

Intelligent Medical Chatbot System For Women's Healthcare.

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Abstract— Even today talking about women health is big taboo in India. The society is unbiased about women especially about their health issues hence they face disparity in the society. Women feel hesitant to talk about or speak about their health issues or problems openly. Thus, the goal of this chatbot is to help women to find information and remedial solutions about their health. Query is processed by the bot and response will be displayed on web application. This chatbot will provide helpful information instantly. It will also provide prediction about the disease that the women might be suffering. So this bot will help to make Right decision and give right advice to women on 24/7 basis. It will act as an helping hand for working women to keep check on their health in their busy routine. At the same time this will also help women in rural areas who are apprehensive to talk about their health issues publicly.

I. INTRODUCTION

The idea of this system is to create a chatbot that can help girls and women find information and medicinal solutions about their health. Women sometimes tend to ignore their health problems due to their busy schedules and hectic lifestyles. Also normally ladies aren't aware of all the treatments regarding the diseases they have. Many of the diseases can be cured if they are treated early and have proper treatments at the early stages itself. This will even decrease the chances of having major health issues later on in life.

On the other hand, sometimes ladies have to visit doctors even for some small problem which is time consuming. Such problems can be solved by using a medical chatbot which can give them proper guidance. Time to time guidance can help girls to remain updated about their health and have a routine check-up of their health. Girls or women can share their health-related problems or symptoms to the bot and the bot will provide proper guidance according to the symptoms they have.

The bot will process the query and will provide a proper response to the user. In this system, we have given women option to chat and also get prediction for the diseases. The chatbot processes the question and answers the women's questions. We have also made use of DialogFlow for connecting women with bot. We have added multiple questions in our Dialogflow, but which women will get answers to their questions. We have majorly taken two diseases in account, that are Breast Cancer and PCOS.

These diseases can be cured if they are detected at an early stages and proper medication is taken time to time. For prediction of the Breast Cancer we have used Logistic Regression algorithm. Where the accuracy is 96% which is maximum compared to rest of the algorithms. For prediction of PCOS we have made use of multiple algorithms whose accuracies are KNN is 72%, MLP Classifier is 63%, Random Forest is 81% and for Logistic Regression is 89%.

II. LITERATURE SURVEY

The approach hired in Chatbot Utilization for Medical Consultant System [1] The chatbot is carried out in IM utility, in which Line utility is utilized in our study. Then the software program transfers the message to Dialogflow, that is the engine of the chatbot. The message is extracted to achieve the motive. In a few cases, to react to the request message, the gadget desires to select out up the statistics from an outside database or outside APIs. To do this, the extra coding is necessary. The structures will generate the actionable statistics that person can apprehend and ship returned to the utility. In closing segment the person will obtain responses in types of video, image, and textual content etc.

The paper Exposes Chatbot for Healthcare System Using Artificial Intelligence [2]. This chatbot is a conversational AI assistants which automates the interactions with the users. Chatbot is powered by AI using ML techniques to interpret natural language. The aim of the paper is to provide the user with minor or major medical and health information. Initially when the user's visits the website, he has to get registered. And later the user can ask the bot their queries. The system uses an expert system to answer the questions. The domain experts also have to register themselves on the platform. The content is stored in form of pattern template. It uses SQL for interacting with database. The durability and performance can be increased by using a Structured Query Language.

The paper Study on Artificial Intelligence in Healthcare [3] emphasizes on how technology can be used in the medical domains, increase productivity, increase efficiency and make diagnostics. As during this ongoing pandemic of Covid-19 there is a need for increase in medical services and technologies. In this paper they have used Support Vector Machine (SVM) to inspect patients suffering from Heart failure. The paper solves various problems by making use of AI, Machine Learning, Agent based system. Use of ELM algorithm is discussed in this paper to improve the accuracy.

III. PROPOSED SYSTEM

- **Authentication Module :** The user can get herself registered on the platform by signing up. Firebase has been used for handling authentication.

- **Chatbot Module:** The chatbot will process all the queries of the user and based on the input it will provide relevant response. The patient or user can ask the questions regarding their symptoms and disease in the chatbot and the chatbot will respond accordingly. We have made use of DialogFlow for connecting women with bot. We have added multiple questions in our Dialogflow ,but which women will get answers to their questions. This chatbot service will be available to the user on 24/7 basis.

- **Disease Prediction Module:** Whenever the user tells about Symptoms it recognizes the symptoms and analysis by machine learning logic algorithms and predicts the disease and gives response to the user. We have consider two disease ,that are Breast Cancer and PCOS. These diseases can be cured if they are detected at an early stages and proper medication.Breast Cancer is been predicted using LogisticRegression algorithm.Where the accuracy is 96%.For prediction of PCOS we have made use of multiple algorithms whose accuracies are KNN is 72%,MLPClassifier is 63%,Random Forest is 81% and for Logistic Regression we got accuracy as 89%.

Logistic Regression can be used to determine the probability of certain class or event when the data is linearly seperable and outcome is binary in nature.

The equation for Logistic Regression is given as:-

$$a=e^{(x_0 + x_1*b)} / (1+e^{(x_0+x_1*b)})$$

where:

b is the input value

a is the predicted output

x0 is the bias or intercept term

x1 is the coefficient for the single input value(b)

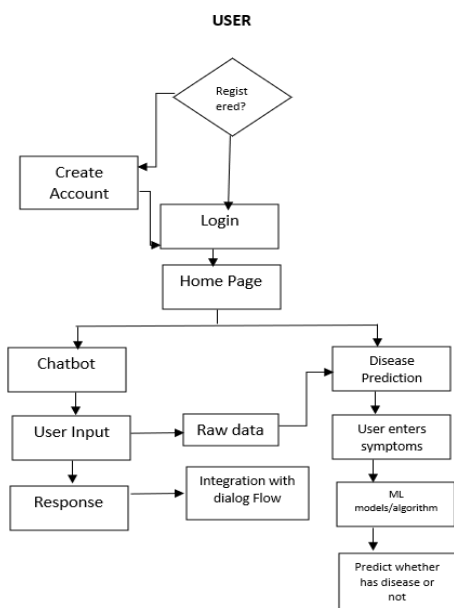


Fig. 1. System Architecture

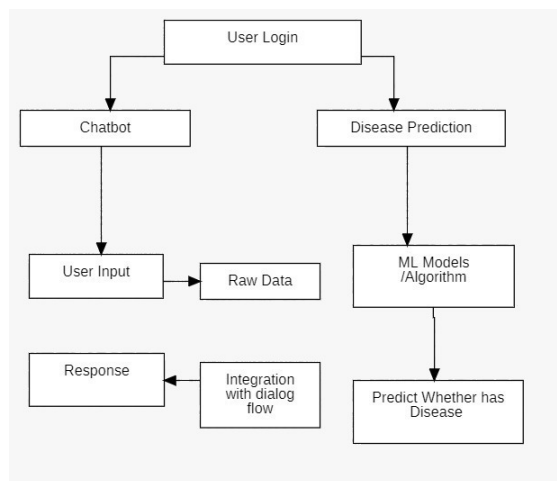


Fig. 2. Training Flow

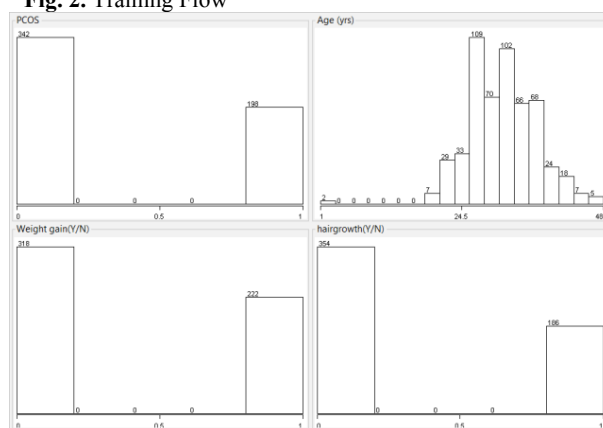


Fig. 3. Methodology of Visualizing data set.(Weka Tool).

In the above figure we have plotted graphs for all the attributed like Age, BMI, Weight loss, Weight gain, Hair loss, Fast food, Skin darkening that we have considered in this application. We have made use of weka tool for visualization.

IV. RESULT

After basic authentication women will get redirected to landing page, she will be getting different options. Figure number 4,5 shows chatbot facility that is been provided to women. In this system, we have given women option to chat and also get prediction for the diseases. The chatbot processes the question and answers the women's questions.

Figure number 7,8,9,10,11 depicts prediction of diseases. We have majorly taken two diseases ,that are Breast Cancer and PCOS. Logistic Regression algorithm is used for prediction of breast cancer .Where the accuracy is 96% which is maximum compared to rest of the algorithms. For prediction of PCOS we have made use of multiple algorithms who accuracies are KNN is 72%,MLPClassifier is 63%,Random Forest I 81% and for Logistic Regression is 89%.

Figure number 14,15,16,17,18 shows Dialogflow. We have made use of Dialogflow for connecting women with bot.We have added questions in

our Dialogflow , by which women will get answers to their queries.

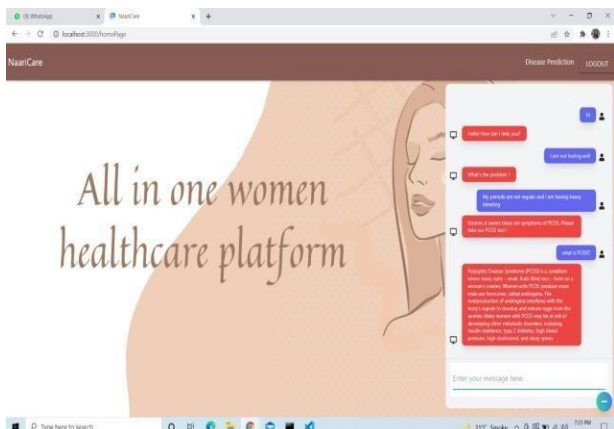


Fig. 4. Output 1

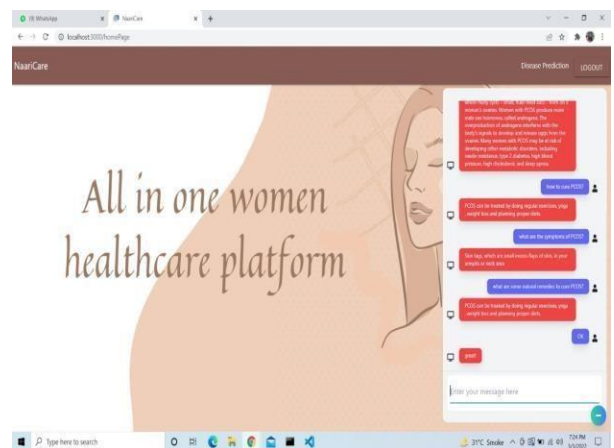


Fig. 5. Output 2

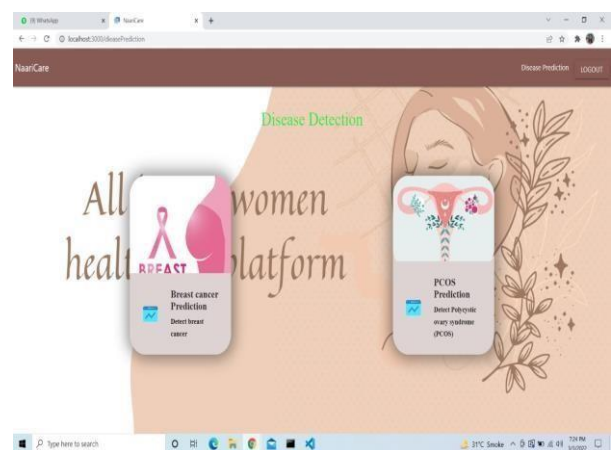


Fig.6. Output 3

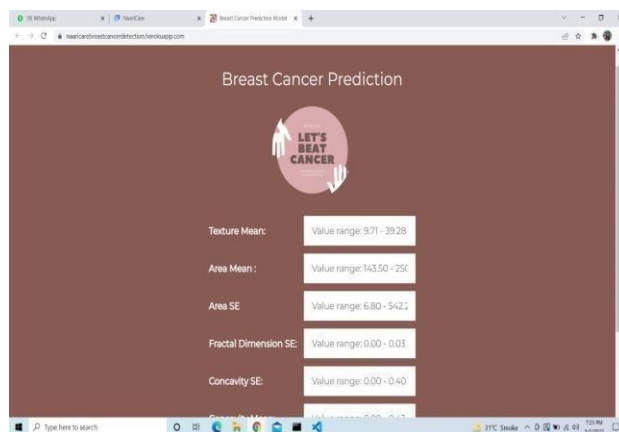


Fig. 7. Output 4

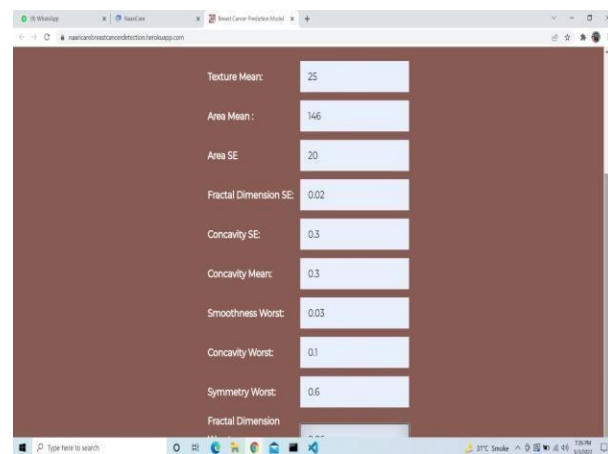


Fig. 8. Output 5

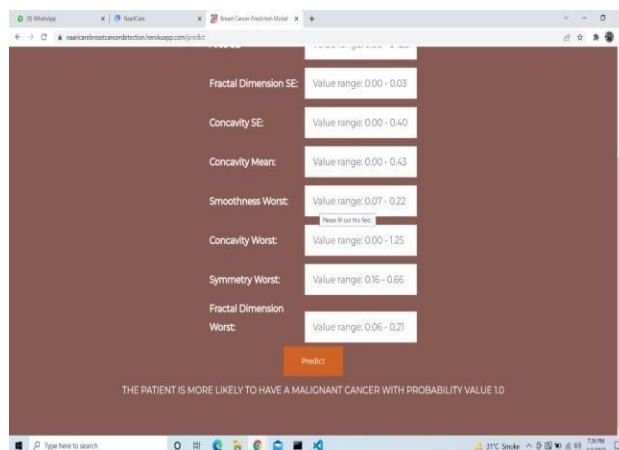


Fig. 9. Output 6

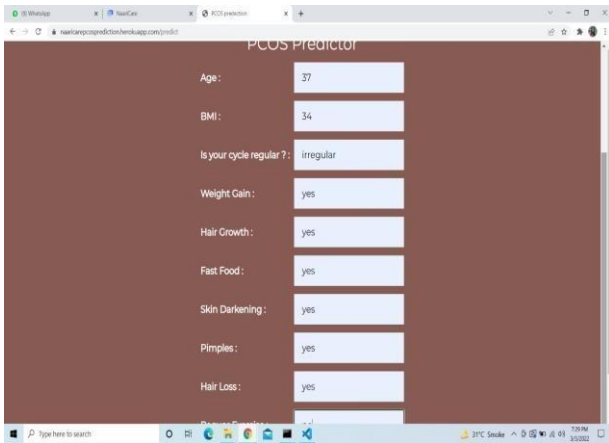


Fig. 10. Output 7

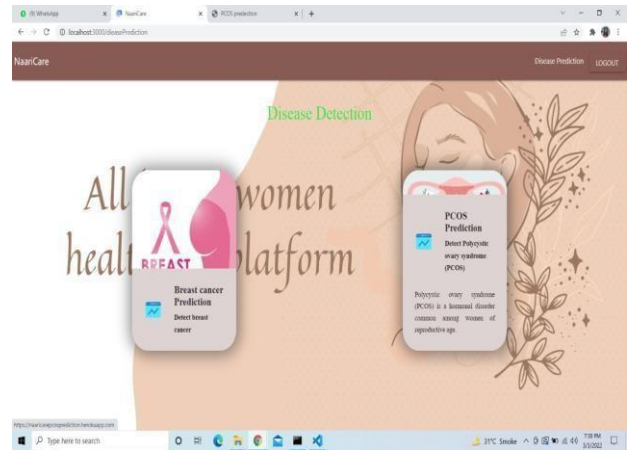


Fig. 13. Output 10

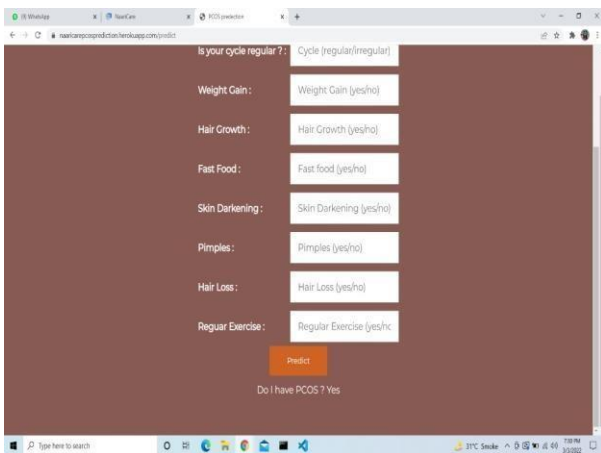


Fig. 11. Output 8

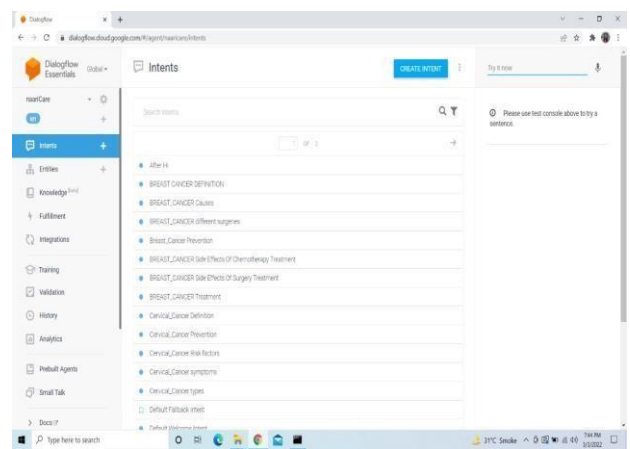


Fig. 14. Output 11



Fig. 12. Output 9

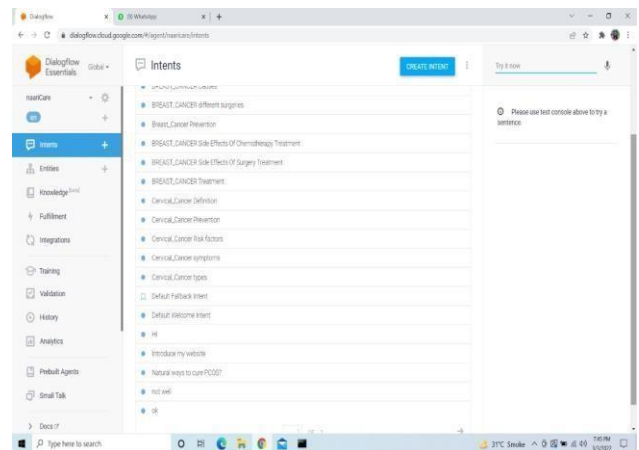


Fig. 15. Output 12

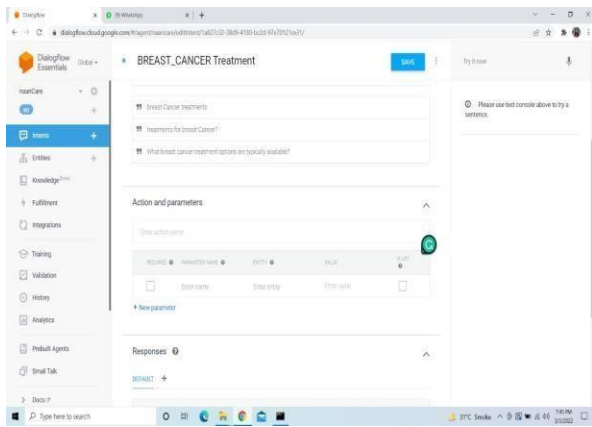


Fig. 16. Output 13

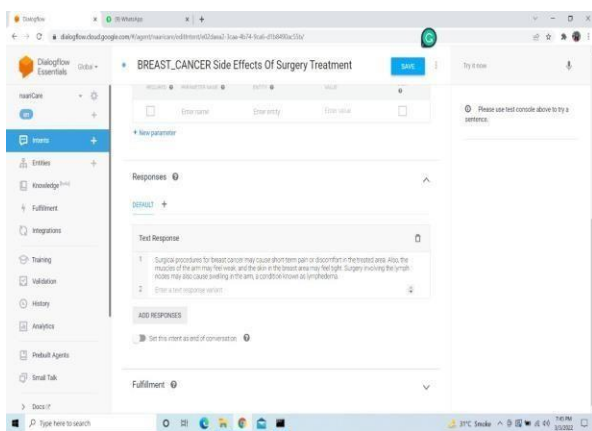


Fig. 17. Output 14

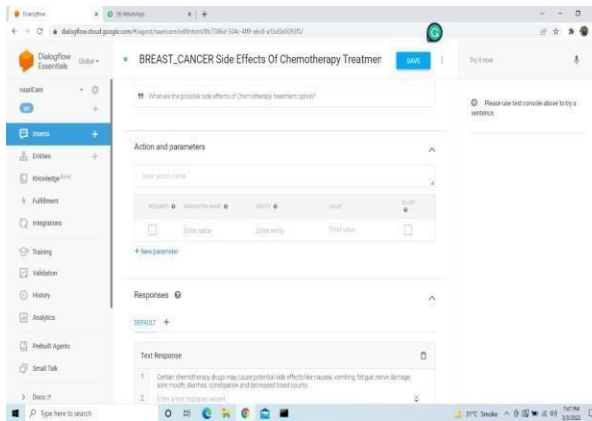


Fig. 18. Output 15

V. CONCLUSION

This web application does the implementation of women health chatbot where the girl user can login into the web application at any time and ask question about the her symptoms and gets disease prediction. This application can help women to remain updated about their health issues and will prevent them from having any major health issues in their future life.

After each registration of the women on our application, dataset will be formed. By making use of dataset of registered women's we can also make analysis on how many women's are suffering from particular disease and how many of them are healthy. For example if we consider two attributes age and BMI .On basis of which graph can be made and future analysis can be made.

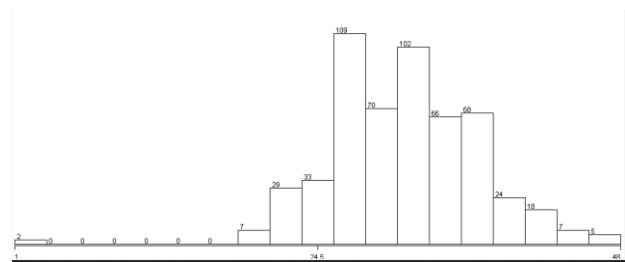


Fig. 19. Visualizing graph of age and BMI(Weka Tool).

VI. LIMITATIONS

The women/girl user will not be able to detect whether she has any disease other than the diseases that we have mentioned in our website.

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