

## A Development of Android-based Mobile Application for Getting Ideal Weight

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### Abstract

*The development of this application has a goal to give people who don't have any idea of how to keep an ideal body weight and to maintain it by having controlled food intakes and exercises. This application is designed by using a Waterfall Model, a 5-phase model that is Communication, Planning, Modeling, Construction, and Deployment starting from as the aforementioned steps. Based on the responds we get from distributing questionnaire, many people didn't know how to exercise properly and didn't bother to check the calories of their food. Their weight is also a problem because most of them still have an Overweight or Underweight status. From those responds, we can conclude that our application will indeed help people to get and maintain their ideal body weight.*

**Keywords:** waterfall model; food calorie; ideal body weight

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### 1. Introduction

In these modern times, technology has helped human in almost every aspect, like a telephone for communicating, Global Positioning System (GPS) to help driver on the road, internet to search for information, and many other. Information Technology is something that is rapidly evolving, especially the smartphone that many people owned. In Indonesia, smartphone user keeps on increasing as the time goes. This smartphone technologies are used in many activities and have become a part of our lifestyle. Smartphone also has a big role in everyday's life. There are many things that could be done by smartphone, and with the application inside, those application can help someone's life if used properly.

Again, these days that is filled with activities, health has become an issue that many people turned a blind eye on. Many individuals wanted to have a healthy body but is having difficulty because of their daily activities. Too much sitting has been shown to increase risk of chronic disease, particularly diabetes [1]-[2]. Lack of exercise and too much sitting it makes our body become overweight. Overweight has become the whole world problem, overweight can increase risk of chronic diseases like cardiovascular disease, type-2 diabetes, obesity related cancers [3]. That is why we want to develop an application to help people to obtain ideal body weight. The reason we created this application on a smartphone is based on the statistic, that smartphone user in Indonesia is very high, with 48% [4]. This amount is higher than other ASEAN country. And the application that we are going to make is an application that created by JAVA programming language with android as its platform. Android is an operating system that is Linux based. Although this operating system has already launched a long time ago, but it gains its popularity only a few years back [5]. This is because many smartphones that is on the market are android-based. Beside that, android is also an open-source operating system that lets developer create their own application freely.

The problem that we are facing is how to give a workout advice via smartphone and how to know how much calorie is taken by food and burned by working out. The goal of this research is to create application to monitor calorie intakes and calories burned, and to give the best advice of working out to maintain and to get their ideal body weight.

## 2. Mobile Application

Mobile application is a type of application with mobile technology that can give user information. Besides having a native application, there is also a mobile website, that is a web application that is designed specifically for mobile. Characteristic of a mobile application usually have a special architecture and a simple presentation [6].

### 2.1. Android

Android is an operating system for mobile that provides open-source platform for developer to create their own mobile application. Android was first bought by Google and is then developed by Open Handset Alliance, which is a union of thirty-four software, hardware, and telecommunication company [7].

### 2.2. Database

Database is a collection of data that is related logically, have a description and used together, which is designed to fulfill the need of information of an organization. In database, there is many kind of object representation that is called entity. Every entity contains few attributes, a properties that is owned by the represented object. An entity has a relationship with other entity if that entity has an association with the other entity [8].

### 2.3. MySQL

MySQL is a fast and strong Relational Application Database Management System (RDBMS). This database application allows user to efficiently input, search, sort, and take data. MySQL server controls access inside data to assure few users can access it together, speed up access inside database, and to assure only authorized user that gains access to the database [9].

## 3. Research Methods

There are 2 methods used to develop this application, namely: analysis method and design method [10]. In analysis method conducted interview, survey, observation, and analysis of similar application [11]. Total number of respondents for this survey was 209 respondents. The result, majority of respondent did not watch their calories, both taken and burned. And majority of the respondent said that they did not workout, because their busy daily activities. Analysis of similar application [11] used to be as a reference to develop this application. This is result of analysis of similar applications:

Tabel 1 Analysis of Similar Application

	7 Minute Workout	Noom Coach: Health and Weight
Platform	Android	Android
Workout List	✓	✓
Food List	X	✓
Pedometer	X	✓
Register dan Login	X	X
Features	Application can adjust time to rest and remind the user to exercise	Application has a feature to count total of calories taken into our body
User Interface	Easy to understand	Easy to understand

The design method used in developing this application is Waterfall Model [12], that consists of 5 steps:

a. Communication

Step to start a project. Starting with spreading questionnaire via social media by using Google Form and also giving it out face to face. The questionnaire consists of questions about workout and food that is done and eaten everyday by each individual. The target we set is to get at least 100 people to fill out those questionnaires. Those data will determine many factors to help us build this application. Interview is also conducted for more accuracy. We interviewed nutrition expert to have knowledge about calories and its nutrition. We also interviewed a Gym trainer from gyms to get a workout advice.

b. Planning

Creating schedule which will later be used as a guide to develop application. This step also starts by making the desired functionality of the application such as User Interface

and Database. Those schedule with the desired functionality will be sorted in order and the estimated time needed.

c. Modeling

After having a rough idea of the functionalities, this step will do those rough idea to reality. By designing those functionalities, there will be guides which will later be used for coding process. The design of the functionalities will be made based on analyzing the filled-out questionnaire. After analyzing the questionnaires, designing the database and user interface will be the next job. By using storyboard too get the rough sketch of how the application will look, user interface can be constantly changed so that it gets optimal and easy to understand.

d. Construction

This step is where coding takes place. Design that is made in the step before will be the guide. By using Java programming language and Android Studio as the tool to implement it. This application will use database with many variables like total workout done and food type consumed. Database used will be MySQL. This step also will also do testing, where programmer will do functionality test and logic test. By doing a specific test, programmer will be having an easy time to fix any problem they faced. Example of test done is like hardware compability, stored variable in the database, and calculation to check calories taken and burned. We also will do Black Box Testing, a testing method focusing on functionality requirements.

e. Deployment

The step to fix bug that will possibly be encountered after it is launched on the market. Programmer will evaluate user satisfaction and that will be the guide to fix the problem and bugg existing. Using Android PlayStore as the media to spread our application.

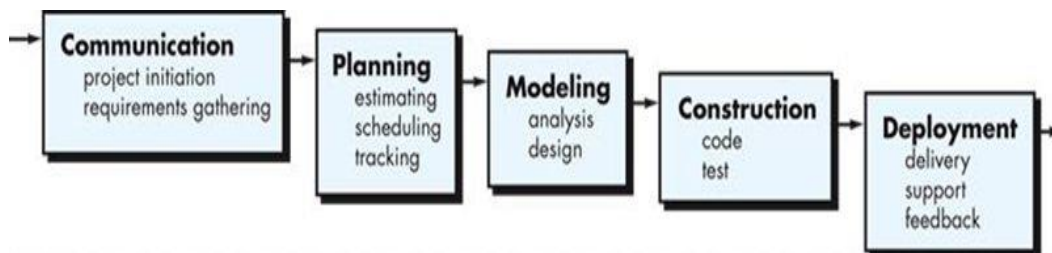


Figure 1 Waterfall Model

#### 4. Results and Discussion

Specification needed to run Calorie Crush is an android device with an operating system of at least 4.4 (Kitkat). User that has registered can type in their email and password as shown in Figure 2. If user have not register, system will show an error message and will tell user to register first. If it succeeds, system will bring user to home screen to use Calorie Crush. Menu consists of Profile, Food, Workout, Calendar, and Help as shown in Figure 3. In this application user can count total of calories left as shown in Figure 4 and calories burned as shown in Figure 6 and 7. Everyone has different total of caloires left, it is obtained from BMI (Body Mass Index). User can choose food from food list; each food will decrease number of calories needed. In this application, user can add list of exercise from database and calculate it as shown in Figure 8. This application also has a calender as reminder to user. Calender will display list of food and workout already done for a day as shown Figure 9. These are the screenshot of Calorie Crush:

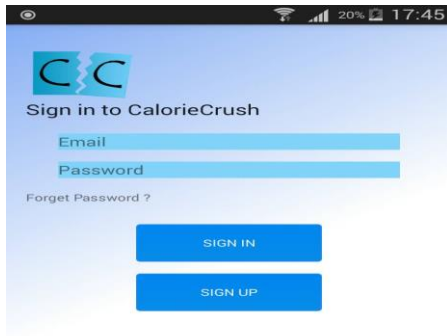


Figure 2 Sign in Calorie Crush

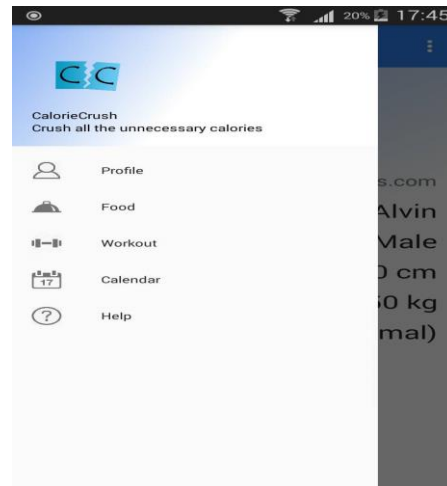


Figure 3 Menu Calorie Crush

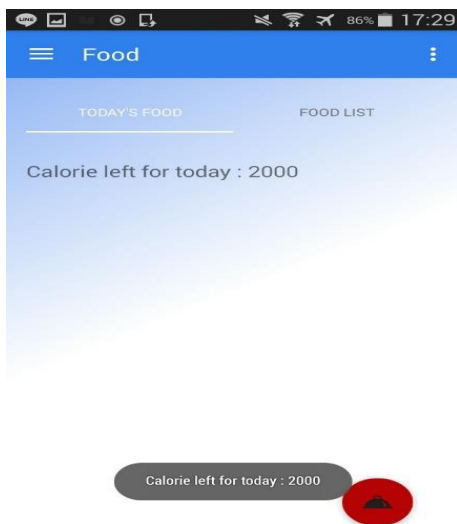


Figure 4 Calorie left for today



Figure 5 Food List



Figure 6 Running Counter



Figure 7 Sit Up Counter

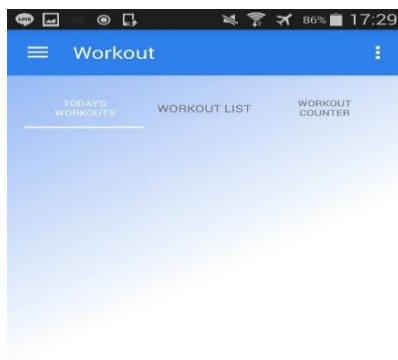


Figure 8 Workout

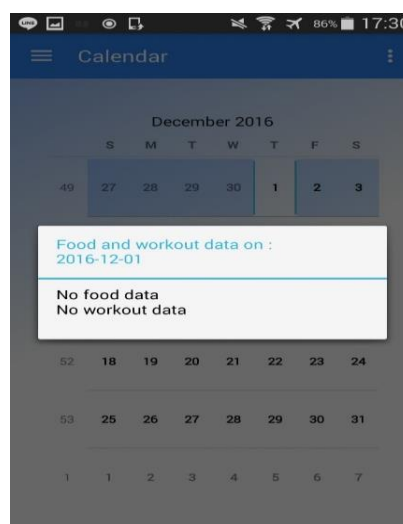


Figure 9 Calender

Evaluation of this application conducted by User Acceptance Test, Eight Golden Rules [11] and Five Measurable Human Factors [11]. Calorie Crush Application Testing is done by Black-Box Testing method [12] conducted on November 23, 2017 until November 26, 2017 on android smartphone. Below are the data of application test result:

Tabel 2 User Acceptance Test

No	Feature	Actor Role	Test Date	Result
1	Login	User	23-11-2017	Pass
		Admin	23-11-2017	Pass
2	Sign Up	User	23-11-2017	Pass
3	View Food	User	24-11-2017	Pass
		Admin	24-11-2017	Pass
4	View Workout	User	24-11-2017	Pass
5	Manage Food	Admin	25-11-2017	Pass
6	Manage Workout	Admin	25-11-2017	Pass
7	Kalender	User	24-11-2017	Pass
8	Choose Food	User	25-11-2017	Pass
9	View Progress	User	26-11-2017	Pass
10	View Profile	User	23-11-2017	Pass
11	Edit Profile	User	24-11-2017	Pass
12	Forget Password	User	26-11-2017	Pass
13	Choose Workout	User	25-11-2017	Pass
14	Logout	User	23-11-2017	Pass
		Admin	23-11-2017	Pass

This application already fulfilling the condition of Eight Golden Rules, namely: consistency, cater to universal usability, offer informative feedback, design dialogs to yield closure, prevent errors, permit easy reversal of actions, support internal locus of control, reduce short term memory load. This application also fulfilling the condition of Five Measurable Human Factors, namely: time to learn, speed of performance, rate of error by users, retention over time, subjective satisfaction.

**5. Conclusion and Suggestion**

Based on the development of Calorie Crush concluded: this application can help user to obtain their ideal body weight by giving workout advice and food. This application also can help user to maintain their ideal body weight and can also record calories taken and burned. For future works, there are several suggestions from respondent that need to be added to this

application as follows: add a Live Chat feature with Gym Trainer or a nutrition expert to consult, and add a Capture feature to count the calorie of a food based on a picture taken.

### References

- [1] Sparling PB, Howard BJ, Dunstan DW, Owen N. Recommendations for physical activity in older adults. *Bmj*. 2015;350:h100–h100. doi:10.1136/bmj.h100.
- [2] Patki SM, Madhavi P, Reddy BC, Madhavi KVP. knowledge and attitude regarding dietary habits among secondary school children in khammam town. 2014; 3: 3468–75. doi:10.14260/jemds/2014/2307.
- [3] Dixon JB. Molecular and Cellular Endocrinology The effect of obesity on health outcomes 2010;316:104–8. doi:10.1016/j.mce.2009.07.008.
- [4] Singapore Management University; Digital Media in Indonesia 2013.
- [5] Nandkishor BR. Android Smartphone Based Body Area Network for Monitoring and Evaluation of Medical Parameters. *Architecture ABAN*. 2014;284–8.
- [6] Fling B. Mobile Design and Development. United State of America: O'Reilly Media; 2009.
- [7] Safaat N. Android: Pemrograman Aplikasi Mobile Smartphone Dan Tablet Pc Berbasis Android. Bandung: INFORMATIKA; 2014.
- [8] Connolly, Thomas; Begg C. Database Systems : A Practical Approach to Design, Implementation, and Management. London: Pearson Education; 2015.
- [9] Welling, Luke; Thomson L. PHP and MySQL® Web Development. United State of America: Addison-Wesley; 2009.
- [10] Adams E. Fundamentals of Game Design. 3rd ed. 2014.
- [11] Shneiderman B, Plaisant C. Designing the user interface : strategies for effective human-computer-interaction. 5th ed. USA: Pearson; 2010.
- [12] Pressman R, Maxim B. Software Engineering: A Practitioner's Approach 8th Edition. McGraw-Hill Education; 8 edition; 2014.