

# *Medical AI Chat Bot Project*

*Student Name: Baseem Salem.*

*Id Number: 207340514.*

*Course: Yearly Project in The Department of CS.*

*University: Haifa University.*

*Mentor: Amit Shahar.*

*Course Director: Amit Shahar*

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# PROJECT OVERVIEW

## Introduction

The healthcare industry is facing a massive shortage of medical professionals, especially in rural areas. This shortage is leading to longer wait times, reduced quality of care, and increased healthcare costs. Additionally, patients often struggle to access healthcare due to financial or logistical barriers. These challenges have led to a growing demand for digital solutions that can improve healthcare accessibility and efficiency.

My medical chatbot is designed to provide patients with helpful medical advice. It can answer questions and adapt its responses to the conversation's context. Whether patients need information on symptoms, treatments, or other medical concerns, the chatbot is dedicated to offering reliable and personalized feedback.

## Scope and Objective

A medical AI chatbot system is designed to provide personalized healthcare assistance and support to patients, healthcare professionals, and caregivers using artificial intelligence (AI) technology. The system's scope and objectives can vary depending on the specific use case and target audience.

One of the primary objectives of a medical AI chatbot system is to educate patients about their medical conditions, treatment options, and medication schedules. It can provide guidance on lifestyle changes, self-management techniques, and preventive measures, thereby enabling patients to take control of their health and well-being.

The primary scope and objective of a medical AI chatbot system encompass enhancing the patient experience, elevating healthcare outcomes, and optimizing resource allocation within the healthcare ecosystem.

## Modules and their Description

The system comprises 1 major module with their sub-modules as follows:

### ❖ User:

- View the home page.
  - Users can view the home page and read the description of the site.
- Access chat bot page:
  - Users can access the chatbot page by pressing the chatbot button and will be directed to the chatbot page.
  - The user can chat with the chatbot regarding their problems related to health and according to their responses, the disease will be predicted.
- Contact us:
  - Users can contact the admins of the site to give feedback.

## Existing System & Proposed System

### ❖ Problem with the current scenario:

- The current healthcare system is facing several problems that are affecting its ability to provide accessible, affordable, and high-quality care to all individuals.
- The healthcare system has been slow to adopt new technologies.

### ❖ Drawbacks of the existing system:

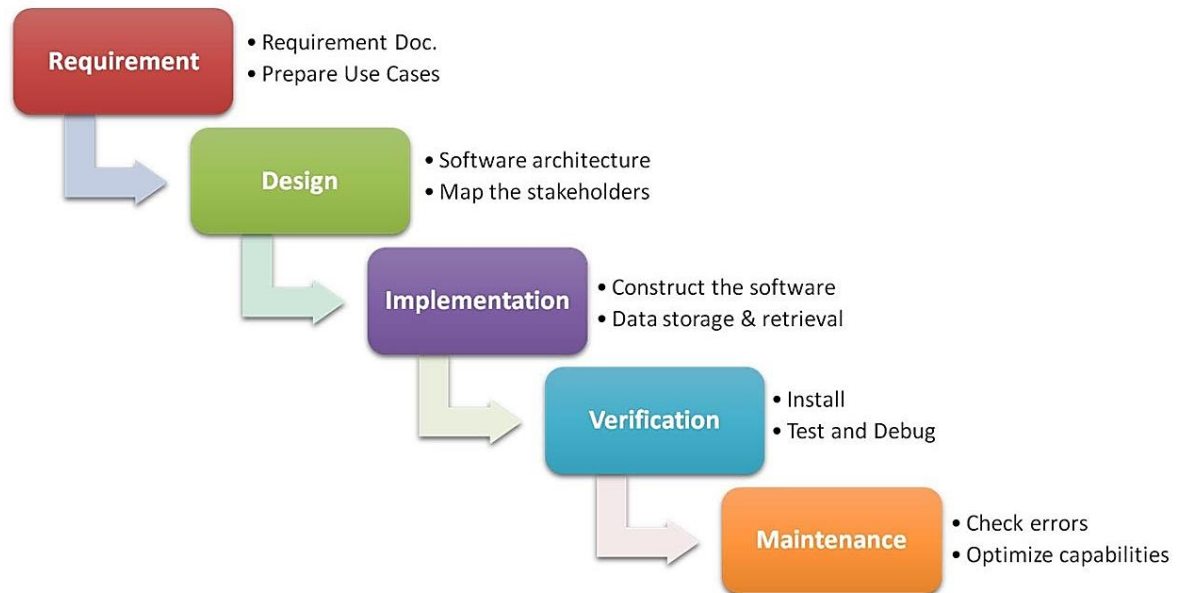
- Most AI chatbots are programmed to handle only a limited range of medical conditions.
- It may not be able to provide accurate advice for complex or rare conditions.

## PROPOSED SYSTEM

- The system comprises 1 major module: User.
- The user will not require to register nor to sign in. The users can chat with the chatbot regarding their problems related to their health. According to the user responses, the chatbot will predict the disease or give the most suitable advice in that current situation.
- The user can give feedback via the contact us button to help make the chatbot better.
- In this project, HTML and CSS are used on the front end, and Python is used on the back end. Here, we have used the Flask framework and open AI for more realistic humane answers.
- This Chatbot helps users to know about their disease when they provide their symptoms. It helps the users to know the prevention and cure tips for most diseases.
- For this system, we have used Classification for disease prediction. In the context of disease prediction, Classification involves training a model to differentiate between different diseases based on the symptoms reported. The output is a categorical label representing the predicted disease

## Project Lifecycle Details

### Waterfall Model



### **Description**

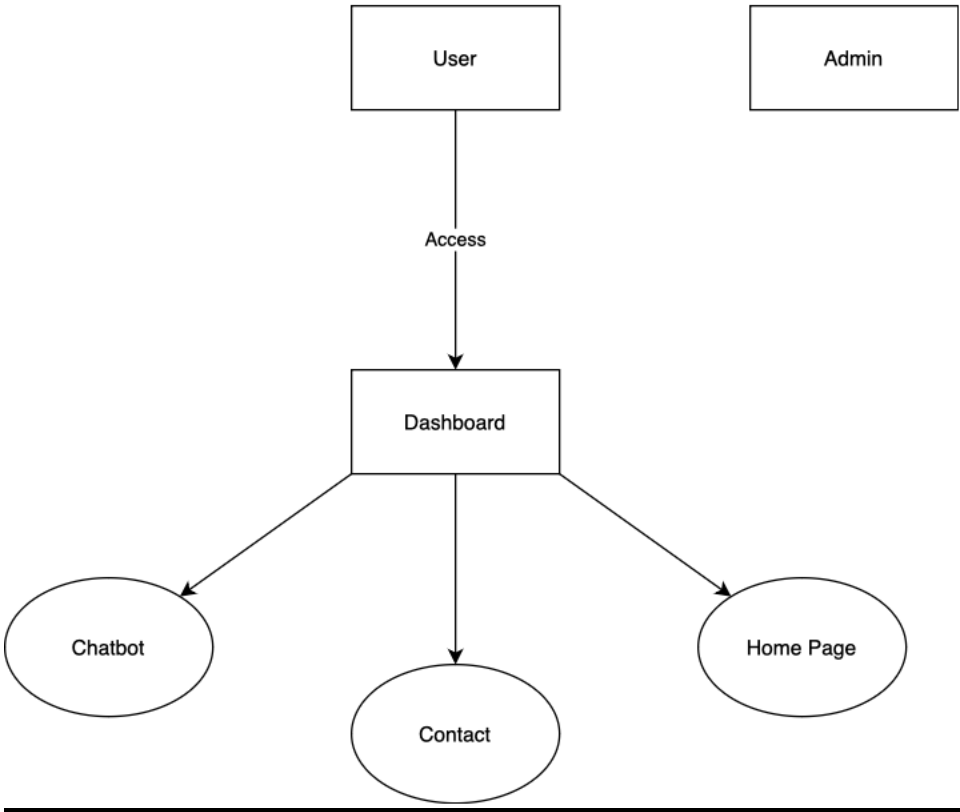
As learned during the SWE course “The Waterfall Model” is a linear sequential flow. Progress is seen as flowing steadily downwards like a waterfall through the phases of software implementation. This means that any phase in the development process begins only if the previous phase is complete. The waterfall approach does not define the process to go back to the previous phase to handle changes in requirements. The waterfall approach is the earliest approach that was used for software development.



# PROJECT DESIGN

E-R Diagram:

**E-R Diagram**



## Use Case Diagram:

### Use case Diagram

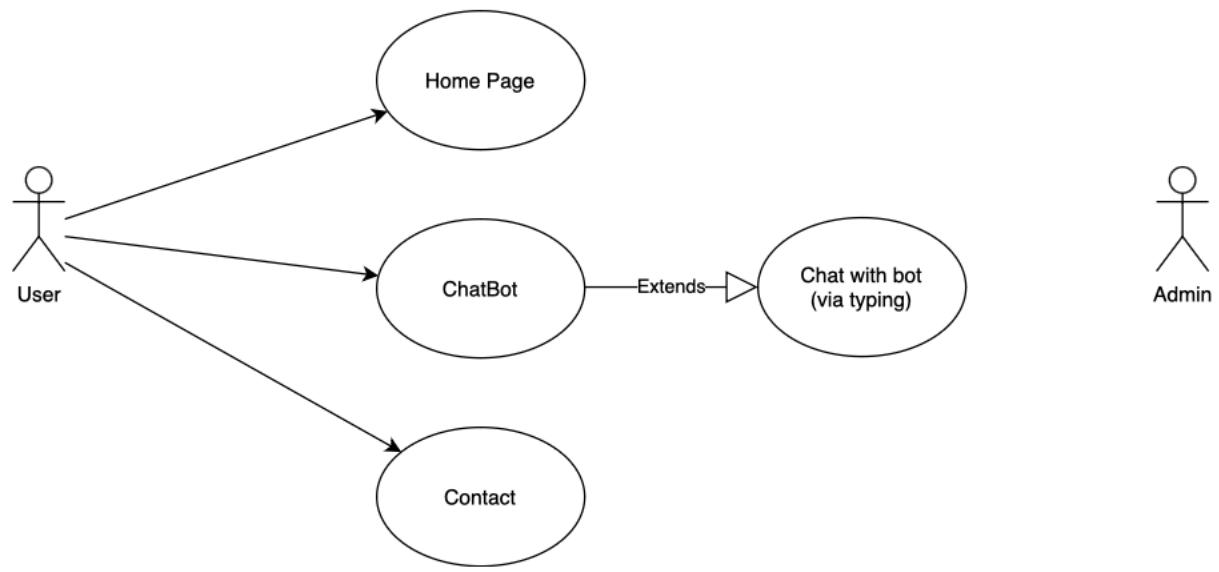
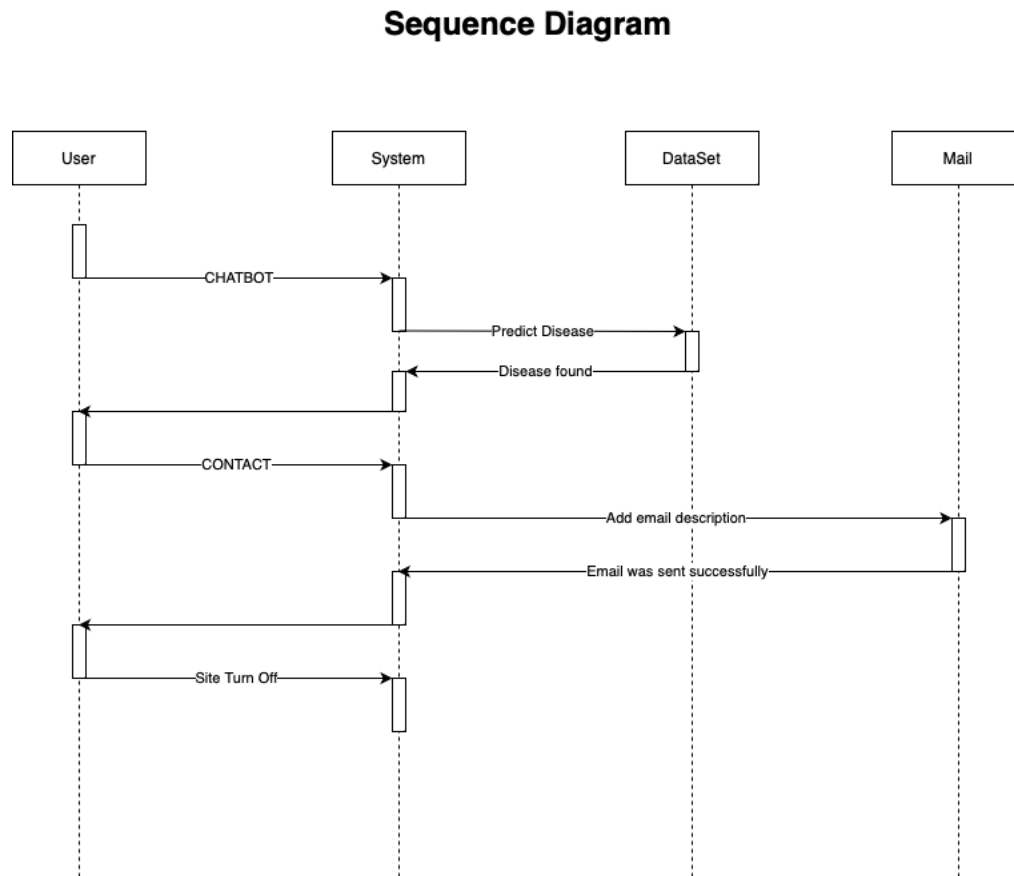


Fig. Use Case Diagram

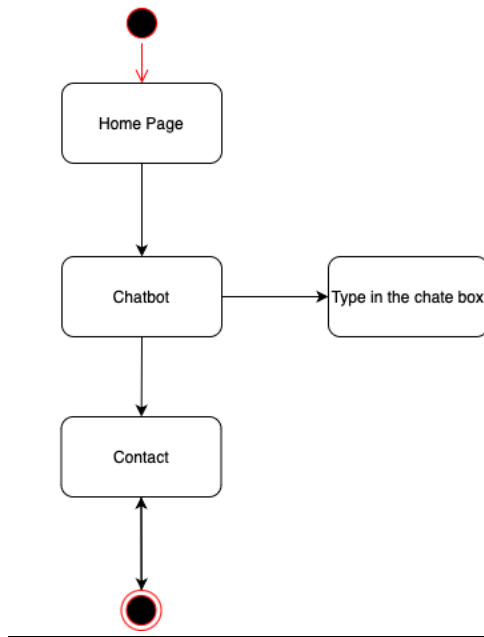
## Sequence Diagram:



**Fig. Sequence Diagram of User**

## Activity Diagram:

### Activity Diagram



**Fig. Activity Diagram of User**

# PROJECT IMPLEMENTATION

## Project Implementation Technology

The Project is designed and developed in Flask and Open AI Framework.  
We used Flask and Open AI Framework for coding the project.

### ***I. Hardware Requirement***

- i. Laptop or PC**
  - Windows or MacOS

### ***II. Software Requirement***

- i. Laptop or PC**
  - Python
  - Visual Studio, PyCharm
  - Terminal

## OVERVIEW OF TECHNOLOGIES USED

# INTRODUCTION

Python is a powerful multi-purpose programming language created by Guido van Rossum. It has simple easy-to-use syntax, making it the perfect language for someone trying to learn computer programming for the first time. This is a comprehensive guide on how to get started in Python, why you should learn it and how you can learn it. However, if you have knowledge of other programming languages and want to quickly get started with Python. Python is a general-purpose language. It has a wide range of applications from Web development scientific and mathematical computing (Orange, SymPy, NumPy) to desktop graphical user Interfaces (Pygame, Panda3D). The syntax of the language is clean, and the length of the code is relatively short. It's fun to work in Python because it allows you to think about the problem rather than focusing on the syntax.

Features of Python Programming:

### **A simple language that is easier to learn:**

Python has a very simple and elegant syntax. It's much easier to read and write Python programs compared to other languages like: C++, Java, C#.

Python makes programming fun and allows you to focus on the solution rather than syntax.

If you are a newbie, it's a great choice to start your journey with Python.

**Free and open source:**

You can freely use and distribute Python, even for commercial use. Not only can you use and distribute software written in it, but you can also even make changes to Python's source code.

Python has a large community constantly improving it in each iteration.

**Portability:**

You can move Python programs from one platform to another and run it without any changes.

It runs seamlessly on almost all platforms including Windows and Mac OS X.

**Extensible and Embeddable.****A high-level, interpreted language:**

When you run Python code, it automatically converts your code to the language your computer understands. You don't need to worry about any lower-level operations.

**Large standard libraries to solve common tasks:**

Python has several standard libraries which makes the life of a programmer much easier since you don't have to write all the code yourself.

**Object-oriented:**

Everything in Python is an object. Object-oriented programming (OOP) helps you solve complex problems intuitively.

## FEASIBILITY REPORT

A feasibility Study is a high-level capsule version of the entire process intended to answer several questions: What is the problem? Is there any feasible solution to the given problem? Is the problem even worth solving? A feasibility study is conducted once the problem clearly understood. A feasibility study is necessary to determine that the proposed system is Feasible by considering the technical, Operational, and Economical factors. By having a detailed feasibility study the management will have a clear-cut view of the proposed system.

The following feasibilities are considered for the project in order to ensure that the project is variable and it does not have any major obstructions.

Feasibility study encompasses the following things:

- Technical Feasibility
- Economic Feasibility
- Operational Feasibility

In this phase, we study the feasibility of all proposed systems and pick the best feasible solution for the problem. The feasibility is studied based on three main factors as follows.



## ❖ Technical Feasibility

In this step, we verify whether the proposed systems are technically feasible or not. i.e., all the technologies required to develop the system are available readily or not.

Technical Feasibility determines whether the organization has the technology and skills necessary to carry out the project and how this should be obtained. The system can be feasible because of the following grounds:

- All necessary technology exists to develop the system.
- This system is too flexible and it can be expanded further.
- This system can give guarantees of accuracy, ease of use, reliability and the data security.
- This system can give instant response to inquire.

Our project is technically feasible because, all the technology needed for our project is readily available.

## ❖ Economic Feasibility

Economically, this project is completely feasible because it requires no extra financial investment and with respect to time, it's completely possible to complete this project in 6 months.

In this step, we verify which proposal is more economical. We compare the financial benefits of the new system with the investment. The new system is economically feasible only when the financial benefits are more than the investments and expenditures. Economic Feasibility determines whether the project goal can be within the resource limits allocated to it or not. It must determine whether it is worthwhile to process the entire project or whether the benefits obtained from the new system are not worth the costs. Financial benefits must be equal or exceed the costs. In this issue, we should consider:

- The cost to conduct a full system investigation.
- The cost of h/w and s/w for the class of application being considered.
- The development tool.
- The cost of maintenance etc...

Our project is economically feasible because the cost of development is very minimal when compared to the financial benefits of the application.

## ❖ Operational Feasibility

In this step, we verify different operational factors of the proposed systems like manpower, time, etc., and whichever solution uses less operational resources, is the best operationally feasible solution. The solution should also be operationally possible to implement. Operational Feasibility determines if the proposed system satisfied user objectives and could be fitted into the current system operation.

- The methods of processing and presentation are completely accepted by the clients since they can meet all user requirements.
- The clients have been involved in the planning and development of the system.
- The proposed system will not cause any problems under any circumstances.

Our project is operationally feasible because the time requirements and personnel requirements are satisfied. We are a team of four members, and we worked on this project for three working months.

## ADVANTAGES OF PROJECT

### **Advantages:**

- The system is available round the clock.
- It can save a considerable amount of time for healthcare professionals.
- It can help patients engage more actively in their own healthcare by providing education and guidance.
- Help improve overall efficiency in the healthcare system.

### **Limitations:**

- AI chatbots may not be able to understand the emotional or psychological needs of patients, which can affect the quality of care provided.

## Features:

### 1) Easy Accessibility:

Records can be easily accessed as well as other information.

### 2) User Friendly:

The application will be giving a very user-friendly approach for all users.

### 3) Efficient and reliable:

Chatbot will give answers as fast as possible with no delay.

### 4) Easy maintenance:

**Medical AI Chatbot System is designed** as an easy way. So, maintenance is also easy.

## Examples

### Example 1:

Let's chat? We are online

**Bot:** Hello! I am Baseem's Medical Chatbot. How can I assist you today?

**You:** Hi my name is Linda

**Bot:** Nice to meet you Linda, what seems to be the problem sir?

**You:** I have 64 mg/dL Cholesterol-HDL in my blood, is this good or bad?

**Bot:** Unfortunately, 64 mg/dL is on the high side for Cholesterol-HDL levels, so it would be preferable to lower them. What kind of lifestyle modifications

Type here Send

Let's chat? We are online

is this good or bad?

**Bot:** Unfortunately, 64 mg/dL is on the high side for Cholesterol-HDL levels, so it would be preferable to lower them. What kind of lifestyle modifications have you made so far to reduce your Cholesterol-HDL sir?

**You:** I stopped eating candy cakes and cookies and juice.

**Bot:** That's a great start. Do you exercise regularly and do you have any dietary modifications to your current meals sir?

Type here Send

## Let's chat? We are online

**You:** I stopped eating candy cakes and cookies and juice.

**Bot:** That's a great start. Do you exercise regularly and do you have any dietary modifications to your current meals sir?

**You:** No I don't exercise enough because I work a lot in the house

**Bot:** I see. It is important to make time for regular physical activity, even if it's just a short walk. Would you like me to provide you with some suggestions on how to incorporate regular exercise into your lifestyle sir?

Type here

Send

## Let's chat? We are online

can be anything from brisk walking, jogging, running, biking, swimming, or any other form of physical activity. Are you able to begin doing these exercises sir?

**You:** Should I stop eating fried food as well?

**Bot:** Yes, it is best to avoid fried foods since they are generally high in saturated fats and trans fats. Eating more fruits, vegetables, whole grains, and lean proteins such as fish, poultry, and beans can help reduce your Cholesterol-HDL levels. Would you like me to provide you with some specific diet recommendations, sir?

Type here

Send

## Example 2:

Let's chat? We are online

**Bot:** Hello! I am Baseem's Medical Chatbot. How can I assist you today?

**You:** I feel sick today.

**Bot:** I'm sorry to hear that. What kind of symptoms are you experiencing?

**You:** I feel extreme tiredness that doesn't get better with rest.

**Bot:** I see. Extreme tiredness can be caused by a number of things. Are you experiencing any other symptoms besides tiredness?

Type here

Send

Let's chat? We are online

with rest.

**Bot:** I see. Extreme tiredness can be caused by a number of things. Are you experiencing any other symptoms besides tiredness?

**You:** I am not feeling hungry, trouble swallowing, and have belly pain.

**Bot:** That does sound concerning. I recommend that you see your primary care physician for further evaluation and treatment. In the meantime, make sure to stay hydrated and get plenty of rest.

**You:** I have lumps on my body.

Type here

Send



## Let's chat? We are online

**Bot:** That sounds concerning. Lumps can be caused by a variety of things, so it's best to have them examined by a medical professional. I suggest you visit your doctor for further evaluation and treatment.

**You:** What can it be the cause of that?

**Bot:** Lumps can be caused by a variety of medical conditions. The best way to determine the cause of your lumps is to have a medical professional evaluate them. It's important to seek professional medical attention if you notice any lumps or changes in your skin.

Type here

Send

## Let's chat? We are online

your lumps is to have a medical professional evaluate them. It's important to seek professional medical attention if you notice any lumps or changes in your skin.

**You:** Ok thank you for letting me know.

**Bot:** You're welcome! I'm glad to help. Please don't hesitate to reach out if you have any more questions or need more guidance.

**You:** Bye

**Bot:** Goodbye. I hope you feel better soon!

Type here

Send

## CONCLUSION

This was my project of System Design for a “**Medical AI Chatbot System**” developed in Flask and Open AI in Python programming language. I think this system gave me a lot of satisfaction. Though every task is never said to be perfect in this development field even more improvement may be possible in this application. I learned so many things and gained a lot of knowledge about the development field.