Hello Mom

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Abstract - Even in modern times, many women face a lot of issues while they are pregnant. This includes lack of nutritious food, proper exercise and having an impact on their mental health during maternity. It is seen that 1 in 8 pregnant women die, which is 12.5% of all pregnant women. Considering the current population in the world, this percentage would be a huge number. So, it is an issue which needs addressing. So, our app covers all aspects that very directly addresses some concerns like physical and mental health, education on some sensitive aspects, provides a forum for FAQs, an SOS emergency button to immediately call an emergency contact, make communication between doctor and patient easier and more accessible, make ayurvedic and nutritious food relevant for pregnancy more available and within reach. So, to conclude with this project we are tacking a prevalent issue in the society that is more relevant to our country and particularly rural India.

Index Terms - Flutter SDK, Dart, Node js, Express js, Mongo DB, Python, Heroku

I. INTRODUCTION (HEADING 1)

Pregnancy is the time during which one or more offspring develops inside a woman's uterus. A multiple pregnancy involves more than one offspring, such as with twins. Pregnancy usually occurs by sexual intercourse, but can also occur through assisted reproductive technology procedures. A pregnancy may end in a live birth, a miscarriage, an induced abortion, or a stillbirth. Childbirth typically occurs around 40 weeks from the start of the last menstrual period, a span known as the gestational age. This is just over nine months. Counting by fertilization age, the length is about 38 weeks.

Literature survey

It is always necessary to study and recognize the problems of existing system, which will help in finding out of the requirements for the new system. System study helps in finding different alternatives for better solution. The project study basically deals with different operation and It includes:

1. Data gathering
2. Study of existing system
3. Analyzing problem
4. Studying various documents
5. Feasibility study for further improvements

Following are the steps taken during the initial study: Initially, we collected all the information, regarding surveys conducted and existing applications regarding pregnancy. Then we studied the working of such applications which is done manually. We noted the limitation of those applications which motivated us to design a new application. With the help of these documents, we got basic ideas about the requirements as well as the limitations of existing applications.

The most important thing is to study system thoroughly. Here we are studying both existing system and proposed system so that advantages & disadvantages of both the systems can be understood. The final task was identifying how the report and risk analysis system can be computerized. Some analysis and projections were done regarding changes to be made to the existing system. The new development system for risk analysis is simple without complexities.

II. SYSTEM ARCHITECTURE

A single backend server is shared between both the user and the Doctor application. The database and the machine learning algorithm are present in the backend. The frontend or the interactive part of the user application consists of different features like scheduling appointments, exercises, etc.The frontend or the interactive part of the Doctors application consists of updating examination details and risk analysis of the patient.

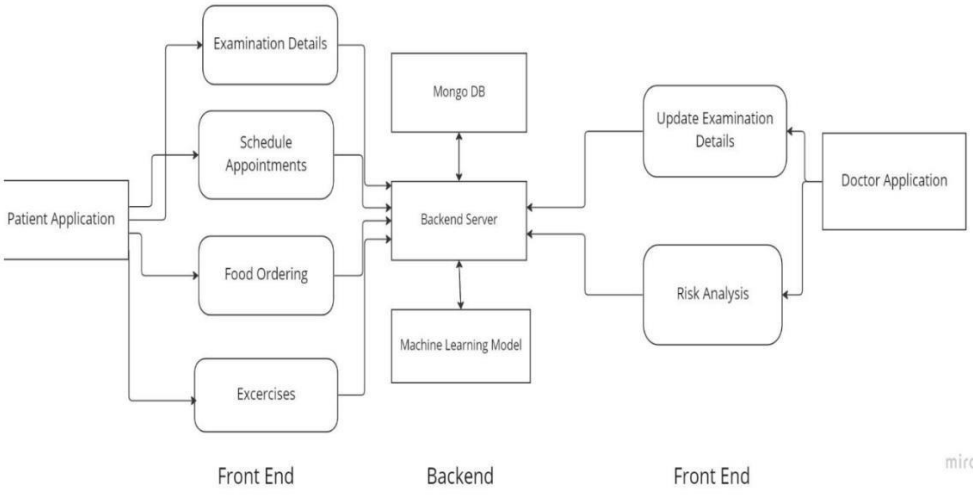

Figure 1 : System Architecture

A. *Use Case Diagram*

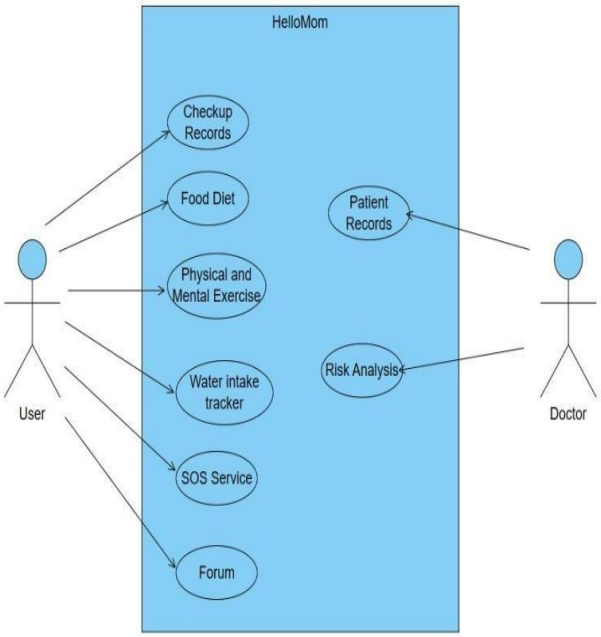

Figure 2 : Use Case Diagram

III. METHODOLOGY

Hello Mom is an application designed to provide pregnant women with personalized information about their health and wellbeing during pregnancy. The application consists of five main modules that are designed to collect data, analyze it, and provide customized information to users.

Module 1: Data Collection

The first module is designed to collect data about the patient's physical characteristics and week of pregnancy. This data is essential for providing personalized recommendations for food and exercise.

Module 2: Customized Display of Data

The second module uses the data collected in the first module to provide customized information to the user. This module uses an algorithm to analyze the data and provide recommendations for food and exercises based on the patient's physical characteristics and week of pregnancy.

Module 3: Food Ordering

The third module is a comprehensive food ordering system that allows users to order healthy food recommended by the application. This module is designed to ensure that pregnant women have access to healthy and nutritious food, which is essential for the health of the mother and the baby.

Module 4: Forum

The fourth module is a real-time forum that allows users to interact with each other and share their experiences. This module is designed to provide emotional support to pregnant women and create a sense of community.

Module 5: Risk Analysis

The fifth module is designed to analyze the data collected in the first module and determine the risk factors associated with pregnancy. This module uses machine learning algorithms such as Logistic Regression, Decision Trees, and Random Forest to analyze the data and provide personalized recommendations to the user.

Overall, Hello Mom is an application that is designed to provide personalized information and support to pregnant women. By collecting data, analyzing it, and providing customized recommendations, the application helps pregnant women stay healthy and make informed decisions about their health and wellbeing during pregnancy.

IV. IMPLEMENTATION

To implement this project, we will need to create four main modules: a user application, a doctor application, a shared database, and a risk analysis ML model that uses the Random Forest algorithm.

The user application can be designed to gather information about the patient's physical characteristics, week of pregnancy, and any other relevant medical information. This information can be stored in the shared database, which can be accessed by both the user and doctor applications. The user application can also provide customized information about food, exercise, and other health-related topics based on the patient's data.

The doctor application can be designed to allow doctors to access the patient's data stored in the shared database. This application can also provide doctors with tools to analyze the patient's data, including graphs and charts that visualize the data. Doctors can use this information to make informed decisions about the patient's health and wellbeing.

The shared database can be designed to store all the data collected by the user application and accessed by the doctor application. This database can be designed to ensure the security and privacy of patient data, including encryption and access controls.

The risk analysis ML model can be designed to analyze the data stored in the shared database and provide personalized recommendations to the patient and doctor applications. This model can use the Random Forest algorithm to analyze the patient's data and identify risk factors associated with pregnancy. The results can be displayed in the user and doctor applications, providing actionable insights to both the patient and the doctor.

Overall, this project can be implemented by a team of developers and data scientists working together to build each module. The user application and doctor application can be built using standard software development practices, while the shared database and risk analysis ML model can be built using modern database and machine learning technologies. By working together, the team can create a comprehensive system that provides personalized information and support to pregnant women and their doctors, helping them make informed decisions about their health and wellbeing during pregnancy.

VIII. RESULTS

Fig 1: Sign Up Page

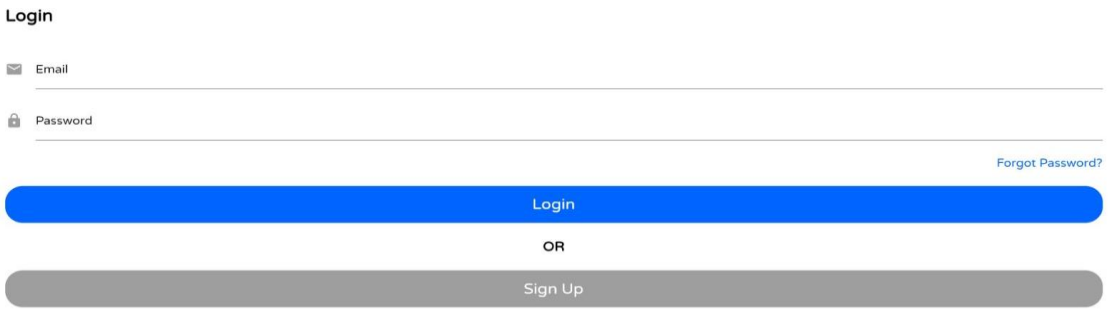

Fig 2: Login Page

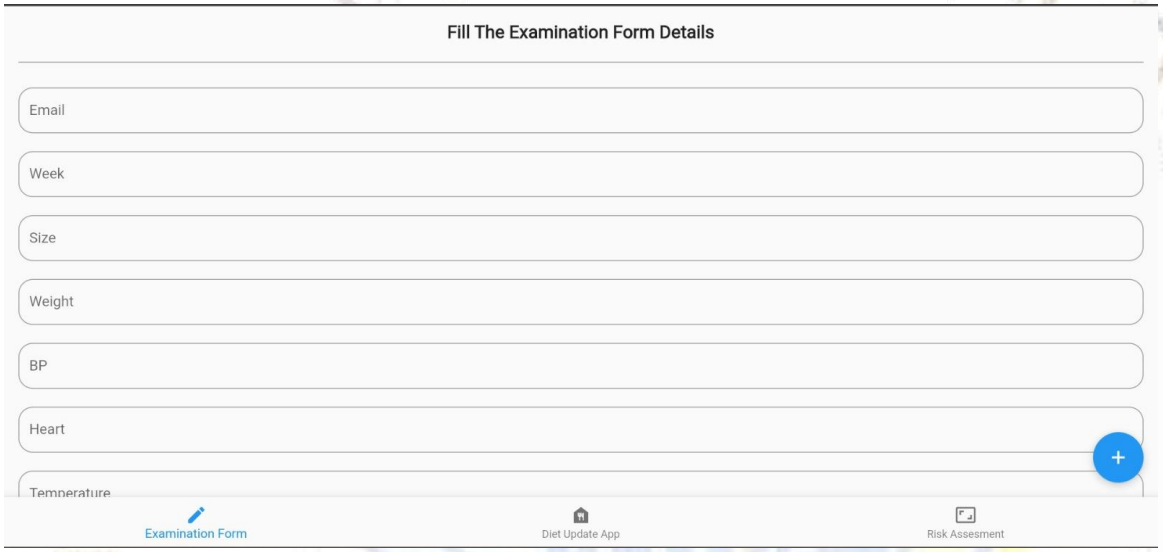

Fig 3: Examination Details

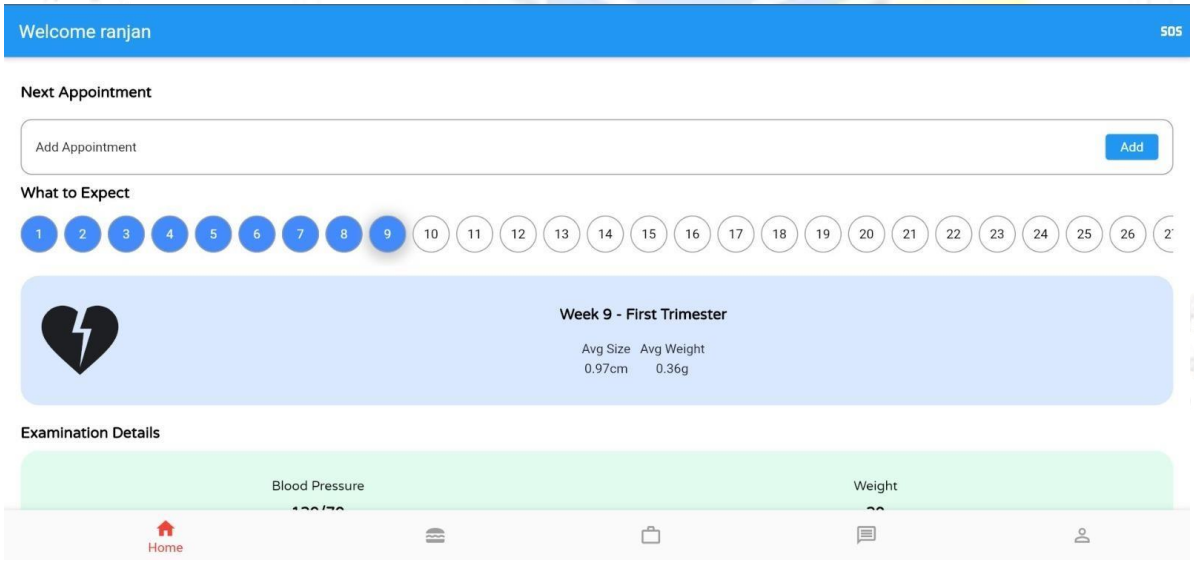

Fig 4: Homepage

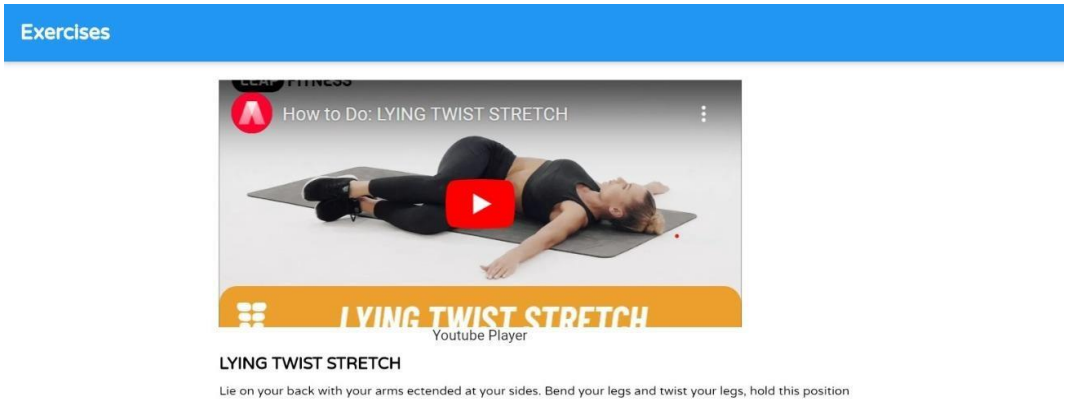

Fig 5: Exercise Page

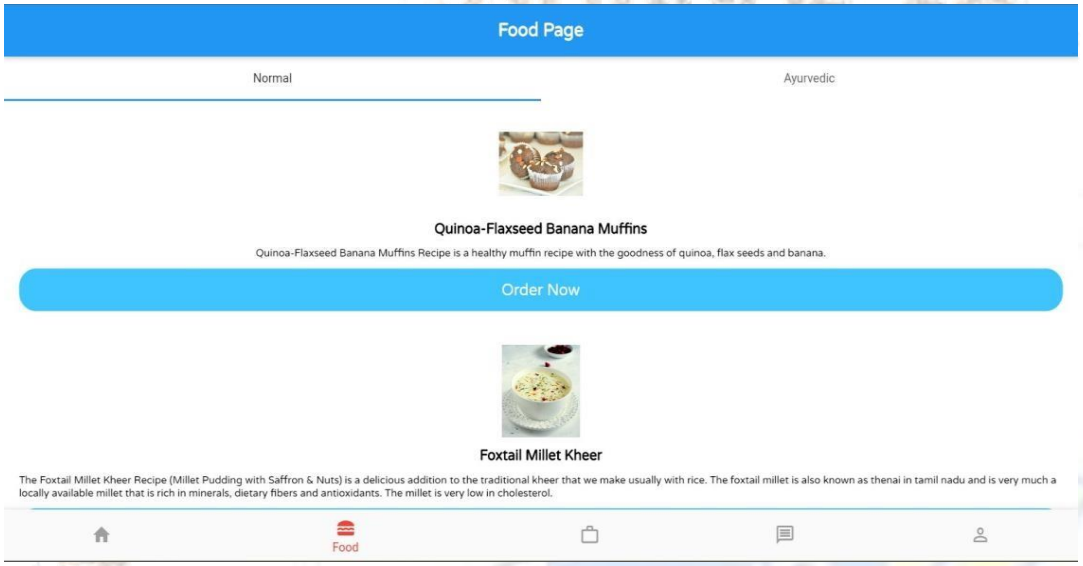

Fig 6: Diet Page

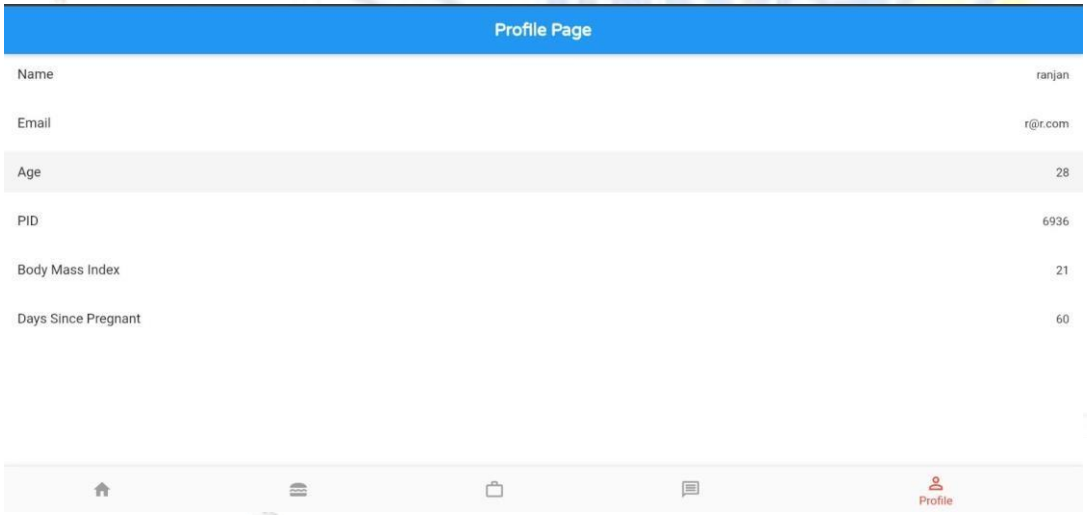

Fig 7: Profile Page

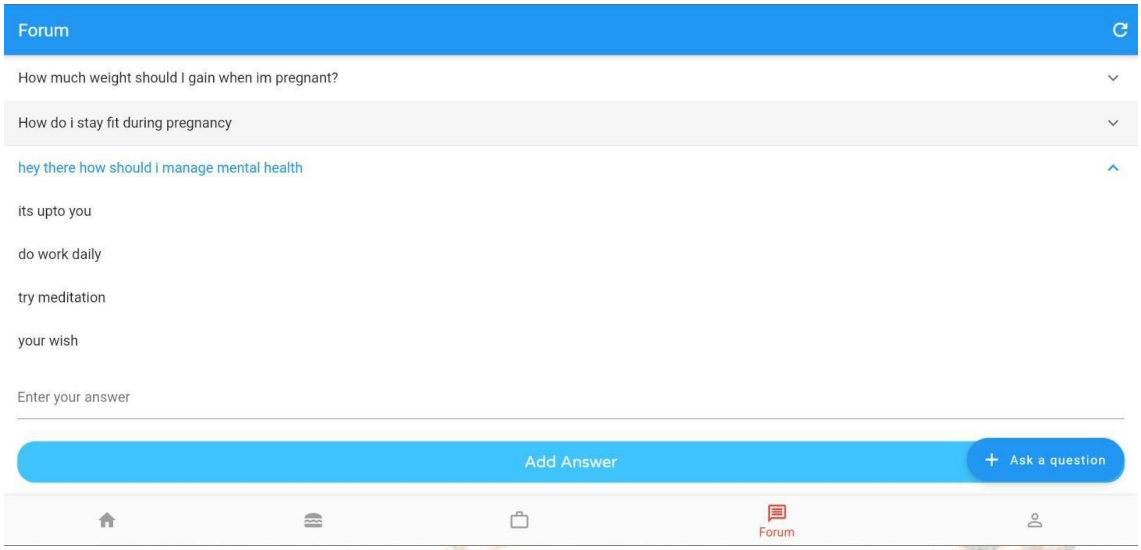

Fig 8: Forum Page

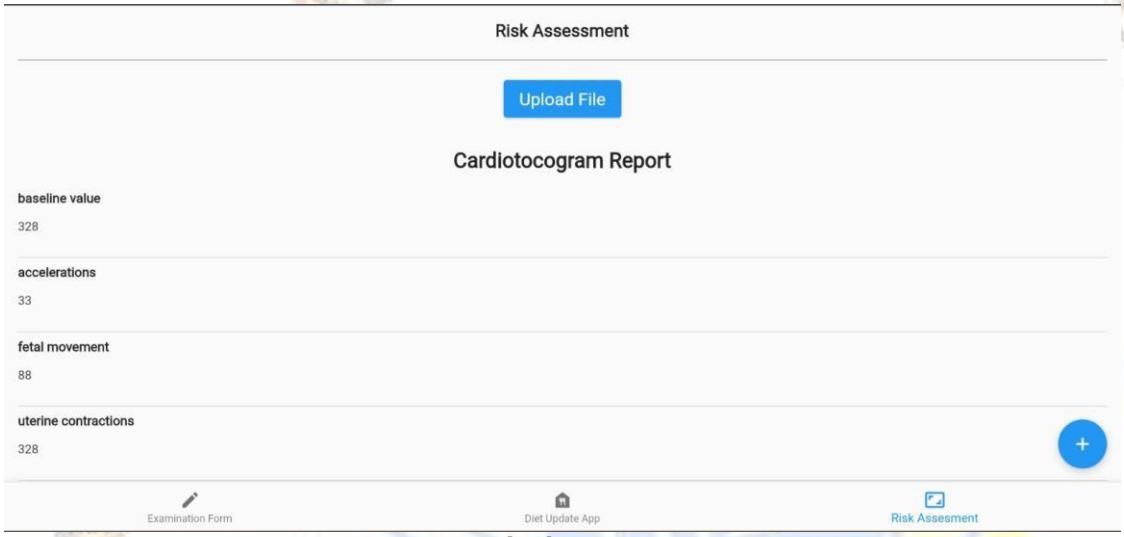

Fig 9: Uploading CTG Report

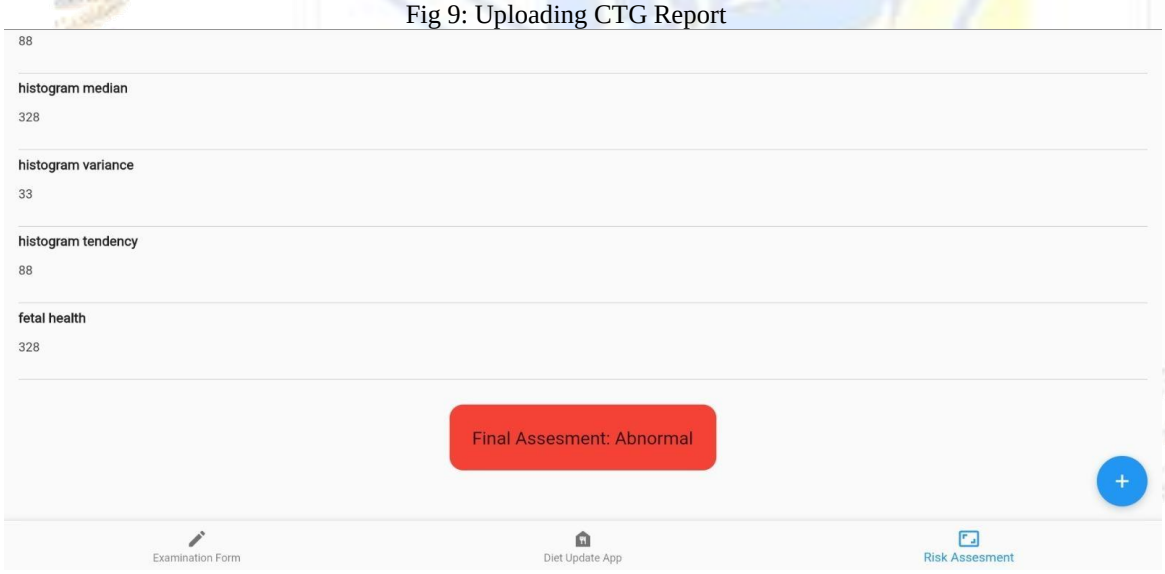

Fig 10: Risk Assessment Result

```
{
  "output": "Normal",
  "score": 0.9404388714733543,
  "values": [
    328,
    33,
    88,
```


Fig 11: Accuracy Test Result

Possible Risk Analysis Results
Normal
Mild Risk
Abnormal

Table 1: Possible Results

IX. CONCLUSIONS

In conclusion, the development of pregnancy health applications like Hello Mom is a promising technology that can help address the healthcare needs of pregnant women. With our research, we have identified the key modules and features required for such an application. These modules include data collection, customized display of data, food ordering system, real-time forum, and risk analysis using machine learning algorithms.

We strongly believe that our application can prove to be an effective tool for both medical professionals and pregnant women. It provides personalized recommendations based on patient data, which can help improve health outcomes and reduce risks associated with pregnancy.

As for future work, there are several areas where the application can be improved. One area is the integration of wearable devices to track and monitor physical activity levels and vital signs of pregnant women. This data can be used to provide more accurate and personalized recommendations for exercise and nutrition. Another area of improvement is the expansion of the risk analysis module to include more machine learning algorithms and data sources.

Furthermore, the application can be extended to include features that support postpartum care and breastfeeding. This would provide continued support for new mothers as they navigate the challenges of motherhood.

In conclusion, the development of pregnancy health applications like Hello Mom has the potential to revolutionize the healthcare industry by providing accessible, cost-effective, and personalized healthcare solutions to pregnant women. With continued research and investment, we can ensure that these applications are deployable for public use and make a positive impact on the lives of pregnant women and their families.

IX. REFERENCES

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