

**A MOBILE APPLICATION  
TO MONITOR ADDICTION ON GAME PLAYING**

by

**MOHD HAFIZ BIN MOKHTAR**

Dissertation submitted in partial fulfilment of  
the requirements for the  
Bachelor of Technology (Hons)  
(Business Information System)

MAY 2012

Universiti Teknologi PETRONAS  
Bandar Seri Iskandar  
31750 Tronoh  
Perak Darul Ridzuan

**CERTIFICATION OF APPROVAL**

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Approved by,

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(Dr. Yong Suet Peng)

UNIVERSITI TEKNOLOGI PETRONAS  
TRONOH, PERAK

May 2012

## **CERTIFICATION OF ORIGINALITY**

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgement, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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( Mohd Hafiz Bin Mokhtar )

## **ABSTRACT**

Modern hand held devices such as smart phones and PDSs have become increasingly powerful in recent years. Dramatic breakthroughs in processing power along with the number of extra features included in these devices have opened the doors to a wide range of commercial possibilities. A lot of free games applications on the platform have driven the kids to spend their time more on the games rather than the studies. As parents, they will be surely worried about the children since the habit may slowly affect the performance on the examinations, school work and social interactions. Researchers say they found in a national Harris Poll survey that 8.5% of youths 8 to 18 who play tablet and computer games show collective signs of addiction that psychologists know exist in pathological gamblers, says Douglas Gentile, PhD, an assistant professor at Iowa State University [1]. Hence, this project will be focusing on the development of an Android application to control the utilization of a game by the kids whereas it will pause the game and alert the kids that they have reached the time limit set by the parents. Besides that, this application also will be very useful for teenagers and students to manage their time between entertainment and studies.

## **ACKNOWLEDGEMENT**

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# **CHAPTER 1**

## **PROJECT BACKGROUND**

### **1.1 Introduction**

In this modern world, technology is the most significant element that will guide and drive us in every step we pass through. One of the fastest technology developments nowadays is mobile device. A mobile device or handheld device is a small, hand-held computing device which is normally designed with display screen, touch input, miniature keyboard and weighting less than 2 pounds or 0.91 kg [1].

The rapid development of mobile devices has opened up wide market for mobile games industry. Mobile games or digital games are games designed and played on mobile devices such as smartphones, feature phones, pocket PCs, personal digital assistants (PDA), tablet PCs and portable media players. The users usually need to download the games before installing it on their mobile devices. There are also certain games that have been preinstalled on the devices before purchasing.



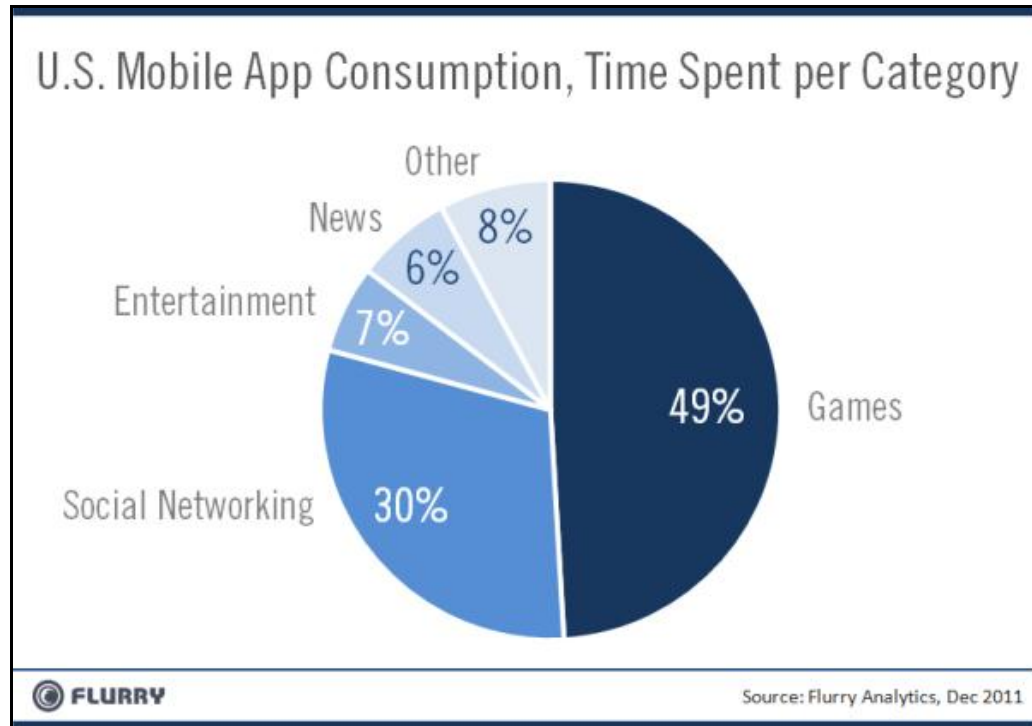


Figure 1.1: Mobile Application Consumption in U.S. [7]

The pie chart above shows the consumption of mobile applications as in December 2011 by United States of America mobile consumers. It is proven that most of the time has been used to play game application with 49% instead of other application such as social networking, entertainment and news.

## 1.2 Problem Statement

Doubtlessly, the invention of smartphones is very important in human's life and also brings a lot of benefits and opens up a lot of opportunities to the application developers. However, there are issues occurred related the usage of smartphones such as social problems, time management, and internet addiction.

A lot of digital games on the mobile devices have driven the kids to spend their time more on the games rather than the studies. As parents, they will be surely worried about the children since the habit may slowly affect the performance on the examinations, school work and social interactions. Researchers say they found in a national Harris Poll survey that 8.5% of youths 8 to 18 who play tablet and computer games show collective signs of addiction that psychologists know exist in pathological gamblers, says Douglas Gentile, PhD, an assistant professor at Iowa State University [2].

According to Chicago's WGN news health segment, the impact from the gaming makes the adrenaline occurred during gameplay makes the experience itself an addictive stimulant [3]. In other words, mobile games are like drugs that will make the addicted users never stop from playing them. The main concern from this situation is about children, students and teenagers as they are the major mobile games' users. A lot of negative effects may happen from the addiction of mobile games in which will lead to unbalance life of a user.

### **1.3 Objectives**

To develop a mobile application that aims to:

- Terminate a mobile game application when set time limit is reached.
- Help parents to monitor and manage their kids' time management.
- Help students to balance their life between entertainment and studies.
- Reduce game addiction and enhance social bonding.

### **1.4 Scope of Study**

This project will cover on how to help parents manage their children's time so that there will be a balance between studies and other entertainment such as tablet games. To make this project usable, meeting with parents and other related person who got

knowledge in this area will be conducted. Suitable data such as time spent by kids on tablet games and their examination results are the main information needed in this project.

This project also will covers on the development of Android software for the parents to monitor and control their kids eagerness on tablet games. This application will be designed using one of Eclipse platform which is Eclipse Integrated Development Environment (IDE) for Java Developers and Android Software Development Kit (SDK). The knowledge about Java programming language is needed in this project. The interface design will focuses more on how to attract the user and make it user-friendly. It must be simple and easy to understand.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

The era of mobile computing, is driving among the largest shifts in consumer behaviour over the last forty years. Impressively, its rate of adoption is outpacing both the PC revolution of the 1980s and the Internet Boom of the 1990s. No matter where, everyone in this world own at least a mobile in which plays major role in their life and has become a symbol of fashion accessory in the market.

#### **2.2 Mobile Application Uses Trend**

Since 2007, with the introduction of the iPhone [4], the smartphone age has moved to an accelerated speed. More and more mobile-related companies have started to focus on opportunities in the mobile space. But how big is that market? And how does it compare to what's available in terms of the regular PC-based internet market?

A 424-page report released by Morgan Stanley entitled, 'The Mobile Internet Report' has explained in details about the fast improvement in mobile internet market on these recent years. In the report which was released on December 2009, Morgan Stanley predicted that the Mobile Internet market will be at least twice the size of Desktop Internet in 2010 [5]. The prediction was made based on analysis comparing Internet users with mobile subscribers. Since 2007, more than 500 million iOS and Android smartphones and tablets have been activated. By the end of 2012, the estimation shows that the cumulative number of iOS and Android devices activated will surge past 1 billion.

As we can see today, the rapid acceleration of mobile phones catalyzed by Apple and Google, just like a storm in the market. Statistically, Google Android is now well ahead from Apple's iOS for iPhone in the stunning race for mobile operating system market share.

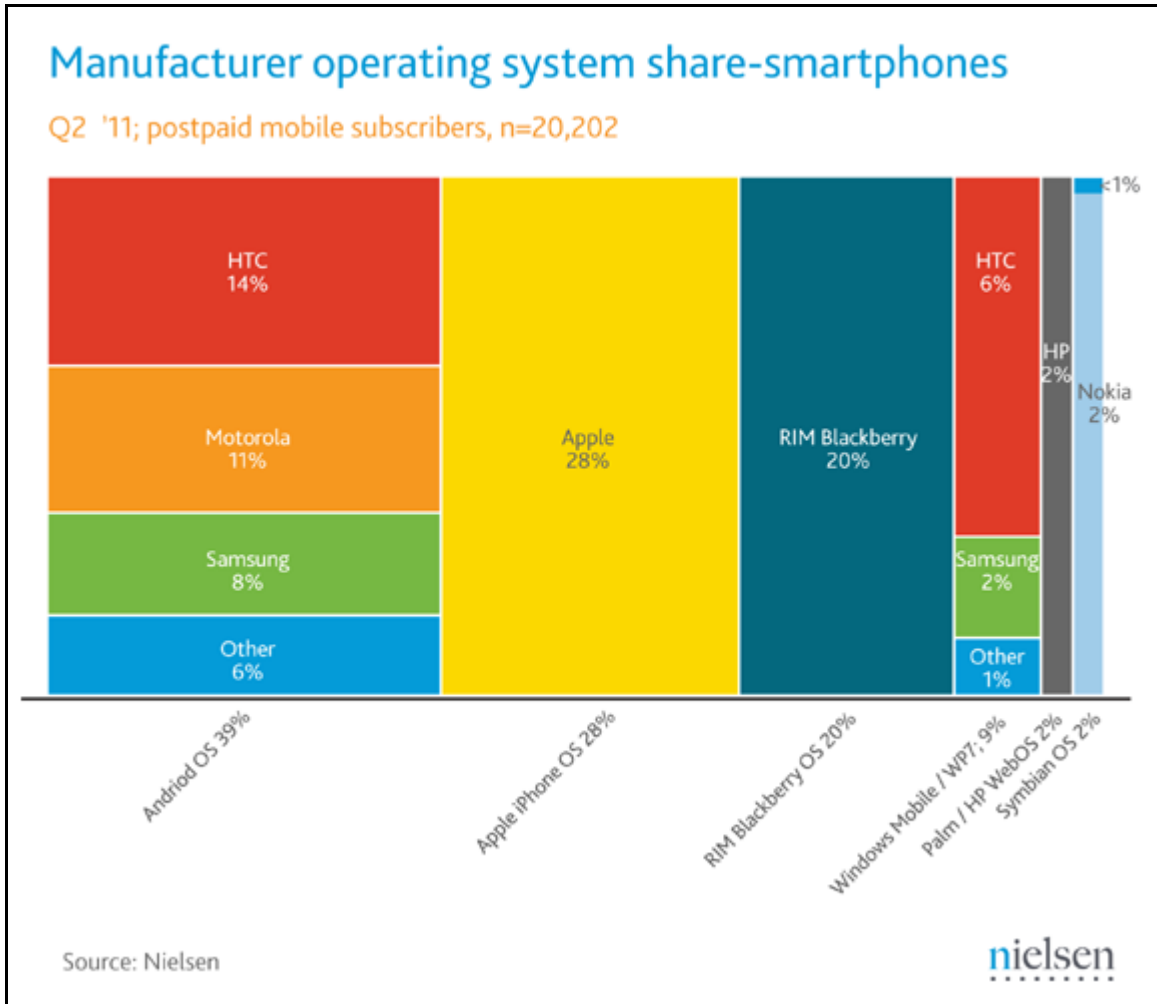


Figure 2.1: Manufacturer Operating System Share on June 2011 [6]

The data by market watcher Nielsen released on June 2011 shows that Android OS owns 39% share on market while on the other hand, Apple has 28% share. With 20% market share, RIM's BlackBerry OS was in the third place and Windows Mobile OS was in the fourth place with 9% of total market. From the statistic we can see that most of

mobile device markets today is conquered by Android based devices. This situation has opened a wide door for Android application developers to deploy their skills and develop more application for the users.

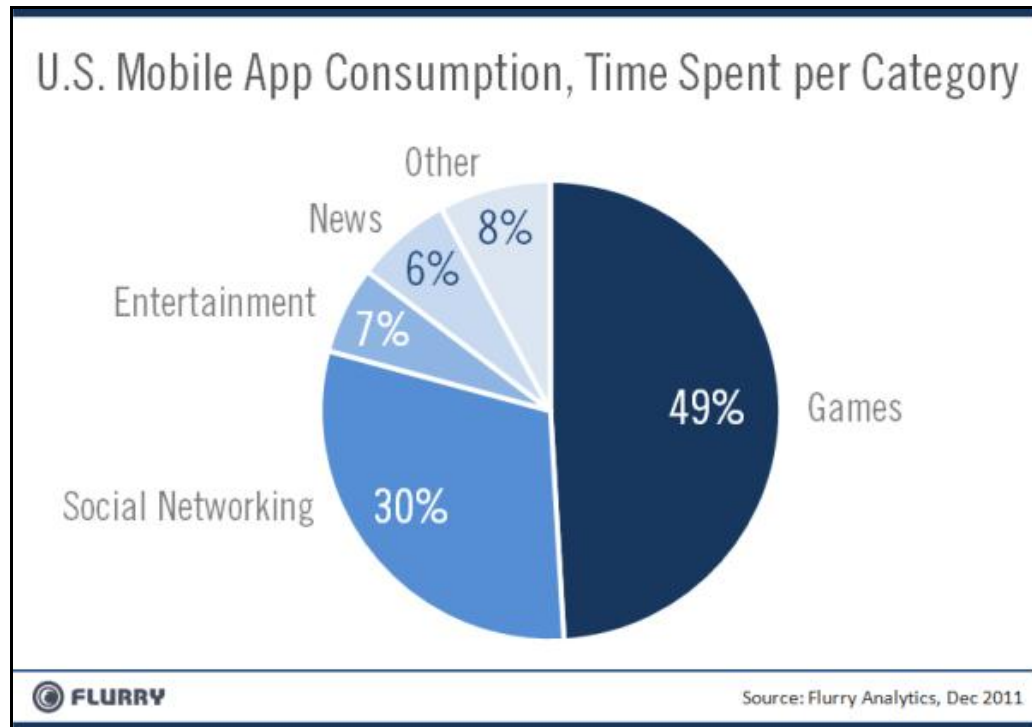


Figure 1.1: Mobile Application Consumption in U.S. [7]

The chart by Flurry.com clearly shows that games category capture the significant majority of consumers' time with 49% more compared to other activities which are social networking, entertainment, news and other activities. Consumers spend nearly half their time using games applications. As we drill down into the category data, consumers use the category more frequently, and for longer average session lengths, compared to other categories. Since Android owns most of the market shares compared to other mobile operating systems, it is expected that more Android based games are played by the most mobile devices users.

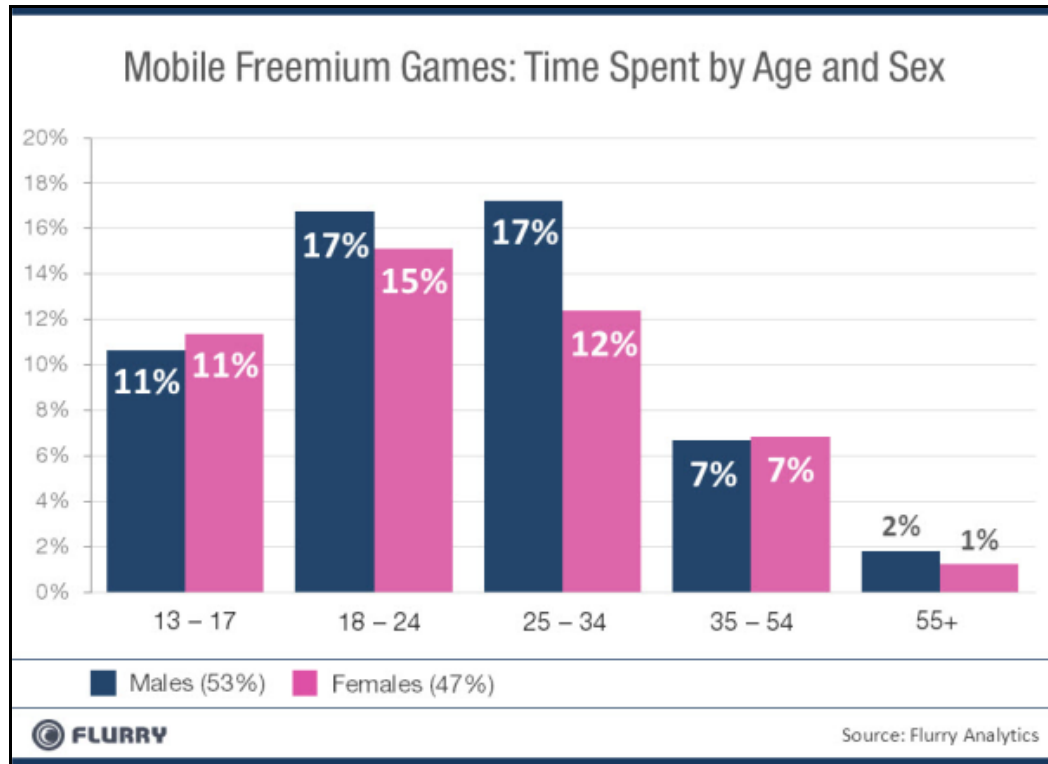


Figure 2.2: Time Spent by Users on Mobile Games [8]

The chart above shows a graphical cross-tabbed view of time spent by age versus sex. Blue columns represent males and pink columns represent females. The amount of time spent by males and females is broken down by age group, from youngest to oldest, left to right. The total split of time spent is presented in the legend, with men edging out women 53% to 47%.

What we can take away from this chart is that time spent in freemium games on mobile is relatively evenly split among males and females, with 18 -34 males (coincidentally considered the best target for hard-core games) representing the largest group about a third of all players. 18 – 34 year old girls come in accounting for 27% of time spent. In total, freemium gamers tend to be younger, with 83% of them under 34 years old.

From the chart, we can see that youngsters with ages from 13 to 24 who play mobile games can be considered as high. Though it may keep them occupied but experts say that playing such games can cause problems in term of health, social life and studies.

## **2.2 Side Effects of Mobile Games**

As hardware power increases, and prices decrease, the smartphone has quietly made quite a foothold as a platform in the mobile game industry. Many companies are using smartphones to target previously unreachable market segments in the mobile gaming. As this platform becomes more popular, researchers are beginning to notice potential problems and dangerous behaviours associated with this type of gaming that has never been observed with any other type of gaming.

In these recent years, the increasing of hardware power as well as the decreasing of prices has made smartphone as a strong platform in mobile gaming industry. A lot of application developer companies starting to use smartphones as their medium to reach mobile gaming market segments. It is proved that the some mobile games have their own positive effects for the users. For example, there was a study conducted to investigate the effect of online multiplayer game on the quantity and quality of second language interaction in the game and on participants' willingness to communicate in the target language [9]. The result of the study is shown by the graph below.



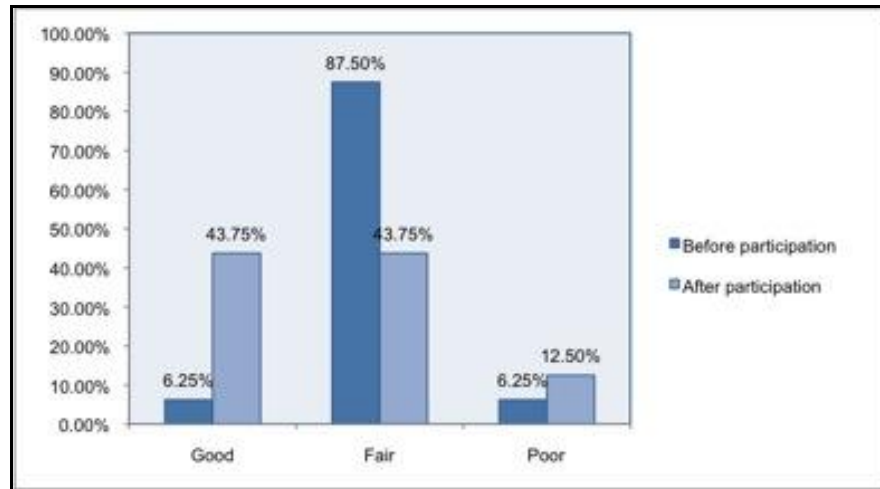


Figure 2.3: Percentage of Learners' Perceived Competence in Their English Communication Skills before and after Participating in Gaming Activities.

The study has approved that digital games also can give positive impacts to the users. The games are able to increase student enthusiasm, lower anxiety, and improve their willingness to communicate to others.

However, apart from the positive effects, unfortunately there are also a lot of negative effects of mobile games to the users. One of the negative effects is the potential for distraction when performing other important activity such as driving. What will be highlighted in this project is the social problem occurred because of the mobile gaming habit.

Recent years, there have been researches and speculations about the potential of games to generate anti-social thoughts and behaviours among the players. For example, a research has been made and came up with statement of direct connection between violent games and violent behaviours and attitudes [10]. But, very little attention has been directed towards mobile games as the less visual capability of mobiles does not give too much effect to the users.

However, if we could see nowadays, increasing of realistic graphic on mobile phone makes the violence and brutally of a game become more obvious. Moreover, the rise of adult content such as content from Playboy offered by Australia's first 3G operator, Three in early 2004 has "open the eyes" of the users especially the children and teenagers. Similarly, many software developers have offering adult content for mobile system [11] in both still and video formats.

The concept of the availability of adult content on mobile devices is similar with the internet pornography which will lead to social problems among users. The same goes to the brutal and violence graphics and action in some games, the children and teenagers will tend to "try" the actions in their real life as we can see from the increasing number of bullying cases in schools.

Moreover, the experience during the gameplay is an addictive stimulant. It is causing the kids forget about their friends, ignore schoolwork and become impulsive and hot tempered. Parents may helplessly witness how their children change habits becoming, from a normal kid, a miserable, withdrawn person, skipping school, being always angry when confronted, and stealing from family and friends to fuel their obsessions. And this personality and behavioral change can last for years.

### **2.3 Game Controlling Techniques**

Mobile games are like drugs. A person who is really addicted to the games may be hardly to avoid from playing them. Informationweek.com has listed down five tips on how to avoid gaming addiction [12]:

1. Decide in advance how many hours you intend to spend playing games (or surfing the Web or whatever), and be hardcore about sticking to it.

2. Establish a day (I do this on Sundays) on which you use no computer or electronic device -- unplug once a week, all day.
3. Ask your significant other from time to time if they feel you ignore them in favor of the computer.
4. Separate your work and play spaces, if possible. (If you play on your work computer, then you'll be tempted to play while working.)
5. Monitor yourself: Are you playing more than before? Are you still enjoying play or is it merely a compulsion? Are you thinking about playing games when you're doing other things? Are you neglecting other areas of your life in favor of playing games?

Nevertheless, all the steps above are solutions from the inner part of a gamer. Hence, it is still risky that he or she unable to avoid the addiction where the steps are difficult to be implemented due to self-discipline of human being. Based on the literature, there is only one technical solution regarding this matter. Game Time Limit for Parents, an iOS application built by XVision is an application that will limit the children's game playing time on the iPhone, iPad and iPod [13].

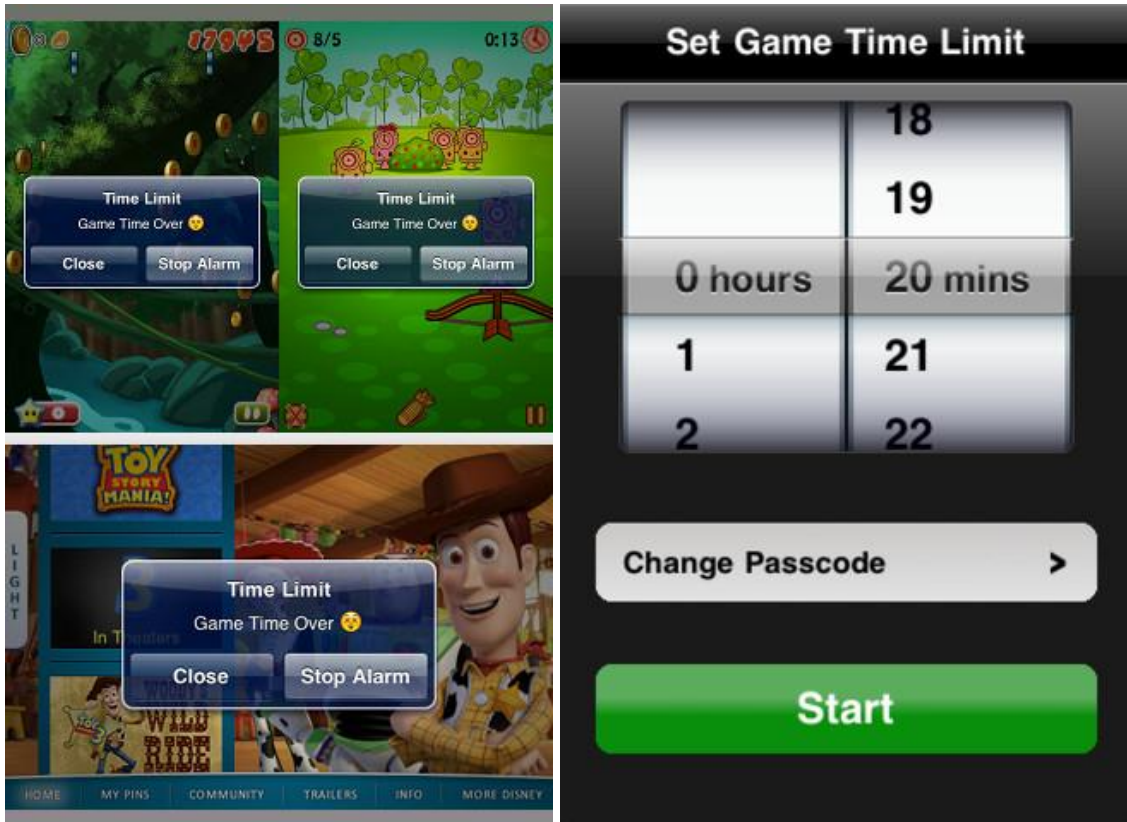


Figure 2.4: Screenshots of Game Time Limit for Parents iOS Application

Below are the operational on how the application works:

1. Parents set the number of minutes the child can play on a device.
2. Parents set a secret Passcode.
3. Start the timer and let the child have their device.
4. When the timer ends, an alarm appears on the screen, stopping the child from playing anymore. The only way to stop the alarm is for him to handover the device to parents. Otherwise, the alarm keeps appearing.

5. Parents enter the Passcode to stop the alarm.

However, this application received negative feedbacks from the consumers. One of the consumers stated that, the application does not deliver on what has been promised. It keeps counting down even when the device is in standby mode. This causes the time limit for game play to be inaccurate. Moreover, the user complained that the application does not “pause” the game whenever certain time limit is reached [13].

Moreover, this application is a paid iOS apps. With \$0.99, mobile devices’ users normally may think twice before purchasing this paid application. They will make some researches and comparisons with other application and most of them will download free application with the same functions.

## **2.4 Conclusion**

We cannot neglect that the increasing number of mobile game applications in these recent years has brought a lot of advantages to the kids, students and other users. However, there are still negative impacts of those games to the users. The available game controlling application in the market is still unstable, lack of user-friendly features and it is paid application. Hence, since Android operating system is the leading platform in the market, a free Android based game controlling application need to be developed for the beneficial of users.

## CHAPTER 3

### METHODOLOGY

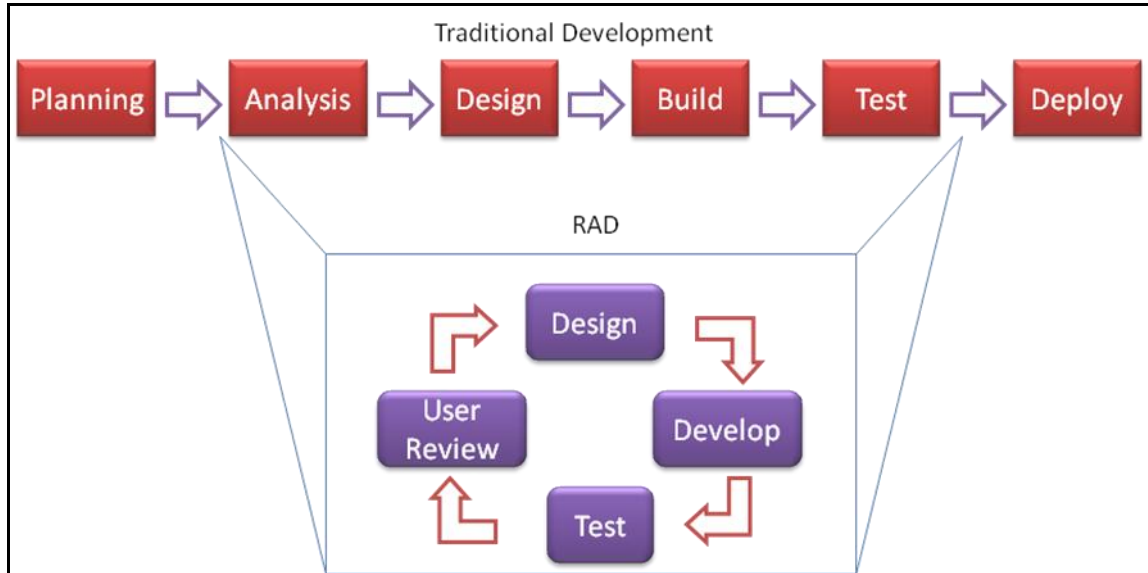
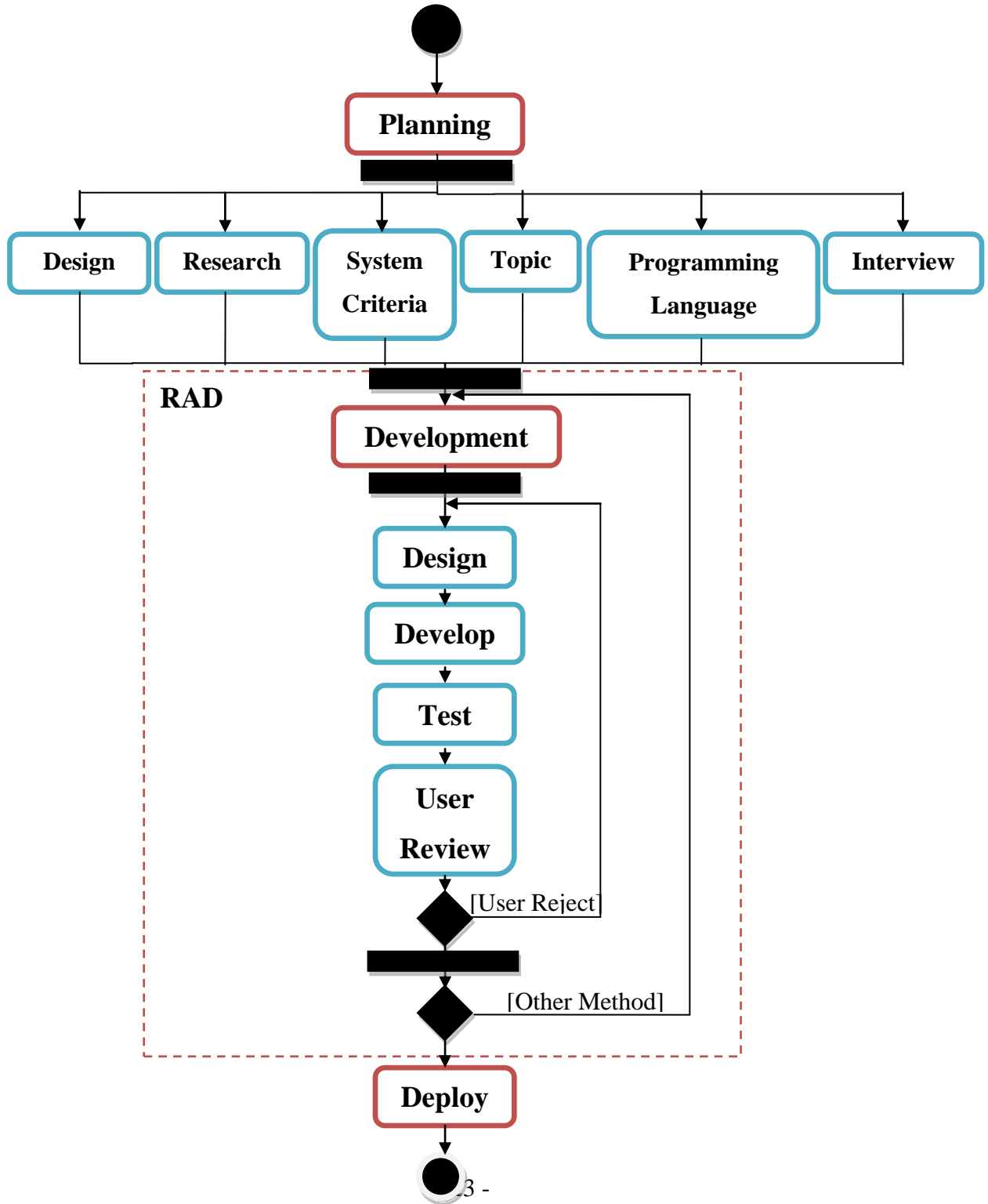


Figure 3.0: RAD System Development [10]

In this project I will be using RAD methodology. RAD (Rapid Application Development) is a term introduced in 1991 by James Martin<sup>1</sup> to describe a software development methodology that involves short iterations and relies partially on prototyping to complete specification requirements. In recent years, the acronym has been used in a broader sense to encompass a set of techniques (such as the use of frameworks) aimed at accelerating application development. RAD is often used in situations where time constraints force an approach in which faster application development is given priority over full functionality and performance.

### 3.1 Development Process Details

#### 3.1.1 Activity diagram for RAD methodology



### **3.1.2 Planning:**

Plan on how to build the application and what platform will be used. For this project I will build Android application as it is the most popular Operating System nowadays and I will be using Eclipse [11] as the platform to develop the app. I will also plan on the time allocated on each step of this project so that it will be finished before the due date. After the proposal of the project is accepted, research will be done followed by the development stage.

### **3.1.3 RAD:**

In RAD stage, the phases involved are design, develop, test and user review. The design of the application will be focused on the operation and interface. For the best result, images will be designed by using Photoshop. All the coding steps will be made by using Eclipse IDE for Java Developers. To build a high class application or product it is usually consist of a series of milestone where different version of prototypes will be developed. The latest version will be better than the previous versions and each version will be tested and reviewed by the targeted users.

### **3.1.4 Deploy:**

Deployment of the product is the last stage in the development process. The data and information gathered from the user testing will be used to develop the final version of the application. The application then will be deployed to the real environment and can be used by the actual users in the market.



### **3.2 Brief overview of the system:**

Android Game Controlling (A-Gamecon) mobile application is an application that functions to control game applications in Android Operating System mobiles. This system is fully operated by the parents to control their kids' addiction to the game applications. Firstly, the parents need to run A-Gamecon application whenever their kids want to play certain game applications in their Android mobiles. Then, parents need to set any time they want the kids to play the game such as 10 minutes. After that, the mobile will be handover to the kids and they will run the game they want to play. After 10 minutes, A-Gamecon will alert the kids that they have reach 10 minutes and the game application will be “pause” and terminated. By implementing this application regularly, the parents can control their kids' addiction to the mobile games so that the kids can focus more on other activities such as homework, studies and social life with their friends.

#### **3.2.2 Research element:**

In order to successfully develop and deploy this application, research must be done. There are several elements in the research which are:

- Research about the steps to develop the application.
- Research about the programming language used to develop the application and how to implement it.
- Interview and seek for important information from the experts.
- Research on how to develop the user friendly interface of the application.

### **3.3 What have been done**

#### **3.3.1 Analysis**

A few actions that have been taken in this project were:

- Study and making comparison with available application in the market that has similarity with A-Gamecon concept. The only application found is developed for iOS and it is paid application and also has some disadvantages.
- Research on how to develop the application. The common and most popular tool to develop an Android application is Eclipse IDE for Java Developers.
- Study about the flow of the application. It consists of how to operate and manage the application in a right way.
- Discussion with Supervisor and experts. The discussion is very important because the Supervisor and the experts have higher level of knowledge to help me in this project. Examples of experts are my friends who have been working on Android project during their Internship Program.

#### **3.3.2 Design**

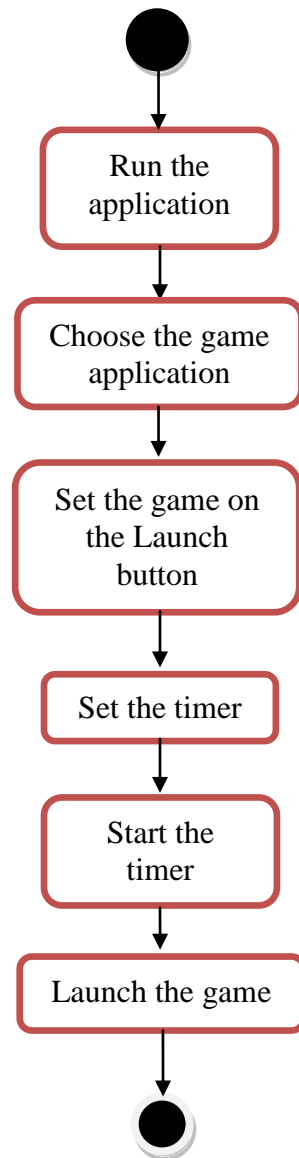
The actions taken in developing the design of the application:

- Study on the design of the interface of the application by making comparison with other similar application.
- Making basic draft of the interface. The main point of the interface design is it is user friendly and easy to operate.
- Building the interface design of the application including the main interface and setting interface.

### **3.3.3 Development**

- Moving the draft of the interface into the real one. The interface of the application must be done before the development of the application.
- Development of the application based on the RAD methodology. Development will be done after all the data and information have been collected and analyzed.
- User acceptance test (U.A.T). UAT is a test conducted to the users after a system is completely developed. The reason of the test is to check if there is any bug or error. The application will be rebuilt if bug and error is detected. If not, the application will be deployed to the actual users.
- Search for any tutorials or code example on the Internet as a reference for the development of this project.

### 3.4 Activity diagram for the application



The activity diagram above is the basic idea on how Android Game Controlling system will work. To launch the application, the users need click the game icon on the devices. At the main interface of the application, the users need to click the menu button on their devices and choose the Setting button. Then, the users will be prompted into an interface where they have to choose their desired game application and set it on the Launch button at the main screen. After that, the users may press back button to go back to the main screen and set the timer. After setting the timer, they need to start the timer and they may launch the game using the Launch button. As soon as the time reached the limit, the game application will be killed.

### **3.5 Tools**

Several tools were installed on the computer for the development of the Android application. The software are needed for the system development and the interfaces design.

#### **3.5.1 System Development**

The main and the most important software used for this project development is Eclipse [14]. Eclipse is one of the most popular Android development platform used by the majority of the Android developers around the world. It is open source software, hence a lot of tutorials and source code available on the internet. That is the main advantage of Android development using Eclipse. With java language, Eclipse able to build Android application and also design the layout or interface of the application using xml format.

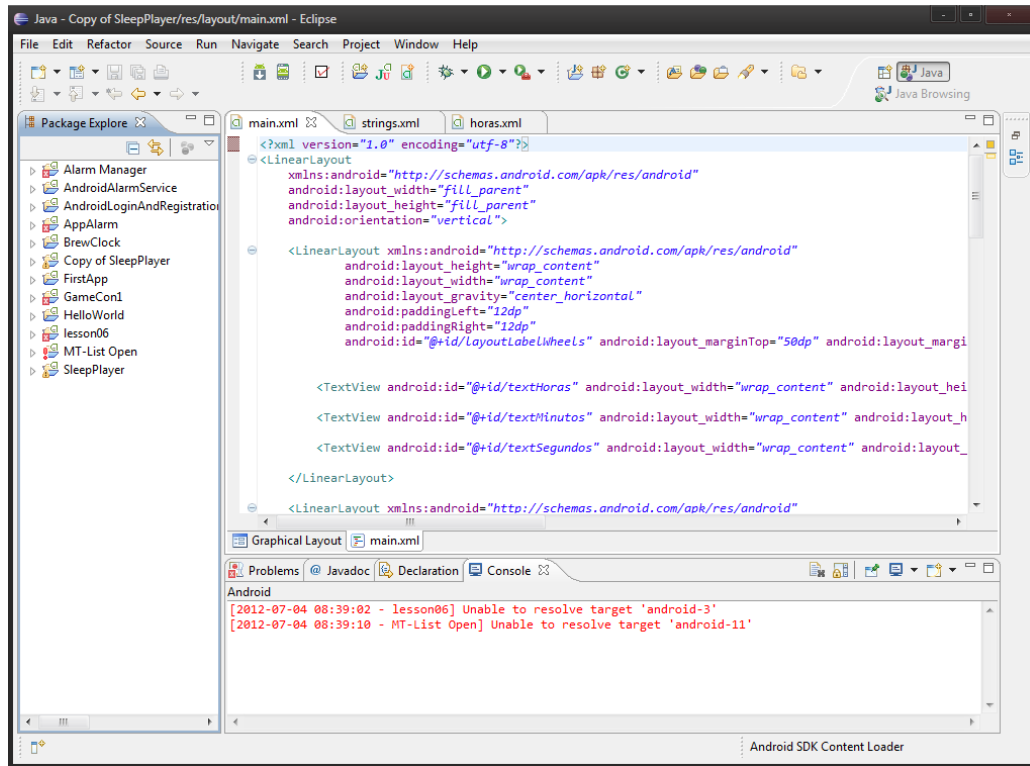


Figure 3.1: Eclipse used for the Android application development

To run the application that has been built, an Android Virtual Device (AVD) has been used. AVD is an emulator that stimulates a real Android device such as smart phone and tablet PC. In other words, AVD can be used as a medium to see how the Android application works on real Android devices without having to buy them on the market.



Figure 3.2: Android Virtual Device (AVD)

AVD can be created as many as we want with different versions of Android OS such as 2.1, 3.0 and 4.0 hence we can run any version of Android application on it.

### 3.5.2 Interface design

A standard Android application will have good interface and design. In this project, Adobe Photoshop is used to develop the images and logo of the application.

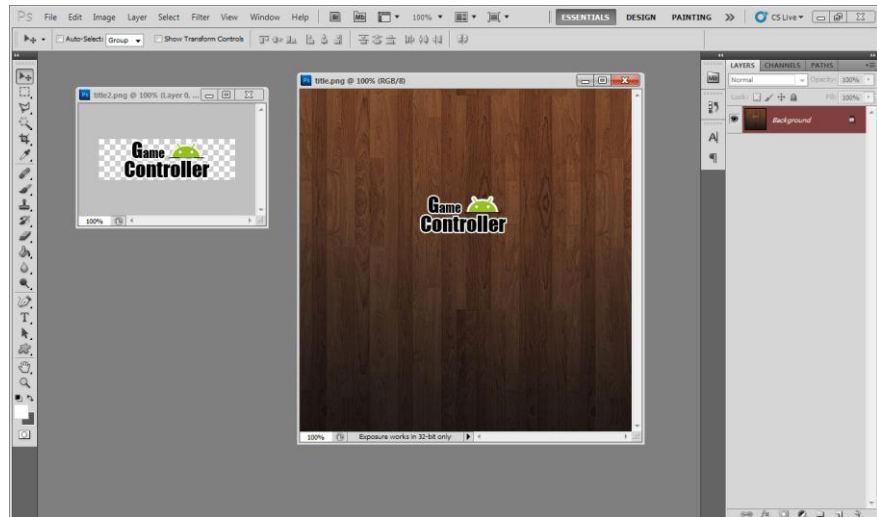


Figure 3.3: Adobe Photoshop is used to design the images



## CHAPTER 4

### RESULT AND DISCUSSION

#### 4.1 System Flow

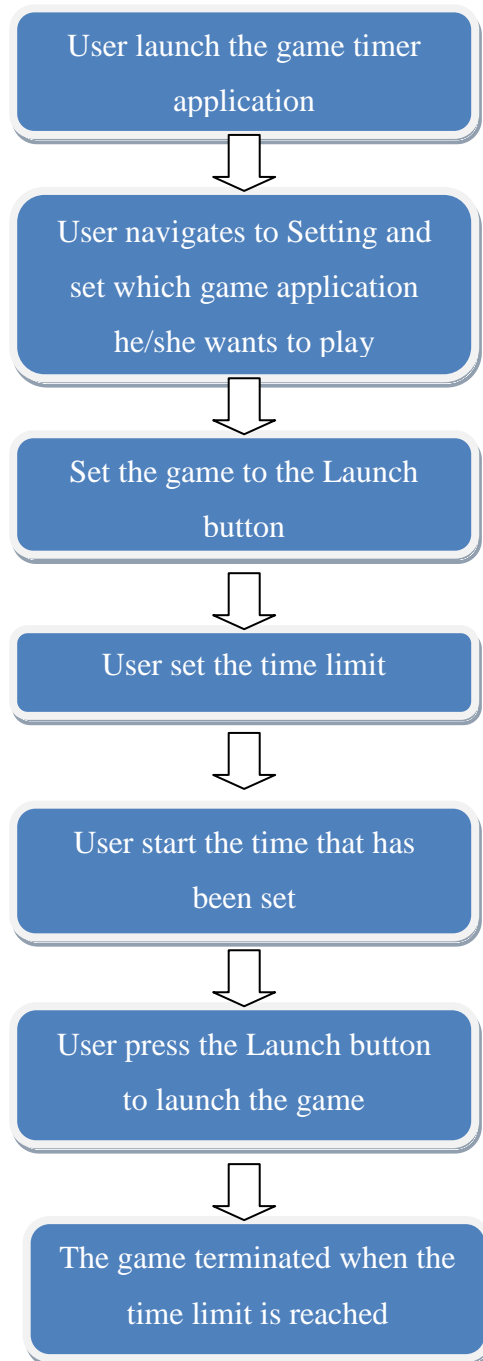


Figure 4.1: System Flow

Based on the system flow of the application, the configuration consists of few simple steps and it is very easy and this will be the advantage of the application where it will boost the user interestingness to use it.

## **4.2 Prototype Overview**

By following the system flow that has been generated, prototype of the application was developed. The prototyped was built by using the idea of keeping the system configuration as simple as possible so that the chance of having good rating from the users is high. There are several steps where a particular user needs to follow to operate the system.

First of all, the users need to click the application's icon on the devices' screen. After the user is successfully logged into the system, they will be navigated to the main page interface.



Figure 4.2: Main Page Interface

The main page of the system consists of three main buttons which are the button to set the time, button to start the timer, and button to launch the mobile game. In order to display and select which game the user wants to play, he/she needs to press Menu button available on their gadget or mobile. The Menu button will display Setting and Quit button.

On the Setting page, the user will have two steps to set the game that he/she wants to play. First, he/she have to choose the game from the list where the list will display all

applications installed on the mobile. After that, the user need to set the game application that he/she has chosen to the Launch button.

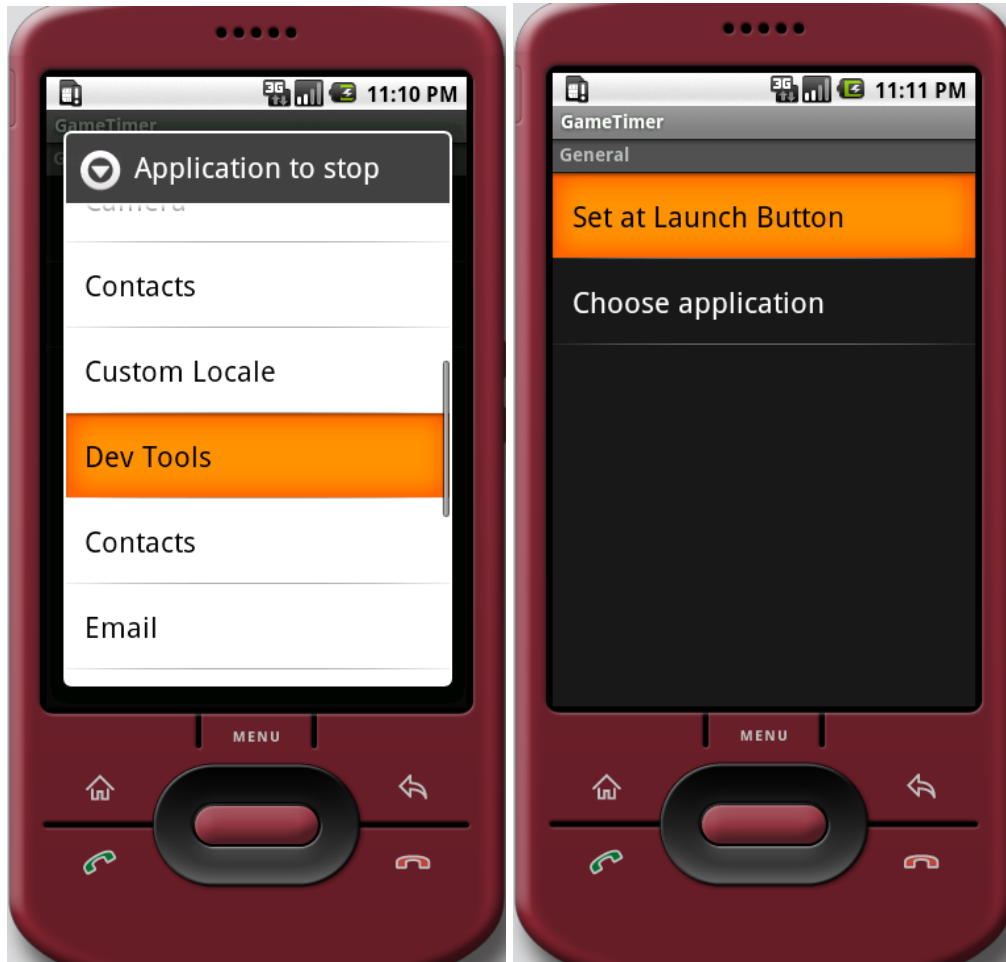


Figure 4.3: Setting Page

After the user chooses the game application that he/she will be playing, the next step would be to set the time limit for the game. To do so, he/she have to move on to the main page where the button to set the time is located.



Figure 4.4: Timer Setting

Lastly, the user can start the timer and then launch the game application by pressing the Launch button.



Figure 4.5: Game Launching Button

### 4.3 User Testing and Review

User testing and review are essential before any deployment of any product in the market. It is very important because the data gathered from the process will determine whether a certain product is meeting or exceeding or below the customers expectation.

For this prototype, I have interviewed 10 people and let them to test it. Stated below is the result for the testing.

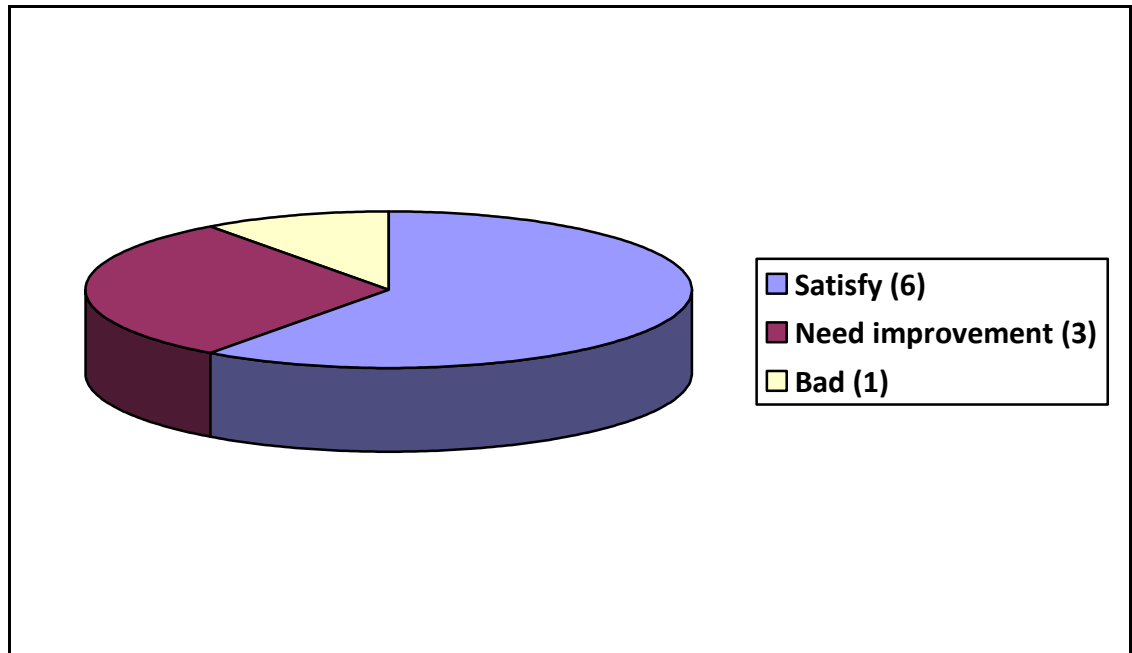


Figure 4.6: User Review

From the result of the User Review, 6 (60%) of the users are satisfied for the prototype. They stated that the operation of the system is very easy and may be successfully accepted by majority of the mobile users in the market.

On the other hand, 1 person or 10% of the overall users disliked the application. The reason for his statement is that the application is useless and impossible to meet the objectives.

Lastly, 3 person (30%) of the users accepted the application but with some improvements. For example, they said that the application needs to be improved in term of design and functionality such as adding more features.

In a nut shell, the prototype is working well and meets the expectation. However, it needs some improvements and features developments.

## **CHAPTER 5**

### **CONCLUSION AND RECOMMENDATION**

#### **5.1 Conclusion**

This Android project highlights the intelligent system to manage and monitor a user's addiction to a particular mobile game. This application is competent to generate the awareness for the mobile or gadget users about the drawbacks of playing mobile games for a long period of time. With continuous implementation, it is believe that the application will be able to:

- a) Reduce mobile game addiction
- b) Improve time management among users
- c) Improve students achievement on their studies
- d) Improve social involvement among users

For conclusion, the prototype that has been developed is working well according to the system objectives. The application is capable to “kill” and terminate any game application that is being played by the users.

#### **5.2 Recommendations**

It is a pride that the application is successfully built and it is working according to what have been planned. However, a lot of improvement in term of interfaces design, features and usability need to be implemented to increase the performance, rating and usability of the application.

First of all, the application needs to have redesign phase where a lot of improvement in term of its icon, images, and interfaces have to be done. To make it



easier process, comparisons with other Android applications can be done so that the standard will be at the same level.

Other than that, popup message can be added so that the application's user-friendly feature will be improved. As an example, the user set the time limit for 5 minutes and then he/she plays the game. When the time reached 5 minutes, a popup message window will appear at the screen telling the user that the game will be terminated in 5 seconds. By adding this feature, the user will have some time before the game is terminated and the game will be not terminated in a sudden.

Another recommendation that need to be looked through is when the kids play another game instead of the game that was launched from the game timer application. The situation happened when initially the game timer launched Game A, but the kid then minimized Game A and then played Game B. So, the game timer application does not working with Game B. Recommendation that can be suggested is to put popup message that will disturb Game B after Game A is idle for 1 minute.

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<[http://www.wired.com/news/business/0,1367,41336,00.html?tw=wn\\_story\\_related](http://www.wired.com/news/business/0,1367,41336,00.html?tw=wn_story_related)> Retrieved 13<sup>th</sup> March 2012
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# APPENDICES

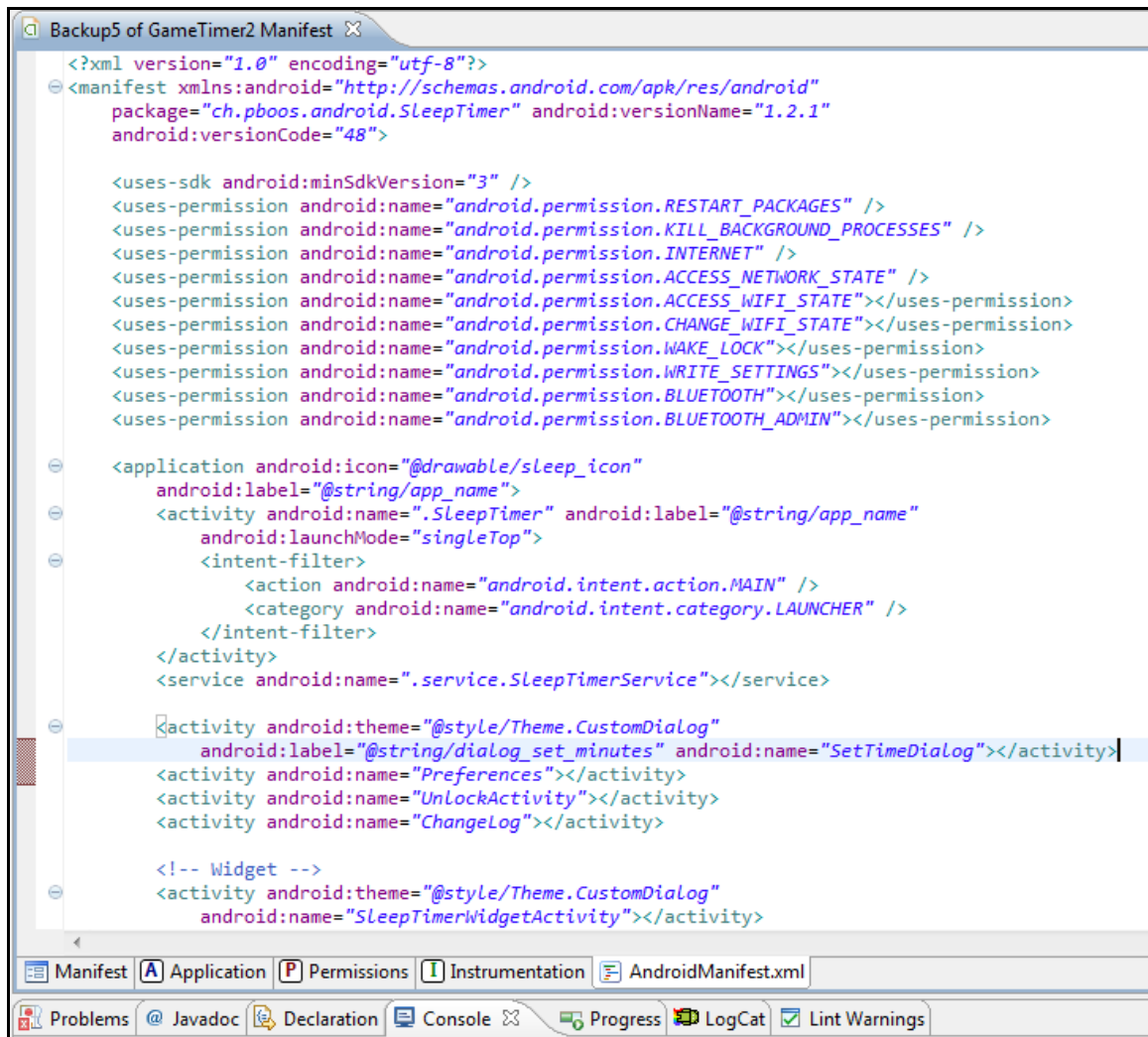
Appendix 1: Gantt Chart for Final Year Project 1

	JUNE			JULY			AUG			SEPT		
Presentation and Interview with selected parties												
Progress Report												
Programming and Prototyping												
Pre-EDX												
Dissertation												
Viva Presentation												
Final Dissertation												
Submit Technical Report												

Appendix 2: Gantt Chart for Final Year Project 2

	JAN	FEB	MARCH	APRIL	MAY
<b>PROPOSAL APPROVAL</b>	■	■			
Title Selection	■				
Gain Approval		■			
<b>ANALYSIS</b>					
<b>Phase 1 – Research on The Similar System in The Market</b>	■	■	■	■	■
Conduct research on the system		■	■	■	■
Submission of extended proposal				■	
<b>Phase 2 – Design Roughly for The System</b>			■	■	
Design the flow of the system			■	■	
Proposal defence and progress evaluation				■	■
<b>Phase 3 - Design</b>				■	■
Design flow chart for the algorithm				■	■
Submission of Interim report					■

## Appendix 3: AndroidManifest.xml



```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="ch.pboos.android.SleepTimer" android:versionName="1.2.1"
    android:versionCode="48">

    <uses-sdk android:minSdkVersion="3" />
    <uses-permission android:name="android.permission.RESTART_PACKAGES" />
    <uses-permission android:name="android.permission.KILL_BACKGROUND_PROCESSES" />
    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
    <uses-permission android:name="android.permission.ACCESS_WIFI_STATE"></uses-permission>
    <uses-permission android:name="android.permission.CHANGE_WIFI_STATE"></uses-permission>
    <uses-permission android:name="android.permission.WAKE_LOCK"></uses-permission>
    <uses-permission android:name="android.permission.WRITE_SETTINGS"></uses-permission>
    <uses-permission android:name="android.permission.BLUETOOTH"></uses-permission>
    <uses-permission android:name="android.permission.BLUETOOTH_ADMIN"></uses-permission>

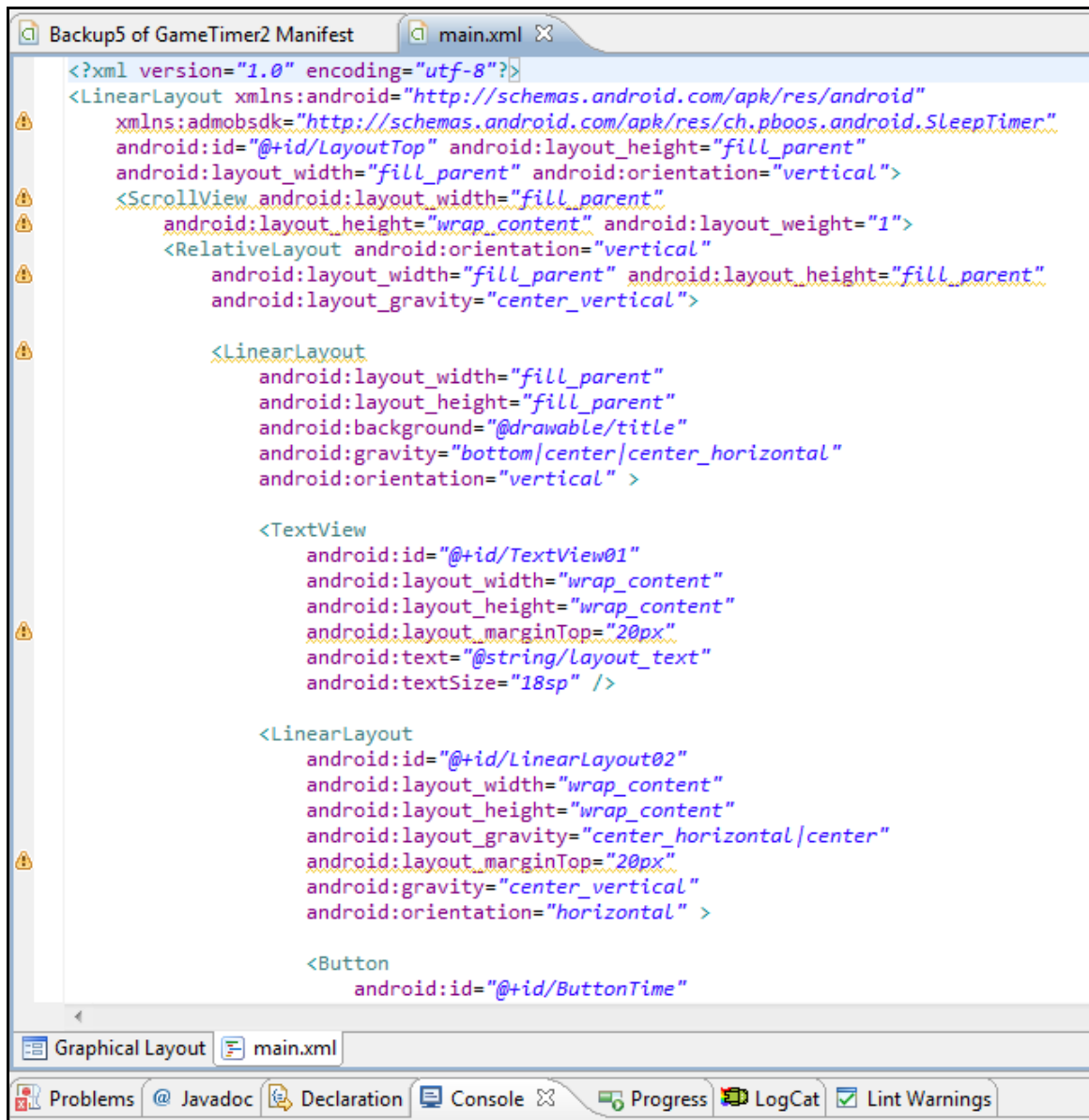
    <application android:icon="@drawable/sleep_icon"
        android:label="@string/app_name">
        <activity android:name=".SleepTimer" android:label="@string/app_name"
            android:launchMode="singleTop">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <service android:name=".service.SleepTimerService"></service>

        <activity android:theme="@style/Theme.CustomDialog"
            android:label="@string/dialog_set_minutes" android:name="SetTimeDialog"></activity>
        <activity android:name="Preferences"></activity>
        <activity android:name="UnlockActivity"></activity>
        <activity android:name="ChangeLog"></activity>

        <!-- Widget -->
        <activity android:theme="@style/Theme.CustomDialog"
            android:name="SleepTimerWidgetActivity"></activity>
    </application>
</manifest>
```

The screenshot shows an IDE window titled "Backup5 of GameTimer2 Manifest". The main area displays the XML code for the AndroidManifest.xml file. The code includes a manifest declaration with package name "ch.pboos.android.SleepTimer", version name "1.2.1", and version code "48". It lists several permissions: RESTART\_PACKAGES, KILL\_BACKGROUND\_PROCESSES, INTERNET, ACCESS\_NETWORK\_STATE, ACCESS\_WIFI\_STATE, CHANGE\_WIFI\_STATE, WAKE\_LOCK, WRITE\_SETTINGS, BLUETOOTH, and BLUETOOTH\_ADMIN. The application section defines an icon, a label, and several activities: SleepTimer (with a singleTop launch mode and an intent filter for the main launcher), a service SleepTimerService, SetTimeDialog (with a custom dialog theme), Preferences, UnlockActivity, ChangeLog, and SleepTimerWidgetActivity (with a custom dialog theme). The IDE interface at the bottom shows tabs for Manifest, Application, Permissions, Instrumentation, and AndroidManifest.xml, along with a toolbar for Problems, Javadoc, Declaration, Console, Progress, LogCat, and Lint Warnings.

## Appendix 4: Main.xml



```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:admobSdk="http://schemas.android.com/apk/res/ch.pboos.android.SleepTimer"
    android:id="@+id/LayoutTop" android:layout_height="fill_parent"
    android:layout_width="fill_parent" android:orientation="vertical">
    <ScrollView android:layout_width="fill_parent"
        android:layout_height="wrap_content" android:layout_weight="1">
        <RelativeLayout android:orientation="vertical"
            android:layout_width="fill_parent" android:layout_height="fill_parent"
            android:layout_gravity="center_vertical">

            <LinearLayout
                android:layout_width="fill_parent"
                android:layout_height="fill_parent"
                android:background="@drawable/title"
                android:gravity="bottom|center|center_horizontal"
                android:orientation="vertical" >

                <TextView
                    android:id="@+id/TextView01"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_marginTop="20px"
                    android:text="@string/Layout_text"
                    android:textSize="18sp" />

                <LinearLayout
                    android:id="@+id/LinearLayout02"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_gravity="center_horizontal|center"
                    android:layout_marginTop="20px"
                    android:gravity="center_vertical"
                    android:orientation="horizontal" >

                    <Button
                        android:id="@+id/ButtonTime"

```

## **A Mobile Application to Monitor Addiction on Game Playing**

Mohd Hafiz Bin Mokhtar

Computer and Information Sciences Department

Universiti Teknologi PETRONAS

Bandar Seri Iskandar, 31750 Tronoh, Perak, Malaysia.

feeziologi89@gmail.com

Vivian Yong Suet Peng

Computer and Information Sciences Department

Universiti Teknologi PETRONAS

Bandar Seri Iskandar, 31750 Tronoh, Perak, Malaysia.

yongsuetpeng@petronas.com.my

### **ABSTRACT**

Modern hand held devices such as smart phones and PDSs have become increasingly powerful in recent years. Dramatic breakthroughs in processing power along with the number of extra features included in these devices have opened the doors to a wide range of commercial possibilities. A lot of free games applications on the platform have driven the kids to spend their time more on the games rather than the studies. As parents, they will be surely worried about the children since the habit may slowly affect the performance on the examinations, school work and social interactions. Researchers say they found in a national Harris Poll survey that 8.5% of youths 8 to 18 who play tablet and computer games show collective signs of addiction that psychologists know exist in pathological gamblers, says Douglas Gentile, PhD, an assistant professor at Iowa State University [1]. Hence, this project will be focusing on the development of an Android application to control the utilization of a game by the kids whereas it will pause the game and alert the kids that they have reached the time limit set by the parents. Besides that, this application also will be

very useful for teenagers and students to manage their time between entertainment and studies.

**KEYWORDS:** Android, game timer

### **I. INTRODUCTION**

In this modern world, technology is the most significant element that will guide and drive us in every step we pass through. One of the fastest technology developments nowadays is mobile device. A mobile device or handheld device is a small, hand-held computing device which is normally designed with display screen, touch input, miniature keyboard and weighting less than 2 pounds or 0.91 kg [2].

The rapid development of mobile devices has opened up wide market for mobile games industry. Mobile games or digital games are games designed and played on mobile devices such as smartphones, feature phones, pocket PCs, personal digital assistants (PDA), tablet PCs and portable media players. The users usually need to download the games before installing it on their mobile devices. There are also certain games that have been preinstalled on the devices before purchasing. A research by



Flurry Analytics shows that in USA 49% of the mobile users' time is used for games instead of other applications.

A lot of digital games on the mobile devices have driven the kids to spend their time more on the games rather than the studies. As parents, they will be surely worried about the children since the habit may slowly affect the performance on the examinations, school work and social interactions. Researchers say they found in a national Harris Poll survey that 8.5% of youths 8 to 18 who play tablet and computer games show collective signs of addiction that psychologists know exist in pathological gamblers, says Douglas Gentile, PhD, an assistant professor at Iowa State University.

According to Chicago's WGN news health segment, the impact from the gaming makes the adrenaline occurred during gameplay makes the experience itself an addictive stimulant [3]. In other words, mobile games are like drugs that will make the addicted users never stop from playing them. The main concern from this situation is about children, students and teenagers as they are the major mobile games' users. A lot of negative effects may happen from the addiction of mobile games in which will lead to unbalance life of a user.

The development of the system aims to produce mobile application to: 1) Terminate a mobile game application when set time limit is reached. 2) Help parents to monitor and manage their kids' time management. 3) Help students to balance their life between entertainment and studies. 4) Reduce game addiction and enhance social bonding.

The scope of this project will include the game addiction among mobile or tablet users, the ways to resolve the issues and the education problems among students.

## II. LITERATURE REVIEW

The era of mobile computing, is driving among the largest shifts in consumer behaviour over the last forty years. Impressively, its rate of adoption is outpacing both the PC revolution of the 1980s and the Internet Boom of the 1990s. No matter where, everyone in this world own at least a mobile in which plays major role in their life and has become a symbol of fashion accessory in the market.

Since 2007, with the introduction of the iPhone [4], the smartphone age has moved to an accelerated speed. More and more mobile-related

companies have started to focus on opportunities in the mobile space.

A 424-page report released by Morgan Stanley entitled, 'The Mobile Internet Report' has explained in details about the fast improvement in mobile internet market on these recent years. In the report which was released on December 2009, Morgan Stanley predicted that the Mobile Internet market will be at least twice the size of Desktop Internet in 2010 [5]. The prediction was made based on analysis comparing Internet users with mobile subscribers. Since 2007, more than 500 million iOS and Android smartphones and tablets have been activated. By the end of 2012, the estimation shows that the cumulative number of iOS and Android devices activated will surge past 1 billion.

Google Android is now well ahead from Apple's iOS for iPhone in the stunning race for mobile operating system market share. The data by market watcher Nielsen released on June 2011 shows that Android OS owns 39% share on market while on the other hand, Apple has 28% share. With 20% market share, RIM's BlackBerry OS was in the third place and Windows Mobile OS was in the fourth place with 9% of total market. From the statistic we can see that most of mobile device markets today is conquered by Android based devices. This situation has opened a wide door for Android application developers to deploy their skills and develop more application for the users.

The increasing of hardware power as well as the decreasing of prices has made smartphone as a strong platform in mobile gaming industry. A lot of application developer companies starting to use smartphones as their medium to reach mobile gaming market segments. It is proved that the some mobile games have their own positive effects for the users. For example, there was a study conducted to investigate the effect of online multiplayer game on the quantity and quality of second language interaction in the game and on participants' willingness to communicate in the target language [6]. The result of the study is shown by the graph below.

Recent years, there have been researches and speculations about the potential of games to generate anti-social thoughts and behaviours among the players. For example, a research has been made and came up with statement of direct connection between violent games and violent behaviours and attitudes [7]. But, very little attention has been directed towards mobile

games as the less visual capability of mobiles does not give too much effect to the users.

However, if we could see nowadays, increasing of realistic graphic on mobile phone makes the violence and brutally of a game become more obvious. Moreover, the rise of adult content such as content from Playboy offered by Australia's first 3G operator, Three in early 2004 has "open the eyes" of the users especially the children and teenagers. Similarly, many software developers have offering adult content for mobile system [8] in both still and video formats.

The concept of the availability of adult content on mobile devices is similar with the internet pornography which will lead to social problems among users. The same goes to the brutal and violence graphics and action in some games, the children and teenagers will tend to "try" the actions in their real life as we can see from the increasing number of bullying cases in schools.

Moreover, the experience during the gameplay is an addictive stimulant. It is causing the kids forget about their friends, ignore schoolwork and become impulsive and hot tempered. Parents may helplessly witness how their children change habits becoming, from a normal kid, a miserable, withdrawn person, skipping school, being always angry when confronted, and stealing from family and friends to fuel their obsessions. And this personality and behavioral change can last for years.

### III. METHODOLOGY

In term of System Development Life Cycle (SDLC), Rapid Application Development (RAD) model is used. RAD is a term introduced in 1991 by James Martin<sup>1</sup> to describe a software development methodology that involves short iterations and relies partially on prototyping to complete specification requirements. In recent years, the acronym has been used in a broader sense to encompass a set of techniques (such as the use of frameworks) aimed at accelerating application development. RAD is often used in situations where time constraints force an approach in which faster application development is given priority over full functionality and performance.

In RAD model, the phases involved are design, develop, test and user review. The design of the application will be focused on the operation and interface. For the best result,

images will be designed by using Photoshop. All the coding steps will be made by using Eclipse IDE for Java Developers. To build a high class application or product it is usually consist of a series of milestone where different version of prototypes will be developed. The latest version will be better than the previous versions and each version will be tested and reviewed by the targeted users.

In order to successfully develop and deploy this application, researches have been done which are:

- Research about the steps to develop the application.
- Research about the programming language used to develop the application and how to implement it.
- Interview and seek for important information from the experts.
- Research on how to develop the user friendly interface of the application.

In analysis phase, actions taken are:

- Study and making comparison with available application in the market that has similarity with the project. The only application found is developed for iOS and it is paid application and also has some disadvantages.
- Research on how to develop the application. The common and most popular tool to develop an Android application is Eclipse IDE for Java Developers.
- Study about the flow of the application. It is consists of how to operate and manage the application in a right way.
- Discussion with Supervisor and experts. The discussion is very important because the Supervisor and the experts have higher level of knowledge to help me in this project. Examples of experts are my friends who have been working on Android project during their Internship Program.

In design phase, actions taken are:

- Study on the design of the interface of the application by making comparison with other similar application.
- Making basic draft of the interface. The main point of the interface design is it is user friendly and easy to operate.

- Building all the interface of the application including the main interface and setting interface.

On the other hand, in development phase, actions taken are:

- Moving the draft of the interface into the real one. The interface of the application must be done before the development of the application.
- Development of the application based on the RAD methodology. Development will be done after all the data and information have been collected and analyzed.
- User acceptance test (U.A.T). UAT is a test conducted to the users after a system is completely developed. The reason of the test is to check if there is any bug or error. The application will be rebuilt if bug and error is detected. If not, the application will be deployed to the actual users.
- Search for any tutorials or code example on the Internet as a reference for the development of this project.

Tools that have been used for the project are divided into two parts which are system development and interface design. For the system development phase, Eclipse [9] is the tool that has been used. Eclipse is one of the most popular Android development platform used by the majority of the Android developers around the world. It is open source software, hence a lot of tutorials and source code available on the internet. That is the main advantage of Android development using Eclipse. With java language, Eclipse is capable to build Android application and also design the layout or interface of the application using xml format.

To run the application that has been built, an Android Virtual Device (AVD) has been used. AVD is an emulator that stimulates a real Android device such as smart phone and tablet PC. In other words, AVD can be used as a medium to see how the Android application works on real Android devices without having to buy them on the market.

For the interface design phase, Adobe Photoshop CS5 has been used. The designs

created by the tool include images and logo of the game timer application.

#### IV. RESULT AND DISCUSSION

The system flow for the application is derived as below:

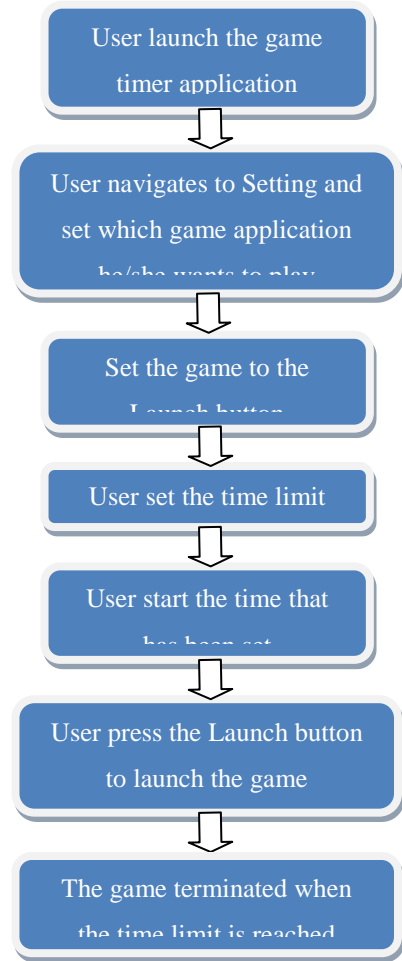


Diagram 1: Application System Flow

By following the system flow that has been generated, prototype of the application was developed. The prototyped was built by using the idea of keeping the system configuration as

simple as possible so that the chance of having good rating from the users is high. There are several steps where a particular user needs to follow to operate the system.

First of all, the users need to click the application's icon on the devices' screen. After the user is successfully logged into the system, they will be navigated to the main page interface.



Figure 1: Main Page Interface

The main page of the system consists of three main buttons which are the button to set the time, button to start the timer, and button to launch the mobile game. In order to display and select which game the user wants to play, he/she needs to press Menu button available on their gadget or mobile. The Menu button will display Setting and Quit button.

On the Setting page, the user will have two steps to set the game that he/she wants to play. First, he/she have to choose the game from the list where the list will display all applications installed on the mobile. After that, the user need to set the game application that he/she has chosen to the Launch button.

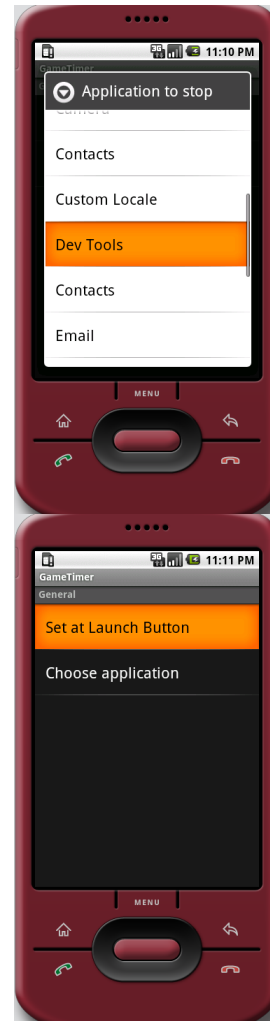


Figure 2: Setting Interface

After the user chooses the game application that he/she will be playing, the next step would be to set the time limit for the game. To do so, he/she have to move on to the main page where the button to set the time is located.



Figure 3: Timer Setting

Lastly, the user can start the timer and then launch the game application by pressing the Launch button.



Figure 4: Game Launching Button

User testing and review are essential before any deployment of any product in the market. It is very important because the data gathered from the process will determine whether a certain product is meeting or exceeding or below the customers expectation.

For this prototype, I have interviewed 10 people and let them to test it. Stated below is the result for the testing.

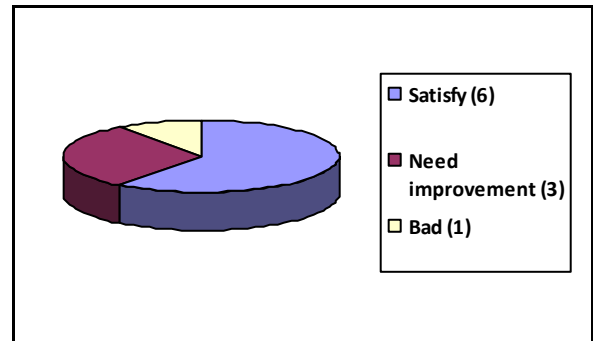


Chart 1: User Review

From the result of the User Review, 6 (60%) of the users are satisfied for the prototype. They stated that the operation of the system is very easy and may be successfully accepted by majority of the mobile users in the market.

On the other hand, 1 person or 10% of the overall users disliked the application. The reason for his statement is that the application is useless and impossible to meet the objectives.

Lastly, 3 person (30%) of the users accepted the application but with some improvements. For example, they said that the application needs to be improved in term of design and functionality such as adding more features.

In a nut shell, the prototype is working well and meets the expectation. However, it needs some improvements and features developments.

## V. CONCLUSION AND RECOMMENDATION

This Android project highlights the intelligent system to manage and monitor a user's addiction to a particular mobile game. This application is competent to generate the awareness for the mobile or gadget users about the drawbacks of playing mobile games for a long period of time. With continuous implementation, it is believe that the application will be able to:

- e) Reduce mobile game addiction
- f) Improve time management among users
- g) Improve students achievement on their studies
- h) Improve social involvement among users

For conclusion, the prototype that has been developed is working well according to the system objectives. The application is capable to “kill” and terminate any game application that is being played by the users.

However, a lot of improvement in term of interfaces design, features and usability need to be implemented to increase the performance, rating and usability of the application.

First of all, the application needs to have redesign phase where a lot of improvement in term of its icon, images, and interfaces have to be done. To make it easier process, comparisons with other Android applications can be done so that the standard will be at the same level.

Other than that, popup message can be added so that the application’s user-friendly feature will be improved. As an example, the user set the time limit for 5 minutes and then he/she plays the game. When the time reached 5 minutes, a popup message window will appear at the screen telling the user that the game will be terminated in 5 seconds. By adding this feature, the user will have some time before the game is terminated and the game will be not terminated in a sudden.

Another recommendation that need to be looked through is when the kids play another game instead of the game that was launched from the game timer application. The situation happened when initially the game timer launched Game A, but the kid then minimized Game A and then played Game B. So, the game timer application does not working with Game B. Recommendation that can be suggested is to put popup message that will disturb Game B after Game A is idle for 1 minute.

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