**Mobile Collaborative Task Tracker and Reminder**

By

Mohd Fuad Bin Ngah Demon

12016

Dissertation submitted in partial fulfilment of

the requirements for the

Bachelor of Technology(Honours)

(Information and Communication Technology)

January 2012

Universiti Teknologi PETRONAS

Bandar Seri Iskandar
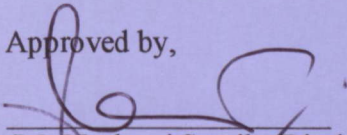
31750 Tronoh

Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

Mobile Collaborative Task Tracker and Reminder

by

Jamilul Fuad Bin Noris Darson

A project dissertation submitted to the
Computer Information Science Programme
Universiti Teknologi PETRONAS
In partial fulfilment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION AND COMMUNICATION TECHNOLOGY)

Approved by,

_____
Ms. Suziah Binti Sulaiman Senior Lecturer
UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
January 2012

CERTIFICATION OF APPROVAL

**Mobile Collaborative Task Tracker and Reminder**

by

Mohd Fuad Bin Ngah Demon

A project dissertation submitted to the
Computer Information Science Programme
Universiti Teknologi PETRONAS
in partial fulfilment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION AND COMMUNICATION TECHNOLOGY)
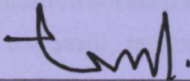
Approved by,

(Ms Nazleeni Samiha Binti Haron @ Baharon)
UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK
January 2012

3

# 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 acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

_____

Mohd Fuad Bin Ngah Demon

## ABSTRACT

In order to increase the efficiency of a project handled and making the team collaboration excellent, the project need to be managed properly and ensure well-organized communication. The project needs to be managed as such that each team member needs to be reminded about their deadline among each other. This will ensure the project going on smoothly according to the flow that had been projected. There are existing tools for this, such as Google task reminder, ReminderFox and others. Still, they are keenly use in an individual reminding rather than reminding the whole team. Given the smart-phones that are already there on the market, it can be used to create a reminder collaboration medium. Being a mobile device, it provides fast, easy communication between team members. For the reason that the device is always carried around, the email, reminder, and other communication services in it are hardly to be ignore. As the reason to this, the author came up with mobile-based apps, called *Mobile Collaborative Task Tracker and Reminder*. It's not only functioning to remind the whole team, but also to keep track of them, to measure their performance. It used the existing smart-phone, in this android are chosen where it can implement the communication features to ensure effective communication for reminding.

## ACKNOWLEDGEMENT

**Table of Contents**

## TABLE OF FIGURES

# CHAPTER 1: INTRODUCTION

## 1.1    Background

Mobile Collaborative Task Tracker and Reminder is a mobile based application. It aims to provide users a collaborated platform with a good User Interface for a better task reminder in a mobile so that the user can access it anywhere, anytime. The reminder is generated by the application and trigger to those who are involve in the same task. Upon approaching the dateline, a reminder will be generated by the system and sent to the respective staffs .One staff or the supervisor will create the reminder with description, where the reminder  involve group, into the Mobile Collaborative Task Tracker and Reminder. And every staff in the group will receive the reminder from their mobile, where they have their own Mobile Collaborative Task Tracker and Reminder. The feedback (whether the task is finished or overdue) of the tasks/projects can be recorded to measure the KPI of the task owner, whether he/she meet the dateline or other way around.  It can be essential for supervisors in managing their staffs.

## 1.2    Problem Statement

In the problem statement, the author has divided it into two groups. The first group is the workers and the second is the student.

1. Worker/Employees

    1.2 Meeting dateline

    > Most of people tend to forget their task and dateline. And when they exceeded their dateline, the progress of the project will slow down.  Most of the people have their own way to remind themselves, such as putting on sticky notes and papers but turn out, it doesn't work well as they tend to misplace the notes and paper. Regarding to the reminder they set on their

pc, turn out it was not really that reliable at all, as at some time, when the reminder alert the user, the user may not be in front of the PC.

2. Students

   2.1 Existing email reminder

   Most of the student are ignoring the campus mail and prefer the latest technology such as text messaging, plus their own email [22]. This happen as they can view their text and personal email everywhere and anytime as nowadays smart-phone provide these features to the. Most of the project updates that project manager or lecturer send to that email will be missed by the student.

3. Worker and students

   3.1 Mobility in handling task

   There exist a few applications such as desktop shared workspaces, where users (student and worker) can sit down in front of PC and have a discussion; and remind each other about their dateline that they need to meet, but not everyone have time to spend on the desk and workspace. People need to bring up the system into mobile, so it can help to remind everyone, even though they are not at their workspace.

10

### 1.3 Objective and Scope of Study

### 1.3.1 Objectives

The two main objectives to be achieve in this projects:

- To study and analyze the requirements for mobile collaborative task tracker and reminder
- To design and develop a user-friendly mobile collaborative task tracker and reminder

### 1.3.2 Scope of Studies

The four main elements for the scope of studies:

- Android OS Smartphone
- Collaborative reminder and tracker
- Interface of how the system should be and reminders looks like
- Students that involve in group project

### 1.3.3 Relevancy and Feasibility of the Project

The relevancy and feasibility of this project are summarized as following:

- Scope
- Adoption
- Technical knowledge

**Scope**

Firstly, the scope of the project involves 4 elements as discussed above – Collaborative reminder and tracker, Android Smartphone, Interface of the reminder and the students that involve in group project. The project has limit down the scope in order to deliver the project on schedule. In this case, the target user is the student that involve in group project

## Adoption

From the report that are prepared by Gartner, total sales of worldwide mobile devices in the year 2010 are 1.6 billion units worth which has a positive increase of 31.8 percent compared to previous year. Plus, there were strong significant sales of Smartphone at the fourth quarter of the year. The sales of Smartphone contribute a 19 percent to the total percentage of mobile communication device sales in 2010. [10]In viewing the sales of Smartphone grouping by their Operating System, its shows a positive climb for Android platform phones. Hence, there is a need of applications for and highly relevant to do project for Android OS Smartphone.

### Technical knowledge

Android apps are written in java. The author has an intermediate level of knowledge in java based on previous few courses that the author has taken. The author has been switching languages for programming from C++, to java, and to visual basic (vb). During the 8 month of Industrial Internship at Bursa Malaysia, the author have been using language vb to develop a full web based system for the usage of the whole department, and it was my first time using vb language. The result is pretty successful, as the system is a success and still being used by the department from Jun 2011 until current (2011). Throughout the years, jumping through each language in developing system, the author found there are not much different in every language as all the function are basically the same. Even it's the first time for the author to develop an application for android, it is believed that he can carry out the project

12

# CHAPTER 2: LITERATURE REVIEW

The research is mainly discussing about the collaboration between mobile and how it can help on managing project better. In this research the author emphasizes on the proposed solution has been stated previously on the introduction.

## 2.1 Student environment

In most of the universities, projects are more often to sign in to groups. They are assigned at 5 to 6 persons per team. This is prior to the discipline outlined in the ACM/Computer Society curricular guidance, as quoted *"on Computing, must include updated professional practice as an integral component of the undergraduate curriculum"-CS2008*. The practice include management and working as part of the team [1]. Aligning to the curricular guidance, some universities particularly instruct the students to work a project in group. Promoting collaboration can yield developmental benefits [13] [14]. This is because in discussion of group, more ideas can be generate, comparing doing a brainstorming alone. Plus, by having fleeting dialog and consumption enables interactive learning, and allows sharing artifacts which enables *constructionist* learning [13]. Nevertheless, there is lack of tools to sustain effective communication among teammates, despite that the communication is important on handling the project.

## 2.2 Team project and tools

In the team project, where the students are from different backgrounds, they may have widely varying schedules. As research that been done by Michael A. Redmond, There are computer science majors that are part-time, and many classes are at night [2]. Part times are such that their days in schools are varying from normal student, and they only available for meetings and assignments on evening or weekends. Well-matched time

schedules in a grouping are critical plus it is hard to find compatible time schedules within a group [2]. In a university where the students have a wide mix of schedules, a crucial aspect of successful group formation is depending on the compatible time-schedules within a group [2]. So, the methods of communicating between them is crucial, the message between them need to deliver in good time, as all of them need to know the updates of the project, the distributing of tasks and meetings. Being able to communicate in mobile is important. Dropping by, having an ad hoc meetings and other forms of sidestepping require flexibility from other mobility plans. Importantly, these collaborative productions often occur in a turn taking manner [10] that requires cautious *timing and orchestration* of individual actions and reaction [9]. Furthermore, in a current condition, where there are an increasing amount of business done by persons on the move. (I.e. according to management consultancy Booz Allen & Hamilton, *"67% of professional workers in Europe are away from their desk or work area more than 20% at the time, which is to say that the need to keep appointment schedules, task list up to date while on the move has never been greater"* [12]). While moving away from desktop, the situation should not hold back the user from accessing information needed for cooperating with the other group members [16]. Currently people apply shared workspace applications and its have been widely investigate in the CSCW field and have proved doing well in supporting different forms of cooperation [17]. However, desktop shared workspaces are most of the time useless especially when people are in meetings, traveling, etc. There exist some mobile tools out there somewhere in the world, however, the existing tools mostly fail to present the mobile users with contact to the resources and tools that can be relevant for an ongoing cooperation [16]. Developing the right mobility tools, can benefit both students and workforce.


## 2.3 Needs of reminding and reminder type

A person tends to forget, and when they do, they will fail to deliver their task on time. When that happens, it decreases the efficiency of the project. That's where the job of reminder came in. Reminder reminds people, reminding people about their task and datelines. We need a reminder as Don Norman States: "keeping the knowledge in your

14

head is not ordinarily a good reminding technique." [6][7]. Furthering the subject, Reminding is one of the most frequent issues users deal with in their daily life [5]. In such of how do people remember, strategies that people claim that they use can be grouped into five categories: Paper based (i.e.: calendar), technological and specialized (e.g. mobile phone reminder and pill boxes), temporal (i.e. integration into routines), people based (i.e.: phone call from friends), and physical (placing books to be returned near front door) [4]. Most of the time people use paper and sticky notes and wrote down thing that they want to remind themselves. It is a popular medium for recording everyday tasks. It's cheap and universally available. However, task details written on paper is easily misplaced [18]. A person needs something that they carry around all the time, with low probability of misplacing it.

In a way of receiving the reminder, an intrusive reminder presentation styles are much less acceptable, in general, than mildly intrusive presentation styles, regardless of reminder content and task context [3]. So the reminder should be arise at the right time, i.e. when the user are not busy with their mobile, or the reminder should be pop-up only when the mobile in the idle state. Furthering the way the reminder should approach the user, it is stated that in approaching, in a way to inform the design of configurable, adaptable reminder system, should be sought by determine, (1) what users need to be reminded of, (2) Why users need reminders, (3) what strategies are used to remember, i.e what techniques' and technologies are currently used and (4) How users would like to receive reminder [4]
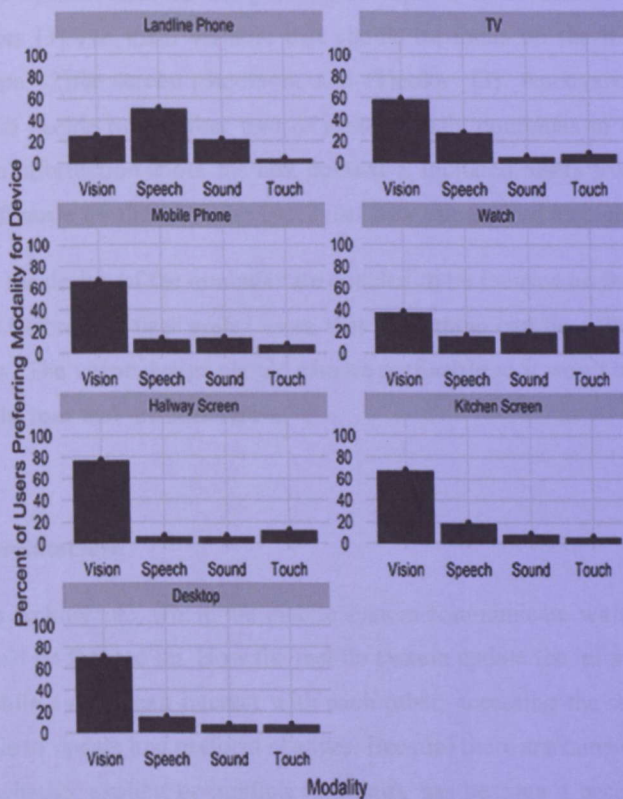
Figure 1 Modality preferences by device for people who prefer only one modality [4]

Through figure 1, it is clearly that the user preferring to have more interface with the vision part, in such of everything could be understand and deliver through vision. Its scores highly compare to speech, touch and sound. Maybe it is due to the fact, that it is a mobile device, you carry it around and having it talking around you all day are pretty annoying.

Furthering to the research of how should the message is displayed to the user, or exactly, how the reminder should looks like. The reminder of the task should not be annoying, as they user might find it objectionable and ignore the function of the application. All the way through the findings, it was said that different users have different preferences; in

16

conclusion the system must be designed to be capable to be skilled and get used to individual users [3]. The main variable that should be focus on the reminder styles is (1)window type, (2)the screen placement, and (3)color [3]. Annoyances are the main aspect that will decide on whether user of system really continues to interact with the system. When information about the task context is included, users frequently reported their vary preference for the reminder types that they categorized as highly annoying [3].

Through this, the design of the reminder are decided to be focused on the vision, as what are discussed before, the user prefer more that everything can be deliver throughout a single display. The vision design should also be preferable so it won't be to annoying as it will make the user feel uncomfortable.

## 2.4 System architecture

In the system architecture, where the mobile system communicate with the server is the part that should be focused on. How the mobile system update the information, and how the other mobile system can interact with each other, accessing the same information, and being able to update and perform changes. Because there are numbers of client, data replication, whether explicit or implicit (caching), has become a necessary element in wireless applications. The system should have the need for rich data modeling primitives and flexible but easy-to-specify conflict definition and resolution [11]. To meet these requirements, sync is proposed to the system. Sync will provides high-level primitives, for predefined classis, that enable developers/system admin to create arbitrarily complex, synchronized, and replicated data objects [11]. Throughout the development, sync may be used to develop the collaboration between mobile.
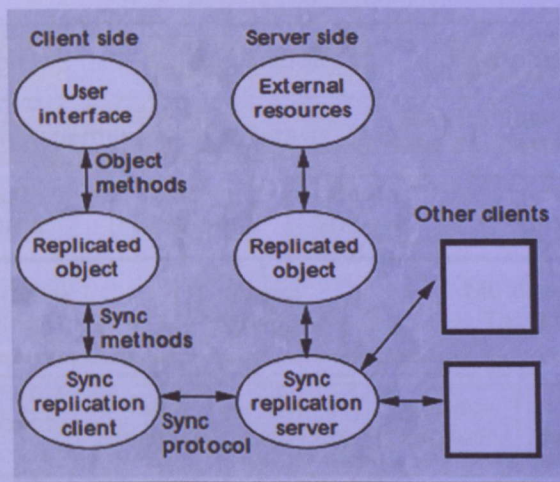
Figure 2 : Sync basic system model [11].

Figure 2 show an example of how sync can be applied in a system. Sync enables changes to information stored on one device, next to be automatically replicated to the other device either locally or remotely and in the end, all other devices that contain the same record, such as laptop PCs or the corporate network server [12]. The replication information that allows concurrent modification may conflict each other. Considering conflicts in a way of, one user modifies, the other users deletes it. To avoid the conflict, it is suggested to divide the copy of at the remote and local [15]. In using the system, the user might not on online state (connected to the network) all the time. There is still considerable in allowing the system to store information offline (taking into consideration where the user might come up with a great idea, but can't update the idea, as there's no connection available) and update it when there's a connection. But considering the data replication and conflict resolution is the most complex part on offline update [21], the idea is still in consideration.

18
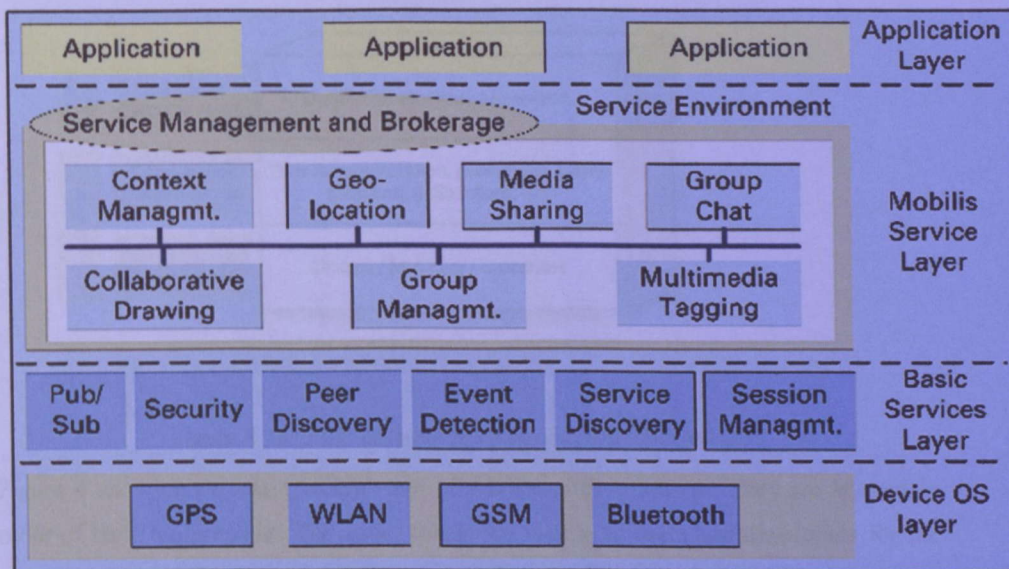
Figure 3 : the Mobilis conceptual architecture [19].

Figure 3 show an example of conceptual architecture layer. Mobilis conceptual architecture for mobile collaboration consist of four layers as in figure 3,(1) The device OS layer, either Windows Mobile, Symbian OS or OS layer in Android, (2) basic Services layers,(3) mobilis services layer contains services for supporting mobile collaboration, and (4)Application layer, where the application resides [19]. The same basic structure goes to every mobile application. These conceptual architecture layers possibly are going to be applying to the proposed mobile system. The systems (mobile application) are not supposed to be too complicated or power and ram consuming. It should be useful and convenience. Battery power represents the critical physical limitation faced. Most of the question asked by user is *"how long can I use my phone if I run this application?"* [20], regarding to this, it is important to understand the power consumption characteristics of each component of the mobile in order to design energy efficient application [20].

19
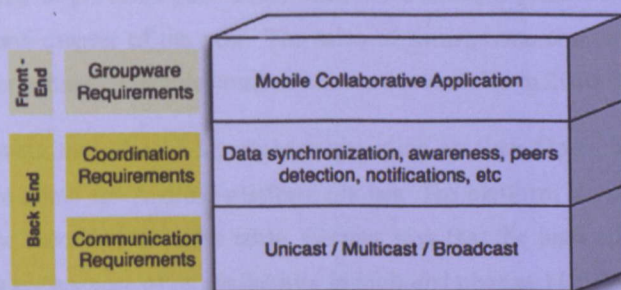
Figure 4 : Mobile collaborative system architecture [27]

Figure 4 showing the basic architecture of a collaborative system. They are layered in order of their requirement. The upper levels are visible to users and developers for the reason that they are mainly related to the application front end [27]. They describe the functionalities that a specific application has exposed to end-users. Requirement which are related to the communication and coordination layers correspond to functionality are placed on the back end [27]. It is invisible to the Client and developers as they are unaware of this issue. Since these are general requirements that are difficult to be indentifying, no traditional elicitation method can be used to proof them [27].

Overall, the system that is going to be developed should be in a way that it can support mobile team collaboration and increase the efficiency of a project. Furthering that it can support the project need to be manage properly and ensure well-organized communication. Plus, providing the right tools of sharing information, keeping tracks of the data and remind each other. In the end, the system should be well build and analyzed so it can support the user efficiently and not troublesome.

## 3 Technology should be used

From the report that are prepared by Gartner, total sales of worldwide mobile devices in the year 2010 are 1.6 billion units worth which has a positive increase of 31.8 percent

20

compared to previous year. Plus, there were strong significant sales of Smartphone at the fourth quarter of the year. The sales of Smartphone contribute a 19 percent to the total percentage of mobile communication device sales in 2010. [10]

In viewing the sales of Smartphone grouping by their Operating System, its shows a positive climb for Android platform phones. The platform grew 18.8 percent and made it to the second rank in the table. Gartner says that the high sales of Android platform phones are because of its availability in high-end phones. [10][23]

**Worldwide Smartphone Sales to End Users by Operating System in 2010 (Thousands of Units)**

| Company | 2010 Units | 2010 Market Share (%) | 2009 Units | 2009 Market Share (%) |
|---|---|---|---|---|
| Symbian | 111,576.7 | 37.6 | 80,878.3 | 46.9 |
| Android | 67,224.5 | 22.7 | 6,798.4 | 3.9 |
| Research In Motion | 47,451.6 | 16.0 | 34,346.6 | 19.9 |
| iOS | 46,598.3 | 15.7 | 24,889.7 | 14.4 |
| Microsoft | 12,378.2 | 4.2 | 15,031.0 | 8.7 |
| Other Oss | 11417.4 | 3.8 | 10432.1 | 6.1 |
| Total | 296,646.6 | 100.0 | 172,376.1 | 100.0 |

Source: Gartner (February 2011)

Figure 5 : Worldwide Mobile Device Sales by OS in 2010

From the figure 5, we can see that the number of Android platform Smartphone will be more than other OS in few years time. Hence, there is a need of applications for and highly relevant to do project for Android OS Smartphone.

## 4   Existing systems review

ReminderFox: is a simple reminder application for Firefox. It's a browser based application, where you have to install it on Mozilla Firefox, and with it, we can put notes on what to reminder on alarm on when the reminder should be triggered. But still,

it's a great and simple system, where the user interface are not troublesome for the user but still, it doesn't move with the same objective as what the author want to achieve, which is to have a mobile collaborative reminder as currently ReminderFox only support personal use, where the reminder only trigger to one person only.

Taskaid: is a mobile reminder which supports android and iOS where the reminder reminds the user at wherever they want (Location based) and whenever they want (Time based). It comes with unique new feature that allows user to share Time Based or Location Based reminder through mobile phone and website. But several comment come from the users as the application did not come handy with android application and upsetting them. Regarding to this, the author are aiming to come up a better interface that can facilitate the user with the interface in using the reminder.
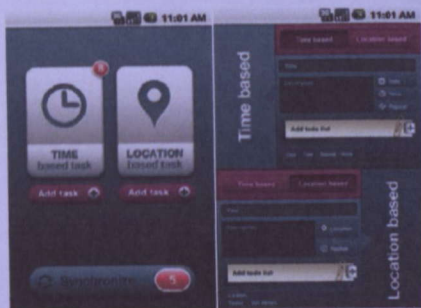


Figure 6 : Taskaid application [26]



alopix on October 11, 2011
★ ☆ ☆ ☆ ☆  **No thanks**
The user interface is not designed for Android and therefore horrible. The buttons/icons are almost not clickable because they are way to small for fingers! Time and location based tasks would be great!

Titch on October 27, 2011
★ ★ ★ ★ ☆  **It's good but.....**
It's not been optimised for android as some of the controls are small and even not rendered correctly on the screen. Other than that it's really good

Figure 7: Screenshot of the user comment on Taskaid application [26]

# CHAPTER 3: METHODOLOGY

This project adopts the Software Development (waterfall) as its system development methodologies. This method is applicable in creating the system as the basic requirement need to be gather in order to develop the system and also to design an appropriate interface, layout, and interaction that are suitable. And follow by the verification of the system and maintenance after the delivery of the system. Figure 3.1 shows the structure of the waterfall methodology.
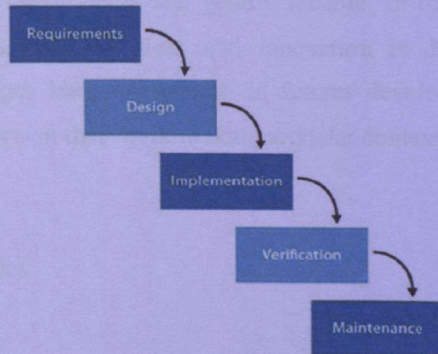


Figure 8 : Structure of Traditional Software Development (waterfall)

The research methodology includes set of procedures listed below:

- Research Methodology
- Project Activities
- Key Milestone
- Gantt Chart
- Tools

## 3.1    Research Methodology

The research methodology for this project involves review of books, journals and other resources which has information related to the research project. The main information

source is from the Internet especially the UTP's e-resources (online subscription), most of articles are taken from ACM digital library. The first stage of the research is finding my scope, so that a clear view can be obtained on what are the things that going to be developed and whether it can be deliver or not. Then continue on looking up for any articles and journal on any reminder application, and looking on what aspect they focus on developing, and what weakness that they found in other application. The research continues on finding the possibilities of bringing the application into mobile, and enhances it to have it user-friendly and greatly reliable. In the end, finding the right forums where users share their ideas and innovation in developing their mobile application, to exchanges ideas an opinion in futures development. This enables to further enhance and learn on their work in that particular context.

## 3.2    Project Activities

In the beginning of the project, everything is focused on the theoretical reading and understanding the project scope. In this stage, critical analysis of the past experiments and projects on mobile application, and reminder is needed.

Through the whole development of project, the analysis that have been done will be use to develop the framework of the system, determine the best server to reside the database for the system and obviously finding the suitable device that would be used to place the prototype of the system. The next step is developing the system. To begin, there are always the tutorials to follow in order to understand how the whole process works provided on the net and forum. Then continue developing the system, part by part and testing it. The whole process need to be repeated while developing more other part until finally, finishing the whole system.

## 3.3    Key Milestone

24

Below are the key milestone that need to be achieve throughout both of the semester if final year project 1 (FYP 1) final year project 2 (FYP 2).

**Semester 1**

| Milestone | Week |
|---|---|
| Project Proposal | Week 3 |
| Extended proposal (10%) | Week 6 |
| Proposal Defense (40%) | Week 9 |
| Interim Report (50%) | Week 11 |

Figure 9: FYP I Milestone

**Semester 2**

| Milestone | Week |
|---|---|
| Progress Report (10%) | Week 7 |
| Pre-SEDEX (10%) | Week 10 |
| Dissertation (40%) | Week 12 |
| VIVA (30%) | Week 13 |
| Technical Report (10%) | Week 14 |

Figure 10 : FYP II Milestone

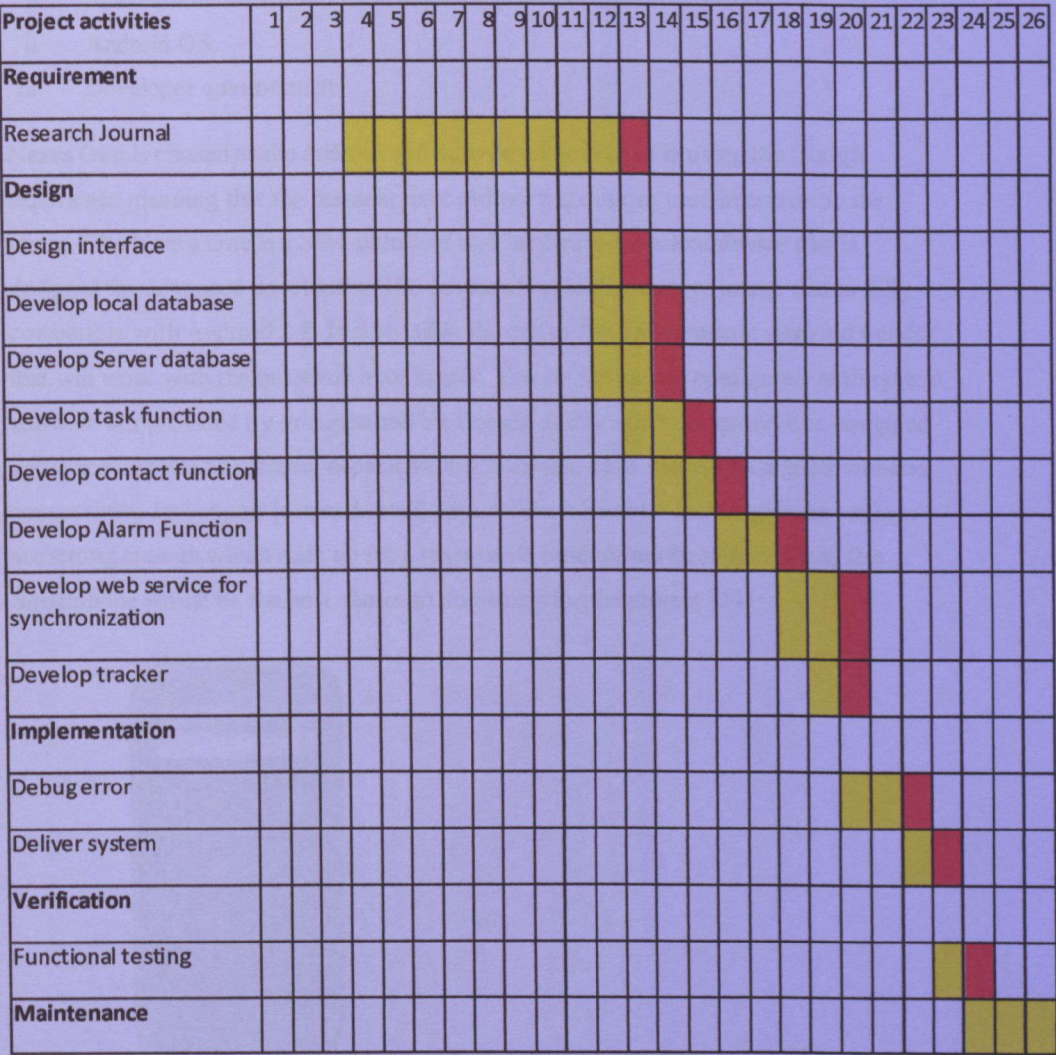| Project activities | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Requirement** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Research Journal | | | | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▨ | ▧ | | | | | | | | | | | | | |
| **Design** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Design interface | | | | | | | | | | | | ▨ | ▧ | | | | | | | | | | | | | |
| Develop local database | | | | | | | | | | | | | ▨ | ▧ | | | | | | | | | | | | |
| Develop Server database | | | | | | | | | | | | | ▨ | ▧ | | | | | | | | | | | | |
| Develop task function | | | | | | | | | | | | | | ▨ | ▧ | | | | | | | | | | | |
| Develop contact function | | | | | | | | | | | | | | | ▨ | ▧ | | | | | | | | | | |
| Develop Alarm Function | | | | | | | | | | | | | | | | | ▨ | ▧ | | | | | | | | |
| Develop web service for synchronization | | | | | | | | | | | | | | | | | | | ▨ | ▧ | | | | | | |
| Develop tracker | | | | | | | | | | | | | | | | | | | ▨ | ▧ | | | | | | |
| **Implementation** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Debug error | | | | | | | | | | | | | | | | | | | | | ▨ | ▧ | | | | |
| Deliver system | | | | | | | | | | | | | | | | | | | | | ▨ | ▧ | | | | |
| **Verification** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Functional testing | | | | | | | | | | | | | | | | | | | | | | | ▨ | ▧ | | |
| **Maintenance** | | | | | | | | | | | | | | | | | | | | | | | | ▨ | ▨ | ▨ |

Figure 11: the Gantt chart for the whole project development

3.5     Tools

The hardware specifications of this project:

i. Smart-phone with build in WiFi or supporting HSDPA/GSM/3 G .
ii. Android OS.
iii. Developer environment

Nexus One is chosen as the android software development as is using the Google experience meaning that the manufacturer did not put custom user-interface on the phone. The Nexus One is a SIM-unlocked and hardware-unlocked device that is designed for advanced developers. The device ships with a system image that is fully compatible with Android 2.2. It is possible for one to flash any custom Android builds that will work with the unlocked boot loader. The device can be configured with system software not provided by or supported by Google or any other company. It is equipped with super AMOLED screen, capacitive touch screen, 16M colors and a good wireless connectivity. Its support java and email application. The color and brightness settings are strong enough which adds up for a reasonable outdoor performance. Thus, this Smartphone would be the best choice to do testing for the project [24].

Figure 12: Nexus One

The suitable environments for the development are eclipse 3.2.3.3, eclipse JDT plug-in and JDK 5 or 6.

And an emulator, as the application may be running on a real device or an android emulator, which equipped with the android SDK.
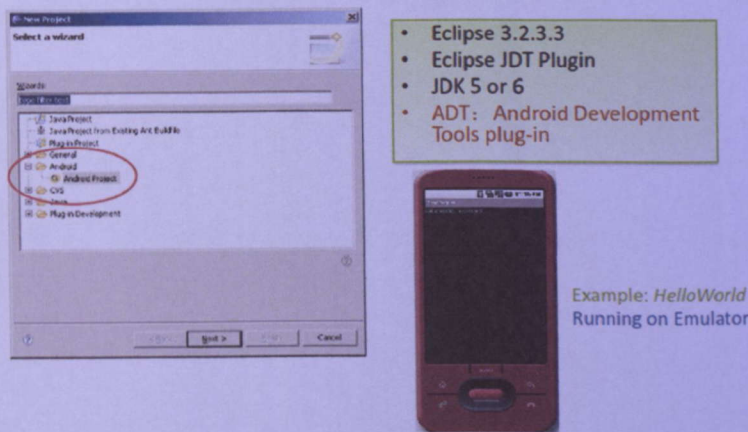


Figure 13 : The environment for android development. [24]

In developing the system, the author chose Android 2.2 Platform with *API Level:* **8.** Android 2.2 is a minor platform release which includes user features, developer features, API changes, and bug fixes. The average API level of current user is around level 8, and even if the users are using a platform which has higher API level, the author did not have to worry as because of the android forward capability. Android applications are generally forward-compatible with new versions of the Android platform. It is because of almost all changes to the framework API are additive, an Android application developed using any given version of the API (as specified by its API Level) is forward-compatible with later versions of the Android platform and higher API levels. The application should be able to run on all later versions of the Android platform, except in isolated cases where the application uses a part of the API that is later removed for some reason.

## 3.6    System Flow

As shown in the figure 3.4 are the flow of how the system should work. Most of the system function are preferred to be done when the system are online, as to ensure that

28

the data will be updated at the same time, to avoid any conflict of data replication, except for the creating reminder itself, which can be done during on offline, and can be updated later on because the time of creating the reminder are not crucial.

Start

create reminder?

yes

create reminder

include people and time to remind

save in local database

No

currently connected to internet?

Update to main database

view tracker

No

No

Have reminder?

yes

send data to people to remind

trigger each's local database to update to main

No

yes

have been reminded?

Remind

No

No

yes

exit Task Reminder?

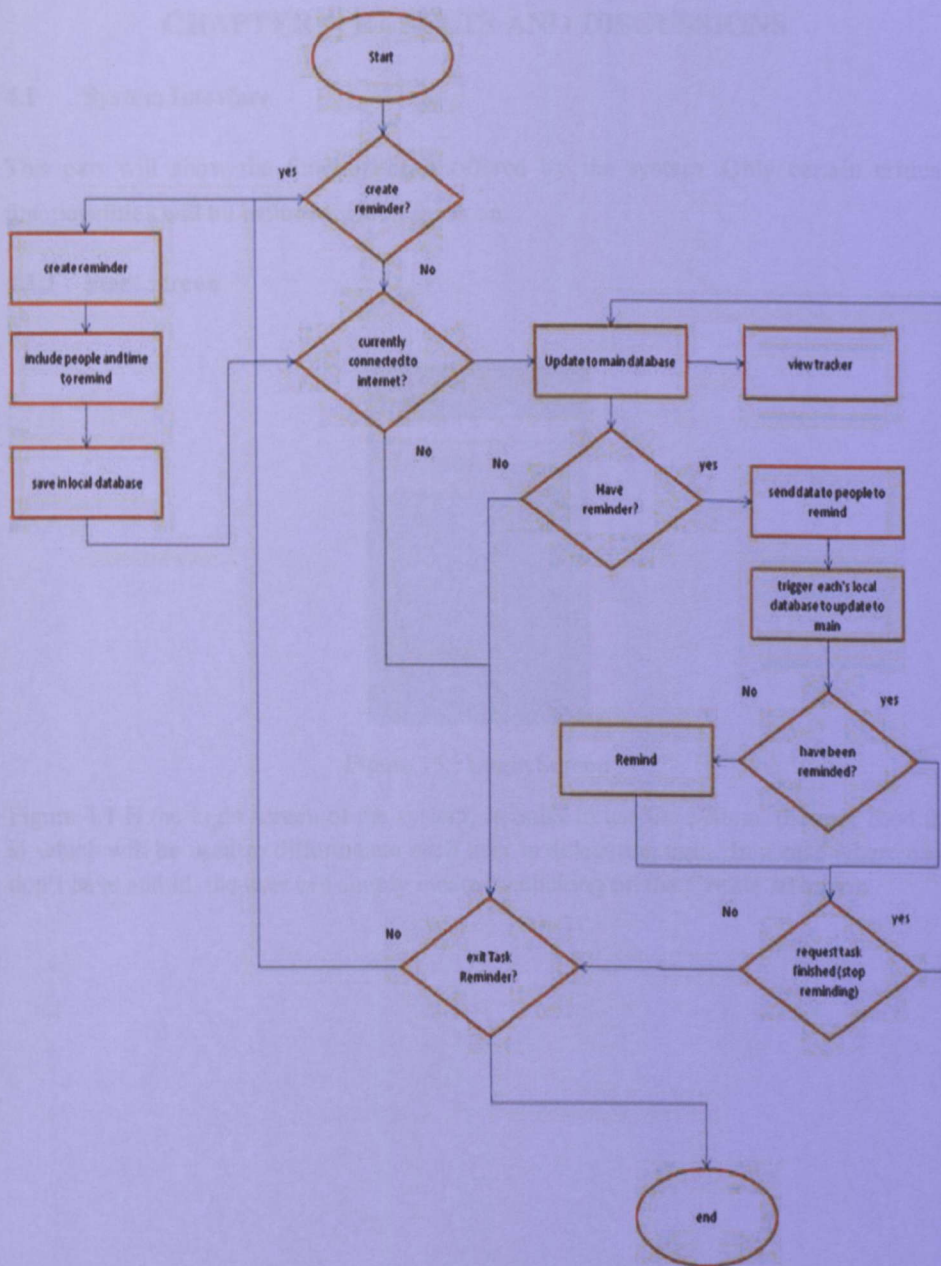request task finished (stop reminding)

No

yes

end

Figure 14 : Flow chart of the system

30

# CHAPTER 4: RESULTS AND DISCUSSIONS

## 4.1    System Interface

This part will show the functionalities offered by the system. Only certain critical functionalities will be included which focus on.

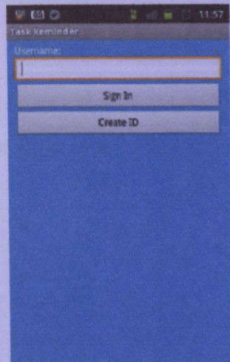### 4.1.1    Start screen



Figure 15 : Login Screen

Figure 4.1 is the login screen of the system, in order to use the system, the user need an id which will be used to differentiate each user in delegating task. In a case where user don't have and id, the user can simply create by clicking on the **Create Id** button
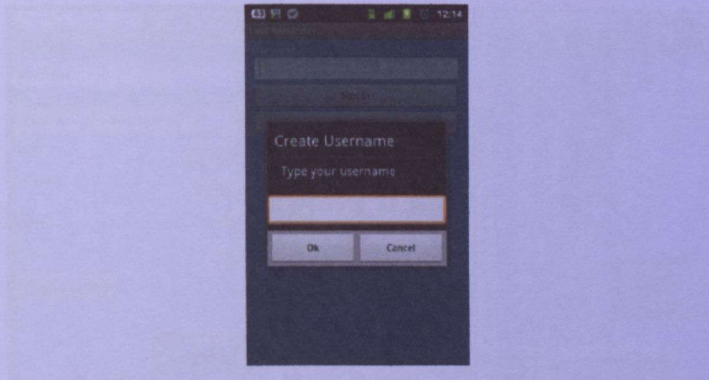
Figure 16 : Create Id

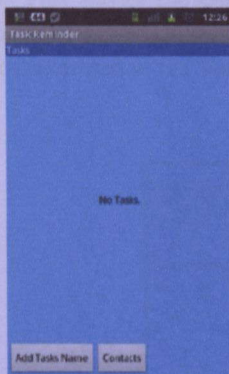Figure 16 shows the prompt out box that allow the user to create their id.
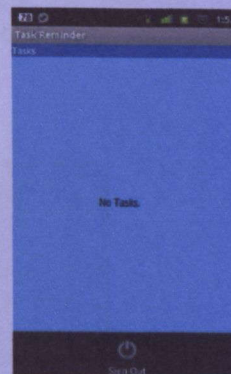


Figure 17 : Main page



Figure 18 : Sign out button

Figure 17 shows the main page of the system that list out the task that is assigned to the user. From here the user are given an option to add new task or contacts. The contacts are list of people the user can assign the task to. By pressing the menu button on the android phone will pop up the sign out button for the user.
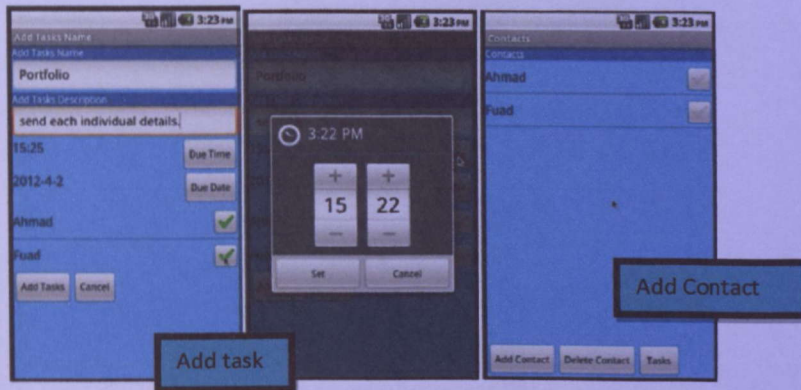
32

Figure 19 : Adding task function and contact.

In adding the task function, the user is able to set the task name, description, time and date for the reminder to be triggered and also those who are going to receive the reminder. This shows the collaborated part of the system. The user also is given the option to add new person in the contact list in a case that there are more people involve needed to be remind in the same task.
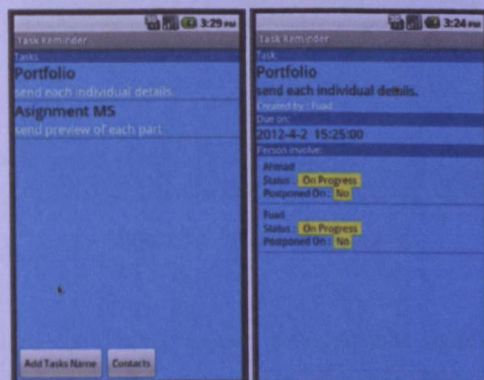


Figure 20 : Main page and task details page.

After adding the task, the main page will list out the task, and by clicking on the task name, user will be redirected to the task details, which show the details of the tasks.
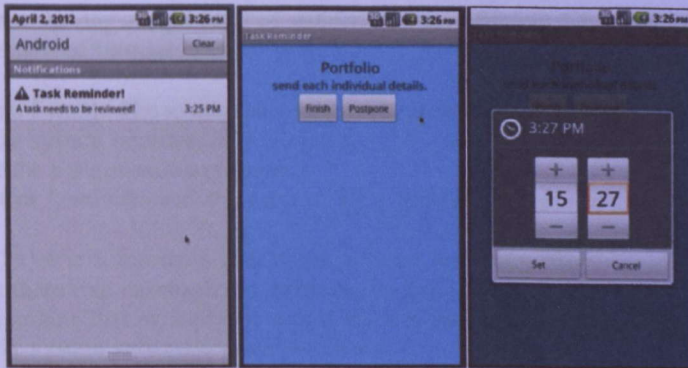
Figure 21: Reminder notifications.

Upon reaching the reminder date, a notification will be prompt to the user, and up to the user to answer whether the task is finished, or need to postpone the reminder further.
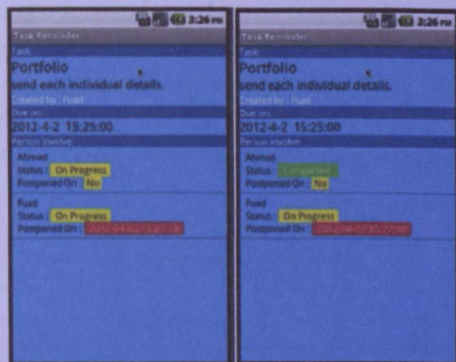


Figure 22 : Task tracking

Figure above show how the tracker is used to track each individual status. Where in figure 22 shows the status of Fuad, which are still in progress, and Ahmad which has finished his task.

## 4.2    Data Analysis

In analyzing the usability and learnability to show the user-friendly of the system, The System Usability Scale (SUS) is used. It's a ten-item scale giving a global view of subjective assessments of usability. The SUS technique is used as its cover a variety aspect of system usability, which includes the need of support, training, and complexity

which leads to having a high level of validity for determining the usability of a system. The SUS consist of 10 questions:

1. I think that I would like to use this system frequently
2. I found the system unnecessarily complex
3. I thought the system was easy to use
4. I think that I would need the support of a technical person to be able to use this system
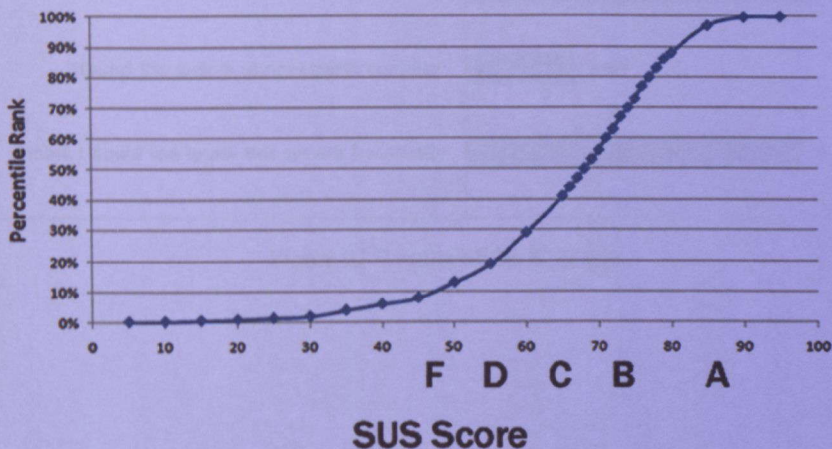5. I found the various functions in this system were well integrated
6. I thought there was too much inconsistency in this system
7. I would imagine that most people would learn to use this system very quickly
8. I found the system very cumbersome to use
9. I felt very confident using the system
10. I needed to learn a lot of things before I could get going with this system

**Scoring SUS.**

- For odd items: subtract one from the user response.
- For even-numbered items: subtract the user responses from 5
- This scales all values from 0 to 4 (with four being the most positive response).
- Add up the converted responses for each user and multiply that total by 2.5. This converts the range of possible values from 0 to 100 instead of from 0 to 40.



The Figure below shows the result from the SUS test.

# System Usability Scale

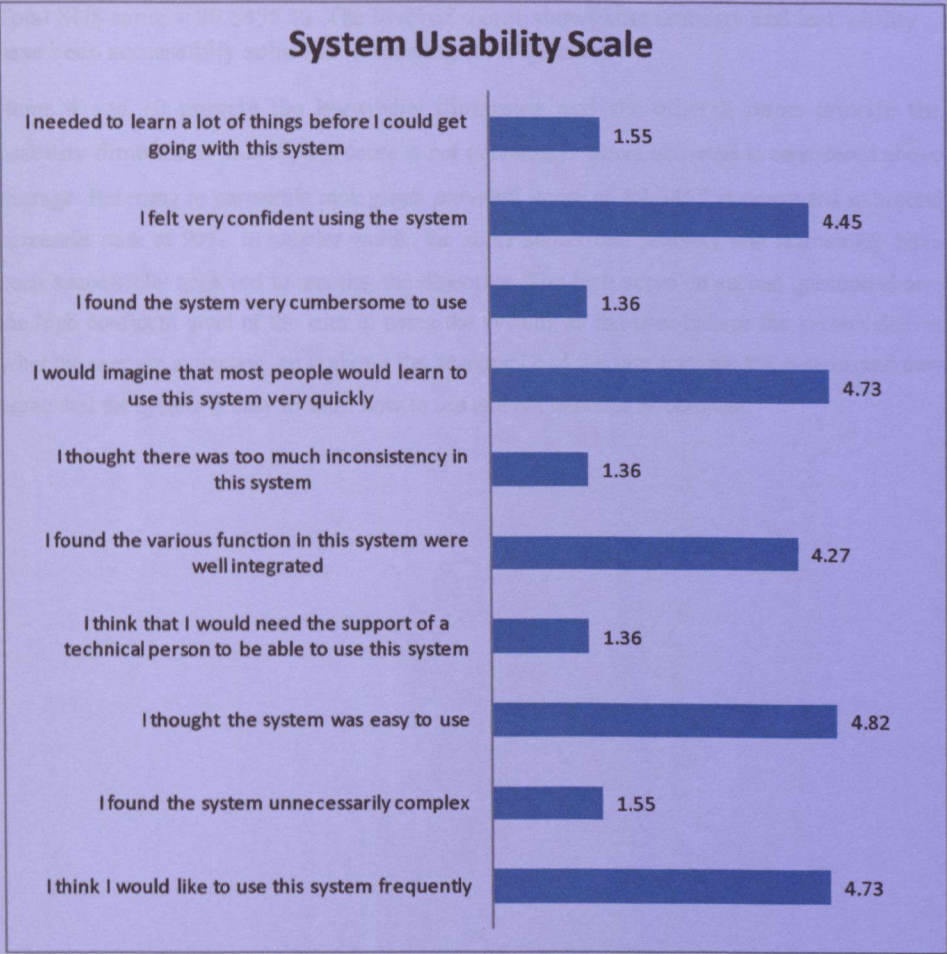| | |
|---|---|
| I needed to learn a lot of things before I could get going with this system | 1.55 |
| I felt very confident using the system | 4.45 |
| I found the system very cumbersome to use | 1.36 |
| I would imagine that most people would learn to use this system very quickly | 4.73 |
| I thought there was too much inconsistency in this system | 1.36 |
| I found the various function in this system were well integrated | 4.27 |
| I think that I would need the support of a technical person to be able to use this system | 1.36 |
| I thought the system was easy to use | 4.82 |
| I found the system unnecessarily complex | 1.55 |
| I think I would like to use this system frequently | 4.73 |

Figure 23 Results of the SUS test

Total SUS score = 89.5455 %. The level of scores shows that usability and learnability have been successfully achieved in meeting the objective.

Items 4 and 10 provide the learnability dimension and the other 8 items provide the usability dimension. In SUS, this score is not percentage. Score above 68 is considered above average. Referring to percentile rank graph provided, score of 89.5455 is converted to around percentile rank of 90%. In simpler words, the score shows that usability and learnability have been successfully achieved in meeting the objective. The high score on second question shows the high confident level of the user in using the system, as the user believe the system deliver what the user are expecting. on It shows the acceptance of the user towards the system, and they agree that the system is easy to learn how to use and not necessarily complex.

# CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

To conclude, people need to be reminded on what the task they have to do, and regarding to this, the reminder need to be mobile so it can remind the user, anytime, anywhere. Mobile Collaborative Task Tracker and Reminder provide a solution by delivering a good user interface for the user the set the reminder not only to oneself, but also to those who are involve with the task. Collaborative are shown in the sharing of the reminder of the same task. Multiple individuals from multiple devices will receive the same reminder, and the presence of tracker to keep track of the status of each individual. The result of testing shows that usability and learnability have been successfully achieved in meeting the objective. In further development of the project, it has a good prospect to further expand its scope into handling bigger task. It can be develop in such as a project management which can does all the same basic thing as Mobile Collaborative Task Tracker and Reminder did, with additional function as all of the user can share their resource and the discussion of the project handled can be done in the application itself. Furthermore, the contact's can be expanded to provide more details of the person, including the picture, so the user can recognize each of person who involve in the task.

# REFERENCES

[1] Adams, W., Addy, E., et al. Association for Computing Machinery. *Computer Science Curriculum 2008: An Interim Revision of CS2001 Report from the Interim Review Task.*2008.

[2]Redmond, M. A Computer Program to Aid Assignment of Student Project Groups. *SIGCSE '01: Proceedings of the thirty-second SIGCSE technical symposium on Computer Science Education.* 2001.

[3] Weber, J., Pollack, M. Evaluation User Preferences for Adaptive Reminding. *ACMDL CHI 2008.*April 5-10, 2008.

[4] McGee-Lennon, M., Wolters, M., Brewster, S. User-Centred Multimodal Reminders for Assistive Living. *ACMDL CHI2011 Session:Home Automation* .May 7-12,2011.

[5] Kim, S., Kim, M., Park, S., Jin, Y., Choi, Y. Gate Reminder: A Design Case of a Smart Reminder. *ACMDL DIS2004*, August 1-4,2004

[6]Norman, D.A. *The Design of Everyday Things.* Double Publishing Group, New York, NY. 1988

[8]Park, SH.,Won,SH., Lee, JB.,Kim,SW. Smart home-Digitally Engineered Domestic Life. *In the Proceeding of First Appliance Design(IAD)*(HP Labs, Bristol,UK, May 6-8, 2003)

[9] Oulasvirta, A., Raento,M., Tiitta, S. ContextContacts: Re-Designing SmartPhone's Contact Book to Support Mobile Awareness and Collaboration. *MobileHCI'05,September 19-22,2005,Salzburg, Austria.*2005.

[10]Sacks, H., Schegloff,E.A, and Jefferson, G.A, Simplest systematic for the organization of turn taking in conversation. *Language 50* (1974), 696-735

[11] Munson, J. , Dewan, P. Sync: A Java Framework for Mobile Collaborative Applications.*1997 IEEE.* 1997.

[12] Jonsson, A., Novak, L. SyncML-Getting the mobile Internet in sync. *Ericsson Review No.3.*2001

[13] Fails,J., Druin, A., Guha, M. Mobile Collaboration: Collaborative Reading and Creating Children's Stories on Mobile Devices.*ACM IDC2010.* June 9-12 2010.

[14] Fails,J., Druin, A., Guha, M. Collocated Mobile Collaboration.*ACM CHI 2009~ Video Showcase.* 2009.

[15] Lara, E., Kumar,R., Wallach, D., Zwaenepoel, W. Collaboration and Multimedia Authoring on Mobile Device.*Procedings of MobiSys 2003: The First International Conference on Mobile System, Applications, and Services, San Francisco,CA,USA.* 2003

[16] Divitini, M., Farshcian, B., Samset, H. Ubicollab: Collaboration support for monile users.*2004 ACM Symposium on Applied Computing.*2004

[17] Apelt, W.,What Groupware Functionality do Users Really Use? *9th Euromicro Workshop on PDP,* (2001), IEEE.

[18] Ludford,P. Frankowski, D., Reily, K.,et al. Because I Carry My Cell Phone Anyway: Functional Location-Based Reminder Applications. *CHI 2006 Proceedings. Everyday Use of Mobiles.* 2006

[19] Springer, T., Endler, M., Loureiro, A. et al.A Flexible Architecture for Mobile Collaboration Services. *Middleware '08 Companion.* 2008.

[20] Borcea, C.,Gupta, A., Kalra, A., et al. The MobiSoC Middleware for Mobile Social Computing: Challenges, Design, and Early Experiences. *MobiSys '07: Proceedings of the 5th international conference on Mobile systems, applications and services.* 2008

[21]Ermilov, T., Heino, N., Auer, S. OntoWiki Mobile- Knowledge Management in your Pocket. *WWW '11 Proceedings of the 20th international conference companion on World wide web.*2011.

[22]D.Carnevele.Email is for old people.*The Chronicle of Higher Education.*October 2006

[23] Gartner. "Gartner Says Worldwide Mobile Device Sales to End Users Reached 1.6 Billion Units in 2010; Smartphone Sales Grew 72 Percent in 2010" Internet: http://www.gartner.com/it/page.jsp?id=1543014, March 1, 2011.

[24] Citation. (2011, November 25). In Wikipedia, The Free Encyclopedia. Last modified 25 October 2011, retrieve on 28 October 2011,from http://en.wikipedia.org/wiki/Android_Dev_Phone

[25]Xuguang, H. (2009). An introduction to android. Dababase Lab.Inha Univeristy.

[26] Users Review. **alopix** retrieve October 11, 2011, **Titch** retrieve October 27, 2011 from Android Market Web Site: https://market.android.com/details?id=com.vsourz.Taskaid&hl=en

[27] Sergio F., Jose A., Valeria H., Andres N. The Iceberg Effect: Behind The User Interface of Mobile Collaborative Systems. *Journal of Universal Computer Science, vol 17, no.2(2011), 138-202.*2011.

[28] Sauro, J. (2011). Measuring Usability With The System Usability Scale (SUS). In Measuring Usability. Retrieved April 11, 2012, from: http://www.measuringusability.com/sus.php

# APPENDICES

## <u>SYSTEM USABILITY SCALE</u>

|  | Strongly dissagree 1 | 2 | 3 | 4 | Strongly agree 5 |
|---|---|---|---|---|---|
| 1 I think I would like to use this system frequently | | | | | |
| 2 I found the system unnecessarily complex | | | | | |
| 3 I thought the system was easy to use | | | | | |
| 4 I think that I would need the support of a technical person to be able to use this system | | | | | |
| 5 I found the various function in this system were well integrated | | | | | |
| 6 I thought there was too much inconsistency in this system | | | | | |
| 7 I would imagine that most people would learn to use this system very quickly | | | | | |
| 8 I found the system very cumbersome to use | | | | | |
| 9 I felt very confident using the system | | | | | |
| 10 I needed to learn a lot of things before I could get going with this system | | | | | |