

DrugCare

Coding Hackathon

TEAM NAME

Masterminds

MEMBERS

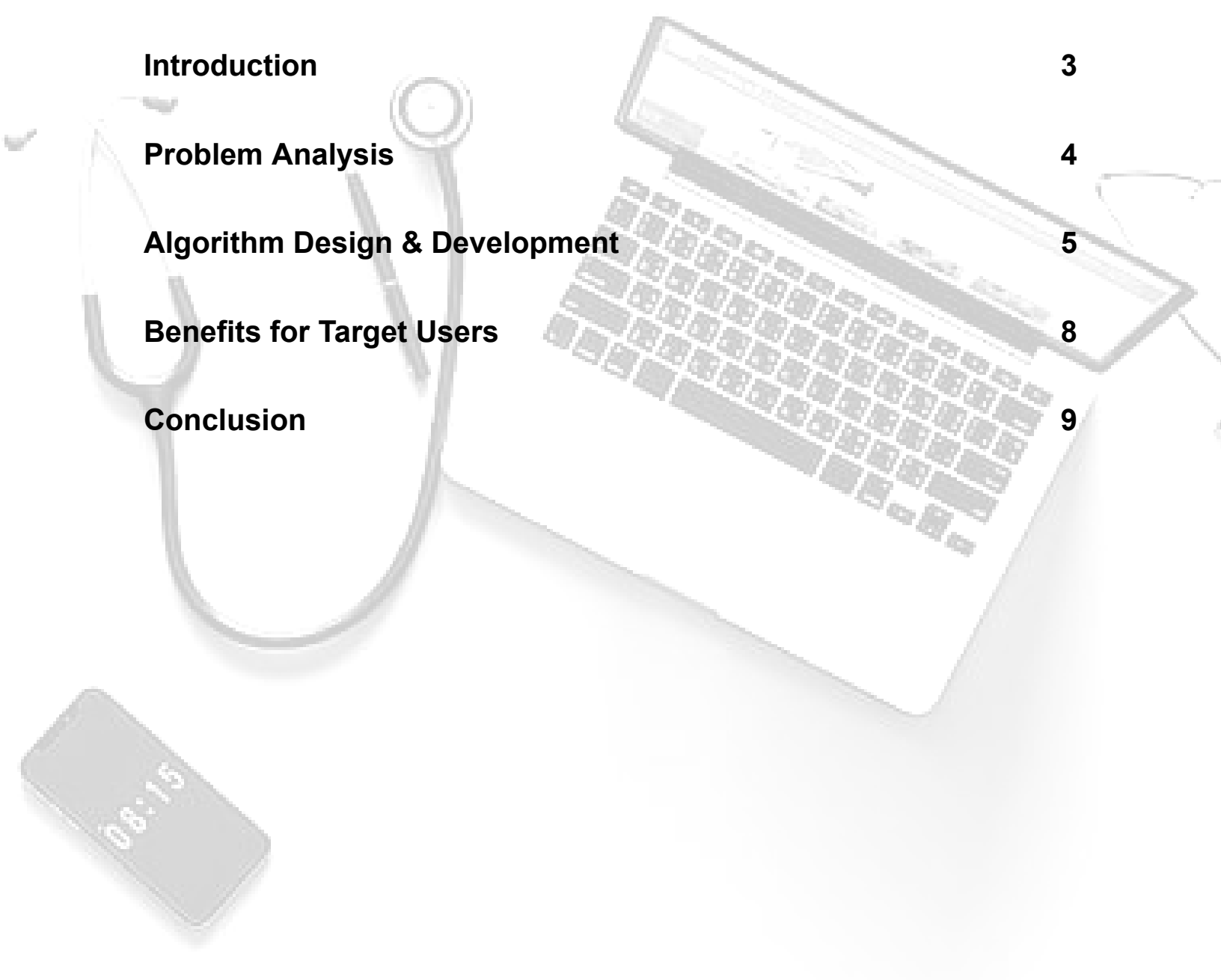
- 1) Cheung Ian - iancheung.goodtime@gmail.com
- 2) Lam Lap Yu - ml7forcode@gmail.com
- 3) Cheung Chun Lok - amosloklok@gmail.com

Uber
Global
Hackathon



Table of contents

Introduction	3
Problem Analysis	4
Algorithm Design & Development	5
Benefits for Target Users	8
Conclusion	9





Introduction

Under the COVID-19 pandemic, the world has witnessed the vulnerability of the global healthcare system. As a result, the focus of industries and leaders have been shifted to improving healthcare systems. In particular, the possibility of online healthcare. The global healthcare sector, as represented by the Russell 3000 HealthCare Index, presented a 19.8 percent increase in 2021, highlighting dramatic growth in this sector.¹ It is further expected that the global healthcare services market is going to grow from 6872 billion USD in 2021 to 7548 billion USD in 2022, at a compound annual growth rate of nearly 10 percent. The growth is mainly due to the companies rearranging their operations due to the impacts caused by the COVID-19 pandemic. The market is expected to reach 10414 billion USD in 2026 at a compound annual growth rate of 8.4 percent.²

The healthcare services market mainly consists of two major aspects: sales of direct medical healthcare services, and related goods that provide human healthcare services. In this report, we will be discussing these main types of healthcare services around the world and how technology can improve them.

Considering the improving survival rates and better quality of life, the contributions of medical advances have played a significant role in such progress. According to a report by TrendWatch, medical advances are responsible for a 70 percent improvement in survival rates for heart attack patients and a two-thirds reduction in mortality rates for those suffering from cancer. Undoubtedly, high medical diagnostics and equipment integrating better doctors' practice patterns have greatly improved healthcare service delivery.

Technological advances have also presented numerous opportunities for improving or even transforming the healthcare sector. The development of technology has certainly reduced human errors, improved clinical outcomes, facilitated care coordination, and improved efficiencies as well as the tracking of data over time.

¹ [Global Healthcare Outlook 2022 – Institutional | BlackRock](#)

² [Healthcare Services Global Market Report 2022](#)



Problem Analysis

For people with minor diseases, whether to take a dose of medication or go for a treatment session only affects them slightly. However, for many people, remembering to take daily medication can be the difference between life and death. Yet, people forget this essential action all the time. According to a survey by Epilepsy Research, almost 50 percent of people who are receiving regular medical treatment forget to take their medication at the right time at least once a month.³

There are numerous pill reminder apps on the market, however, all apps require the patient's manual input. Elderly patients are usually the ones forgetting to take tablets or pills. Nonetheless, most of them are unfamiliar with how to use these apps on their own.

Additionally, sometimes you may need to learn about your medication history or drug prescription records since your last visit to the doctor was ages ago. Indeed, when a patient's condition is outside a doctor's area of expertise and the doctor needs to refer the patient to a specialist who is more knowledgeable about or experienced in treating the condition; or when a patient wishes to receive better service, save money, or find someone closer to their home or workplace, switching doctors could be unavoidable. For patients who have switched away from one doctor to another, past medical and drug prescription records are essential for current doctors to make their best decisions. Yet, many clinics and hospitals still issue printed records to patients, which could be difficult for patients to manage.

Furthermore, every clinic's registration system is different: some may require a phone call, some may require the completion of a form, and some may even require you to schedule an appointment in person. As a result, due to improper arrangement of a doctor's schedule, long waiting times in clinics and hospitals are a common phenomenon.

³ [Poll shows that almost 50% of people forget to take their medication at least once a month | Epilepsy Research UK](#)

Algorithm Design & Development

We plan to design an easy-to-use and comprehensive application that allows patients to obtain prescriptions effectively, provides reminders to take medications in the right amounts and at the right time, and receives additional medication or treatment remotely. In addition, doctors can process different patient cases and patients can review their recent prescriptions and past treatments more efficiently, conveniently, and in a more organized manner.

The mobile application mainly consists of 2 different types of interfaces - one interface for patients and one for doctors and medical professionals. Users will have to log into their accounts every time the application has been opened, and they will be taken to their respective interfaces.



The patient's interface consists of 7 pages

The main page, where an overview of recent updates of medication and treatment, as well as recent prescriptions and medical history, is provided to the user.

The account information page, where the user can view and edit their personal and account information such as name, contact number, email, age, gender, and password.

The schedule page, where the user can view their schedules for appointments, treatment sessions, and time frames for taking medication, as well as scheduling new appointments with doctors of their desired field of specialty, location, and price.

The reminders page, where patients can view the details of current and past notifications and updates from the application.

The conditions page, where patients can upload their heart rates, blood pressure, blood sugar levels, allergies, and other body condition data regularly to aid doctors with the diagnosis and prescription procedures.

The contacts and connections page, where the users can connect with doctors which they have scheduled appointments with. Besides, they can message them as well as send them information on their body condition and past medical or diagnosis records.

The medical history page, where patients can view details for every diagnosis, medicine or treatment prescription, appointment, and treatment session, including the duration of treatment, body condition during the sessions, and comments by the doctor.

The medications and treatments page, where patients can view information on the prescribed medication or treatment they receive, such as the number of days a patient has to consume a certain medicine, the conditions in which the patient should and should not consume the medication, the expected side effects of each medication, the expiry date of each medication, the dosage for each medication, and the schedules and time which notification alerts have been set by their doctors to remind patients to consume their medication. Patients can also choose to pay for a delivery service for sending the prescribed medication from a clinic or pharmacy of the patient's choice to the patient's home directly after the doctor's approval once the prescribed medication has run out. In addition, patients will be able to check a box after consuming each medicine to enable more convenient recovery date estimation and health condition monitoring by their doctors.

The doctor's interface consists of 6 pages -

The main page is where the user is provided with an overview of upcoming appointments, new appointment requests, recent patients, and urgent updates to patients' cases.

The account information page, where the user can view and edit their personal and account information such as name, contact number, email, age, gender, profile picture, profession, occupation, and password.

The schedule page, where the user can view the dates and times of their upcoming appointments with patients as well as schedule new appointments with patients.

The contacts and connections page, where the user can receive messages from patients and communicate with them. Frequent updates and inquiries can be made between doctors and patients through this communications page and the patient's recovery and conditions can be monitored and kept track of if the patient accepts the user's requests to check on the patient's medical history and body condition data.

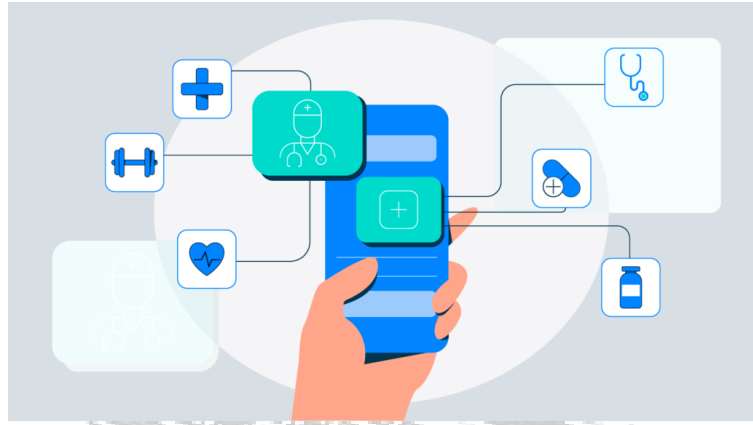
The diagnostics and diagnostics history page, where the doctor can send a detailed diagnosis and prescription, which are all in digital formats, to a patient's account which will then be saved into their medical history page. The doctor, if granted permission from patients, can also view the individual medical history (which includes previous diagnoses, past and current medications a patient has taken, allergies, and body conditions) of each patient they connected with in the contacts and connections page, aiding them to make more precise and reliable diagnoses and prescriptions.

The medications and treatments page, where doctors can prescribe medication to patients who have connected with them and set up notification alerts for the patient to remind them to consume their medication at the correct time frame and amounts. Additionally, doctors can keep track of the patient's medication consumption and estimate the number of days it would take for the patient to make a recovery or the number of days before the patient has to replenish the supply of certain medications. These estimations and updates can also be updated on the application for the patients to get a better view of their recovery progress and to remind patients to ask for another prescription of medication.

All of the personal data of patients and doctors (such as medical history, body conditions, personal information, username, and password) will be securely saved on the database and will only be accessible with an authentication key that is only available for authorized users (the patient themselves and the doctors granted permission to view the information). In the prototype, we will be attempting to create a version of this feature using Firebase.

Benefits for Target Users

This app aims to assist healthcare professionals, including patients, pharmacists, and doctors. Both public and private institutions can benefit from the app. We aim to assist mainly two kinds of users: people who provide treatments (doctors and pharmacists) and people who receive treatment (patients, mainly those who take regular pills or drugs). The app will provide a convenient communication medium between the two sides, especially during the pandemic.



With the assistance from the app, patients can be reminded to take medicines on time automatically, ask for professional advice through the communication channel between the patient and the doctor and seek emergency help anytime, schedule doctor appointments, and view past medical records, all within a few clicks.

On the other hand, we believe that the app can reduce the workload of doctors and pharmacists. Doctors can assign the time slots when the patient should take drugs, and the pharmacists can know when the patient's drug runs out to pack them more efficiently and send them to the patient. This app can also reduce the number of times a patient needs to go to the clinic or hospital and have a follow-up, as many patients simply head over to these places to obtain drugs instead of seeking medical advice because they already had done so previously.

The app can also let the doctor assign a follow-up for the patient, and remind the patient about the follow-up, one day before the event. We believe that this can help reduce the number of times patients forget about the follow-up and increase the efficiency of such bookings as a whole.

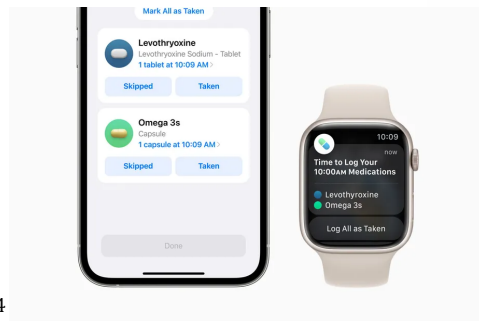
Conclusion

We hope that this project will be useful and convenient for the public, whenever they use public or private healthcare. The ideal outcome of this application is to reduce the number of times one forgets to take medicine, increase pharmacists' efficiency when packing the drugs, increase the convenience for patients to contact the medical professional, and shorten the time needed for booking a follow-up. Overall, we aim to reduce the inconvenience and the current procedures, increasing the productivity and efficiency of the entire healthcare system.

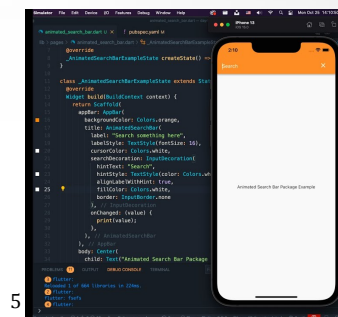
We aim to create interfaces for tablets and smartphones to utilize their portability. We also develop a website version, so that people can always just have a look using a browser, without installing the application.

Although applications for reminding patients (especially elderly patients) to consume medication exist and some individual doctors, clinics, or hospitals offer online diagnosis services, there has yet to be a service to allow for a centralized, convenient, and comprehensive way to contact any doctor or clinic of any specialty for a diagnosis, to request medicine delivery, to view one's medical history, and to receive medication consumption reminders all at once.

All in all, we hope that by developing this application, we can provide a better service to patients, especially the elderly ones, to improve their experience in medical services. Thank you for your time reading our proposal.



4



5

⁴ [Apple's medication feature is a step in the right direction - The Verge](#)

⁵ [Flutter 100 Days of Code UI Design Example - afgprogrammer](#)