Faculty of Computer Science and Technology

FASTING REMINDER MOBILE APPLICATION

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Bachelor of Computer Science with Honours (Software Engineering)

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ABSTRACT

Obesity has been an issue around the world. However, the issue got worse overtime especially those in the developing countries. Malaysia, as one of the developing countries, over half of adults are obese and overweight. This matter should be taken seriously as it can burden the health care system as well as overall quality of life. One of the famous methods to solve the issue, intermittent fasting (IT) involves eating patterns in which individuals will no consume anything which have calories in a certain period with intervening periods of normal food intake, on a recuring basis. However, doing IF properly tracking the fasting time to ensure that you are doing it according to the fasting time. In order to track fasting time efficiently, tools such as fasting tracker is widely used. According to survey with 30 respondents more than half of them agreed to have a proper fasting tracker to track the fasting time efficiently. Hence, the project is proposed to develop a fasting reminder mobile application with using Agile model. The proposed application enable user to track their fasting time with the fasting timer. User can also set reminders to remind themselves to start or end fast with the proposed application. With the help of the proposed application, user can reduce the hustle of tracking their fasting time manually as well as other personal progress like weight.

ABSKTRAK

Obesiti merupakan isu di seluruh dunia. Isu tersebut telah menjadi serius terutamanya di negara yang sedang membangun. Malaysia merupakan salah satu negara yang sedang membangun juga ada lebih daripada separuh orang dewasa adalah obese dan berlebihan berat badan. Perkara ini perlu dipandang serius kerana ia boleh membebankan sistem kesihatan dan juga kualiti hidup secara keseluruhan. Puasa berselang sebagai salah satu cara yang berkesan untuk menyelesaikan issue tersebut melibatkan corak pemakanan di mana individu tidak dapat mengambil makanan atau mininuman yang berkalori dalam tempoh tertentu dengan tempoh selang pengambilan makanan biasa secara berulang. Untuk mengamalkan IF, individu tersebut perlu megesan waktu puasa dengan betul bagi memastikan individu tersebut melakukannya mengikut waktu puasa. Bagi mengesan waktu puasa dengan cekap, peralatan seperti penjejak puasa digunakan secara meluas. Menurut tinjauan dengan 30 responden, lebih separuh daripada mereka bersetuju untuk mempunyai penjejak puasa yang betul untuk mengesan waktu puasa dengan cekap. Justeru, projek ini dicadangkan untuk membangunkan aplikasi mudah alih peringatan puasa dengan menggunakan modal Agile. Aplikasi tersebut membolehkan pengguna untuk menjejaki waktu puasa mereka dengan pemasa puasa. Pengguna juga boleh menetapkan peringatan mereka untuk mengingatkan diri untuk memulakan atau menamatkan waktu puasa dengan aplikasi yang dicadangkan. Dengan bantuan aplikasi yang dicadangkan, pengguna boleh mengurangkan kesibukan menjejaki masa puasa mereka secara manual serta kemajuan peribadi lain seperti berat

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CHAPTER 1

INTRODUCTION

1.1 Background

Obesity has been a growing concern around the world (Mitchell, N. S., 2011). According to WHO (2022), obesity is defined as excessive fat accumulation that presents a health risk. The obesity epidemic is not restricted to industrialised societies; in developing countries, it is estimated that over 115 million people suffer from obesity-related problems WHO (2022). Malaysia as one of the developing countries, has been suffering from this epidemic. As stated by Bernama (2022), one in of two adults in Malaysia is overweight and 19.7% were obese after done the National Health and Morbidity survey in 2019. Being Obesity increased the risk of getting serious chronic diseases and health condition, this includes diabetes, hypertension, stroke, breathing problem, as well as having mental illness like depression, anxiety (CDC, 2022).

There are a few science-backed ways to lose weight to solve the obesity issue, namely:

- Exercise which defines as a body activity that enhances or maintains physical fitness and overall health and wellness (Kylasov, 2011)
- Diet, the practice of eating food in a regulated way to decrease, maintain, or increase body weight, or to prevent and treat diseases such as diabetes and obesity, (Strycha, I., 2006)
- Intermittent fasting, an eating pattern during which you refrain from consuming any calories for an extended period of time (Snyder, C., 2022)

However, intermittent fasting is the best method for weight loss as it can be done at any time and any places as it is a pattern of eating that involves regular short-term fasts and consuming meals within a shorter time period during the day (Bubnis, 2022). Exercise and dieting aren't as good as fasting because for exercise you need to have enough time to do so while dieting you have to prepare specific food for the diet plan which will consume time and money to do so.

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1.2 Problem Statement

By using fasting as a weight loss method, we need to track the fasting time by setting a timer or alarm clock to remind fasting time, then record the fasting time as soon as it ends. However, it is not efficient to manually track the fasting time, like record it on notes, calendar, and Excel spreadsheet. Using notes to record the fasting time also need to draw the graphs manually to make comparison of the fasting results (visualise issue).

Same goes with excel spreadsheet, it requires some time to learn to build graph from each records inputted to make comparison of the weight loss progress between the fasting plan used to test whether which plan is working for weight loss.

Thus, a fasting reminder mobile application is proposed to help user to automatically record the data of their fasting progress as well as building graph from the data recorded.

1.3 Scope

The proposed system is a fasting reminder mobile application. This mobile application enables the users to use it to track fasting time. We consider only the basic functions and define the users such as:

- Automatically record fasting duration when user ends the fasting timer.
- Remind them about their fasting progress through notification messages, like reminding them to start their fast or fast time is almost end.

The mobile application will be tested by 10 users to determine whether the app function as expected after being implemented. The project will be using Flutter, a cross-platform framework for mobile application development where it can be used on both Android and iOS operating system.

1.4 Aims & Objectives

The main goal of this project is to develop an Android mobile application to track fasting progress and remind fasting time. To achieve this goal, the following objectives are identified:

1. To study and analyse the existing fasting tracking mobile application.
2. To implement mobile application which user can use it to set reminder for fasting as well as track their fasting record.
3. To evaluate user experience of the proposed mobile application through survey form and app testing.

1.5 Brief Methodology

The Figure 1.1 shows the software methodology applied into this project is Agile model (DevCom, 2021). It is an iterative software development method focused on result to software delivery where the software is built sequentially from the start of the project. There are few phases in the Agile model as follow:
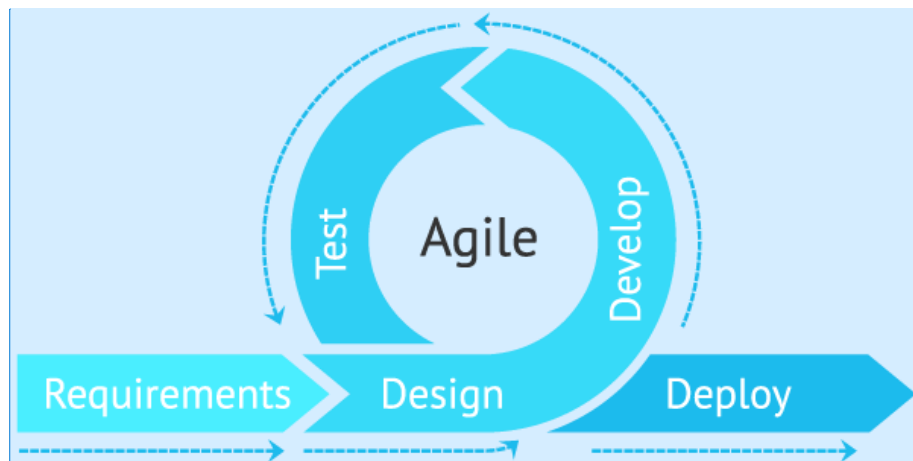

Figure 1.1: Agile methodology diagram (Goff, A. 2023)

Step 1 Requirement gathering: The beginning of the Agile methodology, where requirements need to be gathered before starting develop the proposed mobile application, Fasting Reminder mobile application. Requirements are obtained by using surveys, interviews, and also have discussions with supervisor.

Step 2 Design prototype: Design a working prototype using the requirement obtained from previous phase.

Step 3 Implementation of Design: Begin the actual application coding using Flutter as frontend and Firebase as backend.

Step 4 App testing and debugging: Test the implemented application to locate and fix any errors or bugs.

Step 5 Deployment: In this phase, the application is released and can be used by user.

Step 6 Feedback: After release the application, present it for user to review. After that, plan new iteration based on the feedback received by starting from step 1 until complete development of the application.

1.6 Significance of Project

The Fasting Reminder mobile application can create a reminder for fasting at a certain time and date when the users set it so that they would not forget to fast at the time and date they set. If the user forgets to fast, they will lose the benefit of fasting. The main benefit of fasting is weight loss and includes health benefits like protecting organs from chronic diseases such as type 2 diabetes, heart diseases, age-related neurodegenerative disorders, and cancers (Cabo and Mattson, 2019).

1.7 Project Outcome

A mobile application that enables users to track their fasting time as well as set reminders for fasting at a specific times and dates. In addition, users will be able to view their past fasting record as well as body weight record to see their progress. The Fasting Reminder mobile application can create a reminder for fasting at a certain time and date when user set it so that they would not forget to fast at the time and date they set. If the user forgets to fast, they will lose the benefit of weight loss.

LITERATURE REVIEW

2.1 Introduction

This chapter is about to study the importance and effectiveness of fasting and the type of fasting plan. Also, this chapter reviews three existing mobile applications to make an analysis of its features as well as its pro and cons. By reviewing these existing mobile applications, the proposed mobile application adopts some of their good features.

2.2 The Background of Fasting

2.2.1 Importance of Fasting

According to Snyder and Gunnars (2022), weight loss is one the main reasons why people try to do intermittent fasting. Fasting can create calorie deficit, meaning that your body has fewer calories than it needs to maintain current weight or function.

Furthermore, intermittent fasting does support weight loss by reducing your appetite, thus increasing fullness without feeling hunger (Ravussin, 2019). Besides that, fasting also able to improve overall health as the following:

- Lowering blood pressure (Wilhelmi, 2019).
- Improve blood sugar (Sutton, 2018).
- Repair damaged cells (Baherniya, 2018).

2.2.2 The effectiveness of fasting

The research done by Gabel et al. (2018) is to study the effect of time-restricted feeding on body weight and metabolic disease risk factors in obese adults. They conducted research on two different groups for twelve weeks which, consists of twenty-three obese participants for each group, a controlled group which the participants normally eat while the other group only had eight hours of feeding time, the remaining sixteen hours they will fast.

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The research results showed that the time restricted group has decreased their blood pressure, body weight, and appetite. On the other hand, the controlled group do not have any changes in their blood pressure and body weight.

From the research we can conclude that fasting will benefit us with some clinical benefits with reducing blood pressure and weight loss.

2.2.3 The Types of Fasting

According to Snyder and Gunnars (2022), the most popular types of fasting plans are the following:

- Time-restricted eating or daily approach, fast for at least 12 hours or longer and feast on the remaining hours. Most people find this approach is easy to stick with for long term.
- 5:2 diet, eat normally for 5 days and 500-600 calories on the remaining 2 days
- Alternate day fasting, fast every other day.
- Eat Stop Eat, having 24 hours fast once or twice a week.

In summary, fasting does bring more long-term health benefits, not just for weight loss. However, when fasting for extended periods of time, one must be conscious of how their body feels. During fasting, common adverse effects such as headache, dizziness, mental fog, and lethargy are caused by low sodium levels (Fung, n.d.). This can be remedied through the consumption of salt, bone broth, or pickle juice.

2.3 Reviews of Similar Existing Systems

We reviewed three most relevant system to our project, namely Fasting (Leap Fitness Group, 2019), Life (LifeOmic, 2018) and Zero (Longevity Science,Inc, 2019). These systems are the most recommended fasting apps in the market as they have better UI and features than similar apps.

2.3.1 Fasting - Intermittent Fasting

Figure 2.1: Fasting app

Fasting is a fasting tracker app which developed by Lead Fitness Group (Leap Fitness Group, 2019). Users can tap the Start or End fasting button to control the fasting timer as shown in Figure 2.1. Also, the fasting time has features such as fasting plan, fasting timer, dashboard to track progress such as weight and fasting time, water tracker to track how much water consumed daily. Also, the app does have push-up notification to display the body status when starting to fast.

However, the free version does not offer all the fasting plans, and some educational insights.
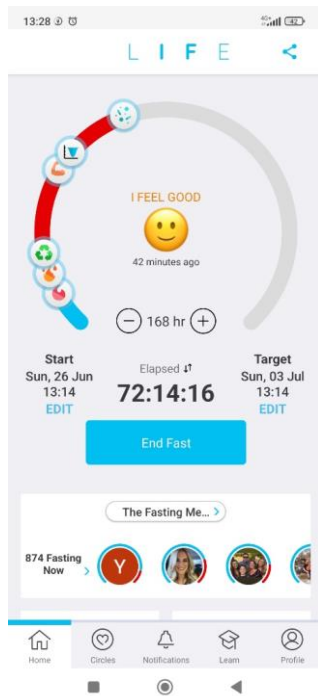
2.3.2 LIFE Intermittent Fasting

Figure 2.2: Life fasting app

LIFE is an intermittent fasting app developed by LifeOmic (LifeOmic, 2018). It has a special feature that allows users to join or create a circle to interact and motivate each other. According to Oussedik et al. (2017), accountability and peer support play important roles in sustaining lasting changes in your lifestyle.

The app is very easy and straightforward to use. Like most intermittent fasting apps, the fasting timer is the first thing you see when opening the app, as shown in figure 2.2. You can start or end the fasting time manually by tapping "Start Fast" or "End Fast" buttons on the screen and adjust the length of fasting time with the "+" and "-" buttons. One of the best features is that it shows the approximate time when your body starts to use fat as fuel.

Besides fasting tracker, the other features that the app does:

- Enable user to create or join circles which allow users to see other users fasting progression and overall fasting statistics as well as sending a private messaging.
- Various tracking features besides fasting, such as logging your weight, waist circumference, glucose, and ketones.
- Educational content in the form of text article and video
- Offer premium services like real-time coaching and biomarker blood tests.

However, the app does not have fasting plan, whether it is free or premium version.
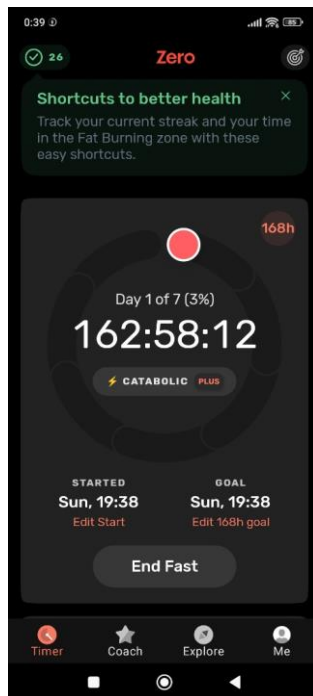
2.3.3 Zero - Intermittent Fasting

Figure 2.3: Zero fasting app

Zero is an intermittent fasting app developed by Zero Longevity Science, Inc (Longevity Science,Inc, 2019). Like other similar fasting apps in the market, it is designed to track your progress and make notes on the fasting and weight management journey. The key features that the app include:

- Fasting timer to enable users to track their fasting time.
- Customised fasting plans –to customised fasting plan according to personal needs.
- Personal health insights to help users to understand how their diet works, premium version offers advanced and more detailed personal health insight.
- Educational content from experts on intermittent fasting and weight management. It comes in the form of video and audio segments as well as written text.

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