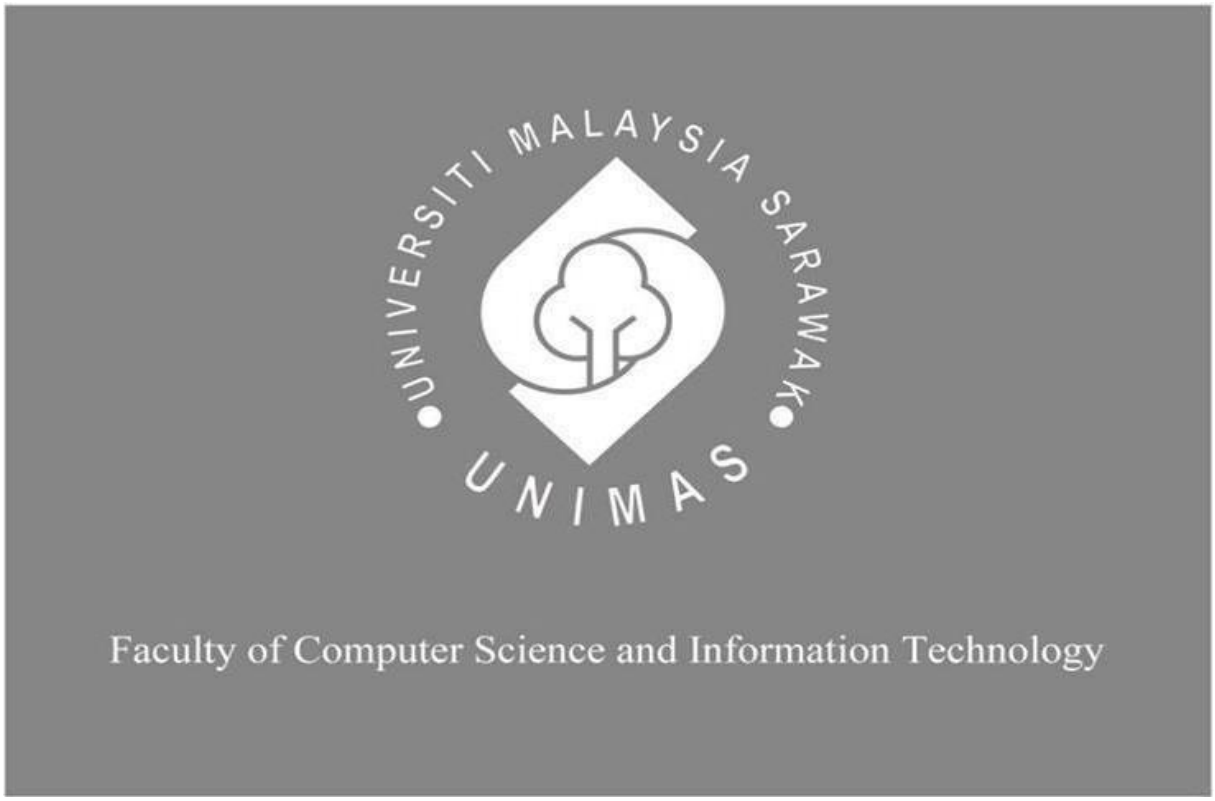

"Mectime": An Interactive Reminder Mobile Application For The Elderly To Take Their Scheduled Medication.

JYUSSIANA MOLLY JOSEPH

Bachelor of Computer Science with Honours

(Software Engineering)

2023

“MECTIME”: AN INTERACTIVE REMINDER MOBILE APPLICATION FOR THE ELDERLY TO TAKE THEIR SCHEDULED MEDICATION.

JYUSSIANA MOLLY JOSEPH

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ABSTRACT

The issue of medicine adherence among the elderly population is a growing concern as the prevalence of chronic diseases increases among this age group. Ensuring that the elderly take their medicine regularly and in the correct dosage and frequency can be a challenging task, with various barriers such as forgetfulness, lack of understanding of the medication regimen, and difficulties in accessing healthcare. However, with the increasing use of mobile phone technology in everyday life, mobile phones have the potential to serve as a valuable tool in improving medicine adherence among the elderly. The focus of this project is to develop a mobile application to support medicine adherence among the elderly population. The application will be designed to provide reminders and correct medication use. The project will also explore the barriers and facilitators to medicine adherence among the elderly and will develop strategies to address these issues. The ultimate goal of this project is to improve the health outcomes of the elderly population by ensuring regular and correct medication use. By utilizing mobile phone technology, this project aims to make it easier for the elderly to remember their medication schedule. The impact of this project has the potential to be significant, not only in improving the health outcomes of the elderly population, but also in reducing healthcare costs and improving the quality of life for the elderly.

ABSTRAK

Isu pematuhan ubat dalam kalangan warga emas semakin menjadi kebimbangan kerana peningkatan kekerapan penyakit kronik dalam kalangan kumpulan umur ini. Tugas memastikan warga emas mengambil ubat mereka dalam dos dan kekerapan yang betul boleh menjadi tugas yang mencabar, dengan pelbagai halangan seperti terlupa dan kurang pemahaman tentang ubat. Walau bagaimanapun, dengan peningkatan penggunaan teknologi telefon pintar dalam kehidupan seharian, telefon pintar berpotensi untuk menjadi alat yang membantu dalam meningkatkan pematuhan ubat di kalangan warga emas. Fokus projek ini adalah untuk membangunkan aplikasi mudah alih bagi menyokong pematuhan perubatan dalam kalangan warga emas. Aplikasi ini akan direka bentuk untuk memberikan peringatan tentang masa mengambil ubat serta cara penggunaan ubat yang betul. Matlamat utama projek ini adalah untuk meningkatkan tahap kesihatan warga emas dengan memastikan penggunaan ubat yang teratur dan betul. Dengan memanfaatkan teknologi telefon pintar, projek ini bertujuan untuk memudahkan warga emas mengingati jadual pengambilan ubat mereka. Projek ini bukan sahaja dapat meningkatkan tahap kesihatan warga emas, tetapi juga dapat mengurangkan kos penjagaan kesihatan dan meningkatkan kualiti hidup mereka.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

Patients fall into several categories, including infants, young children, adolescents, adults, and senior citizens. Every patient needs to take the right medications in the right amounts at the right times. The elderly in particular, needs to take their medications every day. In Malaysia, almost all seniors of age 65 and above suffer from conditions such as hypertension, diabetes, and arthritis (Shah et al., 2021). The striking issue is that patients, especially the elderly, frequently fail to take their medicine on time with the right dosage. Elderly people frequently forget things; therefore, someone needs to keep track of their medication routine. However, nowadays, everyone owns a smartphone. So, in order to fix the issue, we must make a full use of this technology.

This is a project to create a mobile application with the goal of reminding the elderly of their dosage timings via an alarm ringing system so that they can stay on top of their medicine and stay healthy. Along with the fields for the date, time, and the description of the medicine, it enables users to set an alarm. This allows them to set alarms for several medications at various intervals, or at the same time each day. It is a simple and easy to use health application that saves money and time.

1.2 PROBLEM STATEMENT

The problem of medication non-adherence and incorrect usage among older adults is a significant issue in the healthcare industry, as it can lead to serious health consequences such as increased hospitalization rates and decreased quality of life. According to a study published in the Journal of the American Geriatrics Society in 2019 (Chou, 2019), older adults are at a higher risk for medication non-adherence due to cognitive decline, difficulty managing multiple medications, and lack of support. In fact, one study published in the Journal of the American Medical Association (JAMA) in 2018 (Bartels, 2018) found that up to 50% of older adults do not take their medications as prescribed.

Furthermore, a study published in the Journal of General Internal Medicine in 2020 (Lin, 2020) found that older adults often have difficulty remembering the correct instructions for their medications, leading to confusion and incorrect usage. This can include forgetting how many times per day the pills should be taken or taking them at the wrong time of day. This problem can be further compounded by the fact that older adults may be taking multiple medications for different conditions, making it even more difficult for them to keep track of the correct instructions for each one. In fact, according to a study published in the Journal of Gerontological Nursing (Tran, 2019) nearly half of older adults who were prescribed five or more medications per day were found to have difficulty managing their medications.

1.3 OBJECTIVES

The primary objective of this project is to develop a reliable medication reminder app for elderly patients. The project's other objectives are as follows:

1) **To display information about medications:** This application will have the capability to display information related to the medications that patients will be taking.
2) **To alert elderly on time:** This application will include an alarm feature to remind the elderly to take their medication at a scheduled time.
3) **To evaluate the effectiveness of the application:** This project should include a study to evaluate the effectiveness of the application in improving medication adherence and reducing medication errors in elderly patients.

1.4 METHODOLOGY

For this project, Rapid Application Development (RAD) will be the methodology. Rapid Application Development (RAD) is a software development methodology that emphasizes rapid prototyping and iterative development. The methodology starts by identifying the problem or opportunity that the software will address, and then gathering requirements from stakeholders using techniques such as interviews, focus groups, and surveys (Kroll & Rose, 2020). After that, a preliminary design for the software is created, including a high-level architecture and a user interface mock-up (Hossain, 2018). This design is then used to build a prototype of the software using rapid prototyping tools and techniques. The prototype is then tested with a small group of users to gather feedback and identify any issues. Based on the feedback, the design and prototype are iteratively refined until the software meets the needs of stakeholders (Bhardwaj & Sharma, 2019). The final version of the software is then developed

using a variety of tools and techniques, such as agile development or extreme programming, and it is tested to ensure that it meets the requirements and is free of bugs. Finally, the software is deployed to end-users and ongoing support is provided.

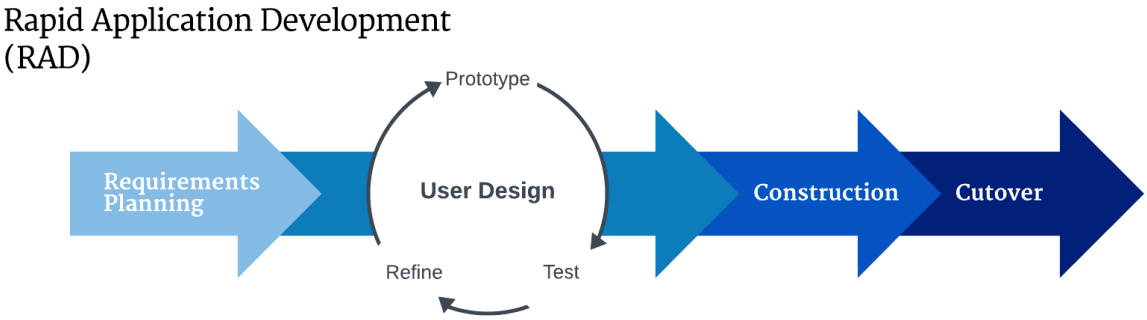

Figure 1.1: RAD Methodology (Kissflow,2023).

Firstly, the report must be planned by identifying the problem statement, defining the requirements, and establishing the aim. In the subsequent user design phase, development, prototyping, and testing will be undertaken. In this phase, users can collaborate with the developer to ensure that their demands are met at every stage of the design process and that their goals are achieved. Developers and users can utilise this information to ensure that the planned mobile application is as flawless as possible. In the rapid construction phase, the prototypes developed in the design phase are transformed into applications. This phase focuses primarily on coding and development. The cutover phase is the implementation and testing step that precedes the launch of the mobile application.

1.4.1 Requirements Analysis

The project title and project description, such as problem statement, objectives, scope, and project outcome, are addressed with the supervisor during the requirements analysis phase. The literature review is then defined. The purpose of studying an existing mobile application is to analyse and comprehend the concept of the existing mobile application. The purpose of comparing the strengths and weaknesses of the existing mobile application and the proposed application is to improve the existing mobile application by providing a recommended solution. Aside from that, the project's requirements will be examined using the questionnaire distributed to the target audience. Before moving on to the designing process, all needs must be stated in the proposal and approved by the supervisor.

1.4.2 User Design

The mock-up of the proposed mobile application is designed during the user design phase. A medicine reminder mobile application for the elderly is proposed. The major goal of the design phase is to create a user-friendly interface with functions that will help the proposed mobile application achieve its goals. After the design process is completed, the proposed mobile application can be developed.

1.4.3 Rapid Construction

During the Rapid Construction phase, the design for the proposed mobile application is translated into computer code. In order to put the project into action, the programming tools and language that is most appropriate for the task are utilised. The actual construction of the mobile application consists of preparing the necessary tools, coding and compiling the code.

1.4.4 Cutover

Following the completion of the development stage, the mobile application that is being suggested will enter the phase of testing and debugging. The testing process is required to guarantee that all necessary requirements are met. All modifications are performed when a developer or user discovers a bug. Once the testing of the functionality of the medicine reminder mobile application for the elderly has been finished, it can be launched to users.

1.5 SCOPES

The scope will define the parameters or focus of the project.

i. **User**

   The targeted user for this mobile application is Malaysian senior citizens that needs to take medicine on schedule.

ii. **Device/Platform**

   Only Android phones will be able to use this mobile application.

iii. **Language**

   The mobile application will be in Malay language.

1.6 SIGNIFICANT OF THE PROJECT

Many people will benefit from this medication reminder mobile application project. The elderly can take their medication on time and in the correct dosage. With the help of the mobile application, the user's family members do not have to constantly ensure that the user is taking the medication correctly. Healthcare facilities, such as hospitals and clinics, are also benefiting from the mobile application. Medication adherence in patients reduces the likelihood of disease progression and lowers health-care costs. With it, the community can live a better and healthy life.

1.7 EXPECTED OUTCOMES

At the conclusion of this project, a reliable and user-friendly mobile application that efficiently reminds users to take their medications on time will be presented. The mobile application will adhere to industry standards and achieve all project objectives, making it accessible and usable for end users. The design of the system of the application will be created with user-friendliness in mind, allowing for smooth navigation.

The mobile application will feature several key functionalities, including the ability for users to use the application in Malay, customise alarms for each of their medications, view their medication history, snooze the alarm as needed, add, edit, and delete medicines, and maintain a thorough medication diary. These features will provide users with the tools necessary to efficiently manage their medication schedules and ensuring that they are taking their medications as prescribed.

1.8 PROJECT SCHEDULE

The Gantt Chart of project schedule are attached as Appendix A. The following is the description of the project schedule.

The project schedule is an essential tool for keeping the project on track and ensuring that all tasks are completed in a timely manner (Koutsoyiannis, 2018). It helps the project manager and developers to stay focused on the goals and objectives of the project and to ensure that the project is completed successfully (Koutsoyiannis, 2018). The project is divided into two parts: Final Year Project 1 (FYP 1) and Final Year Project 2 (FYP 2).

FYP 1 includes the following chapters: Chapter 1 (Introduction), Chapter 2 (Literature Review) and Chapter 3 (Methodology or Requirement Analysis). Chapter 1 provides an overview of the project and its objectives, while Chapter 2 reviews the relevant literature on the topic. Chapter 3 outlines the methodology and requirement analysis used in the project (Koutsoyiannis, 2018).

FYP 2 includes the following chapters: Chapter 4 (Implementation and Testing) and Chapter 5 (Conclusion and Future Work). Chapter 4 covers the implementation and testing of the application, while Chapter 5 provides a conclusion on the project and an overview of possible future work (Koutsoyiannis, 2018).

1.9 REPORT OUTLINE

The first chapter is an introduction to the proposed project. The first chapter of this document is dedicated to providing an in-depth overview of the proposed mobile application and the background information surrounding it. This chapter is broken down into several important sections, each of which will be discussed in detail. This chapter consists of several important parts such as Background, Problem Statements, Project Objectives, Methodology, Scopes, the Significance of Project, and the Expected Outcomes.

The second chapter is a literature review. This chapter delves into the examination of several existing mobile applications that serve as medicine reminders, with the goal of analysing and discussing the technology and functionality used in these applications. The primary focus is on reviewing and relating other selected similar mobile applications to the proposed project, in order to gain a better understanding of the current state of the field and identify potential areas for improvement. Additionally, this chapter will also discuss the software used for both the front-end and back-end development of the proposed medicine reminder application, providing insight into the technical decisions that have been made and their rationale. Overall, the objective of this chapter is to provide a comprehensive overview of the existing mobile applications for medicine reminders, and to use this information to inform the design and development of the proposed project.

The third chapter is a chapter for requirement analysis and design. This chapter is dedicated to delving deeper into the methodology that has been selected for the proposed project. The methodology chosen for this project will be discussed in detail, including the rationale behind its selection and how it will be applied throughout the development process. Furthermore, this chapter will also discuss the design of the mobile application that will be implemented as the

proposed project. This chapter will provide a comprehensive understanding of the design of the proposed project, and how it aligns with the overall objectives and requirements of the project.

The fourth one is a chapter for implementation. This chapter describes the implementation phase of the proposed project, which is based on the design developed in the previous user design phase. This includes a detailed description of the project implementation steps, along with corresponding figures to provide a clear understanding of the process.

The fifth chapter is a chapter for system testing. This chapter will cover the testing phase done on the proposed project. This includes a variety of tests to ensure that the application is functioning correctly and meets the requirements. Additionally, usability testing will also be carried out to gather feedback from actual users and make any necessary adjustments before the final release of the application.

The concluding chapter of this project documentation will be the conclusion. Future enhancements to the developed project will be described in the conclusion section. In addition, any problem that has not yet been resolved in the development of this project will be further discussed for future reference.

1.10 Summary

In summary, this chapter describes the overall information regarding the proposed project which is a medicine reminder mobile application for elderly. The first section, Background, sets the stage by providing context for the project and outlining relevant information prior research or existing solutions in the field. The Problem Statements section clearly defines the problems that the proposed project aims to address, and the Project Objectives section lays out