Group Assignment-4

IT 7123

Business Intelligence

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Team Domain: Healthcare Informatics.

Dataset: Diabetes Informatics Management

1. INTRODUCTION

- Diabetes is a common chronic illness with significant health implications.
- Patients face complex tasks like blood glucose monitoring, medication adherence, and lifestyle changes.
- Our initiative leverages Business Intelligence (BI) technology to enhance diabetes care.

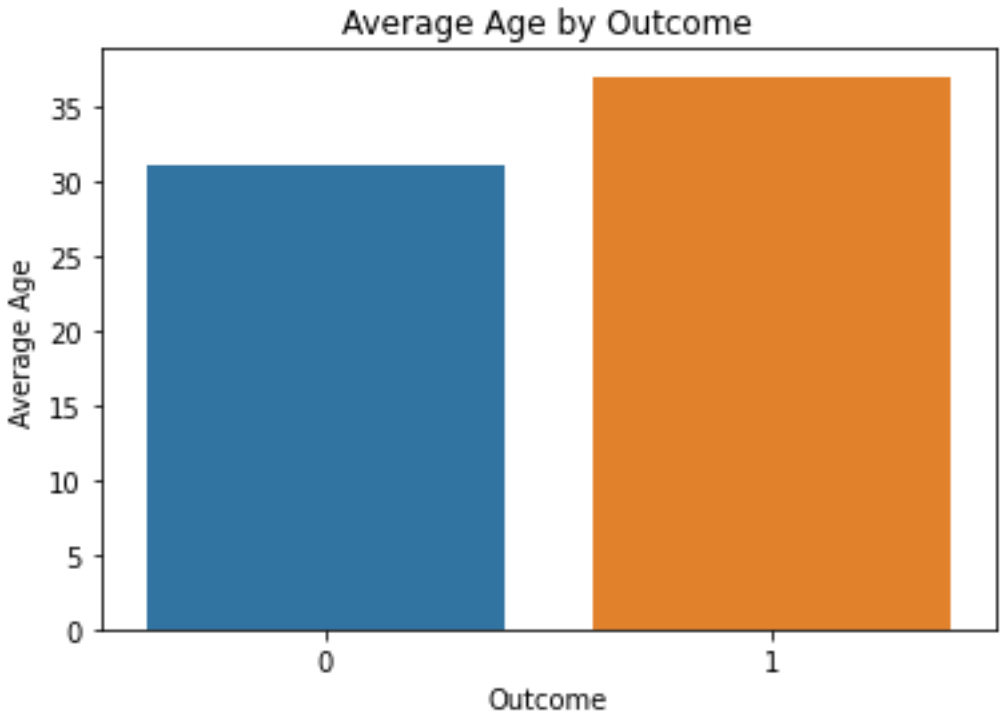
Our initiative aims to transform patient care by utilizing Business Intelligence (BI) technology and acknowledging the complex nature of diabetes management. This novel strategy seeks to address the complex issues that people with diabetes face, including medication adherence, blood glucose monitoring, and lifestyle modifications.

Our vision is to create a more individualized and data-driven approach to diabetes care by incorporating BI. Healthcare professionals will be able to examine vast patient data thanks to technology, which will provide insights into treatment responses, patterns, and trends. This increased awareness makes it possible to develop customized plans that improve overall care quality while also streamlining administration.

Dashboard 1:

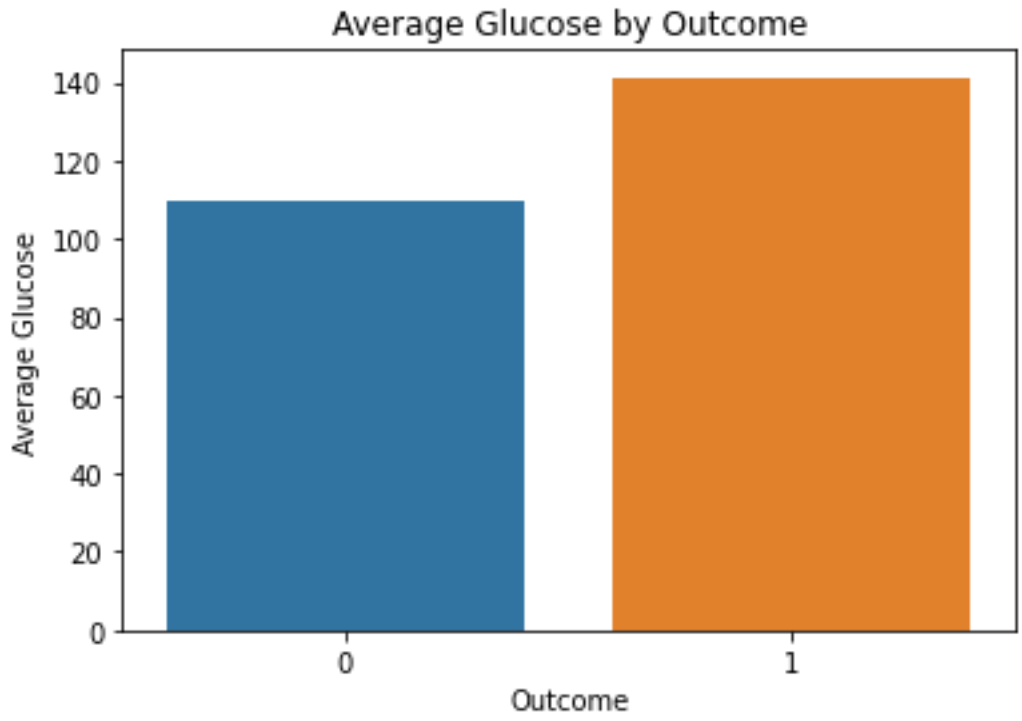
The association between age, diabetes, and glucose levels in the dataset is compellingly illustrated by the bar plot. The average age difference between those with and without diabetes is quite noticeable, according to the data. Those with diabetes tend to be older on average by roughly 6 to 7 years when compared to people without the disease. This age difference is consistent with

known epidemiological trends and may indicate a relationship between aging and the risk of diabetes.



Dashboard 2:

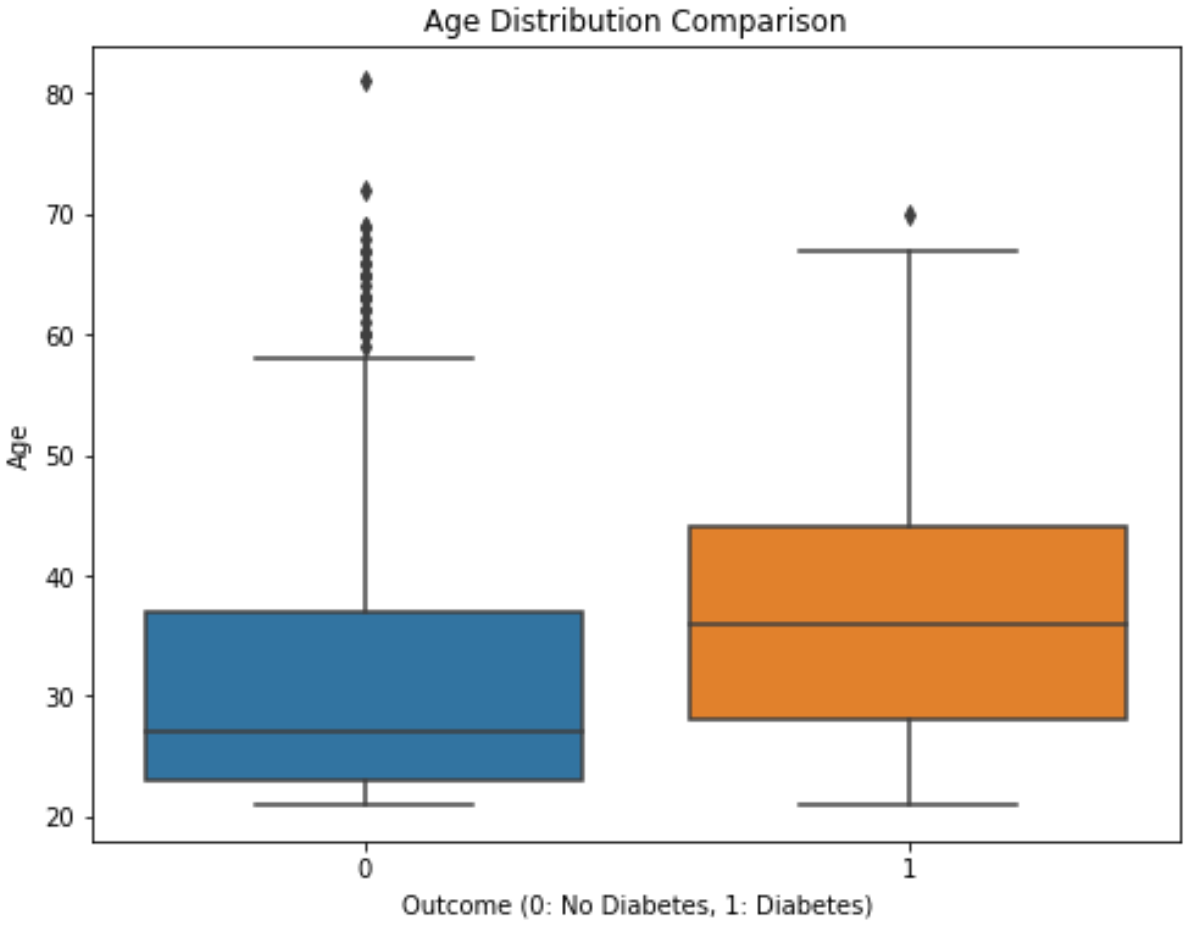
In addition, the plot makes clear that there is a significant difference in the two groups' blood glucose levels. People with diabetes have far higher blood glucose levels than people without diabetes; the difference is about thirty units. The general knowledge that bloods glucose concentrations are frequently greater in diabetics is reinforced by this finding, which highlights the basic function of glucose levels as a critical signal in diabetes diagnosis.



The examination of age and glucose levels together offers a comprehensive view of the dataset. Age may play a role in the occurrence of diabetes, as shown by the observed age differential, and the significant difference in glucose levels highlights the importance of this metric in differentiating between people with and without diabetes. These results provide insightful information on how age and glucose content interact, highlighting patterns and linkages in the dataset that should be investigated further and taken into account in a larger clinical setting.

The knowledge gained from the examination of age, glucose levels, and diabetes prevalence has significant consequences for making well-informed decisions in clinical and public health settings. These results can direct medical professionals in the real world as they apply focused screening and preventive techniques. Healthcare professionals may prioritize routine screenings for those in older age groups due to the documented link between diabetes and aging, which allows for early detection and intervention. Furthermore, the notable variation in glucose levels emphasizes the value of routine monitoring for those diagnosed with diabetes, enabling customized treatment regimens and lifestyle adjustments.

Dashboard 3:



These discoveries can help with diabetes prevention and management policy decisions when viewed from a wider public health viewpoint. Campaigns and resources can be made specifically to target age groups, highlighting the value of early detection and good lifestyle choices. Furthermore, the data can direct the distribution of funds for diabetes education programs aimed at groups with higher average ages, making community health initiatives more successful

These chapters provide insights that can be used to make practical decisions. Healthcare providers can use age-based screening tests to detect diabetes early. Public health initiatives can focus on age-specific education that reduces diabetes risk. Policymakers can effectively allocate resources and improve overall community health by addressing age-related diabetes prevalence and glucose levels.

These findings also provide a road map for creating age-specific public health campaigns that highlight the critical significance of early detection and adopting healthy lifestyle choices. This nuanced approach facilitates the development of educational materials and outreach initiatives that appeal to various age groups, leading to a more effective diabetes prevention plan.

The ramifications reach into the real world of healthcare delivery, enabling clinicians to use age-based screening tests to detect diabetes early. The adoption of a proactive approach facilitates prompt interventions, thereby improving patient outcomes and mitigating healthcare costs. Essentially, these results empower policymakers, public health programs, and healthcare providers to work together to improve community health outcomes by implementing age-specific, targeted interventions.

2.

Name this solution/application. Discuss the rationale behind this naming briefly.

Presenting "GluGuard": An easy-to-use app for managing diabetes.
Justification: "GluGuard" emphasizes our dedication to user-friendly diabetes management by combining guardianship and glucose monitoring.

Discuss three main features you propose to integrate this solution/application. What is the potential impact of these features? Discuss using a block diagram.

Continuous Glucose Monitoring (CGM) Integration:

Feature Description: Connect a continuous glucose monitor (CGM) that records and transmits glucose readings in real-time to the application.

Potential Impact: By eliminating the need for recurrent fingerstick testing, this feature enables users to regularly check their glucose levels. Better decisions about insulin dosages, dietary modifications, and overall diabetes management are made possible by real-time data. To improve user safety, the application can send alarms for both high and low glucose levels.

Insulin Dosing Recommendations:

Feature Description: Provide individualized insulin dose recommendations by using machine learning algorithms to evaluate glucose measurements, carbohydrate intake, and other pertinent aspects.

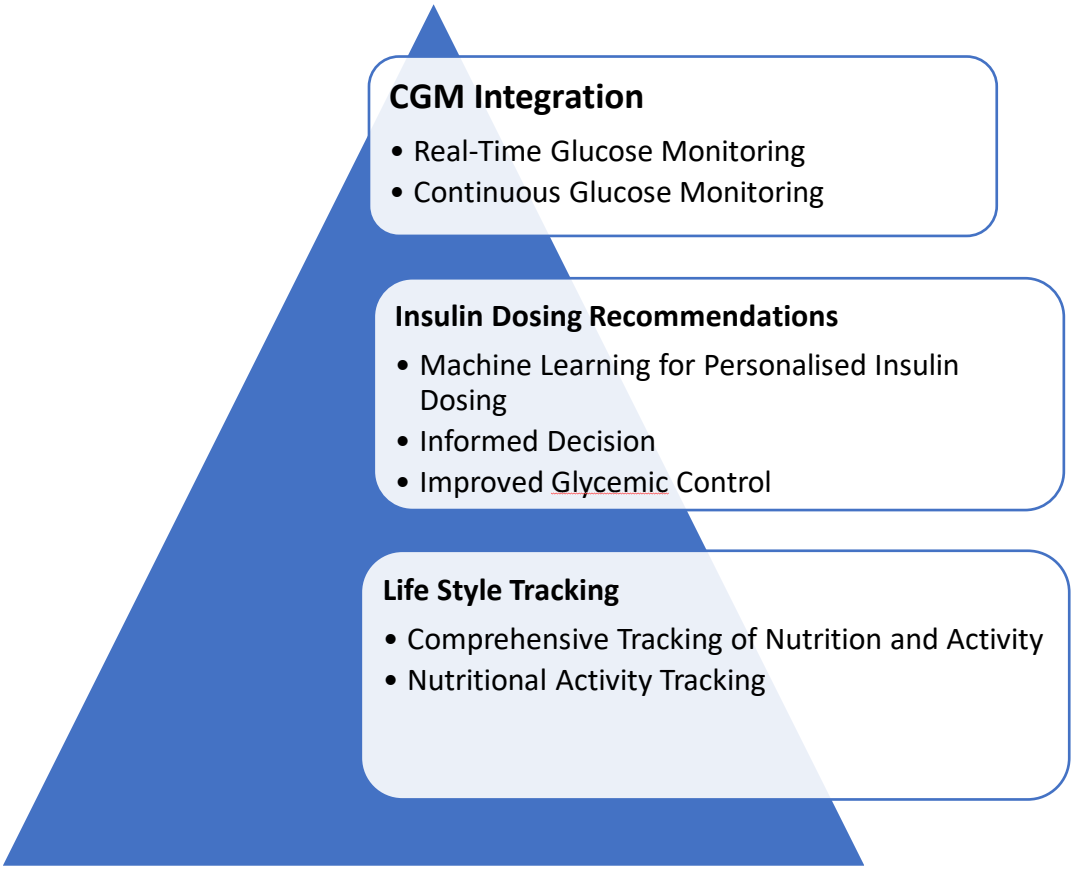
Potential Impact: The program helps users make educated decisions about the delivery of insulin by including intelligent dose recommendations. By lowering the possibility of both hyperglycemia and hypoglycemia, this feature may help improve glycaemic management. It also facilitates a more user-friendly experience by streamlining the intricate procedure for figuring out insulin dosages.

Nutrition and Activity Tracking:

Feature Description: Provide customers with the ability to track their carbohydrate consumption, record physical activities, and log their meals with a comprehensive nutrition and activity tracking system.

Possible Effect: It's critical to track diet and exercise to effectively control diabetes. This function aids users in comprehending how their lifestyle decisions affect their blood glucose levels. Users may make better decisions by using the application's insights regarding how particular foods and activities impact their unique glucose profiles. With time, trends can be found in this data, and diabetes treatment techniques can be improved.

Block Diagram:



How will you incorporate existing cutting-edge AI technologies into your solution? Discuss two specific AI technologies with example cases within the scope of your proposed product/solution/application.

1. **AI Integration for Diabetes Monitoring:**

AI Model: Imagine it as a smart system that analyzes a diabetic patient's data over time using either a long short-term memory (LSTM) or a recurrent neural network (RNN).

An example scenario would be to track the blood sugar of a diabetic. To forecast future blood sugar levels, the AI examines their past, including meals, activity, and insulin usage. This promotes early problem detection and makes recommendations for improved management.

Benefits

spots early variations in sugar levels. provides individualized dietary and insulin recommendations.

motivates patients to follow their prescribed course of care. All in all, it facilitates diabetes management.

2. AI for Drug Compliance:

To use Natural Language Processing (NLP) to drug compliance, a complex model that can decipher patient messages about their prescriptions must be put into use. This AI system actively detects trends and evaluates the subtle emotional undertones in patient comments, going beyond simple data extraction. Using this skill, the AI recognizes patterns in the replies from the patients, which enables it to offer individualized suggestions, like recommending educational resources or alternatives.

The main benefit of using this technology is that it has a significant effect on patient satisfaction. The solution not only strengthens the bond between patients and their healthcare journey by customizing support based on unique insights, but it also greatly improves adherence to

prescribed prescriptions. The AI's capacity to identify and resolve possible problems at an early stage leads to better health outcomes and a more proactive, patient-centred approach to healthcare. In the end, the combination of NLP and drug compliance improves patient care overall while streamlining the prescription feedback procedure.