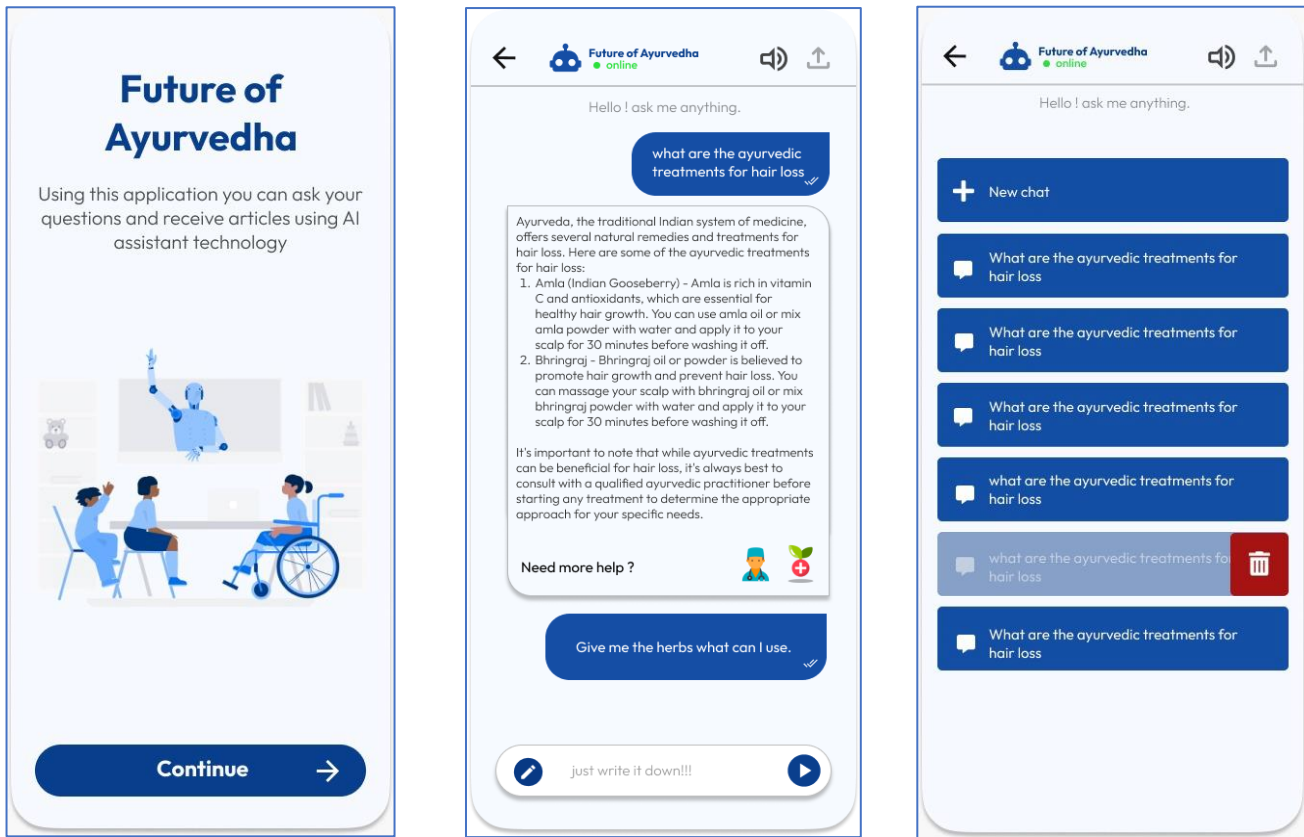
- Server infrastructure: The chatbot system would require server infrastructure to run the necessary software and host the database of patient information and treatment guidelines. The server infrastructure should have adequate processing power, storage, and network bandwidth to handle the expected workload.
- Software development platform: The system would require a software development platform for developing and testing the chatbot software. This may include programming languages, frameworks, libraries, and development tools.
- Natural language processing (NLP) tools: The chatbot system would require NLP tools and libraries to analyze patient questions and identify relevant symptoms and medical conditions.
- Machine learning models: The chatbot system may require machine learning models to improve its accuracy and efficiency over time.
- Database management system: The system would require a database management system

- (DBMS) to store and manage patient information, treatment guidelines, and other relevant data.
- Integration with third-party systems: The system may need to integrate with third-party systems, such as electronic health record systems, to retrieve patient information and provide a more comprehensive view of patient health.
 - Communication channels: The chatbot system would require communication channels, such as web chat or messaging platforms, to enable patients to interact with the chatbot.
 - Security measures: The system would need to implement appropriate security measures, such as encryption, authentication, and access controls, to protect patient information and ensure data privacy.
 - Monitoring and analytics tools: The system would require monitoring and analytics tools to track system performance, identify issues, and make improvements to the system over time.

4.4 User requirements

- Accuracy: Users would expect the chatbot to accurately diagnose their symptoms and provide appropriate treatment options.
- Accessibility: The chatbot should be easily accessible and available 24/7 to answer questions and provide support.
- Ease of Use: The chatbot should be user-friendly and easy to navigate, even for those who may not be tech-savvy.
- Personalization: Users may appreciate personalized treatment recommendations based on their unique symptoms, medical history, and other factors.
- Privacy and Security: Users would expect their medical information to be kept confidential and secure, so the chatbot should have appropriate measures in place to protect user data.
- Feedback and Improvement: Users may appreciate the ability to provide feedback to the chatbot and suggest improvements to enhance their experience.
- Reliability: The chatbot should be reliable and able to handle a variety of symptoms and conditions and provide accurate information consistently.
- Integration: Users may prefer a chatbot that can integrate with other healthcare providers or systems, such as electronic health records, for a more streamlined experience.

4.5 Wireframes



5.GANTT CHART

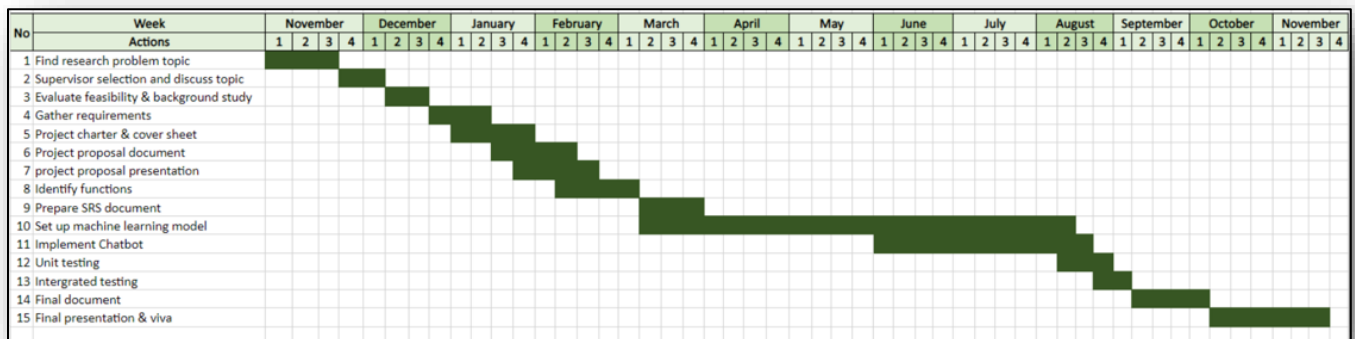


Figure 13: Gantt Chart

Work Breakdown Structure (WBS)

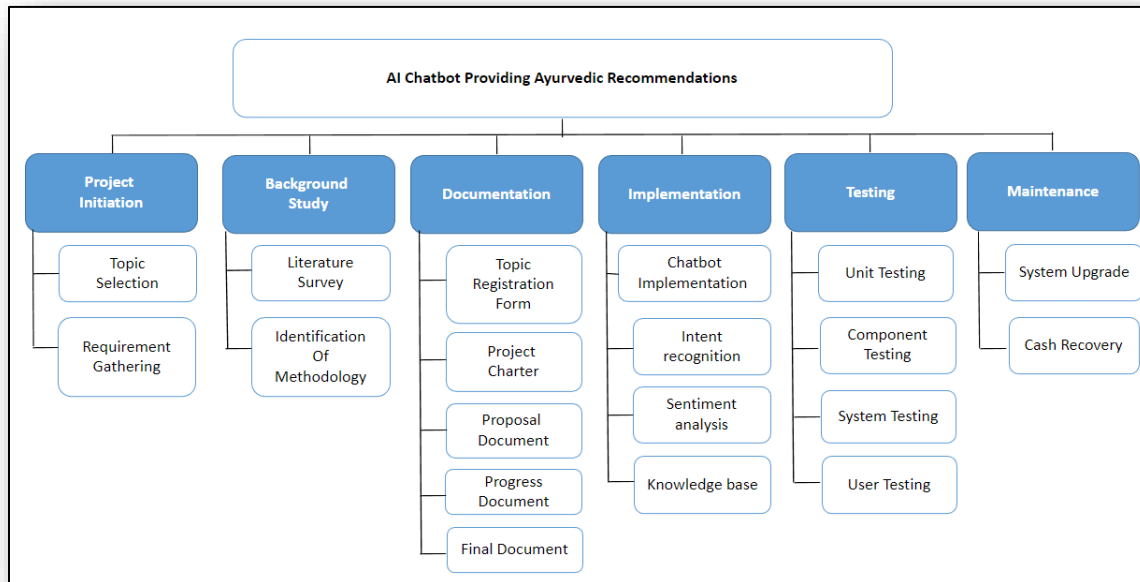


Figure 14:Work Breakdown Structure

6.BUDGET AND BUDGET JUSTIFICATION

EXPENSES	
Requirements	Cost (\$)
Travelling cost for data collection (per day)	1.56
Cost of Deployment (per month)	20
Cost of hosting in Play Store (one-time registration fee)	25
Google NLP (per 1,000 units of sentiment analysis)	99
Storages	0.11
Total Cost	145.67

Table 2:Budget Plan

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8.APPENDICES

Appendix A -PLAGARISM REPORT

The screenshot shows the Turnitin interface for a class. At the top, there's a navigation bar with 'Class Portfolio', 'My Grades', 'Discussion', and 'Calendar'. Below this, a welcome message states: 'Welcome to your new class homepage! From the class homepage you can see all your assignments for your class, view additional assignment information, submit your work, and access feedback for your papers. Hover on any item in the class homepage for more information.' The main section is titled 'Class Homepage' and contains an 'Assignment Inbox: RP-2023-Regular'. The inbox table lists one assignment: 'Project Proposal Report'. The table columns are 'Assignment Title', 'Info', 'Dates', 'Similarity', and 'Actions'. The 'Dates' column shows 'Start: 02-Mar-2023 6:22PM', 'Due: 31-May-2023 11:59PM', and 'Post: 10-Mar-2023 12:00AM'. The 'Similarity' column shows '12%' with a green bar. The 'Actions' column has buttons for 'Resubmit', 'View', and a download icon.

Assignment Title	Info	Dates	Similarity	Actions
Project Proposal Report		Start: 02-Mar-2023 6:22PM Due: 31-May-2023 11:59PM Post: 10-Mar-2023 12:00AM	12%	Resubmit View

Appendix B -SURVEY LINK

<https://forms.gle/JQcxdPGPtDa6SiBY9>

Responses:

https://docs.google.com/forms/d/13Rjfbu-B7r50Zy5zkIPnpfU1K_gx6JShNNVXtkGflqM/edit#responses