



Faculty of Electrical and Electronic Engineering Technology



**DEVELOPMENT OF MOBILE BASED MEDICAL MANAGEMENT
SYSTEM USING ANDROID STUDIO AND FIREBASE**

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ADHWA AIMAN SAHAR BIN AZHARI

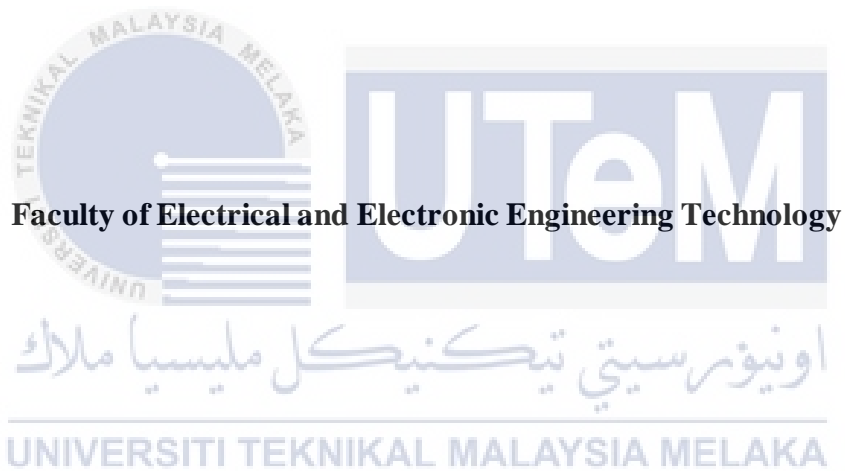
Bachelor of Computer Engineering Technology (Computer Systems) with Honours

2022

**DEVELOPMENT OF MOBILE BASED MEDICAL MANAGEMENT SYSTEM
USING ANDROID STUDIO AND FIREBASE**

ADHWA AIMAN SAHAR BIN AZHARI

**A project report submitted
in partial fulfillment of the requirements for the degree of
Bachelor of Computer Engineering Technology (Computer Systems) with Honours**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2022

Tajuk Projek : DELOPMENT OF MOBILE BASED MEDICAL MANAGEMENT SYSTEM
USING ABDROID STUDIO AND FIREBASE

Sesi Pengajian : 2 2022/2023

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Tarikh: 8/1/2023

Tarikh: 31/1/2023

DECLARATION

I declare that this project report entitled “DEVELOPMENT OF MOBILE BASED MEDICAL MANAGEMET SYSTEM USING ANDROID STUDIO AND FIREBASE” is the result of my own research except as cited in the references. The project report has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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Student Name

: Adhwa Aiman Sahar Bin Azhari

Date

: 8/1/2023

APPROVAL

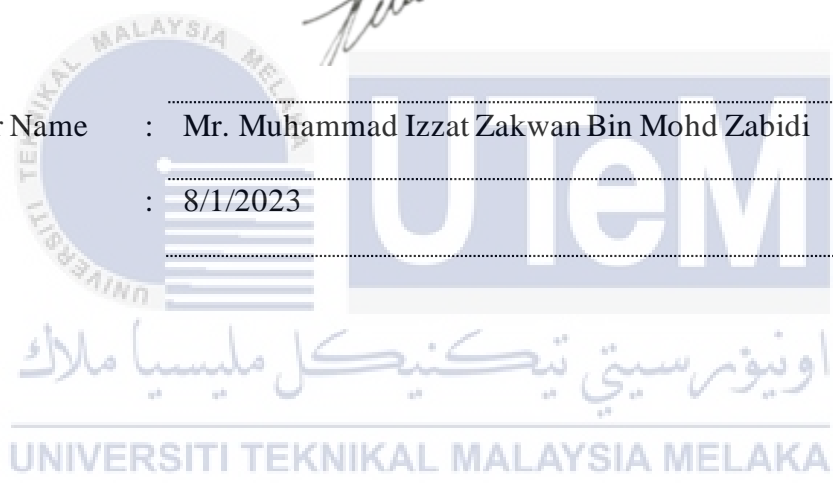
I hereby declare that I have checked this project report and in my opinion, this project report is adequate in terms of scope and quality for the award of the degree of Bachelor of Computer Engineering Technology (Computer Systems) with Honours.

Signature :



Supervisor Name : Mr. Muhammad Izzat Zakwan Bin Mohd Zabidi

Date : 8/1/2023

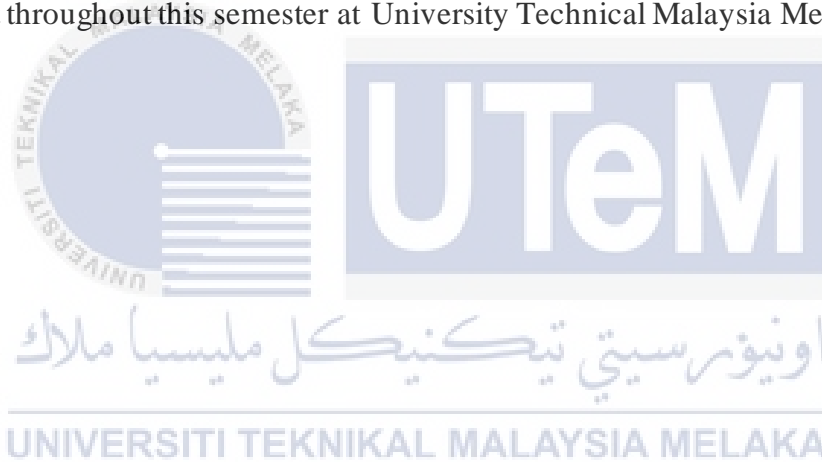


DEDICATION

I dedicate this project to my dear parents, who have provided all the support and assistance that has enabled our efforts to succeed. They never surrendered, and I will always remember them.

Next, I'd like to thank the lecturer Mr. Muhammad Izzat Zakwan Bin Mohd Zabidi, who served as my supervisor throughout Project Sarjana Muda 2, for all the assistance and cooperation they provided. Throughout the project, your patience, expertise, and words of encouragement were a tremendous source of inspiration for me.

Then, I would like to thank all my friends for their cooperation, advice, motivation, and support while working on Project Sarjana Muda 2. Thank you for your moral guidance and support throughout this semester at University Technical Malaysia Melaka, lecturers, and staff.



ABSTRACT

Health is expensive but being sick can be even more so. As a result, prevention is preferable to cure. Many people do not prioritise their medical care and only visit the doctor when they are seriously ill or have been diagnosed with a disease at a late stage; however, we can prevent this from happening in the first place. Many people are unaware that during a medical check-up, we can check or request any type of treatment, including blood screening, physical examination, glucose screen test, ultrasound scan, x-ray, doctor consultation, and many others. Chronic patients, such as those with hypertension or diabetes, who always have their monthly appointments, can book their slot in the Medical Management System without having to manually book at the hospital. As a result, after we book our medical appointment, the admin will approve it and provide the patient with a date and time to attend their medical appointment. This feature is very useful for people who live or stay far away from any clinic or in the city because they can have an appointment without having to wait too long in the clinic. This medical management system has two directories: admin and users. Doctors or admin can access their patients' previous medical records stored in the app's database and upload the medical report after the medical appointment. Users or patients can use the home interface that's book their medical appointment, check doctor availability and other medical information. The interface for this application will be built in Android Studio, and the database will be stored in Firebase using Authentication, Real Time Database and Storage Database. It will also be designed to be user friendly, simple to use, and understandable so that anyone can use it. Hopefully that this app will help many people who have had problems with their medical health and will help to improve our medical system.

ABSTRAK

Kesihatan adalah perkara paling penting dan mahal dalam kehidupan. Mengikut perpatih, mencegah lebih baik dari mengubati. Akan tetapi ramai masyarakat tidak mengambil kisah atau endah tentang kepentingan kesihatan mereka dan hanya akan menyesal di kemudian hari apabila doktor telah mengesahkan mereka menghadapi penyakit atau penyakit yang tidak boleh diubati. Ramai juga masyarakat yang tidak tahu atau tidak peka tentang kelebihan pemeriksaan kesihatan, ini kerana kebanyakan mereka hanya melakukan pemeriksaan kesihatan ketika sekali sekala sahaja. Ketika melakukan pemeriksaan kesihatan kita juga boleh meminta doktor atau staff untuk memeriksa perkara-perkara yang lain seperti kaunseling kesihatan ataupun pemeriksaan fizikal. Akan tetapi, ada juga segilintir masyarakat yang menghidap penyakit kronik seperti darah tinggi atau kencing manis melakukan pemeriksaan kesihatan setiap bulan. Oleh itu, mereka boleh menempah pemeriksaan kesihatan mereka dengan menggunakan applikasi Medical Management System yang dikhaskan untuk pesakit menempah pemeriksaan kesihatan tanpa pergi ke hospital. Akan tetapi, tempahan hanya boleh dibuat jika doktor tersebut mempunyai slot kosong dalam waktu tersebut. Applikasi ini akan dibuat dan direka menggunakan Android Studio untuk bahagian permukaan dan Firebase untuk menyimpan data-data pesakit. Justeru, kami berharap agar sistem ini dapat digunakan oleh orang ramai dan memudahkan urusan antara pesakit dan juga pihak hospital.

ACKNOWLEDGEMENTS

Before anything else, I would like to thank my supervisor, Mr. Muhammad Izzat Zakwan Bin Mohd Zabidi, for their invaluable guidance, wise words, and patience throughout this project.

I am also indebted to Universiti Teknologi Malaysia Melaka (UTeM) and the Faculty of Electrical and Electronic Engineering Technology for the financial assistance which enabled me to complete the project. Not forgetting my colleague's willingness to share his ideas and thoughts regarding the project. My deepest gratitude goes to my parents and family members for their support and prayers throughout my studies.

Lastly, I would like to thank all the Universiti Teknologi Malaysia Melaka (UTeM) staff, my colleagues and classmates, the faculty members, and other individuals who are not listed here for their cooperation and assistance.

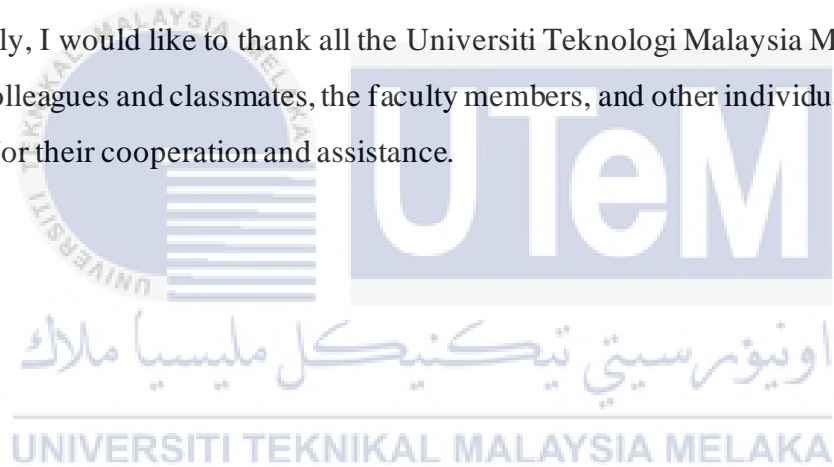


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CHAPTER 1

INTRODUCTION

1.1 Background

The Mobile Based Medical Management System by using Android Studio and Firebase is a comprehensive dispensing workflow management system designed to improve accuracy, efficiency, time, and management. Until 2022, most clinics in Malaysia were still doing all their work manually and lacked an advanced management system to improve their clinic workflow. This manual system necessitates the clinic assistant or pharmacist manually monitoring all bookings for health or medical check-ups, which causes the clinic to become crowded and the patient to wait for a long time for their turn.

This frequently happens every day, especially in a general hospital because of the number of patients coming for their regular medical check-ups. This is especially true for patients who have a chronic disease such as hypertension or diabetes, as these patients are required to have an appointment check-up every month. This causes the workflow at the hospital to become a mess, and there will always be a problem because the hospital or clinic still uses ticket numbers for medical appointments and still uses hardcopy to record the patient medical report.

Therefore, to resolve issues of this nature, there is an immediate need to develop a mobile-based medical management system that will be beneficial not only for the medical facility (whether it be a hospital or a clinic), but most importantly for the patients. With the help of this Medical Management System, we can schedule an appointment for a medical check-up by first determining whether the attending physician is available within the app. After that, we can use the app to store and generate our medical report. This system will be of great benefit to both the patients and the hospital in terms of its ability to handle incoming and outgoing patients in a more streamlined and effective manner.

1.2 Problem Statement

The administration of the hospital or clinic has traditionally stored medical records in filing cabinets. It will be laborious and challenging to manage a very large and busy hospital or clinic using records that are kept on paper. This will make it difficult to keep track of the inventories about the medical report of patients, the availability of doctors, and the registration of patients. In addition, patients frequently have appointments with their own personal doctors, but when they arrive at the clinic, the doctor isn't available to see them. This makes it difficult for patients to clear their schedules to return the following day for another appointment with the same doctor. This piece of project work will notify or prompt the clinic assistant or pharmacist about the patient appointment date and doctor availability, and the patient can get ready to clear their schedule in preparation for the appointment.

1.3 Project Objective

The main aim of this project is to design a project that control the workflow of the medical management system. Specifically, the objective are as follows:

- a) To create a user-friendly mobile-based Medical Management System Application.
- b) To develop a system that can book the medical appointments and the doctor can upload medical reports.
- c) To test efficiency of the Medical Management System Mobile Application by 10 questions of survey.

1.4 Scope of Project

This system is intended for use in any hospital or clinic in Malaysia. Patients, doctors, and hospital or clinic staff are the intended users of the system. This project focuses on creating a system for storing digital patient records and upload medical reports. This system can also use the apps to book their next medical appointment by checking the doctor's availability. It also includes some additional functions that can assist target users in improving their performance.

- Admin
 - Can register and login and the data will be saved in the database.
 - Write and upload the medical report.
 - Search and review the previous medical report.
- Patient
 - Can register or create an account and the data will be saved in the database.
 - Can booking their appointment with the doctor by check the doctor availability on the apps.
 - Can check the doctor available through the apps.
 - There's a medical information inside the apps.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

As part of the process of developing the Mobile Based Medical Management System, a literature survey was carried out to ensure that the system developed accurately reflects both the positives and negatives associated with the technology. In order to ensure that the development of the project goes off without a hitch, a number of studies on the implementation of Medical Management Systems have been carried out. These studies examined the positives and negatives of a number of different management systems. The Mobile Based Medical Management System is able to use the flaws that have been found in previously implemented systems as a guide to eliminate these problems. The use of these systems also results in the provision of recommendations concerning the manner in which the quality of the application may be enhanced. A literature review gives information on the many different kinds of features that can be added to or given in this application. This information can also be found in the review. In addition, there is a way to get an idea for the introduction of new features that will make this app stand out from the competition and be significantly more fascinating than the app that is currently available.

2.2 Past Related Research

For educational purposes, the research information will center on the educational board. The selection of research materials is contingent on the employed system, product, and apparatus. The source must be acceptable in the system format, such as research books, journals, articles, or authorized websites or applications.

2.3 Literature Review

2.3.1 A Mobile Application by Teladoc Health

In this instance, Teladoc Health Inc. developed a mobile application to enhance the healthcare experience by providing a full spectrum of care powered by technology and data to improve health on a large scale. They increase access to various physical and mental healthcare services by equipping individuals with insights that inspire and expedite better health decisions and foster clinical collaboration that results in higher quality care. Their system has a few critical features for customers or users, such as virtual care for consumers. It includes developing data-driven, individualized experiences that adapt to the changing healthcare needs of an individual. Next, virtual care for clinicians is enabled, allowing clinicians to easily extend their reach using simple software and medical-grade telehealth devices. In addition, their virtual tools enable real-time clinical collaboration with colleagues worldwide to address the most demanding care challenges. They conclude by emphasizing the significance of empowering healthier lifestyles by stating that their connected devices and personalized, timely, actionable outreach are essential to this end. To assist individuals in achieving long-term behavior modification, including improved management of chronic conditions such as diabetes and hypertension and enhanced wellness and prevention efforts. This system is not available for consultations in other countries, and you must be a monthly subscriber to use their application.

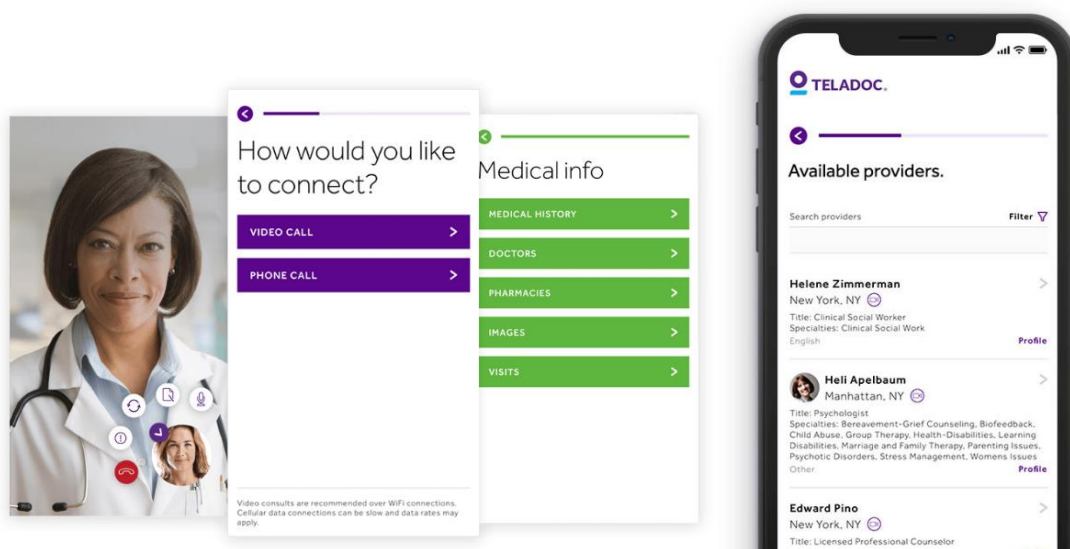


Figure 2.3.1: The Mobile Interface by Teladoc Health

2.3.2 Healthcare and Exercise Mobile Application by GENERIS

GENERIS Healthcare and Exercise Mobile Application is a DNA-powered platform that focuses on your health and wellness. They combine clients' genes, goals, and lifestyle preferences to help them achieve their objectives through personalized and actionable plans. This app has a few main features, such as food management. Users discover which foods work with them rather than against them. GENERIS will provide customized meal plans based on their DNA, goals, and food preferences. They will determine which foods your body will respond to and which foods you should avoid. Personalized activity plans are the next feature. GENERIS will assist you in improving your performance. Make the most of your workout routine by learning which workouts are best for you based on your unique genes. Finally, supplement your body with personalized vitamin plans. GENERIS will change your perspective on your body. Use your DNA to save time and money by determining which increases your body may require based on your genes and goals. Some of the disadvantages I discovered with this application are that it is more focused on health and lifestyle, so it is not suitable for people who are much older or do not like to exercise.

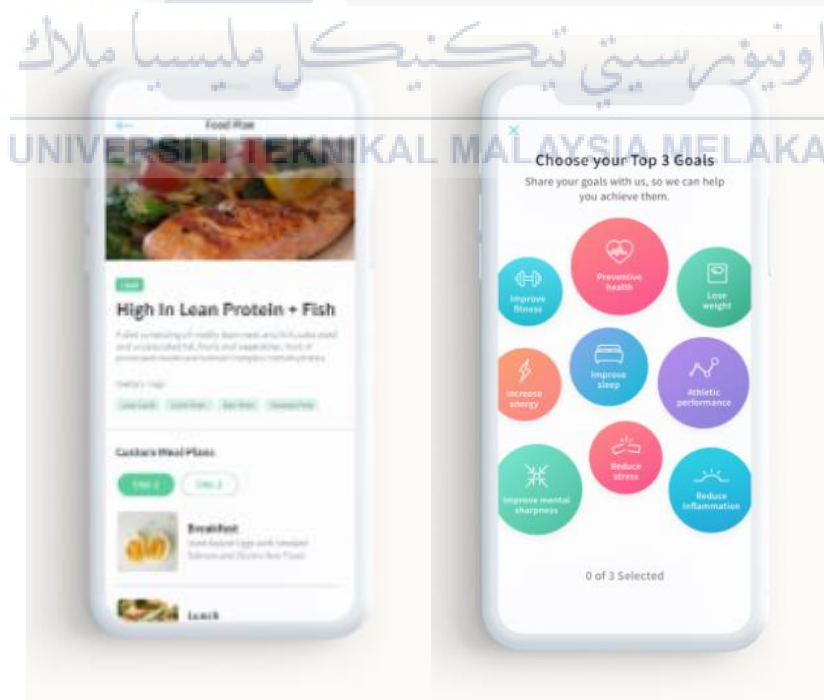


Figure 2.3.2: The Mobile Interface for GENERIS Mobile Application

2.3.3 MySugr Diabetes Management for Mobile Based Application

MySugr, a mobile-based application, is the third application very similar to my case study. MySugr is a diabetes management app created by people with diabetes for people with diabetes. The mySugr app centralizes your essential diabetes data from connected devices, integrations, and manual entries. Throughout your diabetes journey, the mySugr app will be by your side, keeping you motivated, confident, and ready to reduce your diabetes. MySugr apps had some fantastic features, such as the logging menu. The login menu includes some excellent tools to make logging easier. You can log important therapy data such as blood sugar, meals, activity, insulin, and so much more in the mySugr app. You can embrace the wonderful world of data logging with features like the Photo Function and entry customization. The following features are for connecting your devices and services. Connecting your diabetes device to mySugr will automatically log your blood sugar readings into the app. There's no need to flip through pages any longer! Everything is available in the app with a few taps. There is also a feature called mySugr Bolus Calculator that assists you in calculating the appropriate amount of insulin for corrections and mealtimes. There is also a feature called Analytics that displays an analysis of all relevant data points and patterns in your blood sugar. Swipe to the left to access diabetes data from the previous 7, 14, 30, or 90 days. You'll be able to identify areas where you can be improved, thanks to clear infographics. The only disadvantage of this application is that it only focuses on Diabetes management, so people who do not have diabetes will not find it helpful.

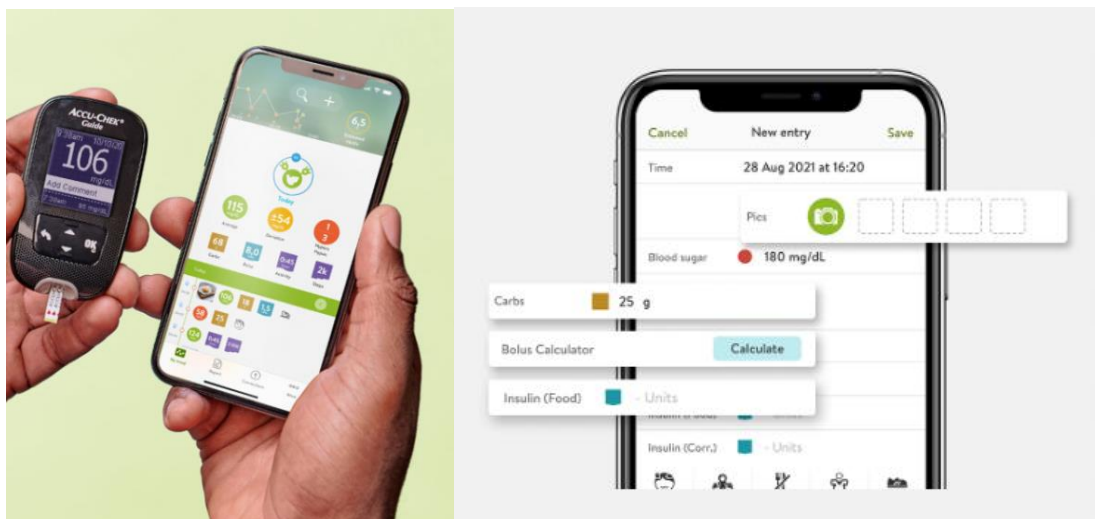


Figure 2.3.3 MySugr Interface for Mobile Based Application

2.2.4 Health2Sync Chronic Disease Management for Mobile Based Application

Health2Sync is a mobile application that focuses on chronic disease management. It efficiently manages chronic disease by transforming data into the informative analysis. Some of the features of this app are simple to log in and review. The Health2Sync App visualises your blood glucose, blood pressure, weight readings, and daily activities to assist you in making changes and taking complete control of your health. Following that are partner care and patient support. The Health2Sync App and Patient Management Platform connect to healthcare professionals, family, and friends to assist you in overcoming diabetes. Finally, personalised assistance. The Health2Sync App provides reminders and tips based on your records to help you make timely adjustments. They claim that after three months of using the Health2Sync application, users with an initial HbA1c > 7% experience a 2.0% drop in HbA1c. Health2Sync also claims to have products and cloud-based services certified under the following global/national standards.



Figure 2.3.4: Health2Sync Chronic Disease Management Mobile Interface

2.3.5 Mobile Based Application by Dr on Demand

This application is called Dr on Demand that is an application that make your appointment with your doctors just from home without physically go to the clinics or hospital. Dr on Demand helps you to get an appointment with a psychiatrist, psychologist or therapist without going to their office and just open up your webcam and microphone you get your appointment virtually. Some of health conditions that they provide such as chronic

health conditions, coughs and colds, rashes or skin conditions, flu symptoms, migraine, seasonal allergies and mental health conditions. You can also use Doctor on Demand for preventive health and wellness check-ups. If you're interested in therapy or psychiatry services but not sure exactly what kind of support you need, Doctor on Demand can help with that, too. Their free assessment helps screen for anxiety and depression before you even sign up. This can give you a better understanding of the level of distress you're dealing with on a daily basis. Although the assessment only asks questions about depression and anxiety, Doctor on Demand does offer support for plenty of other mental health symptoms and conditions, too. These include bipolar disorder, post-traumatic stress disorder (PTSD), insomnia, and substance use disorders. Some of cons that I notice on this Doctor on Demand application is you may need to wait a few days for an appointment. Next is depending on your location, you may only have a few therapists to choose from. And lastly you can't get a prescription for stimulants or benzodiazepines.



Figure 2.3.5: Doctor on Demand Mobile Interface

2.3.6 Microsoft Cloud for Healthcare

Microsoft Cloud for Healthcare offers dependable, integrated capabilities that make it easier to improve the overall healthcare experience. And Microsoft + Nuance outcomes-focused AI solutions help you innovate for the future. Enhanced patient engagement is a feature of Microsoft Cloud for Healthcare. Provide safe, personalised experiences that engage patients at every point of care. Next, encourage health team collaboration. Connect, employ, and manage your team with tools that assist them in providing the best care possible. Aside from that, it is to safeguard health information. This program can help your