



Faculty of Computer Science and Information Technology

***SELF-MONITORING APP FOR HOME QUARANTINE COVID-19 FOR
SENIOR CITIZENS AT SAMARAHAN***

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Bachelor of Computer Science with Honours (Multimedia Computing)

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**SELF-MONITORING APP FOR HOME QUARANTINE COVID-19 FOR SENIOR
CITIZENS AT SAMARAHAN**

WONG HAO MUN

This project is submitted in fulfilment of the requirements for the degree of Bachelor of
Computer Science with Honours (Multimedia Computing)

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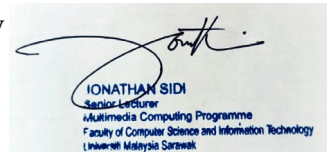
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ABSTARCT

As a result of the COVID-19 pandemic era, regardless of the age, each one of the citizens would need to own a smartphone to be able to check-in to any location by themselves or to report on their COVID-19 health status, test result and to keep up with the latest updates. However, the senior citizens especially seem to be struggling with the new technology. Hence, the proposed project's goal is to research and improve the UI/UX of the self-monitoring mobile application based on MySejahtera usage among senior users in Samarahan. This project was created using Agile methodology. A qualitative procedure was used to analyze the requirements, and a survey was conducted. The survey included 32 senior citizens in Samarahan above the age of 65. The proposed project aims to create a COVID-19 home quarantine self-monitoring mobile application that is both functional and user-friendly for the senior citizens.

ABSTRAK

Akibat daripada era pandemik COVID-19, tanpa mengira usia, setiap rakyat perlu memiliki telefon pintar untuk mendaftar masuk ke mana-mana lokasi sendiri atau melaporkan status kesihatan COVID-19 mereka, keputusan ujian dan untuk mengikuti perkembangan terkini. Walau bagaimanapun, warga emas terutamanya, nampaknya bergelut dengan teknologi baru. Justeru, matlamat projek yang dicadangkan adalah untuk menyelidik dan menambah baik UI/UX aplikasi mudah alih pemantauan sendiri berdasarkan penggunaan MySejahtera dalam kalangan pengguna kanan di Samarahan. Projek ini dibuat menggunakan metodologi Agile. Prosedur kualitatif digunakan untuk menganalisis keperluan, dan tinjauan telah dijalankan. Tinjauan itu melibatkan 32 warga emas di Samarahan yang berumur 65 tahun ke atas. Projek yang dicadangkan itu bertujuan mewujudkan aplikasi mudah alih pemantauan sendiri kuarantin di rumah COVID-19 yang berfungsi dan mesra pengguna untuk warga emas.

CHAPTER 1

INTRODUCTION

1.1. Introduction

This project will determine whether senior users can adapt to modern technologies like MySejahtera apps as a new life norm. The section that this project focuses on is the home quarantine self-monitoring section. Based on MySejahtera, if they are positive for COVID-19, they will get an SMS or MySejahtera notification. Besides, if someone reports themselves through the HelpDesk in the MySejahtera app, they will be contacted by the Covid-19 Assessment Centre (CAC) or the District Health Officer. A Health Assessment Tool form must be filled in daily in the “Things to do” section (Government of Malaysia, 2021).

Based on my observation, the user interface or user experience is unpleasant for the older generations. The forms provided to fill up are text-based only, which shows that the UI/UX for the Health Assessment Tool form did not consider the usage of senior citizens. With only text-based, they might not be able to fully understand the form due to poor text visibility and readability and a lack of awareness and unfamiliarity, which will result in inaccurate results, which could endanger the lives of the senior citizens.

Hence, this project focuses on improving the UI/UX of the Self-Monitoring app based on MySejahtera usage among senior users in Samarahan.

1.2. Problem Statement

The self-monitoring mobile application for home quarantine COVID-19 aims to provide an easy-to-understand application by considering a suitable UI/UX for senior citizens in Samarahan. Based on the statistics, 11 percent of the Sarawak population, or 306,800 people, consisted of senior citizens in 2018 (Lim, 2020) and expect an increase of 15 percent of the senior citizen population by 2030.

The smartphone's significant impact may benefit users of various ages, but seniors need help absorbing technology (Pethig & Kroenung, 2019). We must consider problems like poor text visibility and readability because of the age factor (Fuglerud et al., 2018; Griffin-Shirley et al., 2017; Yu & Fong, 2016). As a result, senior citizens may encounter issues such as visibility, focus recognition, and poor comprehension (Mujtaba Awan et al., 2021). With the current self-monitoring function in MySejahtera being only text-based, senior citizens might have difficulties completing the needed actions.

As the MySejahtera application is relatively new, senior citizens have a lack of awareness and unfamiliarity with the application, which creates a barrier for them to adopt it (Mujtaba Awan et al., 2021), resulting in them not knowing how to use the self-monitoring function in the MySejahtera application when needed.

1.3. Scope

Senior citizens above 65 years of age who stay in Samarahan are the target audience for this project. It is the nearest location to Universiti Malaysia Sarawak (UNIMAS) for more effective data collection. For senior citizens that are undergoing COVID-19 home quarantine, this self-monitoring mobile app will be utilized as a tool for them to monitor their health.

1.4. Aim and Objectives

Aim

To create an improved self-monitoring mobile application for home quarantine COVID-19 for senior citizens in rural Sarawak based on MySejahtera.

Objectives

The objectives of this project are as follows:

- To design an easy-to-understand self-monitoring mobile application for senior citizens,

- To develop a self-monitoring mobile app that could improve the user experience for senior citizens, and
- To evaluate the level of effectiveness in the UI/UX of self-monitoring mobile application.

1.5. Brief Methodology

The Agile method is used in this project. Agile is a method for iterative, sequential software development. During the software lifecycle, agile application development facilitates the organisation of processes for designing, planning, developing, and testing.

This project comprises six phases: requirements, design, development, testing, feedback and accept. Each phase is critical to ensuring the process runs smoothly, and the desired output is obtained. The Agile method is shown in Figure 1.1.

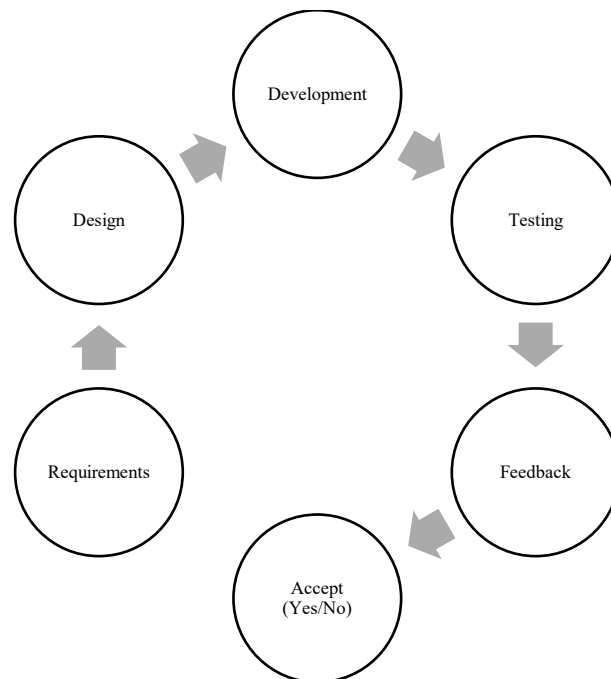


Figure 1.1 Agile Methodology

1.5.1 Requirement

All challenges, objectives, and expected outcomes are defined and collected in this phase before proceeding to the design phase. Evaluate existing and ongoing issues that need addressing for

senior citizens over 65 to self-monitor their health throughout the COVID-19 home quarantine.

This phase also specifies the hardware, software, and user requirements needed to complete the project. The following is a list of the hardware and software required:

- Laptop
- Mobile phone with Android operating system
- Android Studio
- Figma

1.5.2 Design

The design phase is where the project system's process is created based on the needs and characteristics of the application. In addition, the interface design for mobile applications will be decided during this phase to aid the overall system development.

1.5.3 Implementation

This phase will be used to create and design the user interface once the design is complete. Android Studio will be used to create the mobile application.

1.5.4 Testing

The project will be tested to ensure that all features work as expected and to identify any errors or flaws. This phase is completed to ensure that the project is error-free and functional. The project will be tested to improve the system.

1.5.5 Feedback

This phase comes after the testing phase. After being tested, feedback will be collected.

1.5.6 Accept

The system will be improved based on their feedback to comply with the needs of the senior citizens. This phase is on whether the project will be accepted by the user or not.

1.6. Significance of Project

This project will aid the senior citizen's health with a convenient and more accurate self-monitoring result during COVID-19 home quarantine.

This self-monitoring app is essential because it allows users to monitor their health throughout the home quarantine period to ensure their health is top-notch and emergency help will be sent if their health is at risk. The self-monitoring app allows senior citizens to feel safer during the home quarantine, knowing their daily health is being monitored and tracked.

1.7. Project Schedule

The final year project is divided into Final Year Project 1 (FYP 1) and Final Year Project 2. (FYP 2). FYP 1 is divided into three chapters: the introduction, the literature review, and the methodology or requirement analysis and design in chapter 3. Appendix A contains the Gantt charts for the project schedule FYP 1 and FYP 2.

1.8. Project Outcome

The outcome of this project is a fully functional self-monitoring mobile application that can be an effective tool to monitor senior citizens' health throughout the COVID-19 home quarantine. Besides, it acts as a safety tool to ensure that help is only one call away if their health is at risk.

1.9. Outline

Chapter 1: Introduction

Chapter 1 provides an outline of the proposed project. In this project, a self-monitoring mobile application for home quarantine Covid-19 with an intuitive UI/UX based on the MySejahtera app is created for senior citizens aged 65 and older. The problem statement identifies the problems with the application. The methodology outlines the procedures needed in creating the application, whereas the objectives specify the objectives that must be accomplished for this project. The proposed application's scope is then shown. The project schedule shows the

project's timeline, while the project's significance indicates how important the proposed project is to the application. Finally, the expected outcome reflects the result of the project.

Chapter 2: Literature Review

Chapter 2 reviewed the survey of an existing application based on application features similar to the proposed project. Data is gathered from numerous journals, publications, and articles to accomplish this. The project's advantages, disadvantages, and limitations will all be evaluated in the comparison.

Chapter 3: Methodologies

Chapter 3 describes the approach utilized to improve the overall project. The Agile methodology will be applied to develop the proposed application. The hardware and software used in this project and the six stages of the Agile methodology were thoroughly discussed.

1.10. Summary

This chapter describes the proposed mobile application's introduction. This proposed project aims to create a self-monitoring application for home quarantine Covid-19 for senior citizens. This chapter contains the problem statement, project goals, the chosen Agile methodology, the project scope, the significance of the project, and the expected outcome.

CHAPTER 2

LITERATURE REVIEW

2.1. Overview

The literature review discusses similar mobile applications and compares the functionalities of existing applications with the proposed application. This chapter discusses the literature review of existing self-monitoring applications for home quarantine COVID-19 and compares the functionalities of the existing applications with the proposed application. This part ensures that the proposed application may improve regarding the user interface, user experience, or weaknesses of existing applications that senior citizens may adopt.

A comparison of three existing relevant applications will yield an analysis that will allow the proposed apps to adapt to the strengths and limitations of the existing applications. The benefits, challenges, and potential prospects in previous literature on language learning will be analysed.

2.2. Review of Related Apps

The existing application, which will be explored below, shares the same concepts as the proposed application but differs in functionality and user interface design.

2.2.1 MySejahtera

MySejahtera was created in Malaysia to help track the COVID-19 spread there by enabling users to do self-evaluations. Citizens who test positive for COVID-19 will be notified through SMS or MySejahtera. If they tested at home, they would have to update the HelpDesk on the MySejahtera app.

They will be contacted by the COVID-19 Assessment Centre (CAC) or the District Health Office and will be required to complete the daily health assessment instrument on MySejahtera as indicated in Figure 2.1.

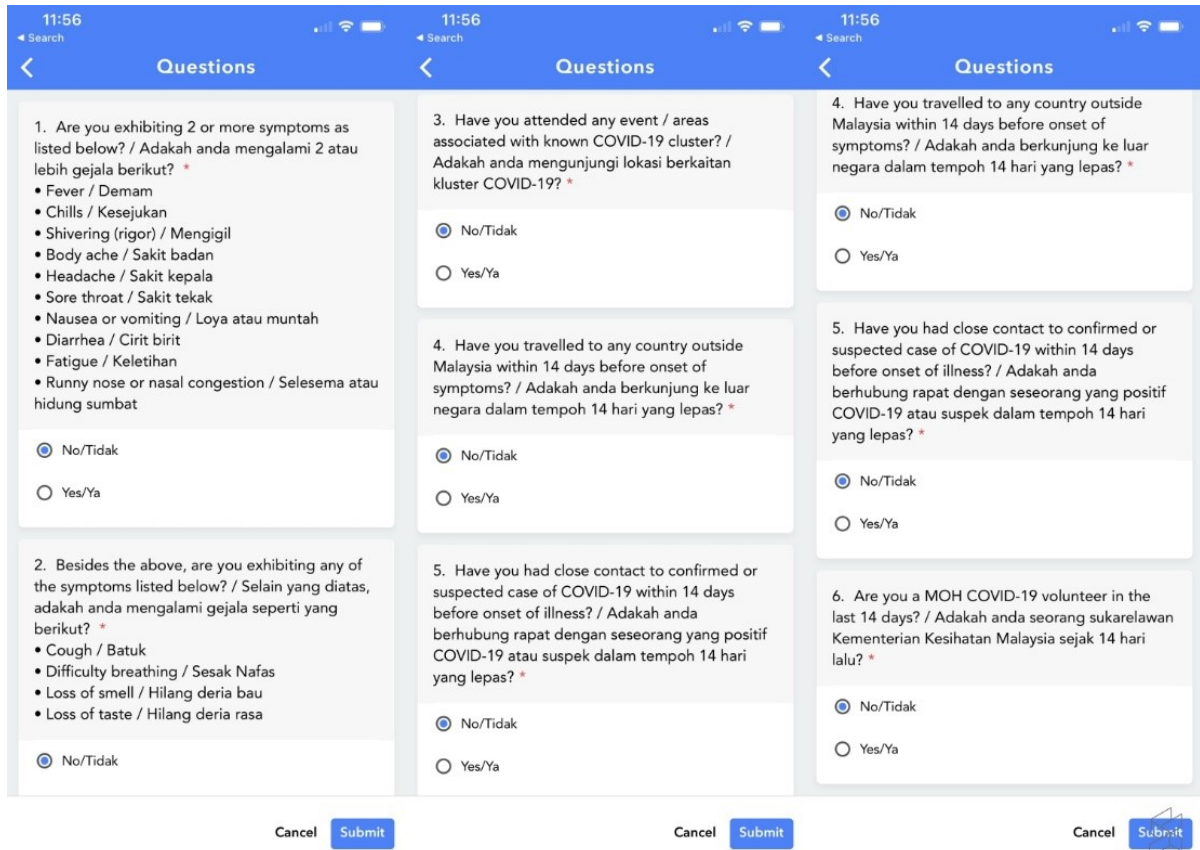


Figure 2.1: MySejahtera Self-Assessment Tool

Patients in the high-risk category will be instructed to go to the COVID Assessment Centre (CAC) or will be issued a Digital Home Surveillance Order via the app. If the patient's symptoms worsen, they should call an emergency hotline or head to the closest hospital immediately.

Strengths:

- Minimal usage of color in the user interface for a clean look.
- Questionnaire with only two options (Yes or No) ease the process.

Weaknesses:

- Font size is difficult to read, especially for people with visual impairments.

- Limited language provided in the assessment tool, with only English and Bahasa Melayu.
- Text-only assessment tools are hard to understand for some people.
- Radiobox are too small to be selected easily.

2.2.2 Covidom

Covidom is for COVID-19 quarantine patients, with a regional control centre for alert management. Patients can register by giving basic registration information such their age, gender, phone number or email address, when their symptoms started, and their risk profile. Patients are then given the option to register by clicking on a link via a brief mobile message or email, as shown in Figure 2.2 (Yordanov et al., 2020).

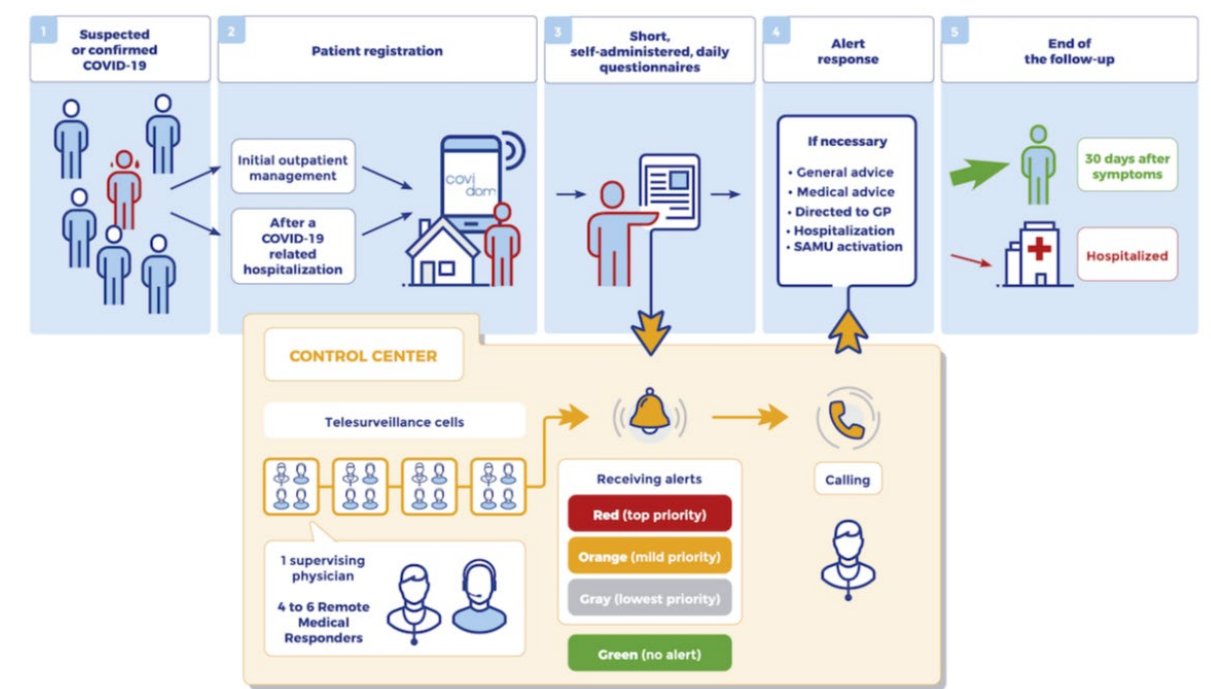


Figure 2.2: The Covidom Registration and Self-Monitoring COVID-19 Quarantine Steps

After symptom onset, the online application delivers surveys to the user multiple times per day (Kondylakis et al., 2020) for 30 days (Yordanov et al., 2020), to which the patient can respond regarding their current health problems. The application will transmit an alert to a

medical monitoring centre if it receives alarming user replies. If an emergency arises, the patient will be instructed to contact emergency services (Kondylakis et al., 2020). These questionnaires contain no more than ten short, standardised questions. As shown in Figure 2.3, patients can access questionnaires through a computer or smartphone and are reminded to complete them via mobile message or email if they do not respond. The doctor who performed their initial evaluation must collect the questionnaire responses twice daily from high-risk patients, but just once daily from low-risk patients. (Yordanov et al., 2020).

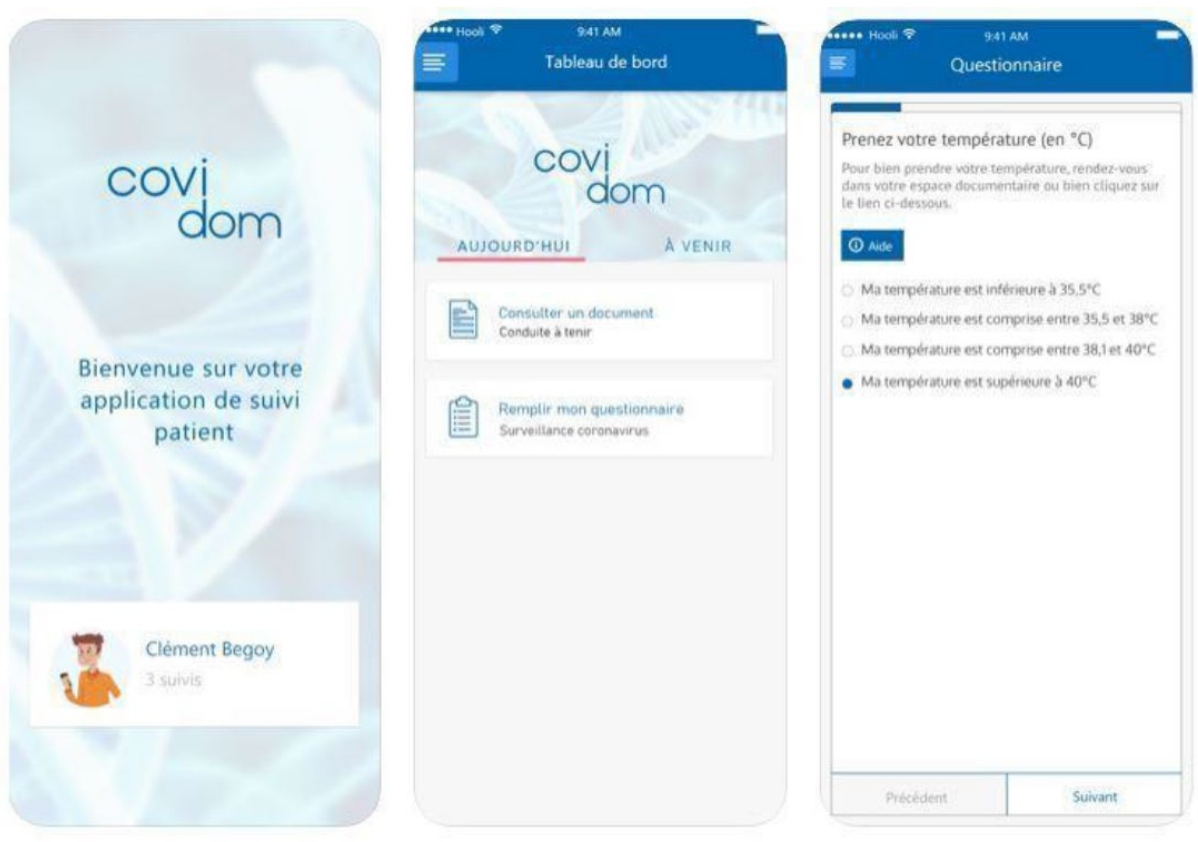


Figure 2.3: Covidom Self-Monitoring Questionnaire

In the web application, patients may also get instructions on how to take their temperature, pulse rate, and breathing rate as well as how to get psychiatric treatment if necessary. In the event of an emergency, patients are encouraged to call the national emergency department. (Yordanov et al., 2020).