DiabetCare

An Artificial Intelligence based Mobile Application for Predicting the Risk of Prediabetes Mellitus, Gestational Diabetes Mellitus and Type 2 Diabetes Mellitus

Nirmani Jayaprabha Pathiranage - W1850888 | 20210078

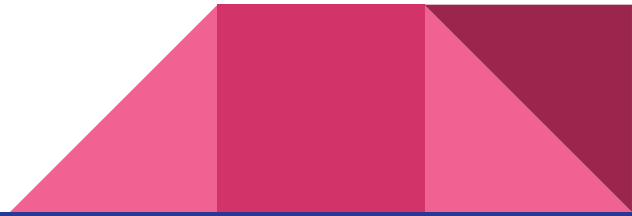
Problem Domain

In the medical field, it is essential to predict diseases early to prevent them.

Diabetes Mellitus is one of the most dangerous diseases all over the world.

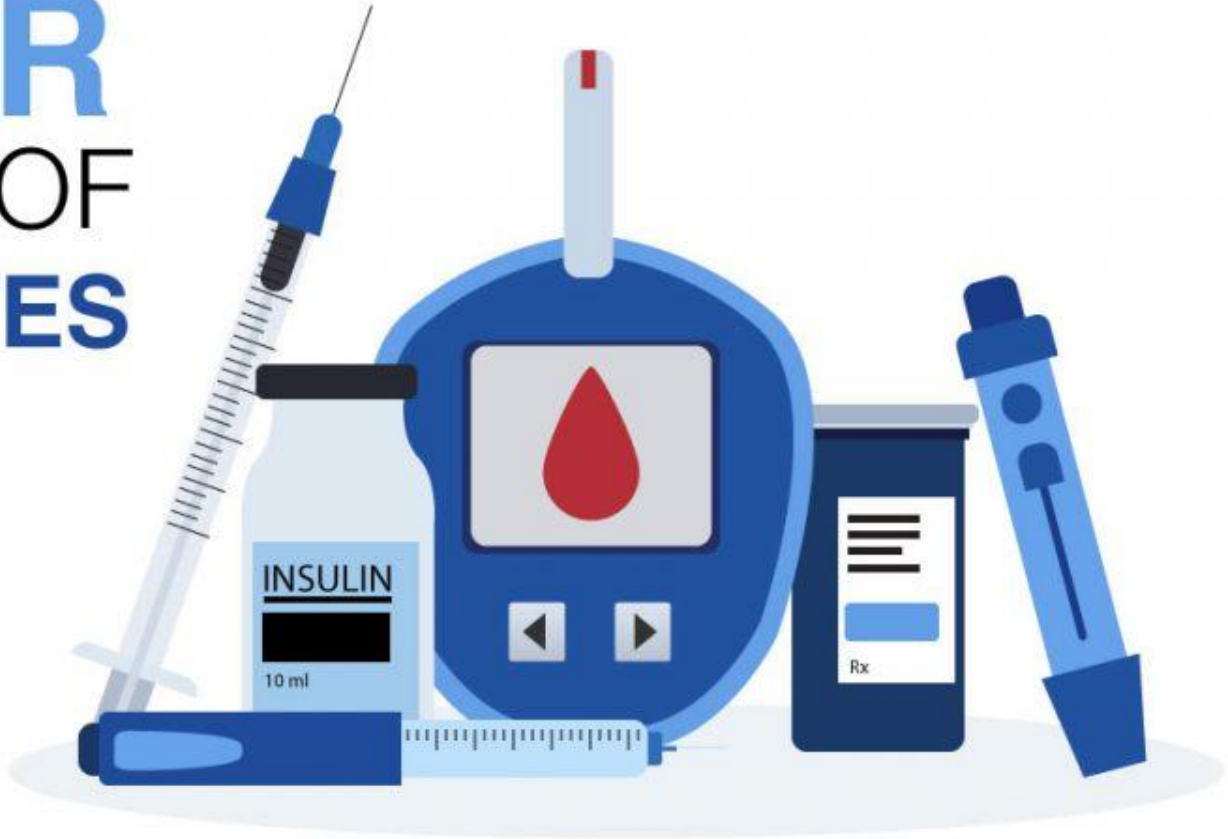
In modern lifestyles, sugar and fat are typically present in our dietary habits, which have increased the risk of diabetes mellitus.

There are different types of diabetes with different risk levels, as well as complications which can seriously damage parts of our body.



Country	Statistics
Sri Lanka	Prevalence of diabetes in adults is 9.8% of the total adult population. Total cases of diabetes in adults is 1,417,600. **Source:** International Diabetes Federation (Released on February 10, 2022)
	Sri Lanka diabetes prevalence (the percentage of people aged 20-79 years who have type 1 or type 2 diabetes) was 11.3% in 2021. **Source:** World Health Atlas, 2021
World (Global)	About 422 million people worldwide have diabetes, in which the majority living in low-and middle-income countries. 1.5 million deaths are directly attributed to diabetes each year. **Source:** World Health Organization, 2022
	537 million adults (20-79 years) are living with diabetes – 1 in 10. This number is predicted to rise to 643 million by 2030, and 783 million by 2045. Over 3 in 4 adults with diabetes live in low and middle-income countries. Almost 1 in 2 (240 million) adults living with diabetes are undiagnosed. Diabetes is responsible for 6.7 million deaths in 2021 – 1 every 5 seconds.

THE FOUR TYPES OF DIABETES



SOMA TECH INTL

Research Gap

Problem Domain

No automated application is still implemented to predict the risk of being diagnosed with the most common categories of diabetes in Sri Lankan context without age restriction.

Research Domain

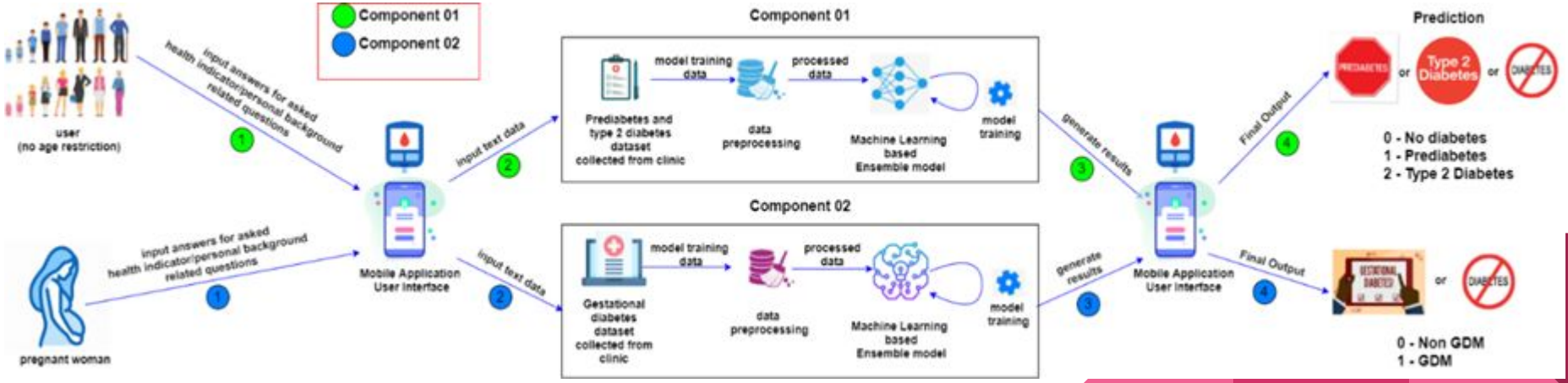
Most previous studies have used one particular ensemble scheme for mellitus risk prediction where other ensemble schemes are still unexplored, and have not examined the performance difference between classifier ensemble and base classifier in the ensemble.

Proposed Novel Solution

Design, develop and evaluate an automated novel approach in the face of a mobile application for early prediction of the risk of having the most common 3 types of diabetes mellitus (Type 2 diabetes, prediabetes and gestational diabetes), with less/without medical supervision.

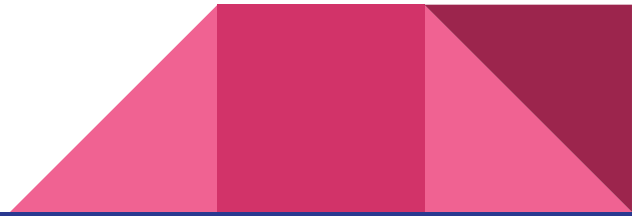
Components of the Proposed Mobile Application

1. **Component 1:** For users to test whether they have prediabetes or type 2 diabetes condition (without age restriction).
2. **Component 2:** For pregnant women to test whether they have gestational diabetes condition.



Demo

1. Type 2 Diabetes/Prediabetes Risk Prediction
2. Gestational Diabetes Prediction



Progress & Future Plans

Current Progress and future plan to complete the project by the end of April 2023.

Current Progress

- Core Research components are implemented in the prototype.
- Finalized models work with unseen test data.

Future Plan (for the next 2.5 months)

- Design of the mobile user interfaces should be improved.
- Implementation of the mobile app should be done.
- Backend API should be implemented with Flask.
- Backend API should be integrated with the implemented mobile application.
- Perform user acceptance testing and get feedbacks from medical and technology experts regarding the Minimum Viable Product.

Thank you!